

18717

THE STATE OF SOUTH CAROLINA

In the Court of Appeals

APPEAL FROM ORANGEBURG COUNTY
Court of Common Pleas
James C Williams, Jr , Circuit Court Judge

ORIGINAL

Case No 08- CP-38-826

Kareem J Graves and Tara Graves, individually and as duly appointed
personal representatives of the Estate of India Iyanna Graves Appellants,

vs

CAS Medical Systems, Inc Respondent

Record on Appeal
Volume II

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SC Court of Appeals

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The undersigned certifies, pursuant to Rule 209(c), SCAR, that the Record on Appeal contains no matter which is irrelevant to the Appeal



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November 5, 2010

1 CONTENTION ABOUT THAT, THERE MAY NOT BE ANY CONTENTION
2 ABOUT THAT ANYMORE MR PAINTER IN PARTICULAR I THINK
3 SAID THAT, I DON'T KNOW THAT THAT'S REALLY WHAT THEY
4 MEAN TO BE DOING THERE IN THE ANSWER THEY SAY THERE'S
5 A DEFECT THAT ALLOWS THE BAR TO APPEAR WITHOUT THE ALARM
6 SOUNDING BUT THEY DON'T GIVE ME THE FACTUAL BASIS FOR
7 THAT CONTENTION, ANY DOCUMENTS SUPPORTING THE CONTENTION
8 OR PERSONS WHO WILL TESTIFY TO THAT AND AGAIN, THAT'S
9 GETTING TO THE HEART OF THE OUTSTANDING EXPERT ISSUE

10 THE COURT WHAT I READ IN THEIR
11 ANSWER, THIS IS, THIS IS ON THE ADDITIONAL
12 INTERROGATORIES, RIGHT?

13 MR. DuBOSE. CORRECT, YOUR HONOR
14 THE COURT AND WHY IS THE ANSWER
15 NOT SUFFICIENT?

16 MR. DuBOSE WITHOUT LOOKING OVER
17 YOUR SHOULDER, WHAT I'VE PUT IN MY MOTION WAS THAT THE,
18 THEY STATE THAT A DEFECT ALLOWS THE BAR TO APPEAR
19 WITHOUT THE ALARM SOUNDING

20 THE COURT IT SAYS, "IT IS
21 PLAINTIFFS' CONTENTION THAT THE SOFTWARE CODE HAS A
22 DESIGN DEFECT WHICH MAY THE, QUOTE, ALARM HEARD, AND
23 QUOTE, BAR, TO BE PLACED IN THE WAY FORM WITHOUT THE
24 ALARM ACTUALLY SOUNDING "

25 MR DuBOSE. RIGHT AND I BELIEVE

1 THE INTERROGATORY ALSO ASKS THEM TO IDENTIFY THE FACTUAL
2 BASIS FOR THAT CONTENTION AND ANY DOCUMENTS SUPPORTING
3 THAT CONTENTION AND THE NAMES OF ANYBODY WHO WILL
4 TESTIFY TO THAT CONTENTION, AND THAT'S WHAT I DIDN'T
5 GET

6 THE COURT. ALRIGHT MR WINSLOW,
7 WHAT ABOUT THAT?

8 MR. WINSLOW. AND YOUR HONOR, WE
9 THOUGHT WE HAD ANSWERED HIS QUESTION THE FACTUAL BASIS
10 WOULD GO BACK TO THE REQUEST FOR PRODUCTION AND THAT
11 WOULD BE ENUMERATED AS A SUBPART TO THIS QUESTION I
12 BELIEVE, AND THAT WOULD MAKE THIS ACTUALLY TWO SEPARATE
13 QUESTIONS AND WE - - -

14 THE COURT. WELL, I THINK THAT'S
15 REALLY COVERED IN WHAT WE'VE ALREADY TALKED ABOUT ON THE
16 EARLIER REQUEST TO PRODUCE AND INTERROGATORIES I THINK
17 THEY NEED TO GIVE HIM WHATEVER THEY'VE GOT

18 MR. WINSLOW AND I UNDERSTAND, YOUR
19 HONOR, BUT HE'S ALREADY ASKED, YOU KNOW, FIFTEEN
20 INTERROGATORIES, HE'S MAXIMIZED HIS DISCOVERY IF HE
21 STARTS BREAKING THESE UP INTO SUB-PARTS AS HE'S DOING,
22 ASKING TWO QUESTIONS IN ONE, THEN HE'S GOING OVER HIS
23 ALLOTTED AMOUNT AND THIS IS A TWO QUESTION, ONE IS A,
24 ANSWER THIS, AND THEN ALSO, IT GOES TO YOUR FACTUAL
25 BASIS THAT'S TWO QUESTIONS IN ONE

1 THE COURT. I DON'T THINK SO, I
2 MEAN, IF YOU'D HAD, THE ANSWER COULD HAVE BEEN, WE DON'T
3 HAVE ANY SUCH OPINION, THERE WOULDN'T BE ANY SUCH
4 QUESTION SO, I DON'T THAT, I'M NOT GOING TO LET YOU
5 OUT ON THAT GROUND

6 WHAT'S THE NEXT ONE?

7 MR DuBOSE NUMBER TWO, YOUR HONOR

8 THE COURT DO YOU CONTEND THAT --
9 GEE, THIS IS A TWO PAGE QUESTION "PLAINTIFF OBJECTS TO
10 THIS INTERROGATOR AS WRITTEN AS IT IS VAGUE IT IS
11 UNCLEAR, DEFENDANT IS SPEAKING OF ALL ALARM HEARD AND
12 BAR AT THE WAVE FORM OR ONLY CERTAIN INSTANCES IT IS
13 PLAINTIFF'S CONTENTION THAT THE ALARM DID NOT SOUND
14 DESPITE THE FACT THAT CERTAIN HUMAN EVENTS HAD OCCURRED
15 WHICH SHOULD HAVE TRIGGERED THE ALARM TO SOUND IN SUCH
16 CONTENTION PLAINTIFF CONTENDS THAT ON AT LEAST TWO
17 OCCASIONS THE ALARM DID NOT SOUND DESPITE THE HUMAN
18 EVENTS THAT SHOULD HAVE TRIGGERED THE ALARM TO SOUND "

19 MR DuBOSE YOUR HONOR, IF I COULD
20 BORROW THAT FROM YOU A MINUTE MAYBE I CAN - - -

21 THE COURT ALRIGHT, LET ME LOOK AT
22 IT ONE SECOND

23 MR DuBOSE ALRIGHT I'M SORRY

24 THE COURT WELL, HE, HE'S ASKING IF
25 YOU CONTEND THAT THE ALARM INDICATOR ERRONEOUSLY

1 INDICATED THAT THE ALARM SOUNDED AND IF YOU DO CONTEND
2 THAT IT ERRONEOUSLY INDICATED THAT THE ALARM SOUNDED
3 WHEN THE ALARM DIDN'T SOUND, THEN WHAT DO YOU HAVE TO
4 BACK THAT UP? AND YOUR ANSWER DOESN'T DEAL WITH IT AT
5 ALL, YOUR ANSWER JUST SAYS, IT IS PLAINTIFF'S CONTENTION
6 THAT THE ALARM DID NOT SOUND SO, YOUR ANSWER DOESN'T
7 DEAL WITH THE QUESTION THE QUESTION IS, IF YOU THINK
8 THAT THE ALARM -- THE MONITOR THAT SAID IT SOUNDED WAS
9 WRONG WHAT BASIS, WHAT FACTS DO YOU HAVE TO BACK THAT
10 UP? AND YOU DIDN'T ANSWER THAT QUESTION, YOU JUST SAID,
11 WELL, THE ALARM DIDN'T SOUND

12 DO YOU WANT TO SEE IT MR DuBOSE?
13 BUT THAT'S WHAT IT AMOUNTS TO

14 MR DuBOSE NO, THAT CORRESPONDS
15 WITH WHAT I HAVE HERE

16 THE COURT DO YOU SEE WHAT I'M
17 SAYING?

18 MR WINSLOW YOUR HONOR, THAT MIGHT
19 BE BECAUSE THE QUESTION IS SO LARGE AND VAGUE IT WAS
20 MISUNDERSTOOD I MEAN, IT'S - - -

21 THE COURT. WELL, ALRIGHT, IF YOU
22 LOOK -- I DIDN'T EVEN READ A THROUGH - - -

23 MR. WINSLOW. I MEAN, IT'S SUCH A,
24 I MEAN, IT'S A TEN PART - - -

25 THE COURT --- K ALRIGHT YOU'VE

1 GOT THE ALARM -- THE MONITOR HERE, AND IT'S GOT ITS
2 ALARM IN IT AND OVER HERE YOU'VE GOT THIS DEVICE THAT
3 SUPPOSED TO LET US KNOW IF THIS ALARM IS SOUNDING HE'S
4 ASKING YOU IF YOU ARE CONTENDING THAT THIS ALARM, THIS
5 DEVICE OVER HERE ERRONEOUSLY INDICATED THAT THE ALARM
6 SOUNDED WHEN IT ACTUALLY DIDN'T SOUND OVER HERE, AND IF
7 THIS DEVICE ERRONEOUSLY INDICATED AN ALARM THAT IT
8 REALLY DIDN'T HEAR, WHAT FACTS DO YOU HAVE TO BACK UP
9 THAT OPINION? AND YOUR ANSWER SAYS, THIS ALARM OVER
10 HERE DID NOT SOUND

11 MR. WINSLOW. IN WHAT, IN WHICH
12 EVENT? HE'S VERY VAGUE IN WHEN THE SOUNDING OF THE
13 ALARM OR NON-SOUNDING OF THE ALARM, IS IT JUST IN REGARD
14 TO THAT DAY?

15 MR. DuBOSE YOUR HONOR, I -- IF I
16 CAN HELP YOU

17 THE COURT YES, SIR

18 MR. DuBOSE ALRIGHT, THE OBJECTION
19 WAS THAT IT WAS VAGUE AS TO TIME, BUT I THINK THE
20 INTERROGATORY IS ACTUALLY VERY SPECIFIC AS TO TIMES,
21 DURING THE HOUR OR SO THAT, ACTUALLY THE LAST FOUR HOURS
22 OF INDIA GRAVES' LIFE AND IF HE DOESN'T UNDERSTAND
23 THAT AS BEING THE INTENT THEN I'LL BE HAPPY TO REPHRASE
24 IT TO DO THAT

25 THE COURT WELL, HE DIDN'T

1 UNDERSTAND THAT, SO WE'LL CLARIFY THAT THE LAST FOUR
2 HOURS OF THE CHILD'S LIFE

3 MR. DuBOSE RIGHT AND THAT
4 ENCOMPASSES THE LAST TIME THE MONITOR WAS TURNED ON

5 THE COURT AND THE OTHER, THE REST
6 OF THAT IS JUST DETAILING A LITTLE BIT SO IT WOULDN'T BE
7 SO VAGUE AND I THINK HE'S ENTITLED TO HAVE THAT
8 ANSWERED PROPERLY, BECAUSE I DON'T THINK YOUR ANSWER
9 REALLY ADDRESSED IT

10 ALRIGHT, WHICH ONE IS NEXT?

11 MR. DuBOSE WE CAN JUMP OVER TO
12 NUMBER FIVE, YOUR HONOR

13 THE COURT. I'M GLAD TO JUMP OVER

14 MR. DuBOSE. ALRIGHT I AXED A FEW
15 OF THEM OUT LAST NIGHT, JUDGE, IF THAT WILL GIVE YOU A
16 BETTER FEELING

17 THE COURT DO YOU CONTEND THAT THE
18 ALARM INDICATOR IN THE ALARM CHANNEL ON THE INDIA GRAVES
19 DOWNLOAD CAN APPEAR WITHOUT THE MONITOR MICROPHONE
20 HEARING THE ALARM? IF SO, IDENTIFY THE FACTUAL BASIS
21 FOR YOUR CONTENTION AND DOCUMENTS SUPPORTING YOUR
22 CONTENTION AND ALL PERSONS WHO WILL TESTIFY INCLUDING
23 THE FOLLOWING YOUR ANSWER WAS, PLAINTIFF IS UNABLE TO
24 RESPOND TO THIS REQUEST AT THIS TIME, AS THE ELECTRONIC
25 SOFTWARE CODE HAS NOT BEEN PROVIDED AT THIS TIME

1 PLAINTIFF IS UNABLE TO TEST SUCH CODE AND THEREFORE ANY
2 RESPONSE TO THIS INTERROGATORY WILL BE SUPPLEMENTED UPON
3 FURTHER TESTING OF THE CODE AND HE SAYS HERE, BY A PEN
4 NOTATION THAT YOU GOT THE CODE ON NOVEMBER THE EIGHTH

5 MR WINSLOW. AND WE WILL SUPPLEMENT
6 IT, YOUR HONOR

7 THE COURT. ALRIGHT, YOU'RE GOING TO
8 RESPOND TO THAT

9 WHAT ELSE CAN WE SKIP OVER?

10 MR DuBOSE. OKAY WELL, WE CAN
11 SKIP OVER SIX AND GO TO SEVEN, YOUR HONOR

12 THE COURT. ALRIGHT

13 MR DuBOSE ON AN EARLIER -- INDIA
14 GRAVES DIED ON APRIL ELEVEN BACK IN MARCH WHEN SHE WAS
15 AT HOME ON THE MONITOR THERE WAS SEVERAL OCCASIONS WHERE
16 THE DOWNLOAD FOR THE MONITOR LOG INDICATED THAT THE
17 FRONT ALARM WAS NOT HEARD, MEANING THE MICROPHONE DIDN'T
18 HEAR THE FRONT ALARM AND TURNED ON THE REAR ALARM, AND
19 MADE NOTATION OF THAT IN THE LOG THERE ARE OTHER
20 OCCASIONS WHERE THE REAR ALARM WAS ALSO NOT HEARD BY THE
21 MICROPHONE AND IT MADE NOTATION OF THAT ONE OF THEIR
22 EXPERTS SAYS, LOOK AT THAT, THAT'S EVIDENCE THAT THIS
23 MONITOR IS DEFECTIVE WE DON'T AGREE WITH THAT, WE
24 THINK, AND WE'RE GOING TO GET TO THIS A LITTLE FURTHER,
25 TOO, IN OUR MOTION TO AMEND, BUT INTERROGATORY SEVEN IS

1 DIRECTED TO THOSE EVENTS WHERE THE ALARM WAS INDICATED
2 NOT HEARD, AND ASKING WHAT BASIS THEY HAVE, I THINK,
3 WITHOUT HAVING THAT IN FRONT OF ME, TO CONTEND THAT
4 THAT'S A DEFECT

5 THE COURT SO, THAT'S WHERE YOUR
6 SOFTWARE IS SAYING THAT THE ALARM ALARMED, BUT THIS
7 DEVICE OVER HERE, THE MONITOR'S ALARM DIDN'T PICK IT UP?

8 MR. DuBOSE WELL, LET ME CLARIFY
9 THAT A LITTLE BIT THE MONITOR HAS A LOT OF WHAT THEY
10 CALL MODULES OF SOFTWARE ONE MODULE DOES JOB A,
11 ANOTHER ONE DOES JOB B IN ADDITION TO THAT, WITHIN THE
12 MONITOR IS THAT MICROPHONE THAT WE'VE BEEN TALKING
13 ABOUT, AND IT LISTENS FOR THE ALARM, AND IF IT HEARS IT
14 IT LOGS IT, IF IT DOESN'T HEAR IT, IT LOGS THAT AND
15 TURNS ON THE REAR ALARM LIKE WE'VE TALKED ABOUT THE
16 OTHER - - -

17 THE COURT IF IT DOESN'T HEAR IT
18 HOW DOES IT KNOW IT DIDN'T HEAR IT?

19 MR. DuBOSE. IT KNOWS THAT THE ALARM
20 IS SUPPOSED TO BE GOING OFF THROUGH THE COMPUTER
21 SOFTWARE, AND IF IT'S -- IT'S ALWAYS ON, BUT IF IT
22 DOESN'T HEAR THE ALARM WHEN IT SHOULD, THE LOG HAS
23 INDICATED THAT THE FRONT ALARM IS NOT HEARD, AND THAT'S
24 HOW THEY TRIGGER THE REAR ALARM IN FACT, THE GUY THAT
25 DEVELOPED THE SOFTWARE HAS GOT A PATENT ON THIS IT'S

1 THE ONLY MONITOR THAT DOES THIS SO, ANYWAY, ALL OF
2 THAT'S IN THE MONITOR THE SEPARATE PIECE OF SOFTWARE
3 THAT WE'VE BEEN TALKING ABOUT IS WHAT YOU LOAD ON YOUR
4 COMPUTER SO YOU CAN DOWNLOAD THAT INFORMATION OFF OF THE
5 MONITOR ON TO YOUR COMPUTER

6 THE COURT. SO, YOU ARE ASKING WHICH

7 - - -

8 MR. DuBOSE. I'M ASKING, WAS -- I'M
9 SORRY, YOUR HONOR, GO AHEAD

10 THE COURT ARE YOU ASKING WAS THERE
11 A MALFUNCTION OF THE GRAVES MONITOR OR WAS THERE A
12 MALFUNCTION OF THE REPORT GENERATOR, IS THAT, WHEN YOU
13 SAY, ALL OF THE REPORT GENERATOR?

14 MR. WINSLOW YES

15 MR. DuBOSE. YES, SIR, THE REPORT
16 GENERATOR IS THAT SECOND SOFTWARE

17 THE COURT. IS THAT AN EITHER/OR?

18 MR. DuBOSE. I'LL HAVE TO LOOK AT
19 IT, YOUR HONOR

20 THE COURT. OR AND? ARE YOU GIVING
21 HIM A CHOICE?

22 MR. DuBOSE WELL, I'M ASKING HERE
23 WHETHER THEY INDICATE STRICTLY WHETHER IT'S A
24 MALFUNCTION OF THE REPORT GENERATOR AND MR GRAVES, I
25 MEAN, MR WINSLOW KNOWS WHAT THAT IS

1 THE COURT WELL, - - -

2 MR. DuBOSE. THAT'S, THAT IS A
3 PACKAGE - - -

4 THE COURT. I JUST WANT TO BE SURE
5 I UNDERSTAND IT

6 MR. DuBOSE. OKAY

7 THE COURT. DO YOU CONTEND THAT THE
8 FRONT ALARM HEARD, REAR ALARM HEARD INDICATIONS ON INDIA
9 GRAVES DOWNLOAD INDICATE A MALFUNCTION OF INDIA GRAVES'
10 MONITOR, OR THE REPORT GENERATOR SOFTWARE? IS THAT
11 GIVING HIM A CHOICE, IT WAS EITHER THE INDIA GRAVES
12 MONITOR OR THE REPORT GENERATOR, OR IS THAT SAYING ONE
13 OF THESE FAILED AND IT'S THE SAME THING, THE SAME TYPE
14 OF FAILURE?

15 MR. DuBOSE. THE QUESTION IS, AND
16 YOU'RE RIGHT, YOUR HONOR, IT'S NOT PHRASED AS WELL AS I
17 SHOULD HAVE

18 THE COURT WELL, I'M SURE TO Y'ALL
19 IT'S PROBABLY CLEAR BUT TO ME IT ISN'T

20 MR. DuBOSE. WELL, THE QUESTION I
21 MEANT TO ASK WAS, DO YOU CONTEND THAT EITHER ONE OF
22 THESE HAD AN ERROR, AND IF YOU DO TELL ME WHERE THAT
23 ERROR IS, AND SO FORTH AND SO ON?

24 THE COURT SO, THE INDIA GRAVES
25 MONITOR AND REPORTER GENERATOR ARE SEPARATE?

1 MR. DuBOSE RIGHT

2 THE COURT OKAY I UNDERSTAND THE
3 QUESTION NOW

4 MR. WINSLOW. AND IS THAT IN REGARDS
5 TO EVERY SINGLE INCIDENT UP FRONT, THE ALARM IN THE REAR
6 NOT HEARD WHILE IT WAS ON INDIA?

7 THE COURT FOUR HOURS

8 MR. WINSLOW JUST THOSE FOUR HOURS

9 MR. DuBOSE. WELL, THIS ACTUALLY
10 OCCURRED ON A PRIOR OCCASION, YOUR HONOR, THERE ARE
11 ABOUT MAYBE SIX OR SEVEN EVENTS BACK IN MARCH

12 MR. WINSLOW SO, THIS IS IN REGARD
13 TO EVERY SINGLE ONE OF THEM THAT THAT OCCURRED?

14 MR. DuBOSE WELL, IF YOU'RE
15 COMPLAINING, IF YOUR CLIENTS, OR EXPERTS RATHER, ARE
16 GOING TO COME IN AND SAY THAT THERE ARE SIX ALARM NOT
17 HEARDS AND THAT'S SIX DIFFERENT ERRORS IN THE CODE, I
18 THINK I WOULD LIKE TO KNOW THAT

19 MR. WINSLOW. WELL, BUT THEY HAVEN'T
20 SAID THAT

21 MR. DuBOSE. BUT IF THEY'RE GOING TO
22 SAY IT'S ALL ONE CODE, -- WELL, MR DAUGHERTY CAME IN
23 AND SAID, THAT SHOULD NOT HAPPEN, THERE SHOULD NEVER BE
24 A FRONT ALARM NOT HEARD, THAT IS A DEFECT IN THIS
25 MONITOR WITHOUT ANY BASIS, WITHOUT HAVING TESTED IT,

1 WITHOUT HAVING TO TEST TO SEE WHETHER YOU CAN PUT YOUR
2 THUMB OVER THE HOLE AND KEEP IT FROM ALARMING, HE JUST
3 SAID THAT OUT OF THE BLUE IF THAT'S GOING TO CONTINUE
4 TO BE YOUR OPINION I WANT TO KNOW THE BASIS FOR THAT

5 MR. WINSLOW I DON'T SAY THAT AS
6 BEING OUR OPINION, THAT'S NOT WHAT'S BEEN TESTIFIED TO,
7 IT'S BEEN TESTIFIED THAT THE ALARM DID NOT SOUND,
8 CAUSING THE DEATH OF THIS BABY THAT'S THE OPINION IF
9 YOU'RE TRYING TO FORMULATE OTHER DEFENSES, OR
10 FORMULATING THAT OUR EXPERTS ARE NOT BEING CREDIBLE,
11 THAT'S SOMETHING YOU CAN DO ON CROSS-EXAMINATION BUT
12 IN THIS SITUATION YOU'RE ASKING FOR A VERY BROAD
13 QUESTION, IN REGARD TO ALL OF THE INCIDENTS OR JUST A
14 FEW OF THEM AT A CERTAIN TIME PERIOD? I JUST DON'T
15 UNDERSTAND IT, IT'S VERY BROAD TO ME

16 THE COURT WELL, THEY WOULD BE
17 IDENTICAL INSTANCES, WHETHER IT WAS ONE OR SIX, HIS
18 OPINION WOULD BE THE SAME, I IMAGINE, TO EACH OF THEM

19 MR. WINSLOW SO, WHAT I'M ASKING,
20 WE CAN ASK THIS, NOT HAVING TO BREAK IT DOWN FOR EACH
21 ONE, BUT WE COULD JUST ANSWER THIS AS A GENERAL, IF THE
22 ALARM DOESN'T SOUND THIS IS WHAT HAPPENS, THIS IS THE
23 BREAKDOWN OF IT, AND WE DON'T HAVE TO GO SIX TIMES AND
24 DO IT

25 THE COURT. UNLESS HE CONTENDS THERE

1 WERE DIFFERENT REASONS AND DIFFERENT MALFUNCTIONS
2 ISN'T THAT RIGHT?

3 MR. DuBOSE THAT'S EXACTLY RIGHT,
4 YOUR HONOR, THAT'S WHERE I AM

5 THE COURT YEAH

6 MR. DuBOSE AND IT'S NOT THE ALARM
7 NOT BEING HEARD THE NIGHT THE CHILD DIED WE'RE TALKING
8 ABOUT HERE, WE'RE TALKING ABOUT THE INDICATOR OF AN
9 ALARM NOT HEARD, FRONT ALARM NOT HEARD, AND AT DIFFERENT
10 TIMES REAR ALARM NOT HEARD BACK IN MARCH

11 THE COURT AND THAT WAS, IS -- WHAT
12 YOU'RE SAYING IS, HE SAID THAT WAS EVIDENCE THAT THE
13 MACHINE WAS DEFECTIVE

14 MR. DuBOSE RIGHT WITHOUT ANY
15 BASIS PROVIDED TO ME

16 THE COURT. WELL, YOU NEED TO
17 PROVIDE A BASIS FOR THAT, I THINK HE'S RIGHT, I'LL
18 GRANT THAT PART OF THE MOTION

19 ALRIGHT, WHAT'S NEXT?

20 MR. DuBOSE. IN INTERROGATORY NUMBER
21 TEN, YOUR HONOR, THERE ARE, AS YOU'VE READ IN OUR MEMO,
22 OTHER COMPLAINTS REGARDING THE MONITOR, AND NONE OF THEM
23 HAVE BEEN DETERMINED TO BE VALID, BUT THERE ARE OTHER
24 COMPLAINTS THEY'VE INDICATED THEY'RE GOING TO BRING
25 THE PARENTS INVOLVED IN ONE OF THOSE COMPLAINTS TO TRIAL

1 AND THIS INTERROGATORY BASICALLY ASKS THE NAMES OF ANY
2 OTHER PEOPLE THEY'RE GOING TO BRING TO TRIAL THAT
3 HAVEN'T ALREADY BEEN IDENTIFIED AND THEIR ANSWER WAS,
4 WELL, YOU'VE GOT THE COMPLAINTS, SO YOU SHOULD KNOW
5 BUT HAVING A LIST OF COMPLAINANTS IS DIFFERENT THAN
6 HAVING A LIST OF WITNESSES SO, I WANT A LIST OF
7 WITNESSES IT MAY BE THAT THERE ARE NOT ANY, BUT I'M
8 ENTITLED TO AN ANSWER

9 THE COURT. YES, SIR, HE'S ENTITLED
10 TO AN ANSWER I MEAN, IF YOU'VE GOT SOMEBODY THAT
11 CLAIMS IT FAILED AND YOU INTEND TO HAVE THEM TESTIFY,
12 HE'S ENTITLED TO KNOW WHO THEY ARE

13 MR. WINSLOW YES, SIR

14 THE COURT ABSOLUTELY

15 ALRIGHT

16 MR. DuBOSE INTERROGATORY TWELVE,
17 I'M SORRY, YOUR HONOR, THE NEXT ONE

18 THE COURT. IF YOU CONTEND THAT THE
19 ALARM HEARD INDICATORS LOGGED BY THE AMI-PLUS SOFTWARE
20 ARE CREATED BY COMPUTER CODE AND THE MONITOR SOFTWARE,
21 IDENTIFY WHICH MODULE AND PORTION OF THE CODE WITH THE
22 MODULES YOU CONTEND CREATE THE INDICATIONS ON THE LOG,
23 THE SPECIFIC PORTIONS OF ANY DOCUMENTS SO STATED, AND
24 ALL PERSONS WHO WILL TESTIFY AND THE ANSWER IS,
25 PLAINTIFF OBJECTS TO THIS AS BEING VAGUE AND OVERLY

1 BROAD PLAINTIFF IS UNSURE AS TO WHAT INFORMATION THE
2 DEFENDANT IS TRYING TO GATHER IN THIS REQUEST
3 PLAINTIFF IS UNAWARE OF ANY WAY FOR THE INDICATORS TO BE
4 LOGGED IF NOT BY SOFTWARE CODE

5 SO, MAYBE IT REQUIRES SOME
6 EXPLANATION

7 MR. DuBOSE WELL, I'LL BE HAPPY TO
8 DO THAT, YOUR HONOR THEY'VE ANSWERED PART OF IT, THEY
9 DO CONTEND IT'S LOGGED BY SOFTWARE THAT'S IMPLICIT IN
10 THEIR ANSWER

11 THE COURT WELL, IT IS, KIND OF,
12 YEAH

13 MR. DuBOSE. BUT I'M NOT SURE WE
14 AGREE WITH THAT, AND I WANT TO KNOW, THEREFORE, THEIR
15 BASIS FOR THAT CONTENTION

16 THE COURT YOUR ANSWER SAYS,
17 PLAINTIFF IS UNAWARE OF ANY WAY FOR THE INDICATORS TO BE
18 LOGGED IF NOT BY SOFTWARE CODE SO, THAT'S AN ADMISSION
19 THAT THEY ARE LOGGED BY SOFTWARE CODE AND SO, HE WANTS
20 TO KNOW WHY YOU THINK THEY ARE LOGGED BY SOFTWARE CODE
21 APPARENTLY, HE THINKS THAT'S SUSPECT

22 MR. WINSLOW WELL, LET ME, LET ME
23 TRY TO CLARIFY IT FOR MYSELF, YOUR HONOR

24 THE COURT. SURE

25 MR. WINSLOW. WHAT HE'S SAYING IS,

1 THE MONITOR'S REPORT ONTO THE GENERATOR, HOW DOES THAT
2 HAPPEN? IS THAT - - -

3 MR. DuBOSE. NO, THAT'S NOT RIGHT
4 THE QUESTION IS WHETHER YOU CONTEND THAT THE LOG WHICH
5 IS THE VERY BASIC PART OF THE MONITOR THAT TAKES DOWN
6 INFORMATION ITS GIVEN TO RECORD WITH REGARD TO THE ALARM
7 HEARD PORTION OF THE INFORMATION ON THE LOG IS, WHETHER
8 THAT INFORMATION IS DELIVERED TO THE LOG BY SOFTWARE OR
9 BY ELECTRONIC OPERATION OF THE MICROPHONE DIRECTLY

10 MR. WINSLOW. AND WHEN YOU SAY, LOG,
11 ARE YOU REFERRING TO THE REPORT GENERATOR, THE LOG THAT
12 PRINTS OUT OR ARE YOU TALKING ABOUT - - -

13 MR. DuBOSE NO, THE REPORT
14 GENERATOR DOWNLOADS THE LOG OFF OF THE MONITOR I'M
15 TALKING ABOUT THE LOG IN THE MONITOR

16 MR. WINSLOW. SO, YOU'RE TALKING - -

17 -

18 MR. DuBOSE IT'S AN ELECTRONIC
19 MEMORY IN THE MONITOR, AND THE REPORT GENERATOR JUST
20 HELPS YOU GET THAT INFORMATION OFF THE MEMORY ONTO A
21 DESK TOP OR LAP TOP COMPUTER IN REPORT FORM, IN A REPORT
22 FORMAT

23 MR. WINSLOW YOU WANT TO KNOW HOW
24 THAT INFORMATION GETS INTO THE LOG ON THE MONITOR?

25 MR. DuBOSE. CORRECT, YEAH I THINK

1 I USED THE WORD, LOG IN THERE AND IN MR WINSLOW'S
2 DEFENSE, YOUR HONOR, SOME OF THESE WORDS CAN KIND OF
3 OVERLAP, AND YOU KNOW, A LOT OF THESE INTERROGATORIES
4 ARE CLEAR WHEN YOU WRITE THEM, AND MAYBE NOT AS CLEAR
5 WHEN YOU READ THEM ON THE OTHER END

6 THE COURT. WELL, APPARENTLY, THERE
7 ARE TWO ALTERNATIVES THAT CAN BE CREATED BY COMPUTER
8 CODE OR IT CAN BE CREATED BY THE MICROPHONE ITSELF IS
9 WHAT YOU HEARD

10 MR. DuBOSE. DIRECTLY BY THE
11 MICROPHONE, RIGHT

12 THE COURT SO, THAT WOULD BE GIVING
13 THEM A CHOICE

14 MR WINSLOW OKAY OKAY

15 THE COURT BUT IN EFFECT, YOU'VE
16 ANSWERED THAT BY SAYING, IT CAN ONLY BE THE SOFTWARE
17 CODE SO, HE WANTS TO KNOW WHAT YOU'RE BASING THAT ON

18 MR. WINSLOW WELL, AND I MAY HAVE
19 BEEN MISTAKEN, BECAUSE I THOUGHT HE WAS REFERRING TO THE
20 REPORT GENERATOR LOG THAT PRINTS OUT

21 THE COURT SO YOU DEFINITELY - - -

22 MR. WINSLOW SO, I'LL HAVE TO GO
23 BACK AND REVISIT THAT ONE, YOUR HONOR

24 THE COURT YOU NEED TO REDO YOUR
25 ANSWER ON THAT ONE

1 ALRIGHT-

2 MR. DuBOSE. ALRIGHT, YOUR HONOR,
3 NEXT WE COME TO OUR REQUESTS TO ADMIT

4 THE COURT. ALRIGHT

5 MR. DuBOSE. AND YOU'VE GOT A COPY
6 OF THOSE THERE I BELIEVE

7 THE COURT. YES, SIR

8 MR. DuBOSE. OKAY NUMBER ONE, WE
9 DIDN'T BELIEVE THAT THEIR ANSWER ADDRESSED THE QUESTION

10 THE COURT. ADMIT THAT THE
11 PLAINTIFFS HAVE NOT IDENTIFIED THE SPECIFIC DEFECT THAT
12 THEY CLAIM IS PRESENT IN THE SOFTWARE CODE WHICH CAUSES
13 THE MONITOR'S AUDIBLE ALARM INTERMITTENTLY TO FAIL TO
14 SOUND WHEN IT SHOULD PLAINTIFF DENIES THIS REQUEST AS
15 WRITTEN PLAINTIFF ADMITS THAT THE FAULTY DESIGN
16 CONSTITUTES A DEFECT THAT WAS THE PROXIMATE CAUSE OF THE
17 INCIDENT MADE THE BASIS OF THIS LAW SUIT

18 DO YOU WANT, YOU'RE ASKING FOR THE
19 SPECIFIC DEFECT WHICH CAUSES THE MONITOR'S AUDIBLE ALARM
20 INTERMITTENTLY TO FAIL TO SOUND AND IT SAYS, YOU'VE
21 NOT ADMITTED, YOU'VE NOT FOUND A SPECIFIC DEFECT, AND
22 YOU SAY, WE DENY THIS REQUEST, WHICH MEANS, YOU HAVE
23 IDENTIFIED THE SPECIFIC DEFECT AND THEN YOU SAY THAT
24 THE FAULTY DESIGN CONSTITUTES A DEFECT

25 MR. WINSLOW. THAT'S CORRECT, YOUR

1 HONOR THE DESIGN, THE STRUCTURE OF THE CODE ITSELF IS
2 THE DEFECT THAT CAUSES THE ALARM NOT TO SOUND

3 THE COURT WELL, AND YOU'RE ASKING
4 WHAT THE FAULTY DESIGN WAS WHAT WAS FAULTY IN THE
5 DESIGN?

6 MR. DuBOSE WELL, THE SPAGHETTI
7 CODE IS WHAT HE'S TALKING ABOUT, THAT ALLEGATION BUT
8 ALL I'M TRYING TO DO IS ENCAPSULATE IN A REQUEST TO
9 ADMIT TESTIMONY THAT WE'VE ALREADY GOTTEN FROM THEIR
10 EXPERTS I'M VERY SURPRISED THAT THEY DIDN'T ADMIT THAT
11 BECAUSE, FOR EXAMPLE, MR DAUGHTERY, AND I THINK I'VE
12 ALREADY QUOTED THIS SAME LANGUAGE IN OUR MOTION FOR
13 SUMMARY JUDGEMENT, I ASKED HIM, "BUT THE SPAGHETTI CODE
14 ITSELF, ASSUMING THAT IT IS SPAGHETTI CODE, DIDN'T
15 CAUSE, IS NOT ITSELF THE BUG," "NO", "IN THE CODE?" HE
16 HAD INTERRUPTED ME ANSWER "THE BUG IS SOMEWHERE IN
17 THE LINES OF CODE WHICH ARE INCORRECT " "OKAY, SO"
18 QUESTION "SO IF WE WANT TO GO FIND THE DIRECT CAUSE OF
19 THE PROBLEM WE'D HAVE TO FIND THE BUG, RIGHT?" ANSWER
20 "THAT'S CORRECT " LIVELY TOLD ME THE SAME THING "BUT
21 GETTING BACK TO MY QUESTION, IT'S THE BUG THAT IS THE
22 CAUSE OF THE MALFUNCTION IN A COMPUTE?" ANSWER
23 "THAT'S" AND THEN I CONTINUED MY QUESTION, "NOT THE
24 METHOD, THE GENERAL METHOD IN WHICH THE CODE IS
25 STRUCTURED?" ANSWER "THAT'S CORRECT " AND THIS

1 BLEEDS OVER TO THE HEART OF OUR SUMMARY JUDGEMENT
2 MOTION, WHICH IS A DIFFERENTIATION BETWEEN THEIR CLAIM
3 THAT A POORLY STRUCTURED CODE IS A DEFECT, OR DO THEY
4 HAVE TO FIND THE DEFECT IN THE CODE THAT MADE THE THING
5 MALFUNCTION, IF IT DID, IN FACT, MALFUNCTION? SO, THE
6 REQUEST TO ADMIT IS SIMPLY TO ADMIT WHAT THESE GUYS HAVE
7 ALREADY TESTIFIED TO, WHICH IS, YOU HAVEN'T FOUND THE
8 BUG-

9 MR. WINSLOW AND YOUR HONOR, THAT'S
10 NOT WHAT THEY'VE GOT TO TESTIFY TO THEY'VE TESTIFIED
11 THERE IS A DEFECT, AS IS WITH DR LIVELY, AND WE'RE
12 GOING TO ASK THEM THESE CERTAIN QUESTIONS AGAIN, BUT
13 HE'S TESTIFIED THERE IS A DEFECT, AND THAT THE STRUCTURE
14 OF THE CODE MAKES IT IMPOSSIBLE TO TRACK AND TRACE
15 NOW, THERE ARE MULTIPLE PROBLEMS WITHIN THE CODE ITSELF,
16 BECAUSE OF THE STRUCTURE OF THE CODE IN GENERAL, THAT'S
17 WHAT CAUSES THESE PROBLEMS SO, THEREFORE, THAT IS THE
18 DEFECT, I MEAN, THAT DEFECT IS THE STRUCTURE AND
19 THAT'S WHAT'S WRITTEN HERE, I BELIEVE

20 THE COURT WELL, I MEAN, I - - -
21 MR. DuBOSE. THAT ISN'T WHAT THEY
22 TOLD ME, JUDGE

23 MR. WINSLOW AND YOUR HONOR, I - -

24 -

25 THE COURT SIR?

1 MR. DuBOSE. THAT ISN'T WHAT THEY
2 TOLD ME

3 MR WINSLOW. AND YOUR HONOR, I'LL
4 BE MORE THAN HAPPY TO GO BACK AND ASK THEM AGAIN IF YOU
5 WANT ME TO, BUT - - -

6 THE COURT I REMEMBER READING THE
7 PART IN THE QUOTE SOMEWHERE THAT HE SAID THAT YOU HAVE
8 TO FIND THE BUG I MEAN, THAT THERE'S - - -

9 MR. WINSLOW BUT THE BREAKDOWN, I
10 MEAN, THERE'S TWO WAYS TO REMEDY THIS IT'S THE
11 STRUCTURE THAT'S THE DEFECT, IT'S THE PROBLEM BUT IF
12 YOU WANTED TO, REALLY, THERE'S MULTIPLE PROBLEMS, IT'S
13 NOT JUST THE ALARM NOT SOUNDING, THERE'S INCIDENTS OF
14 THE ALARM SOUNDING TOO MUCH THERE'S INCIDENTS OF THE
15 ALARM BEING LOGGED, I GUESS, AS BEING TURNED OFF WHEN
16 IT'S NOT TURNED OFF THERE'S MULTIPLE PROBLEMS, AND
17 EACH ONE OF THESE IS CAUSED BY A CERTAIN STRUCTURE IN
18 THE CODE SO, IF YOU WANT TO TAKE A CERTAIN PROBLEM YOU
19 HAVE TO GO THROUGH AND FIND THAT EXACT AREA, BUT THE
20 MAJOR DEFECT, THE PRIMARY DEFECT IS THE STRUCTURE ITSELF
21 THAT CAUSES THESE MULTIPLE PROBLEMS AND THAT'S, I
22 BELIEVE THAT'S WHAT'S WRITTEN AND I CAN REWRITE IT, I
23 CAN TALK TO THEM AGAIN, BUT - - -

24 MR. DuBOSE. JUDGE, ALL I ASKED
25 THERE IS WHETHER, I ASKED HIM TO ADMIT THEY HADN'T FOUND

1 THE BUG AND THEY CAN SAY ALL DAY, IF THE COURT LETS
2 THEM, THAT WE CAN'T FIND THE BUG BECAUSE OF THIS, AND
3 THAT, AND THAT IT'S SPAGHETTI CODE SO IT'S JUNK CODE TO
4 BEGIN WITH, BUT THE FACT, THE NARROW QUESTION THAT I
5 ASKED IS, DID YOU FIND THE BUG? AND THE ANSWER IS, NO,
6 AND HE'LL TELL YOU THE ANSWER IS NO, AND I WANT IT IN
7 THE ANSWERS TO MY REQUEST TO ADMIT

8 MR. WINSLOW YOUR HONOR, AND I, HE
9 RAISED THE QUESTION, HE SAID, IDENTIFY THE SPECIFIC
10 DEFECT WE HAVE IDENTIFIED THE DEFECT IF HE'S LOOKING
11 FOR A BUG THEN THAT, I DON'T KNOW WHAT A BUG EXACTLY IS,
12 I'D LIKE HIM TO DEFINE THAT FOR ME, BUT - - -

13 THE COURT. WELL, IF YOU SAY IT'S A
14 FAULTY DESIGN YOU'VE GOT TO SAY HOW IT'S FAULTY YOU
15 CAN'T JUST SAY IT'S A FAULTY DESIGN AND LET THE JURY
16 WONDER HOW IT'S FAULTY, - - -

17 MR. WINSLOW. THE QUESTION IS - - -

18 THE COURT. AND THAT'S WHAT HE'S
19 ASKING

20 MR WINSLOW. I UNDERSTAND, YOUR
21 HONOR

22 THE COURT THAT Y'ALL HAVEN'T FOUND
23 OUT WHAT IT'S FAULTY THAT'S WHAT HE'S ACCUSING YOU OF
24 NOT HAVING DONE IS TO FIND OUT WHY IT'S A FAULTY DESIGN

25 MR. WINSLOW WELL, IT'S THE

1 STRUCTURE, AS THE EXPERTS HAVE TESTIFIED TO BUT I'LL
2 ASK THEM AGAIN, YOUR HONOR, I HAVE NO PROBLEM DOING
3 THAT

4 THE COURT WELL, I THINK, I MEAN,
5 I'M NOT MISSING THE BUG, BUT IT LOOKS TO ME LIKE HE'S
6 TRYING TO, HE'S ASKING YOU, HOW IS THE DESIGN FAULTY?
7 ISN'T THAT WHAT IT AMOUNTS TO? FAULTY DESIGN IS A
8 PRETTY BROAD TERM

9 MR DuBOSE YOUR HONOR, THEY WANT
10 TO SAY THE CAR IS YELLOW, THEREFORE, THE BREAKS FAILED

11 THE COURT. YEAH

12 MR WINSLOW. THAT'S NOT, THAT'S NOT
13 TRUE, THAT'S NOT TRUE AT ALL THE STRUCTURE OF THE CODE
14 AS TESTIFIED TO BY THE EXPERTS, WHETHER MR DuBOSE
15 UNDERSTANDS THEM, IT MIGHT NOT HAVE BEEN AS CLEAR IN THE
16 DEPOSITION, THE STRUCTURE ITSELF IS LIKE A PILE OF
17 SPAGHETTI, IT'S THE WEAVING, THE WAVING, THE CROSSING OF
18 THE PARTS AND I UNDERSTAND, YOUR HONOR

19 THE COURT. WELL, THEN, YOU NEED TO
20 BE MORE SPECIFIC IN YOUR RESPONSE, AND THEN I'LL BE GLAD
21 TO HEAR MR DuBOSE ONCE YOU'RE MORE SPECIFIC, BUT I
22 DON'T THINK THIS THING, THERE'S A FAULTY DESIGN, ANSWERS
23 THE QUESTION

24 MR WINSLOW I'LL SPECIFY THAT,
25 YOUR HONOR

1 THE COURT I MEAN, YOU KNOW, YOU
2 COULDN'T SAY, THE CAR ROLLED OVER BECAUSE IT WAS FAULTY
3 DESIGN IN THE CAR, YOU'VE GOT TO BE A LITTLE BIT MORE
4 SPECIFIC ABOUT THAT

5 MR WINSLOW I CAN SPECIFY AS TO
6 THAT, YOUR HONOR

7 THE COURT. AND THAT MIGHT NOT
8 SATISFY YOU WHEN YOU GET IT, BUT IT SEEMS TO ME THAT
9 WOULD GET US CLOSER TO THE ANSWER YOU'RE LOOKING FOR

10 MR. DuBOSE. WE CAN TAKE IT ONE STEP
11 AT A TIME

12 THE COURT. ALRIGHT

13 MR WINSLOW THANK YOU, JUDGE

14 THE COURT WHAT'S NEXT?

15 MR DuBOSE. NEXT IS REQUEST NUMBER
16 TWO THEY ADMITTED THE REQUEST BUT ATTEMPTED TO QUALIFY
17 IT WITH -- I'M SORRY, I'M CAUGHT UP BY MY OWN TYPO HERE
18 -- PHRASE TO THE -- QUOTE TO THE EXTENT THAT, IT IS
19 PLAINTIFF'S CONTENTION THAT DEFECT IS BASED ON THE
20 FAULTY DESIGN AND THAT AGAIN GOES BACK TO THE
21 CONTENTION OF WHETHER THEY CAN JUST SAY, FAULTY DESIGN,
22 OR WHETHER THEY HAVE TO IDENTIFY THE SPECIFIC DEFECT
23 WITHIN THE CODE THAT THEY CLAIM CAUSED THIS PROBLEM
24 THEY TAKE US TO TEST FOR NOT REPAIRING IT, BUT THEY
25 HAVEN'T FOUND IT

1 MR. WINSLOW. AND AGAIN, YOUR HONOR,
2 IT'S THE SAME ARGUMENT AS BEFORE WE CAN TRY TO SPECIFY
3 THAT FOR MR DuBOSE

4 THE COURT. WELL, I THINK THEY NEED
5 TO BE A LITTLE BIT MORE SPECIFIC IN THEIR ANSWERS

6 ALRIGHT, SIR, WHAT'S NEXT?

7 MR DuBOSE AND NUMBER FOUR, YOUR
8 HONOR, THIS GETS BACK TO UPDATING YOUR EXPERT REPORTS

9 THE COURT. ADMIT THAT THE
10 PLAINTIFFS HAVE IDENTIFIED NO DEFECT IN THE REPORT
11 GENERATOR SOFTWARE VERSION O-ONE, DOT, ONE-A, THAT WOULD
12 LEAD TO AN INDICATION ON INDIA GRAVES' MONITOR DOWNLOAD
13 THAT AN AUDIBLE ALARM SOUNDED WHEN IT DID NOT IN FACT
14 SOUND PLAINTIFF DENIES THIS REQUEST AT THIS TIME AS
15 THE PLAINTIFF STATES THEY HAVE NOT YET BEEN ABLE TO
16 FULLY TEST THE SOFTWARE

17 MR WINSLOW. AND WE CAN SUPPLEMENT
18 THAT, YOUR HONOR

19 THE COURT. SO, YOU NEED TO
20 SUPPLEMENT THAT

21 ALRIGHT, NEXT

22 MR. DuBOSE NUMBER FIVE IS IN THE
23 SAME CATEGORY AS THAT, YOUR HONOR, I THINK THAT'S
24 ANOTHER ANSWER WHERE THEY SAID THEY WEREN'T READY TO
25 ANSWER AT THAT TIME

1 THE COURT. AND IT SAYS YOU WILL
2 SUPPLEMENT THIS WHEN YOU'VE HAD TIME TO FULLY TEST THE
3 REPORT GENERATOR OKAY?

4 MR. WINSLOW OKAY

5 MR. DuBOSE. NOW MIGHT BE A GOOD
6 TIME ASK WHETHER THEY HAVE DONE THAT, WHETHER THEY ARE
7 NOW READY TO SUPPLEMENT THAT AND ANSWER THESE OTHERS

8 THE COURT ARE YOU MAKING PROGRESS
9 ON THAT?

10 MR. WINSLOW YOUR HONOR, I DO
11 BELIEVE THEY'VE LOOKED AT IT, I'LL HAVE TO ASK THEM, OF
12 COURSE, I BELIEVE THEY WILL GET IT, IT'S PROBABLY IN MY
13 -- NOT TO ADDRESS THESE DIRECTLY, AND I WILL DO THAT

14 THE COURT. ALRIGHT

15 MR. DuBOSE. NUMBER SIX, YOUR HONOR,
16 THEY DENIED THE REQUEST CLAIMING THAT IT WAS VAGUE, AND
17 WE CONTEND THAT THE ONLY FAIR READING OF THE REQUEST WAS
18 THAT IT PERTAINS TO THE ORDINARY OPERATION OF THE
19 MONITOR WITH REGARD - - -

20 THE COURT ALRIGHT ADMIT THAT THE
21 ALARM HEARD INDICATOR AS LOGGED BY THE SOFTWARE ARE
22 PLACED THERE BY THE MICROPHONE INSIDE THE MONITOR AND
23 NOT BY THE COMPUTER CODE IN THE ALARM MODULE PROPORTION
24 OF THE MONITOR SOFTWARE I THINK THAT'S REPHRASING ONE
25 WE'VE ALREADY ASKED EARLIER

1 MR. WINSLOW. AND I THINK MR DuBOSE
2 GAVE US CLARIFICATION, OR GAVE ME CLARIFICATION ON THAT,
3 AND SO I CAN READJUST THAT ONE

4 THE COURT. IS THAT THE EXACT SAME
5 ONE WE WERE TALKING ABOUT A WHILE AGO?

6 MR DuBOSE. IT'S ANOTHER PART OF
7 THAT, ANOTHER FACET OF THAT, THAT'S RIGHT, YOUR HONOR

8 THE COURT. PLAINTIFF DENIES THIS
9 REQUEST AS VAGUE THE ALARM HEARD IS NOT IDENTIFIED,
10 NOR IS THE TIME FRAME REFERRED TO DEFINED, PLAINTIFFS
11 ARE UNSURE THAT THE DEFENDANT REFERS TO ALL -- WELL, I
12 THINK WE TALKED ABOUT THAT A WHILE AGO OKAY SO, - -

13 -

14 MR DuBOSE THEIR ANSWER TO NUMBER
15 SEVEN, YOUR HONOR, IT WASN'T CLEAR WHETHER FROM THEIR
16 RESPONSE THEY INTEND THEIR DENIAL TO APPLY BOTH TO THE
17 ASTERISK INDICATOR AND THE BAR ON THE WAVE FORM ACTIVITY
18 CHANNEL THOSE ARE TWO DIFFERENT INDICATORS, OR - - -

19 THE COURT. YES, HE'S ASKED TWO
20 QUESTIONS AND YOU'VE ANSWERED ONE

21 MR DuBOSE. YE

22 MR WINSLOW. AND WE'LL GO BACK AND
23 ADDRESS THE OTHER ONE, OBVIOUSLY

24 THE COURT. ALRIGHT

25 MR. DuBOSE. THEY'VE DENIED THE

1 FAULTY -- THE DESIGN IS FAULTY IS YOUR ANSWER, IT'S JUST
2 TOO BROAD

3 MR. WINSLOW ALLOW ME TO JUST MAKE
4 SURE, ON NUMBER NINE, I SEE IT SAYS, IDENTIFIED NO
5 HARDWARE DEFECT IN THE AMI-PLUS MONITOR SOFTWARE THAT
6 CAUSED -- IS THIS A HARDWARE QUESTION ON NUMBER NINE?

7 THE COURT. NUMBER TEN

8 MR. DuBOSE NO, WE'RE ON NUMBER
9 TEN

10 MR. WINSLOW. OH, I APOLOGIZE

11 MR. DuBOSE SO, THAT WOULD BE,
12 NUMBER NINE IS POORLY AND I'M NOT PURSUING THAT

13 MR. WINSLOW SO, NUMBER TEN ALSO

14 THE COURT. NUMBER TEN

15 MR. WINSLOW YES, SIR, YOUR HONOR,
16 I'LL CLEAN THAT UP

17 THE COURT. ALRIGHT NUMBER EIGHT
18 IS THE FRONT ALARM AND REAR ALARM NUMBER TEN IS THE
19 FRONT ALARM NOT HEARD, REAR ALARM NOT HEARD OKAY,
20 THAT'S THE DIFFERENCE

21 ALRIGHT, WHAT'S NEXT?

22 MR. DuBOSE. YOUR HONOR, IT OCCURS
23 TO ME, IF I MAY, THAT, TO AVOID BEING BACK HERE IN
24 THIRTY DAYS DOING THIS ALL OVER AGAIN WHEN I GET THEIR
25 ANSWERS, I HOPE I'M CLEAR THAT I DRAW, AND I THINK THE

1 REQUEST, ON NUMBER EIGHT, I BEG YOUR PARDON, YOUR HONOR,
2 BUT IT'S WITH THE RESPONSE TO NUMBER ONE, THEIR DENIAL
3 IS INCONSISTENT WITH THEIR EXPERTS' TESTIMONY THAT THE
4 ALLEGED FAULTY DESIGN OF CODE AS A WHOLE DID NOT IN AND
5 OF ITSELF CAUSE THE FAILURE IN THE MONITOR

6 THE COURT. AND THAT'S JUST WHAT
7 WE'VE BEEN TALKING ABOUT

8 MR. DuBOSE YEAH

9 THE COURT BECAUSE HE -- ADMIT THAT
10 THE PLAINTIFFS HAVE IDENTIFIED NO SOFTWARE DEFECT IN THE
11 MONITOR SOFTWARE THAT CAUSED OR WOULD HAVE CAUSED THE
12 FRONT ALARM OR REAR ALARM FAILURES IN THE MONITOR, WHICH
13 FAILURES WERE ALLEGED BY WALTER DAUGHTERY AND YOU'VE
14 GOT FAULTY DESIGN OF THE SOFTWARE CODE IS THE DEFECT
15 AND I THINK THAT'S TOO BROAD, YOU'VE GOT TO NARROW THAT
16 DOWN

17 MR. DuBOSE ALRIGHT NUMBER TEN IS
18 REALLY THE, MY COMMENTS ARE THE SAME AS FOR NUMBER
19 EIGHT

20 THE COURT ADMIT THE PLAINTIFFS
21 HAVE IDENTIFIED NO SOFTWARE DEFECT IN THE MONITOR THAT
22 CAUSED OR COULD HAVE CAUSED THE FRONT ALARM NOT HEARD,
23 REAR ALARM NOT HEARD, THE EVENTS LOGGED IN THE INDIA
24 GRAVES MONITOR DOWNLOAD AND YOURS IS THE SAME ANSWER,
25 IT JUST NEEDS TO BE MADE MORE SPECIFIC, THE SOFTWARE IS

1 FACTS DRAW A CLEAR DISTINCTION BETWEEN THE STRUCTURE OF
2 THE CODE OF THE OPERATION OF THE CODE THAT IS, THE
3 CODE, ACCORDING TO THEIR EXPERTS, CAN BE A HOLY MESS AS
4 FAR AS HOW IT'S ORGANIZED, PUTTING YOUR BLUE SOCK AND
5 YOUR RED SOCK TOGETHER, BUT IT CAN STILL WORK PERFECTLY,
6 OR IT MIGHT NOT AND WHETHER IT WORKS PERFECTLY OR NOT,
7 REGARDLESS OF THE ORGANIZATION, OKAY, IS WHETHER THERE
8 IS A BUG OR A CODE ERROR IN THE CODE ITSELF AND THAT
9 IS WHAT ALL OF THESE QUESTIONS PERTAIN TO THEY WANT TO
10 TALK ABOUT THE BIG PICTURE, WELL, IT'S A MESS I WANT TO
11 FIND OUT WHAT THE ERROR IS THAT CAUSED THE PROBLEM AND
12 IT'S GOT TO BE BY THEIR OWN TESTIMONY WHICH WE'VE LOOKED
13 AT WITHIN THE CODE AND THAT'S WHAT THESE QUESTIONS ARE
14 DIRECTED TO AND I JUST WANT THAT TO BE CLEAR TO MR
15 WINSLOW

16 MR WINSLOW. AND I UNDERSTAND
17 THAT'S, REALLY WHAT MR DuBOSE IS TELLING ME, BUT HE'S
18 TRYING TO GET THE OPINION TO THE EXPERTS AND HAVE THE
19 EXPERTS GIVE THEIR OPINION TO HIM YOU KNOW, THE
20 EXPERTS HAVE GIVEN THEIR OPINION TWICE AT LEAST NOW,
21 THAT THE STRUCTURE ITSELF LED TO THESE PROBLEMS IN THE
22 ALARM SO HE MIGHT BE TRYING TO NARROW IT AND SAY WHAT
23 IT SHOULD BE, AND I UNDERSTAND THAT FROM THE DEFENDANTS,
24 BUT THE PLAINTIFFS THEMSELVES AND THE EXPERTS ARE SAYING
25 THAT IT IS, THE DEFECT IS THE STRUCTURE, IT'S NOT JUST

1 THE CODE THAT'S BEEN PUT OUT THERE, IT'S THE STRUCTURE
2 THAT CAUSES THESE PROBLEMS, AND WE'LL ANSWER THESE
3 QUESTIONS AS HAVE BEEN DIRECTED, YOUR HONOR AND WE CAN
4 REVISIT IT IN THIRTY DAYS IF WE NEED TO, BUT THE
5 OPINIONS THE EXPERTS GIVE ARE TO A SPECIFIC DEFECT, AND
6 WE WILL STATE THAT AGAIN, AND HOPEFULLY IT WILL SATISFY
7 MR DuBOSE THAT'S ALL WE CAN DO

8 THE COURT WELL, - - -

9 MR DuBOSE AND I GUESS MY POINT
10 IS, YOUR HONOR, THAT THAT IS NOT SATISFACTORY BECAUSE
11 THAT'S NOT WHAT I'M ASKING I'M ASKING IF THEY'VE FOUND
12 THE BUG WITHIN THE CODE

13 THE COURT. HE WANTS SOMETHING
14 SPECIFIC, AND THAT'S WHAT I'M SAYING, YOU'VE GOT TO GIVE
15 HIM SOMETHING SPECIFIC OR TELL HIM, YOU KNOW, IF YOU
16 FILE ANOTHER ONE LIKE THIS THEN THAT'S WHAT WE'LL BE
17 HEARING ON THE SUMMARY JUDGEMENT MOTION

18 MR. WINSLOW YES, AND WE'LL BE - -

19 -

20 THE COURT. HE'S TRYING TO HELP YOU
21 GET ENOUGH EVIDENCE IN THE RECORD SURVIVE SUMMARY
22 JUDGEMENT

23 MR WINSLOW AND WE WILL SPECIFY

24 THE COURT OKAY

25 MR DuBOSE I THINK WE'RE ON NUMBER

1 ELEVEN, YOUR HONOR

2 THE COURT OH, I THOUGHT WE WERE
3 THROUGH

4 MR. DuBOSE. WELL, WE'VE GOT TWO
5 MORE, YOUR HONOR, ELEVEN AND TWELVE

6 THE COURT. OKAY

7 MR. DuBOSE THE LAST SENTENCE OF
8 THEIR RESPONSE IN NUMBER ELEVEN, IT'S INCONSISTENT WITH
9 THE ADMISSION THEY MADE IN THE FIRST I DON'T THINK
10 THE RULES ALLOW THEM TO ADMIT SOMETHING AND THEN TAKE IT
11 AWAY WITHOUT EVEN MOVING ON TO THE NEXT NUMBER

12 THE COURT ALRIGHT, ELEVEN ADMIT
13 THAT THE PLAINTIFFS HAVE IDENTIFIED NO HARDWARE DEFECT
14 THAT CAUSED OR COULD HAVE CAUSED THE FRONT ALARM NOT
15 HEARD, REAR ALARM NOT HEARD, THE LOG IN THE MONITOR
16 DOWNLOAD WHICH WERE ALLEGED AS EQUIPMENT FAILURES BY
17 WALTER DAUGHTERY

18 NOW, HOW IS THAT DIFFERENT FROM - -

19 -

20 MR. DuBOSE. YOUR HONOR, WE'VE MOVED
21 FROM SOFTWARE TO HARDWARE

22 THE COURT. TO HARDWARE, ALRIGHT,
23 THAT'S GOING TO YOUR HARDWARE ALRIGHT ADMITTED AT
24 THIS TIME, HOWEVER, PLAINTIFF'S EXPERT RESERVES THE
25 RIGHT TO SUPPLEMENT HIS DISCLOSURE PRIOR TO THE CLOSE OF

1 DISCOVERY PLAINTIFF FURTHER STATES FOR CLARIFICATION
2 THAT PLAINTIFF IS IN NO WAY ADMITTING THAT NO SUCH
3 DEFECT EXISTS SO, HE'S SAYING, WE HAVEN'T FOUND IT,
4 BUT WE STILL THINK IT'S THERE

5 MR. WINSLOW. NO, WE'RE SAYING WE
6 HAVEN'T FOUND IT BUT WE'RE NOT SAYING IT'S NOT THERE, WE
7 JUST DON'T KNOW HIS QUESTION IS, WE'VE IDENTIFIED IT
8 AND THE ANSWER IS, WE ADMIT THAT, WE HAVE IDENTIFIED IT,
9 BUT WE DON'T KNOW IF IT'S THERE OR NOT WE DIDN'T FIND
10 ONE, WE HAVEN'T FOUND ONE TO THIS POINT, BUT IF ONE DOES
11 DEVELOP OR ONE DOES, IS FOUND, WE'RE NOT EXCLUDING
12 OURSELVES FROM BRINGING THAT UP LATER

13 THE COURT AND WHAT'S YOUR PROBLEM
14 WITH THAT? I MEAN, I UNDERSTAND WHAT HE'S SAYING, HE,
15 BUT HE'S -- IF I'M ASKED TO INTERPRET THAT IN A MOTION
16 FOR SUMMARY JUDGEMENT OR A TRIAL I'M GOING TO IGNORE THE
17 LAST SENTENCE

18 MR. DuBOSE. WELL, WHEN I READ IT I
19 CAN'T, I'VE GOT TO MAKE MY MOTION SO, THAT'S WHY I'M
20 HERE, BUT I THINK THE LAST SENTENCE IS INCONSISTENT, I
21 THINK IT SHOULD BE STRICKEN BUT IF YOU'RE JUST GOING
22 TO IGNORE IT DOWN THE ROAD, THEN I'M OKAY WITH THAT,
23 TOO

24 MR. WINSLOW AND MOVING ON, WE'LL
25 GO AHEAD AND SUPPLEMENT NUMBER TWELVE, AS WELL, SO WE

1 CAN BE DONE WITH THESE DISCOVERY QUESTIONS

2 MR. DuBOSE. ALRIGHT I THINK THAT
3 WILL BE HELPFUL

4 THE COURT. OKAY ALRIGHT

5 MR DuBOSE YOUR HONOR, ALONG WITH
6 THE REQUEST TO ADMIT WE SENT INTERROGATORIES TIED TO
7 THOSE REQUESTS TO ADMIT, AND THEY'RE, AND I THINK YOU
8 HAVE THOSE IN FRONT OF YOU

9 THE COURT YES, SIR

10 MR DuBOSE WE CALLED THEM FURTHER
11 INTERROGATORIES WE ASKED THEM TO EXPLAIN THE BASIS OF
12 ANY REQUESTS TO ADMIT THAT WERE NOT ADMITTED, AND THEY
13 SAID, WELL, YOU'VE ALREADY GO THAT, AND WE DON'T AGREE
14 WITH IT BUT I'LL TELL YOU, JUDGE, IF HE'S GOING TO
15 REVISIT ALL OF THESE, MAYBE HE CAN JUST REVISIT THAT,
16 TOO, AND WE CAN LOOK AT IT AS ATTACHED - - -

17 THE COURT WELL, I THINK HE WOULD
18 HAVE TO - - -

19 MR. DuBOSE. --- IF WE HAVE TO

20 THE COURT WELL, I WOULD THINK HE
21 WOULD HAVE TO REVISIT THIS

22 MR DuBOSE I THINK WE WOULD

23 THE COURT. I THINK SO

24 MR. DuBOSE. I THINK WE WOULD

25 THE COURT ALRIGHT

1 MR. DuBOSE. YOUR HONOR, I THINK
2 OTHER THAN THE SUMMARY JUDGEMENT MOTION WHICH YOU'RE NOT
3 GOING TO HEAR TODAY, THE ONLY OTHER ISSUE, WELL, THERE
4 ARE TWO OTHER ISSUES ONE OF THEM IS OUR MOTION TO
5 AMEND

6 THE COURT. RIGHT

7 MR. DuBOSE. AND WE'VE ASKED THEM
8 REPEATEDLY WHAT PREJUDICE THERE WOULD BE FROM THE
9 AMENDMENT WE'VE PROPOSED THEY'VE ANSWERED WITH,
10 THERE'S NO EVIDENCE TO SUPPORT THAT WE'VE TALKED ABOUT
11 THE FRONT ALARM, REAR ALARM NOT HEARD ISSUES THE
12 TENSION IN THAT IS BETWEEN A DEFECT AND THE USER SIMPLY
13 COVERING THE ALARM AND I THINK, WE GAVE YOU THE
14 TESTIMONY OF THE MAN WHO DEVELOPED THIS MONITOR OR LED
15 THE CHARGE TO DEVELOP IT HE TALKED ABOUT WHAT COULD
16 TRIGGER THAT, WHAT WOULD TRIGGER THAT ALARM AS FAR AS
17 THE USER IF YOU LOOK AT THE DOWNLOAD, UNFORTUNATELY, I
18 DON'T THINK I BROUGHT IT WITH ME, BUT WHAT HAPPENS, HE
19 TALKED ABOUT IT, IS, YOU'VE GOT A SERIES OF ALARMS, THEN
20 ALL OF A SUDDEN AN ALARM NOT HEARD, AND THEN THE MONITOR
21 IS TURNED OFF CLEARLY, THERE'S HUMAN INTERVENTION
22 THERE IT IS A REASONABLE INFERENCE WITHOUT ANY
23 TESTIMONY THAT - - -

24 MR. WINSLOW. YOUR HONOR, - - -

25 THE COURT MR WINSLOW

1 MR. DuBOSE --- THAT THEY'RE IN THE
2 HABIT, AND I'M NOT, I WOULD BE, TOO, IF I HAD TO HEAR
3 THAT THING OVER A THOUSAND TIMES, THREE OF THEM GOING ON
4 ALL THE TIME, - - =

5 MR. WINSLOW. I'D MOVE TO STRIKE
6 THAT PART

7 MR. DuBOSE EXCUSE ME, I'M ALMOST
8 FINISHED THAT'S THE ONLY VOLUME CONTROL THERE IS,
9 JUDGE ALRIGHT

10 MR. WINSLOW YOUR HONOR, THIS IS
11 WHAT HE'S TRYING TO SAY, THAT THIS INDIVIDUAL THAT LED
12 THE CHARGE SAID THIS IS WHAT HAPPENED HE WASN'T THERE,
13 HE SAID HE SUSPECTS THIS COULD HAPPEN IT'S VERY
14 GENERAL THERE'S NO EVIDENCE THAT SHOWS THERE'S A
15 PROBLEM UNDER RULE FIFTEEN HE HAS THE RIGHT TO AMEND
16 UNLESS IT'S PREJUDICIAL, AND IT IS PREJUDICIAL HE HAS
17 PRESENTED NO EVIDENCE WHATSOEVER, EVERY EYE WITNESS,
18 INCLUDING THE EMS RESPONDER, SAID THERE'S NOT ANY
19 EVIDENCE OF THERE BEING TAMPERING WITH THIS MACHINE
20 PATH, ITSELF, WHEN THEY REVIEWED THE MACHINE, DIDN'T
21 SHOW ANY EVIDENCE WHATSOEVER OF THE MACHINE BEING
22 TAMPERED WITH, OR MUZZLED THE ONLY THING THEY HAVE IS
23 SUSPICION, THAT'S NOT EVIDENCE THAT'S PREJUDICIAL
24 THEY'RE TRYING TO IMPLICATE THAT THESE PLAINTIFFS WHO
25 LOST THEIR CHILD, PURPOSELY, POSSIBLY MALICIOUSLY

1 COVERED UP THIS MACHINE THAT COULD HAVE SAVED THEIR
2 CHILD'S LIFE THEY'VE ALREADY IN THEIR ANSWER HAVE
3 CONTRIBUTORY NEGLIGENCE, WHICH COVERS THE SAME THING
4 THEY'RE TRYING TO RE-ALLEGE THEE SAME PROBLEM, JUST MORE
5 SPECIFICALLY TO TARGET THESE FOUR PARENTS WITH NO
6 EVIDENCE WHATSOEVER AND IT IS PREJUDICIAL, YOUR HONOR

7 THE COURT. WELL, EVERYTHING IN HIS
8 ANSWER IS PREJUDICIAL OR IT WOULDN'T BE THERE, BUT
9 THAT'S NOT LEGAL PREJUDICE, AND THAT'S WHAT WE'RE
10 LOOKING FOR, IS LEGAL PREJUDICE AND I DON'T SEE ANY
11 LEGAL PREJUDICE IN ALLOWING THE AMENDMENT, SO, I'M GOING
12 TO GRANT THE MOTION

13 MR. DuBOSE. ALRIGHT, THANK YOU,
14 YOUR HONOR

15 I NEED TO DOUBLE CHECK MY LIST, BUT
16 I THINK THE LAST THING WE HAVE HERE BEFORE YOU TODAY,
17 YOUR HONOR, REVOLVES AROUND THE SCHEDULE OF THIS CASE
18 AND WHETHER IT WOULD BE APPROPRIATE FOR A JUDGE TO BE
19 ASSIGNED TO THIS CASE TO HANDLE IT I THINK YOU'VE
20 HEARD, THIS IS COMPLICATED STUFF

21 THE COURT WELL, LISTEN, I'M NOT
22 GOING TO DESIGNATE IT A COMPLEX CASE, BUT I WILL
23 SUPERVISE THE DISCOVERY IN THIS CASE AS LONG AS I'M
24 WORKING

25 MR DuBOSE ALRIGHT, SIR

1 THE COURT AND IT LOOKS LIKE NOW
2 THAT'S GOING TO BE PROBABLY THROUGH THE END OF THIS
3 YEAR AND SO, YOU KNOW, ANY -- WELL, THAT'S MY ANSWER

4 MR. DuBOSE ALRIGHT, SIR

5 THE COURT. I MEAN, I HAVE ACQUIRED
6 A LITTLE BIT OF KNOWLEDGE ABOUT THE CASE, AND THAT'S
7 THE, I THINK ONE OF THE PURPOSES FOR DESIGNATING THE
8 CASE AS COMPLEX I DON'T WANT TO DESIGNATE IT AS
9 COMPLEX AND ASSIGN IT TO ME BECAUSE I'M OFFICIALLY
10 RETIRED AND ALTHOUGH I'VE AGREED TO WORK FULL TIME,
11 I'M NOT GOING TO DO IT AFTER JANUARY AND SO, I DON'T
12 THINK WE NEED IT DESIGNATED COMPLEX I WILL RETAIN THE
13 SUPERVISION OF DISCOVERY PROBABLY, IT'S A MOOT POINT
14 FOR ME TO SAY THAT ANYHOW, BECAUSE THEY'RE NOT LETTING
15 US TRAVEL AND SO, THE ONLY THING I'M SAYING IS, IF
16 Y'ALL HAVE MOTIONS, EITHER ONE OF YOU HAVE MOTIONS, I
17 WILL HEAR THEM, WE WON'T PUT THEM ON THE REGULAR NON-
18 JURY DOCKET AND LET THEM COME UP AT SOME FUTURE TIME,
19 BECAUSE THEY'VE ROTATED US BACK AND FORTH TO HEAR NON-
20 JURY MATTERS AND MOTIONS OF THAT NATURE SO, I WILL
21 HEAR ANY DISCOVERY MATTERS FOR THE FORESEEABLE FUTURE

22 MR. DuBOSE. ALRIGHT, SIR MR
23 WINSLOW AND I HAVE HAD SEVERAL CONVERSATIONS ABOUT US
24 NAMING OUR EXPERTS I'M, I'VE GIVEN HIM THE NAME OF OUR
25 DOCTOR THERE'S A MEDICAL ISSUE INVOLVED HERE, TOO, AS

1 YOU MIGHT IMAGINE, AND HE'S GOT THAT WHEN HE'S READY
2 TO DEPOSE THAT DOCTOR HE'S READY TO BE DEPOSED I HAVE
3 NOT NAMED A COMPUTER EXPERT FOR THE SIMPLE REASON THAT
4 I NEED ALL OF THEIR OPINIONS BEFORE MY PEOPLE CAN BE
5 READY AND IT MAY BE THAT, YOU KNOW, FROM WHAT I HEAR
6 I MAY HAVE TO GO HIRE SOMEBODY IN ADDITION TO WHO I'VE
7 HIRED ALREADY I HOPE I DON'T, AND I'M NOT, DON'T MEAN
8 THAT AS A THREAT, I'M JUST LEAVING THAT OPEN AS A
9 POSSIBILITY SO, THE CASE OBVIOUSLY ISN'T READY TO BE
10 TRIED YOU KNOW THAT WHETHER WE GET A SCHEDULING
11 ORDER OR NOT, I JUST WANT THE COURT TO UNDERSTAND, AND
12 MR WINSLOW TO UNDERSTAND THAT WE NEED TO GET, WE NEED
13 TO HEAR FROM THEM BEFORE WE CAN RESPOND

14 THE COURT. WELL, THAT SEEMS, I
15 THINK I AGREE WITH HIM ON THAT

16 MR. WINSLOW I UNDERSTAND, YOUR
17 HONOR, I'M NOT ASKING TO DEPOSE THEIR EXPERTS AT THIS
18 TIME, I JUST WANT TO KNOW WHO THEY ARE SO I CAN START
19 GETTING PREPARED

20 THE COURT WELL, HE CAN'T TELL YOU
21 WHO THEY ARE UNTIL YOU GIVE HIM A LITTLE BIT MORE
22 SPECIFICS YOU'RE JUST SAYING, FAULTY DESIGN, I'VE SEEN
23 THAT TWENTY-THREE TIMES, FAULTY DESIGN, WHICH DOESN'T
24 GIVE HIM ANYTHING TO COMBAT AND SO, I THINK HE'S GOT TO
25 GET SOME MORE INFORMATION FROM YOU SO, HOW LONG WILL

1 IT TAKE YOU TO GET INFORMATION TO HIM THAT I'M TELLING
2 YOU TODAY YOU NEED TO GET HIM?

3 MR. WINSLOW. WELL, BASED ON THE
4 QUANTITY, IF YOU WILL GIVE ME THIRTY DAYS

5 THE COURT. THIRTY DAYS IS FINE

6 MR WINSLOW. AND MR DuBOSE DID SAY
7 HE'S ALREADY HIRED THEM, AND I MEAN, I WOULD JUST LIKE
8 TO KNOW WHO THEY ARE SO I CAN START ON MY RESEARCH AND
9 START PREPARING I'M NOT ASKING TO EVEN TALK TO THEM AT
10 THIS POINT

11 THE COURT. I'VE READ SOMEWHERE THIS
12 GUY THAT INVENTED THE STUFF IS YOUR EXPERT

13 MR. DuBOSE. WELL, HE'S MORE OF A
14 FACT WITNESS, HE CAN TESTIFY TO WHAT HE DID AND WHAT THE
15 MONITOR DOES BASED ON HIS FACTUAL KNOWLEDGE

16 THE COURT. YES BUT I MEAN, WITHIN
17 A REASONABLE TIME AFTER YOU GIVE HIM THAT INFORMATION I
18 WILL REQUIRE HIM TO GIVE YOU THE NAME OF HIS EXPERTS
19 AND I DON'T KNOW WHETHER REASONABLE IS TWO WEEKS OR A
20 MONTH BECAUSE I DON'T KNOW WHAT YOU'RE GOING TO GIVE HIM
21 AND HOW LONG IT'S GOING TO TAKE HIM TO DIGEST THAT SO,
22 THAT'S THE REASON I CAN'T SET A TIME LIMIT TODAY BUT
23 I'LL TELL YOU BOTH THIS, I'M AVAILABLE VIRTUALLY ANYTIME
24 TO HEAR DISCOVERY DISPUTES I DO NOT WANT ANY DISCOVERY
25 DISPUTE DELAYING THE PROGRESS OF THIS CASE AND GETTING

1 IT READY FOR TRIAL ALL YOU'VE GOT TO DO IS CALL, AND
2 I'LL WORK THEM IN JUST, WE HAVE CHAMBERS WEEKS, THIS
3 IS NOT A CHAMBERS WEEK, BUT I CONVERTED IT TO CHAMBERS
4 WEEK FROM CALHOUN COUNTY THAT JUST FELL APART SO, I'M
5 HEARING THESE MATTERS BUT I CAN WORK IT IN ANYTIME
6 SO, IF YOU FILE A MOTION, CALL ME AND WE'LL SCHEDULE A
7 HEARING ON IT DON'T LET IT JUST SIT THERE AND LET
8 EVERYTHING FETER WAITING ON A MOTIONS DOCKET BECAUSE
9 THE LAST ONE WE HAD IN ORANGEBURG COUNTY THE WHOLE THING
10 WAS CANCELLED, IT WASN'T EVEN HEARD BUT I'LL HEAR THEM
11 IN ORDER TO KEEP THE CASE MOVING

12 MR. DuBOSE I HOPE WE WON'T HAVE TO
13 COME BACK IN FRONT OF YOU WITH ANYMORE LIKE WE HAD TO DO
14 TODAY, YOUR HONOR, BUT - - -

15 THE COURT WELL, I HOPE SO, TOO

16 MR. DuBOSE --- I APPRECIATE THAT
17 THE COURT. BUT THAT'S WHAT I'M HERE

18 FOR

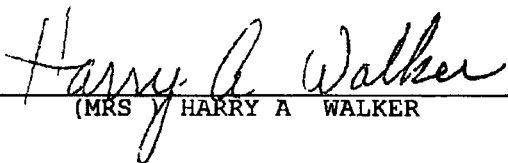
19 MR. WINSLOW. THANK YOU, JUDGE

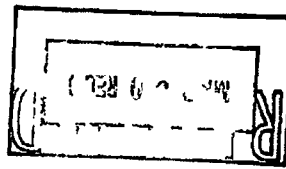
CERTIFICATE

I, THE UNDERSIGNED, MRS HARRY A WALKER, OF ROWESVILLE, SOUTH CAROLINA, OFFICIAL COURT REPORTER FOR THE FIRST JUDICIAL CIRCUIT OF THE STATE OF SOUTH CAROLINA, DO HEREBY CERTIFY THAT THE FOREGOING IS A TRUE, ACCURATE, AND COMPLETE TRANSCRIPT OF RECORD OF ALL THE PROCEEDINGS HAD AND EVIDENCE INTRODUCED IN THE CAPTIONED CAUSE, RELATIVE TO APPEAL, IN THE COURT OF COMMON PLEAS FOR ORANGEBURG COUNTY, SOUTH CAROLINA, ON THE SEVENTEENTH DAY OF MARCH, 2009

I DO FURTHER CERTIFY THAT I AM NEITHER OF KIN, COUNSEL, NOR INTEREST TO ANY PARTY HERETO

DATE MARCH 26, 2009


(MRS HARRY A WALKER)



STATE OF SOUTH CAROLINA	)	IN THE COURT OF COMMON PLEAS
	)	CIVIL ACTION NO 08 CP 38-826
COUNTY OF ORANGEBURG	)	
	)	
KAREEM J GRAVES and	)	
TARA GRAVES individually and as duly	)	
appointed personal representatives of the	)	
ESTATE OF INDIA IYANNA	)	
GRAVES	)	
	)	
Plaintiffs	)	
	)	
vs	)	
	)	
CAS MEDICAL SYSTEMS INC	)	
AMERICAN HEALTHCARE	)	
RESOURCES INC d/b/a ASHBY	)	
MEDICAL and STEVE M ELLIOTT	)	
or any business entity d/b/a ASHBY	)	
MEDICAL and PALMETTO HEALTH	)	
ALLIANCE	)	
	)	
Defendants	)	
	)	

AFFIDAVIT OF MAC LIVELY

I am a Professor of Computer Science at Texas A&M University I obtained my Ph D in Computer Science and Electrical Engineering from Southern Methodist University in 1971 I obtained my M S in Electrical Engineering from Southern Methodist University in 1967

I am a licensed Software Engineer and a licensed Electrical Engineer in the State of Texas I have participated in the design and implantation of numerous software systems including those for use in the medical field

My qualifications are further set out in my CV which has previously been provided

I have been asked to review the software system for the AMI infant apnea monitor I have reviewed the design documentation the testing documentation the software code and various incident reports concerning the AMI monitors

I am familiar with the minimum standards required to make a software system safe and reliable. Additionally, I am also familiar with concepts set forth by the FDA that reflect the properties of ensuring adequate software as reflected in *General Principles of Software Validation, Final guidance for Industry and FDA Staff January 11, 2002 (GPSV)*

I have reviewed the software system for the AMI device. The software system for the AMI device is inadequate, unreasonably dangerous, and falls below the engineering standard of care in its design. The faulty design of the software is the cause of the multitude of audible alarm problems that have been experienced with the device. Further, the faulty design of the software system does not allow the errors causing the failures to be found and corrected. As a result, the device is unreasonably dangerous by reason of the defect in its software design and the defect was the cause of the software failure on April 11, 2004 while being used on India Graves.

This affidavit is intended to supplement and explain my previous opinions. It is not intended to change any opinions that I have previously offered.

Upon my review of the AMI PLUS monitor's software, it is my opinion that the unorganized structure of the code causes lines of code to not follow their intended path and not reach their required destination. This unorganized structure of code does not allow for a recreation or tracking of the exact cause of a missed signal to occur; however, this defect of using unorganized code leads directly to the alarm not sounding and the passing of India Graves. Based on the testimony of the people present the morning of April 11, 2004, the affidavit of Frank Painter, and my previous testimony, shows the defective software structure is the more likely than not cause of the alarm not sounding and the resulting death of India Graves.

It is my understanding that CAS contends that there is no defect in the software code because none of the experts have identified a particular line of code that is incorrect. This is a fundamental misunderstanding of my testimony and software in general.

Software can be defective due to an incorrect set of values in a line of software code. This error can lead to software malfunction. However, software can also be defective due to its design and structure. Software that is improperly designed and has inadequate structure is prone to random errors that cause devices running the software to malfunction. No change to a single line of code will correct the design and structure. This type of defect is even more troublesome and defective than software that has a single line of code that is in error.

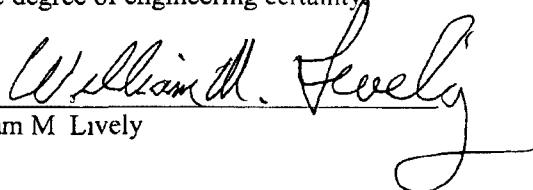
The software system used in the AMI is not appropriately designed and falls below the standard of care. It can best be classified as "spaghetti code" due to its unorganized structure. Spaghetti code is a term used to describe software that has a complex and tangled structure that is not conducive to finding and correcting errors. Spaghetti code uses extensive loops instead of a structured format. The extensive loops create a situation

where the possibilities of error are endless. In 'spaghetti code' there will most likely be errors that occur either frequently or rarely but are intermittent and impossible to correct and find. When the AMI was developed the industry standard was structured programming not "spaghetti code".

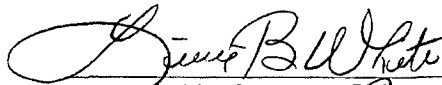
The structure of the code in the AMI is a design flaw and a breach in the engineering standard of care and is the most likely source of the dozens of alarm failures that cannot be explained by either hardware problems or complaint errors. However, the structure is so poor for the software that the errors cannot be fixed or located with any certainty. Therefore, the software used in the AMI should have been completely redesigned and formed in a structured fashion so that the intermittent errors are eliminated. This software redesign and formation would be economically feasible for the Defendant to complete as was testified to in my deposition. The redesign of the software and implementation could likely be completed within six months and cost less than \$500,000.00 if competent and knowledgeable engineers were hired. When dealing with the life of a baby and the impending litigation that could arise this redesign of the software is without a doubt economically feasible.

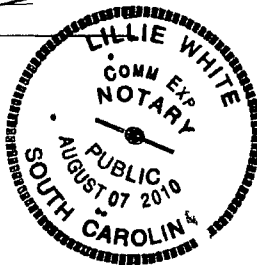
Within a reasonable engineering probability, the design of the AMI software code falls below the standard of care, thus causing a failure of the audible alarm during the events that led to the death of India Graves. The software defect would be economically feasible to remedy by redesigning the software.

The opinions given above are made to a reasonable degree of engineering certainty.


William M. Lively

SWORN before me this 11th day
of March 2009

 (L.S.)
Notary Public for SC
My Commission expires



STATE OF SOUTH CAROLINA	)	IN THE COURT OF COMMON PLEAS
	)	CIVIL ACTION NO 08-CP-38-826
COUNTY OF ORANGEBURG	)	
	)	
KAREEM J GRAVES and	)	
TARA GRAVES, individually and as duly	)	
appointed personal representatives of the	)	
ESTATE OF INDIA IYANNA	)	
GRAVES,	)	
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Plaintiffs	)	
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CAS MEDICAL SYSTEMS, INC ,	)	
AMERICAN HEALTHCARE	)	
RESOURCES, INC d/b/a ASHBY	)	
MEDICAL and STEVE M ELLIOTT	)	
or any business entity d/b/a ASHBY	)	
MEDICAL, and PALMETTO HEALTH	)	
ALLIANCE,	)	
	)	
Defendants	)	
	)	

AFFIDAVIT OF WALTER DAUGHERITY

I am a Senior Lecturer in the departments of Computer Science & Engineering and Electrical & Computer Engineering in the College of Engineering at Texas A&M University. I obtained my Ed D in Mathematical Education from Harvard University in 1977, my M A T in Mathematics from Harvard in 1967 and a B S in Mathematics from Oklahoma Christian College in 1966. I have an extensive background in both teaching and developing computer programming. My qualifications and publications are set forth more fully in my curriculum vitae which is attached as Exhibit 1.

I have been asked to explain the manner in which the software defect in the AMI Plus was identified and the nature of the defect, including identifying all the lines of code that are defective within the structure of the software. I have identified the defective lines of code and have attached those as Exhibit 2 and 3 to this affidavit. This affidavit is intended as a supplement to my previous testimony which I incorporate by reference for further explanation.

I have identified the structure of the software in the AMI Plus as the defect which is causing intermittent alarm failures. In coming to this conclusion I used engineering and computer engineering standards and practices that are regularly used in the field of engineering. My methodology in coming to these conclusions has been to examine all possible causes for the events at issue and then use reliable engineering practices to examine the information and either include or exclude the possibilities as the root cause of the problem. I have not speculated or guessed any information that was not available. In coming to my conclusions I have relied upon my knowledge, training, and experience as set forth in my CV. I have further relied upon my knowledge of general computer engineering principles and my overall knowledge of the body of literature relevant to my field.

First, the problem was identified. The problem was identified as a complaint that the audible alarm did not function during a life critical event involving India Graves.

Second, by using basic engineering and scientific principles, I created a list of all possible reasons that the complaint could occur. The list of possible causes for the complaint includes three broad categories. The categories are hardware failure, software failure, or erroneous complaint. These categories are consistent and inclusive of the same categories identified by CAS and the original developers of the AMI in the engineering fault tree attached as Exhibit 4 to this affidavit. I agree with the analysis of the fault tree to the point that it appropriately sets forth the possible causes for a complaint of audible alarm failure. In addition, my analysis of the complaint includes a more thorough root cause analysis than Exhibit 4.

Third, I gathered all possible data to determine if a sufficient amount of data exists to determine the cause of the complaint of audible alarm failure. I have gathered and reviewed the following information to determine if sufficient data exists to make a finding based on a reasonable engineering probability.

- a Depositions of Kareem Graves, Tara Graves, April Simmons, and Anita Kelly
- b The entire 510k submission and subsequent submission for the AMI/AMI Plus monitors
- c The development protocol and testing documents for the AMI/AMI Plus monitors
- d The documents pertaining to the testing and maintenance of the device at issue in this case
- e All complaints and their respective backup documentation for AMI/AMI Plus audible alarm failure complaints
- f The depositions of witnesses in the *Smith* case
- g The software code for the AMI Plus
- h The manual for the RA78K Series Structured Assembler Preprocessor provided by the CPU manufacturer (NEC) and documented in NEC document number EEU-1254A published in September, 1990

1 EMS records from the night of the event

After reviewing the depth of materials available and the contents, I have determined that there is more than sufficient information to determine the cause of the complaint of audible alarm failure within a reasonable engineering probability. In fact, there is more than enough information to make the determination within a reasonable engineering certainty. There is no information missing that would cause a change in the analysis of the problem.

I reviewed all of the information available that pertains to this problem. After that review, all of the information was evaluated to see whether it supported the inclusion or exclusion of the three possibilities for the cause of the complaint. No information was ignored or discarded because it tended to support or exclude one possibility or the other.

All reasonable possibilities were examined to see if they were excluded from a possible cause of the complaint based on the information available. Based on this analysis, I was able to exclude all reasonable possibilities for the cause of the complaint except software error. I was also able to include software as the only possible cause for this complaint based on the evidence and information presented.

Hardware error was excluded as a possibility based on several factors. First, all possible hardware failures have been thoroughly tested in a scientifically reliable manner and passed such testing. The alarm components and all other hardware components were functional both before and after the event at issue. All evidence was examined and no evidence tended to support a hardware failure in any manner. All potential hardware issues identified in the fault tree for this device included in Exhibit 4 were considered and excluded because no information indicated any hardware problem on this occasion. Therefore, hardware failure was excluded as a possible cause for the complaint.

User error (complaint error) was also excluded as a possibility based on all of the information presented. First, by all accounts from the machine downloads and eyewitnesses, the device was powered on and properly connected during the events involving India Graves. There is no evidence or information to suggest otherwise. Additionally, all other user errors identified in the fault tree (Exhibit 4) for this device were considered and excluded. There is no evidence or information that would support a conclusion that the alarm was tampered, muffled, or improperly used. There is no evidence or information to suggest that the machine was misinterpreting motion artifact, was grounded improperly, or that the settings were incorrectly entered.

I also considered the possibility that the caregiver slept through the alarm. This possibility has also been excluded within a reasonable engineering certainty. The alarm specifications for this device requires the alarm to sound at least 85 decibels. The mother of the Graves child was sleeping approximately four feet from the alarm. If the logs are correct, the alarm would have sounded for approximately two hours. There is no evidence the mother or any other person in the home suffered from any type of hearing deficiency. It would be virtually impossible for a human being to sleep for that length of

time within that distance of an 85 decibel alarm. Further, it would be impossible for all of the caregivers in the home to have slept through the same alarm at the same time.

Oversleeping the alarm is also excluded as a possibility because the caregivers awoke and found the child not breathing. Even if the caregivers slept through the alarm, they would have heard the alarm when they awoke. Finally, the EMT personnel wrote that the loose lead light was on when they arrived, but there was no alarm. The testimony of Anita Kelly confirmed this statement in the records.

The only evidence to support a conclusion that the alarm actually functioned the night of the incident is the log from the device itself. However, as explained below, that information is unreliable and cannot be considered reliable with any degree of engineering probability. It certainly does not have sufficient weight to withstand the overwhelming information to the contrary.

There is no evidence or information that the caregivers misused the device, nor is there any evidence that can support a finding that the alarm actually functioned the night of the incident. Therefore, misuse and complaint error must be excluded as a reason for the complaint of no alarm during this event within a reasonable engineering certainty.

I have also considered whether a software error could have caused the complaint of no alarm during this event. According to the fault tree developed for this product and according to my own analysis, software error is a possible reason for an alarm failure. See Exhibit 4. In fact, that would be the only remaining possibility since hardware error and complaint error have been excluded. However, software error was examined in the same manner as the other possibilities without regard to their exclusion. In examining this possibility, I looked at all of the information previously considered in addition to the software code. There are two possible ways in which the software could fail in such a situation, either coding error or structural error.

First, there could be an error in a line of code, such as a typo, transposed character, or misplaced character within a particular line of code. This type of coding error could allow the program to execute improperly leading to an alarm failure. The software code was examined for such an error and none has been found. Additionally, as explained below, the manner in which the software has failed in the past and in this instance would tend to indicate that the problem is not a simple coding error, but a more complex systematic error.

I have also examined the structure of the software code used in the AMI Plus. The structure of software code determines whether the program will flow in a controlled manner so that the program executes in the manner for which it was designed. Software should be structured so that it executes in a linear fashion. If the software executes properly, then lines of code follow their intended path and reach their required destination. If the software structure does not allow the program to execute in such a manner, the code becomes unreliable and it will not always function in the manner intended.

One way in which the software can be structured improperly is through the use of unconditional branching statements, also known as goto statements. The use of goto statements create an unconditional jump to a labeled statement somewhere in the current function. In other words, the goto statements undermine the organized structure of the program and allows the software to execute in unpredictable and uncontrollable ways. The use of goto statements makes a code unreliable as well as rendering the testing done on the code unreliable. If numerous goto statements are used, the code becomes a patchwork of unreliability and is known in the field of programming as spaghetti code. Spaghetti code is defective by its very nature. It is unreliable and is categorized by intermittent failures that are virtually impossible to fix without removing the goto statements and organizing the code properly. Spaghetti code causes lines of code to not follow their intended path and not reach their required destination. If a program contains spaghetti code, it will almost certainly fail in unpredictable ways at unpredictable times.

The recognition of the dangers of goto statements and their effect are generally recognized in the field of computer programming. As an example, I have attached two relevant texts that are considered authoritative in the field and regularly relied upon in the field. See Exhibits 5, 6.

The AMI Plus Version 13 software used in the device at issue is written in assembly language. In this program, there are numerous goto statements used throughout the code. The goto statements are identified in the code with the mnemonic **BR**. The ledalarm.asm module of the code contains 35 goto statements in the form of unconditional branches with the mnemonic **BR**. See Exhibit 2 for a listing of the goto statements in that module. This module is critical to the function of the alarm system in the device. These goto statements are defective and not fit for use in this device. Additionally, there are 434 goto statements throughout the software. See Exhibit 3. These statements create a patchwork of unreliable and defective spaghetti code which will cause the AMI Plus Version 13 software to fail intermittently within a reasonable engineering certainty.

Further, the use of the goto statements was not necessary as there were other adequate flow-of-control mechanisms available, such as **if**, **if-else**, **for**, **while**, **do** and **switch**, that would have allowed the program to function in an organized linear manner. The proper use of these statements would have avoided creating spaghetti code and would have prevented intermittent failures.

There are two pieces of information that would seem to indicate that the alarm did not fail and therefore no software error exists. As part of my analysis, I fully considered this information and gave it the same weight and degree as all other information.

The first piece of information is the fact that the software has passed all testing. However, the field of software engineering clearly recognizes the principle that testing cannot show the absence of error in software, but only the presence of some errors. See Exhibit 7 which is authoritative and regularly relied upon in the field of computer

programming. Software is never considered to be error free and certainly never considered to be error free because it has passed testing. In the field of software engineering, it is accepted that testing is only able to detect errors that are detectable by that type of testing. In other words, the value of the test is reduced to the limits of the test. Of particular concern, it is generally accepted that spaghetti code is the hardest, if not impossible, to test because it is prone to intermittent failures. Intermittent failures can almost never be discovered by testing except by chance. Therefore, it is the general rule in software engineering that the presence of spaghetti code renders testing ineffective. Due to this problem, the fact that the AMI Plus code passed testing cannot and does not exclude the presence of a software error accounting for the complaint of the failure of the audible alarm during the event at issue.

The only other information that would tend to minimize the chance of a software error occurring are the logs from the device that show an audible alarm sounded during the events at issue. This information must be taken in context that it is produced by software that has hundreds of defective goto statements, i.e., spaghetti code. If the code were organized in a linear fashion and not subject to unconditional branching statements, then a reviewer could consider that the logs are reliable because the program would act as intended. The unorganized structure of the code causes lines of code to not follow their intended path and not reach their required destination. Therefore, it is probable that the logs are unreliable. In light of the undisputed testimony that the alarm did not function, it is certain that the logs are not reliable.

I have also had the opportunity to review dozens of previous complaints relating to the AMI Plus. In those complaints, there are several instances of undisputed witness testimony showing that the alarm did not sound when it should have, but that the device logs stated it did sound. Taken together with all the other information, the logs are inaccurate within a reasonable degree of engineering certainty.

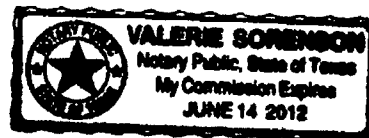
Within a reasonable engineering certainty, I must conclude that the cause of the complaint for the alarm not functioning during the event in question is that the alarm actually did not function and that the root cause of the failure was a software error due to the defective lines of software identified in Exhibit 2 and 3.

All of the available evidence either supports this conclusion or is neutral as to the conclusion. The fault tree for the device, the eyewitness testimony, the nature of intermittent failures, the defective software code, and the dozens of previous incidents lead to the conclusion that only the defective software could have caused this event. All other possibilities have been excluded to a reasonable degree of engineering certainty.

Walter Daugherty
Walter Daugherty

SWORN before me this 17 day
of April __, 2009

Valerie Sorenson (LS)
Notary Public for BRAZOS County
My Commission expires 6/14/2012



STATE OF SOUTH CAROLINA

COUNTY OF RICHLAND

KAREEM J GRAVES and
TARA GRAVES, individually and as duly
appointed personal representatives of the
ESTATE OF INDIA IYANNA GRAVES,

Plaintiffs

vs

CAS MEDICAL SYSTEMS INC ,
AMERICAN HEALTHCARE
RESOURCES INC d/b/a ASHBY
MEDICAL and STEVE M ELLIOTT
or any business entity d/b/a ASHBY
MEDICAL and PALMETTO HEALTH
ALLIANCE

Defendants

IN THE COURT OF COMMON PLEAS
CIVIL ACTION NO 06-CP-40-7398

Affidavit of Frank Painter

BACKGROUND

I am a biomedical engineer with a BS and MS degree in mechanical engineering and certification as a practicing clinical engineer. I have worked in a number of healthcare organizations evaluating and managing the acquisition and maintenance of medical equipment found in all areas of the healthcare environment. I have investigated more than 150 medical device related incidents.

I am currently the Clinical Engineering Program Director in the School of Engineering at the University of Connecticut. I have published and presented articles on the maintenance and management of medical equipment and devices in the healthcare environment as well as healthcare technology risk management.

I have received education in the area of physiology and medical science especially as it relates to biomedical engineering and biomedical devices. I am familiar with JCAHO and FDA regulations and requirements related to medical devices. I am familiar with infant apnea monitors and breathing frequency monitors.

For further information concerning my experience and expertise please refer to my curriculum vitae which has been attached.

ITEMS REVIEWED

I have reviewed the following documents and materials provided by you pertaining to this case

- 1 AMI Design Documents
- 2 FDA Recall Documents
- 3 Adverse Event Reports & Related Service Documents
- 4 Documents Concerning 1998 Recall
- 5 510k Submission
- 6 2001 Recall Termination Letter from FDA
- 7 1998 Recall Termination Letter from FDA
- 8 Equipment Registration
- 9 Adverse Incident Reports
- 10 Service Reports for Model 10114701
- 12 User Manual & Access Guide
- 13 Clinicians Manual
- 14 Service Manual
- 15 Report Generator Manual
- 16 Supporting Software Documents
- 17 Download Reports on India Graves
- 18 Affidavit of Lenny Hottin
- 19 Deposition of Tara Graves
- 20 Deposition of Kareem Graves

Additionally I attended the depositions of Ron Jeffery, Lenny Hottin and Harry Triebel in another case during the month of July, 2007. I also examined and tested an exemplar CAS Medical AMI Plus 9700B breathing frequency monitor.

FACTS OF THE CASE

The product involved in this action is the AMI Plus sleep apnea monitor serial number 10114701 (the AMI Plus) manufactured, designed, and distributed by Defendant CAS, prescribed for the infant decedent India Iyanna Graves by her physician and provided to her parents, the Plaintiffs on February 14, 2004, by agents or employees of Defendant American Healthcare Resources, Inc d/b/a Ashby Medical and/or Defendant Steve M-Elliott or any other business entity known as "Ashby Medical."

India Iyanna Graves was born prematurely on December 30, 2003, at Palmetto Richland Memorial Hospital (Palmetto Richland) in Columbia, South Carolina. She was one of triplet daughters born at 27 weeks gestation to Tara Simmons Graves and Kareem J. Graves. Immediately after birth, India and her sisters were placed in the Neonatal Intensive Care Unit at Palmetto Richland under the care of employees and agents of Palmetto Richland including physicians, nurses, and other health care providers. Due to their medical conditions, sleep apnea monitors were ordered for all three babies by Palmetto Richland, who recommended Defendant

Ashby Medical and the AMI Plus apnea monitor

Tara and Kareem Graves were trained at Palmetto Richland on the use of the AMI Plus apnea monitors prescribed for all three babies, and specifically on the AMI Plus 10114701 monitor prescribed for India. On February 14, 2004 the AMI Plus was delivered by Defendant Steve Elliott, acting as agent of Ashby Medical, to Kareem Graves in the presence of Tara Graves. On February 17, 2004, India was released by Palmetto Richland to her parents' care with the AMI Plus monitor.

When the family returned to their home, the triplets slept in three bassinets in the Plaintiffs' bedroom. All three babies were attached to AMI Plus apnea monitors provided by Defendant Ashby Medical and Steve Elliott. Between February 17 and April 11, 2004, the Plaintiffs became familiar with the alarm lights and the alarm sounds on the AMI Plus monitor.

On April 11, 2004, at the families home on Spring Valley Lane in Orangeburg, South Carolina, the Plaintiffs had laid the babies down for sleep and were properly operating the AMI Plus monitor in an ordinary, routine manner as instructed. At approximately 3:30 am, Tara Graves awoke and noted at least three lights "on" on India's AMI Plus monitor. In observing the machine and with their training, the Graves noticed there were lights signifying an apnea event and bradycardia, however no alarm was sounding, nor was there an audible sound from the AMI Plus monitor. India was not breathing. Plaintiff Tara Graves and her husband contacted EMS and attempted to resuscitate her infant India without success. EMS arrived at 4:01 am. India was never resuscitated and was pronounced dead that same day.

Following the death, Defendant Steve Elliott returned to the home and retrieved the monitor the same day. The monitor was sent to the Defendant CAS for inspection, however it was returned to service later by Ashby Medical.

EXPERT ANALYSIS

For the purposes of this testimony, I have used the term AMI to describe both the AMI and the AMI Plus devices. The AMI Plus is almost identical to the AMI and none of the differences in the two have any bearing on my opinions in this matter.

The AMI is a medical device designed to monitor breathing and heart rates of infants. The device is connected to the infant by way of a two wire set of leads that measure the movement of the chest in breathing, and the rate of the heart.

When working correctly, the device is designed to sound an alarm when the breathing or heart rate falls outside of the parameters set for the device concerning apnea (lack of breathing), bradycardia (slow heart beat), or tachycardia (fast heart rate).

When the device detects an episode, the event is logged in the download. Further, the software sends a signal to the audible alarm to activate. The software also sends a signal to the internal microphone to listen for the audible alarm. If the microphone reports back to the software that

the alarm is not heard a backup alarm is activated. Additionally, an entry is made in the download that the audible alarm failed.

In his affidavit, Lenny Hottin states that the microphone records of the sound of the alarm sounding in the downloads of the machines. This is incorrect. The microphone for the machine is always on. The software for the machine sends a message to the alarm to sound at the same time it sends a message for the microphone to report back whether it 'hears' the alarm. However, if the software does not turn the alarm on, the microphone will not know to 'listen' for the alarm. The downloads from India Graves' machine on April 11, 2004 do not reflect that the machine heard an alarm. Instead, the downloads reflect that either the alarm sounded or the alarm was never activated by the software. By looking at the downloads alone, either situation is a possibility.

Additional information makes it extremely unlikely the audible alarm did activate. Instead, it is most likely that the machine did not activate the audible alarm system.

In this case, it is alleged that India Graves suffered a terminal apnea episode on April 11, 2004. At the time of the incident, the downloads reflect that the machine was turned on and monitoring. Further, the downloads reflect that the machine recognized that a critical event was occurring, i.e. the apnea and bradycardia events. However, testimony of the parents indicates that the alarm was never heard despite their being present in the room. Further testimony indicates that Tara Graves awoke during the night and witnessed the apnea events occurring and even though the alarm lights were activated, there was no presence of an alarm that had sounded.

The death of India Graves was completely avoidable if the AMI monitor would have been properly designed, or if CAS had used appropriate post market surveillance and investigation procedures to investigate a habitual problem with the AMI's audible alarm system.

The Hazard Analysis created by the original developer of the AMI correctly identifies three possibilities of a complaint with the audible alarm.

The first plausibility is a hardware malfunction. If the hardware of the alarm system were to malfunction, then most likely it would be found upon testing. Furthermore, the downloads from the machine would reflect the failure of the audible alarm system. Neither occurred with this machine. Therefore, it is most likely that the hardware is not the cause of the failure of the alarm system in this case.

The second plausibility is a software malfunction. The software of the AMI has been examined by qualified software engineers, William Lively, Ph.D. and Walter Daugherty, Ph.D. They have found that the software for the AMI is disorganized and unreliable. When designing a medical device, it must be designed so that the software problems that present themselves are easily discovered and corrected. If the software is disorganized and unreliable, the critical task of correction cannot be accomplished and the error will continue to repeat itself. The design of the software system for the AMI is unreasonably dangerous and constitutes a defect in the design of the system.

If a problem with the alarm system were caused by software failures there would be certain characteristics. First the failures would most likely be intermittent. Second the failures would not present themselves on the standard testing protocol used by the manufacturer because it would have already demonstrated the ability to pass those protocols before release onto the market. Third, the downloads for the machine would record the events, but not necessarily the alarm failure due to the microphone being activated by the same software as the alarm.

The allegation in the Graves matter meets all of these criteria as does the other 50 or more unexplained complaints concerning the audible alarm system for the AMI machine. The complaints have been steady, but the failures are intermittent. The basic testing protocol used by CAS and others to test these machines have failed to duplicate the problem. Finally the downloads for the machines do not reflect a failure of the audible alarm system.

The third plausibility identified by the Hazard Analysis to explain an alarm complaint is that the complaint is an error and the alarm actually did sound. In the situation involving India Graves that is most unlikely because the mother, Tara Graves actually observed the malfunction i.e. she awoke to the apnea occurring but even though the monitor lights were on the audible alarm did not function.

This is further supported by the fact that there have been more than 50 complaints made concerning the failure of the audible alarm since June 1998. The complaints are by different people and organizations using the machines. Both distributors of the device and parents have observed the failure of the alarm system. However, these complaints all meet the criteria for a software error.

The manner in which the error occurred, the findings of Dr. Lively and the history of the device lead me to conclude that the audible alarm failed on April 11, 2004 due to a software error and allowed India Graves to have a prolonged apnea episode without alerting her parents.

CAS has also failed to act as a reasonable and prudent manufacturer of medical devices in the way that CAS has investigated complaints concerning the audible alarm on the AMI device.

CAS acquired the product from Nellcor Puritan Bennett (NPB)/Mallinckrodt without a detailed product understanding. Each component (hardware, software, test equipment and procedures) was treated by CAS as an entity that was perfectly designed, could be relied on to provide satisfactory results and should not be questioned. As a result CAS's ability and willingness to examine the product when unexpected results occur was limited.

When CAS has received complaints regarding the audible alarm, the test protocol and test methods used have been limited to the protocol provided by NPB / Mallinckrodt at the time of the product line purchase by CAS. Therefore, reported problems are discounted if the monitor passes the tests to which CAS subjects it. No other specialized tests were created by CAS to test the monitor for reported problems. As a result, regardless of the reported problem, if the monitor

passed all the bench, automated and extended tests it was declared to be in good working condition

This has created a situation where the complaints have not even been fully investigated, yet CAS has declared the complaints invalid and returned the device to the market. Even more recklessly, the test methods employed by CAS are not designed to catch software errors. Therefore CAS has determined the complaints to be erroneous without even considering much less investigating potential software errors.

A reasonable manufacturer also has a duty to investigate and track trends within the complaints made to the manufacturer. The process CAS medical used to identify problem trends was managed by Ron Jeffery, CAS QA Manager/Director of Regulatory Affairs. He was the CAS employee who had primary responsibility for monitoring negative problem trends. There was no formal process or system in place to monitor these trends. Instead, Mr. Jeffery used an informal process where he relied on technicians or other people to look out for problems and report the problems to him. In deposition he stated that he never identified a problem with the audio alarms. He also stated that failure to duplicate a problem through service department testing causes a reported problem to be discounted.

Problem trends should be the direct responsibility of Mr. Jeffery and a formal process should be used. It should not be left to the service technicians because these individuals have very limited access to previous service reports and failure trends. Further, these technicians are not engineers and have the least amount of training to understand more complex problems. The process or lack thereof, by CAS is neither reasonable nor prudent for a manufacturer of medical devices.

When customer problems and complaints were reported they were handled in a two-prong fashion. Customer complaints were documented and processed as product complaints. If the monitor was to be returned for evaluation, it was given an RMA number and a service report was created to document the repair. The service technician who did the repair and testing of the monitor only had access to a summary of the complaint which was written on the service report. He did not have access to the full description of the incident and so had no way to accurately recreate the scenario the patient's family had experienced but could only analyze the problem using the limited information he was provided. Additionally, the service technicians did not contact the dealer or the family of the patient to learn more about the true nature and circumstances of the complaint. CAS failed to act as a reasonable and prudent manufacturer by not obtaining full and accurate histories of the complaints before during their cursory investigation.

In conclusion, it is my opinion based on my education, training, experience, and review of the information involved in this case that a problem in the software created by certain patient conditions or by environmental factors the monitor was experiencing caused it to allow alarm conditions to be sensed and displayed but caused the audio alarm not to be activated, allowing family members of children in distress not to be made aware of the abnormal physiological conditions the child was experiencing.

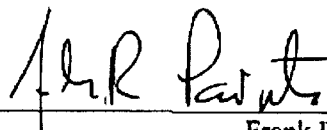
The software that CAS Medical employed in the AMI and AMI Plus breathing frequency monitors was unreliable and unreasonably dangerous for the purpose for which it was being used. The test equipment and procedures that CAS Medical had in place were inadequate to sufficiently test its breathing frequency monitors to confirm problems found in the field by patients and their families.

If CAS had been able or willing to monitor customer complaints and problem trends it could have identified and fixed the problem of the AMI and AMI Plus breathing frequency monitor which was not providing an audio alarm when the monitor had sensed an alarm condition. Had CAS been able or willing to do this this incident would not have happened.

Further, had the Defendant Steven Elliott and Ashby Medical been forthright with the Plaintiffs and explained the numerous problems that the seep apnea monitor experienced and the number of complaints that had been lodged the Plaintiffs would have been able to secure another form of care for their child. However the Plaintiffs were led to believe that this monitor was without fault and thus they used such monitor. Further, the Defendants Steven Elliott and Ashby Medical distributed this machine knowing the errors and grievances with the machine and did not alert their clients or the medical facilities that matched the Defendants with the Plaintiff nor did they cease distribution of the monitor.

To a reasonable degree of engineering certainty the subject apnea monitor was defective and unreasonably dangerous. The defect which caused the audible alarm to malfunction was the direct cause of India's death. To a reasonable degree of engineering certainty the Defendant CAS Medical was negligent in the design of the monitor, and its failure to correct the problems with the monitor further CAS knew or should have known the problems existed. The Defendant Ashby Medical failed to properly warn and inform the minor's parents of the problems they knew or should have known existed.

The opinions given above are made to a reasonable degree of engineering certainty.



Frank Painter

SWORN before me this 12th day
of October 2007



Notary Public for State of Connecticut
My Commission expires 12-31-2009

STATE OF SOUTH CAROLINA	)	IN THE COURT OF COMMON PLEAS
	)	CIVIL ACTION NO 06-CP-40 7398
COUNTY OF RICHLAND	)	
	)	
KAREEM J GRAVES and	)	
TARA GRAVES individually and as duly	)	
appointed personal representatives of the	)	
ESTATE OF INDIA IYANNA GRAVES	)	<u>Affidavit of</u>
	)	<u>Janice E Ross, M D</u>
Plaintiffs,	)	
	)	
vs	)	
	)	
CAS MEDICAL SYSTEMS, INC ,	)	
AMERICAN HEALTHCARE	)	
RESOURCES, INC d/b/a ASHBY	)	
MEDICAL and STEVE M ELLIOTT	)	
or any business entity d/b/a ASHBY	)	
MEDICAL, and PALMETTO HEALTH	)	
ALLIANCE,	)	
	)	
Defendants	)	

BACKGROUND

- 1 I am over the age of eighteen
- 2 I graduated from the University of South Carolina with a B S In Biology in 1968, at which time I went on to the Medical University of South Carolina, but transferred to the SUNY Upstate Medical Center of Syracuse, NY in 1970
- 3 I received my Medical Degree in 1972 and spent the following two years there as a Resident in Anatomic Pathology The next two years I was in Residency for Clinical Pathology at the Center and from July 1975 to June 1976 I was Chief Resident, Clinical Pathology

- 4 I am Board Certified in Anatomic and Clinical Pathology in 1976, and received my certification in Forensic Pathology in 1985
- 5 From July 1976 to September 1977 I served as Assistant Pathologist for the Cayuga County Laboratory, and was a Coroner's Physician from 1976 to March 2000 for Cayuga, Oswego, Cortland Tompkins, and Seneca Counties From 1977 to April 2000 I was the director of the Cayuga County Laboratory I was part-time Assistant Medical Examiner for Onondaga County from 1985 to July 1999, and was Acting Chief Medical Examiner for the same county from November 1993 to June 1994 I served as Cayuga County Coroner for three terms, from 1990 to April 2000 I took the position of Associate Forensic Pathologist for Newberry Pathology Associates in May 2000, and I am member of the Disaster Mortuary Team (DMORT) which served at the TWA 800 crash and the North Carolina Flooded Cemetery

ITEMS REVIEWED

- 6 I have been asked to review the monitor log, the EMT Run Sheet, as well as the autopsy that I performed on April 11, 2004 for India Graves

FACTS OF THE CASE

- 7 On April 11, 2004, the body of India Graves was presented for autopsy This 3-month old black female infant who was one of triplets was found unresponsive by her mother at approximately 3 am on 4-11-2003 The baby has last been seen alive at 12 40 am that same date She was born on 12-3-2003 and had some respiratory problems and a 'heart murmur' Was seen by a local physician on April 10, 2004 for "congestion ' and thrush
- 8 I was not privileged to review the monitor log prior to my completion of the autopsy

report Further, I am not familiar with this piece of equipment as to how it works and how or when it would fail Had such information been available at the time of my report, I would have indicated that the log showed that India had suffered from slowing heart rate and apnea during the time period of 1 39 a m to 2 50 a m

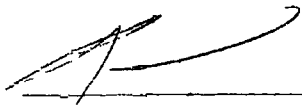
ANALYSIS

- 9 I have reviewed the software system log for the AMI device According to the log, should it be correct India was experiencing slow heart rate and apnea starting at approximately 1 39 a.m she continued to experience slow heart rate and apnea from 1 39 a m to 2 50 a m when the monitor indicates that it was powered down Further from reviewing the EMT Run Sheet it appears that the EMT Tech documents that there was no alarm heard from the monitor
- 10 As is well known in the medical and forensic fields, Sudden Infant Death Syndrome (SIDS) is a diagnosis of exclusion Essentially there are no other indications for a cause of death, or as indicated in my autopsy there were no indications of trauma and/or anomalies found in India. There is a diagnostic term of near SIDS that I am familiar with through my education and experience “Near SIDS” however, is a controversial event which has been reported The “near SIDS babies have had respiratory arrests which reverse when the baby is stimulated This is controversial because the respiratory arrests have not been able to be witnessed by medical personnel so that other causes cannot be ruled out
- 11 I would defer any opinion as to India’s survival to a neonatologist or other similar expert
- 12 The information given above are made to a reasonable degree of medical certainty



Janice E Ross, M D

SWORN before me this 3rd day
of March, 2010



(L S)

Notary Public for SC

My Commission expires 1/14/2015

STATE OF SOUTH CAROLINA	) IN THE COURT OF COMMON PLEAS
	)
COUNTY OF ORANGEBURG	) CIVIL ACTION NO 08-CF 38-826
	)
KAREEM J GRAVES and	)
TARA GRAVES, individually and as duly	)
appointed personal representatives of the	)
ESTATE OF INDIA IYANNA GRAVES	)
	)
Plaintiffs,	)
	)
vs	)
	)
CAS MEDICAL SYSTEMS, INC.,	)
AMERICAN HEALTHCARE	)
RESOURCES, INC. d/b/a ASHBY	)
MEDICAL and STEVE M ELLIOTT	)
or any business entity d/b/a ASHBY	)
MEDICAL, and PALMBITO HEALTH	)
ALLIANCE,	)
	)
Defendants.	)

SUPPLEMENTAL AFFIDAVIT OF WALTER DAUGHERITY

PERSONALLY APPEARED BEFORE ME THE UNDERSIGNED, who being duly sworn, deposes and states as follows

1 My name is Walter Daugherty, I am over the age of eighteen, and I am a Senior Lecturer in the Department of Computer Science and Electrical Engineering in the College of Engineering at Texas A&M University. I obtained my Ed.D in Mathematical Education from Harvard University in 1977, my M.A.T in Mathematics from Harvard in 1967 and a B.S in Mathematics from Oklahoma Christian College in 1966

2 I have an extensive background in both teaching and developing computer programming. My qualifications and publications are set forth more fully in my curriculum vitae which has been previously submitted

3 I make the within statements based on my personal knowledge except where otherwise stated

4 I have been asked to further explain the manner in which the software defect in the AMI Plus was identified and the nature of the defect. This affidavit is intended as a

supplement to my previous testimony which I incorporate by reference for further explanation.

5 First, I will address the opinions expressed in the Supplemental Affidavit of Roger Pressman.

Dr Pressman states in his supplemental affidavit that there is the availability of testing; however, Dr Pressman has stated that he has never looked at the code and is basing his statements "solely on the program flow illustrated in the flowchart." This flowchart was the one that I created on only one portion of one module of the actual code (see attached draft flowchart that I had previously created). However, in his supplemental affidavit Dr Pressman repeatedly refers to my flowchart of one portion of the ledalarm.asm module as "the ledalarm.asm component," mistakenly identifying my flowchart of one portion of the ledalarm.asm module as a flowchart of the complete ledalarm.asm module, which it is not.

As stated several times throughout his supplemental affidavit, the flowchart which I created was only on the "ledalarm.asm" module of the subject code. Furthermore, the flowchart only represents approximately twenty percent (20%) of that module.

Since Dr Pressman did not review the actual code, he did not know this.

As I have expressed previously, the defect in the code is the lack of structure. This code would be considered spaghetti code for the reasons I have previously stated. Additionally, Dr Pressman seems to agree to some extent in paragraph 60 of his Supplemental Affidavit. In that paragraph Dr Pressman notes that "the designer has chosen not to maintain dogmatic adherence to functional domain." This is an understated way of stating the code lacks the proper structure.

In fact, Dr Pressman in his textbook agrees with me that the code must be rewritten. On page 401, Figure 14.7 presents flowcharts for four classes of loops; the AMI code clearly matches the fourth class, "unstructured loops," concerning which Dr Pressman states on the following page (page 402), "You can't test unstructured loops effectively. Redesign them." This statement accurately reflects the knowledge and practice in the industry.

Further, Dr Pressman opines that the ledalarm.asm component can be adequately tested and generally refers to techniques without actually setting forth any specific testing criteria. Since the AMI source code is replete with unstructured loops, the tests described by Dr Pressman are

ineffective. The standard of care in the industry would be to redesign the entire code for the AMI so that it makes proper use of structured programming.

When this software was created for the AMI, the standard of care and standard of good engineering practice was to write in higher-level structured language, then use a tool to convert that to assembly code. NEC had such a tool available for this processor. Instead of following the standard of care, the programmers attempted to write the code directly in assembly language without sufficient attention to program structure, which has led to the unstructured spaghetti code seen in this software.

Unfortunately, the programmers for the AMI used an inferior tool when this superior tool was available, and failed to properly inspect and debug the program code. The programmers opted not use the tools at their disposal and ignored good engineering practices by having code written directly to assembly. If you do that, you get unstructured code like we have here which is more prone to error and in which bugs are less likely to be found and fixed. The standard of care for the programmers would have been to flowchart the program so that it could be structured properly instead of using an ad hoc approach. Software design starts with good planning and the use of a flowchart to plan the software. The programmers failed to flowchart the program, and that was a breach of standard engineering principles at the time. By their purchase of this product and their obligations as the owners of this product line, CAS had the responsibility to correct these mistakes when it purchased the product line.

I also disagree with Dr. Pressman that any testing criteria on the software will show the absence of a defect. Furthermore, Dr. Pressman disagrees with this principle in his text. As stated on page 379, "Debugging will always have one of two outcomes. (1) the cause will be found and corrected, or (2), the cause will not be found." This is a basic principle in software. Testing can only show the presence of certain bugs, not the absence of them. See also, Software Testing 2nd Edition by Ron Patton.

6 As stated in much of the literature, testing is not to determine the absence of defect. You can only show the presence of a defect that happens to be susceptible to that test. Bugs can be intermittent, unpredictable, and completely un-reproducible. The very nature of their unpredictability often makes them difficult to locate, if not impossible. If spaghetti code is used, such as with the AMI, it is almost certain that an intermittent error will not be found. This is the essence of the defect in the code which caused the monitor to malfunction. The software and design industry recognized this "lack of structure" as being substandard as far back as 1965. It was clearly negligent to use this kind of software and design in the monitor and a structured program which was an alternative

consistent with industry best practices was available which would have produced a superior code. This kind of software and design was available years before the monitor was designed and manufactured

7 The appropriate action that should have been taken by CAS when they purchased this monitor line would have been to review the software thoroughly; instead, with incredible negligence the programmers at CAS neglected to review the software, and failed to discover the defective structure of the code.

8 The use of this type of structure, or rather, lack of proper structure (spaghetti code), leads to more frequent and/or intermittent errors, which are more difficult to locate and fix than in structured programming. Therefore, the use of spaghetti code is more likely to lead to intermittent errors that cannot be adequately tested and may never be found.

9 As I have expressed in my deposition, in order to find a specific line of code that created the alarm in this case not to sound, it would literally take decades of time and manpower to determine. This phenomenon relates directly to good software engineering practices to create and/or diagram the flow of logic during the design stage and to design the code in a structured format. This was not done during the design of this product, nor was this done at any time since its inception.

10 The incredible negligence of CAS by using spaghetti code is a direct and proximate cause of the death of India Graves, and had CAS used the alternative design of structured code, more likely than not the monitor would have alarmed, and according to Dr. Wilkins the parents would have been awakened, and they would have stimulated India, ending the spine event.

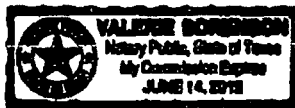
11 I have also been asked to supplement my testimony in regards to the issues relating to other AMI Plus monitoring devices malfunctioning. I am aware of numerous other monitor malfunctions and the Defendant had notice of these malfunctions. It was incredibly negligent for the Defendant not to have at least recognized its duty to determine the cause of the malfunctions and corrected the problems or redesigned the monitor prior to other users using the equipment. The design of the system makes the diagnosis of the cause of the malfunction virtually impossible. Thus when the Defendant knew about numerous other malfunctions and continued to allow its product to be used was a conscious act which is deplorable.

12 I have been requested to further supplement my affidavits with additional industry literature, therefore attached please find the same.

Walter Daugherty
Walter Daugherty

SWORN before me this 2 day
of February , 2010

Valerie Lounson (L.S.)
Notary Public for Brazos County, State of Texas
My Commission expires 6/14/2012



STATE OF SOUTH CAROLINA) IN THE COURT OF COMMON PLEAS
) CIVIL ACTION NO. 06-
CP 40 7398
COUNTY OF RICHLAND)

KAREEM J. GRAVES and)
TARA GRAVES individually and as duly)
appointed personal representatives of the)

ESTATE OF INDIA IYANNA GRAVES) Affidavit of William M. Lively
)
Plaintiffs)

vs)
)

CAS MEDICAL SYSTEMS, INC.)
AMERICAN HEALTHCARE)
RESOURCES, INC. d/b/a ASHBY)
MEDICAL and STEVE M. ELLIOTT)
or any business entity d/b/a ASHBY)
MEDICAL and PALMETTO HEALTH)
ALLIANCE)
)
Defendants)

BACKGROUND

I am a Professor of Computer Science at Texas A&M University. I obtained my Ph.D. in Computer Science and Electrical Engineering from Southern Methodist University in 1971. I obtained my M.S. in Electrical Engineering from Southern Methodist University in 1967.

I am a licensed Software Engineer and a licensed Electrical Engineer in the State of Texas. I have participated in the design and implantation of numerous software systems, including those for use in the medical field.

My qualifications are further set out in my CV which is attached to this affidavit as Exhibit 1.

ITEMS REVIEWED

I have been asked to review the software system for the AMI infant apnea monitor. I have reviewed the design documentation, the testing documentation, the software code, and various incident reports concerning the AMI monitors.

I am familiar with the minimum standards required to make a software system safe and reliable. Additionally, I am also familiar with concepts set forth by the FDA that reflect the properties of ensuring adequate software as reflected in ***General Principles of Software Validation, Final guidance for Industry and FDA Staff January 11, 2002 (GPSV)***

FACTS OF THE CASE

The product involved in this action is the AMI Plus sleep apnea monitor serial number 10114701 (the AMI Plus) manufactured, designed, and distributed by Defendant CAS prescribed for the infant decedent India Lyanna Graves by her physician and provided to her parents, the Plaintiffs, on February 14, 2004, by agents or employees of Defendant American Healthcare Resources, Inc. d/b/a Ashby Medical and/or Defendant Steve M. Elliott or any other business entity known as Ashby Medical.

India Lyanna Graves was born prematurely on December 30, 2003, at Palmetto Richland Memorial Hospital (Palmetto Richland) in Columbia, South Carolina. She was one of triplets born at 27 weeks gestation to Tara Simmons Graves and Kareem J. Graves. Immediately after birth, India and her sisters were placed in the Neonatal Intensive Care Unit at Palmetto Richland under the care of employees and agents of Palmetto Richland, including physicians, nurses, and other health care providers. Due to their medical conditions, sleep apnea monitors were ordered for all three babies by Palmetto Richland, who recommended Defendant Ashby Medical and the AMI Plus apnea monitor.

Tara and Kareem Graves were trained at Palmetto Richland on the use of the AMI Plus apnea monitors prescribed for all three babies, and specifically on the AMI Plus 10114701 monitor prescribed for India. On February 14, 2004, the AMI Plus was delivered by Defendant Steve Elliott, acting as agent of Ashby Medical, to Kareem Graves in the presence of Tara Graves. On February 17, 2004, India was released by Palmetto Richland to her parents' care with the AMI Plus monitor.

When the family returned to their home, the triplets slept in three bassinets in the Plaintiffs' bedroom. All three babies were attached to AMI Plus apnea monitors provided by Defendant Ashby Medical and Steve Elliott. Between February 17 and April 11, 2004, the Plaintiffs became familiar with the alarm lights and the alarm sounds on the AMI Plus monitor.

On April 11, 2004, at the family's home on Spring Valley Lane in Orangeburg, South Carolina, the Plaintiffs had laid the babies down for sleep and were properly operating the AMI Plus monitor in an ordinary, routine manner, as instructed. At approximately 3:30am, Tara Graves awoke around 3:30am and noted at least three lights on India's AMI Plus monitor. In observing the machine and with their training, the Graves noticed there were lights signifying an apnea event and bradycardia, however, no alarm was sounding, nor was there an audible sound from the AMI Plus monitor. India was not

breathing Plaintiff Tara Graves and her husband contacted EMS and attempted to resuscitate her infant India without success. EMS arrived at 4:01 am. India was never resuscitated and was pronounced dead that same day.

Following the death Defendant Steve Elliott returned to the home and retrieved the monitor the same day. The monitor was sent to the Defendant CAS for inspection; however, it was returned to service later by Ashby Medical.

EXPERT ANALYSIS

I have reviewed the software system for the AMI device. The software system for the AMI device is inadequate and unreasonably dangerous in its design. The design of the software is the most plausible cause of the multitude of audible alarm problems that have been experienced with the device. Further, the design of the system does not allow the errors causing the failures to be found and corrected. As a result, the device is unreasonably dangerous by reason of the defect in its software design and the defect was the most plausible cause of the software failure on April 11, 2004 while being used on India Graves.

All software systems will contain some amount of errors. Software cannot be exhaustively tested, but it can be tested to a level of confidence. When designing a software system, it must be presumed that errors may present themselves after testing has been concluded. Therefore, a software system that is appropriately designed must be organized so that system errors can easily be found and corrected.

The software system used in the AMI is not appropriately designed. It can best be classified as spaghetti code due to its unorganized structure. Spaghetti code is a term used to describe software that has a complex and tangled structure that is not conducive to finding and correcting errors. Spaghetti code uses extensive loops instead of a structured format. The extensive loops create a situation where the possibilities of error are endless. In spaghetti code, there will most likely be errors that occur either frequently or rarely, but are intermittent and impossible to correct and find. When the AMI was developed, the industry standard was structured programming, not spaghetti code.

The structure of the code in the AMI is a design flaw that is the most likely source of the dozens of alarm failures that cannot be explained by either hardware problems or complaint errors. However, the structure is so poor for the software that the errors cannot be fixed or located with any certainty. Therefore, the software used in the AMI should have been completely redesigned and formed in a structured fashion so that the intermittent errors are eliminated.

Reviewing the documentation supplied by the various companies who owned or own 9700/Ami/Ami Plus, I find very poor techniques of software engineering applied to software development and maintenance. The Requirements Traceability Matrix is fraught with numerous inconsistencies and missing items. In the code listings, there is

poor documentation and mostly poor and cryptic variable names. Such properties make it extremely difficult to maintain the code -- fix defects in the code with no indexed symbol table (variables) or list of acronyms chosen for the variables. This is a major problem for life critical software where quickly fixing code is paramount. In the 1990s when the software was developed 'industry best practice' was transitioning from 'structured programming' (where every module subsection has a single point of entry among other things) to 'object oriented programming' (where a program is constructed from communicating objects). Either approach would have been reasonable to develop the Ami software. However this was not done and the code is more correctly characterized as 'spaghetti code' due to the tangled and complex control structure in which program flow resembles a pile of spaghetti making verification, validation, debugging, analysis, maintenance, etc. more difficult.

The primary conclusion is that there is a high probability that an error in the software is causing the loose lead alarm failure problem. The fact that this and other problems with alarms have persisted so long gives credence to the idea that poor software engineering techniques were used in the development of the 9700/Ami/Ami Plus apnea monitor, as does the fact that no fix in the software has been forthcoming.

Further had the Defendant Steven Elliott and Ashby been forthcoming with the Plaintiffs and explained the numerous problems that the Sleep Apnea monitor experienced and the number of complaints that had been lodged, the Plaintiffs would have been able to secure another form of care for their child. However, the Plaintiffs were led to believe that this monitor was without fault and thus they used such monitor. Further, the Defendants Steven Elliott and Ashby distributed this machine knowing the errors and grievances with the machine and did not alert their clients or the medical facilities that matched the Defendants and the Plaintiffs nor did they cease distribution of the monitor.

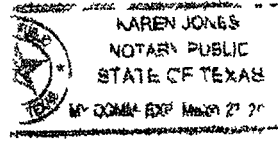
To a reasonable degree of engineering certainty, the subject baby monitor was defective and unreasonably dangerous. The defect which caused the audible alarm to malfunction was the direct cause of India's death. To a reasonable degree of engineering certainty, the Defendant CAS Medical was negligent in the design of the monitor and its failure to correct the problems with the monitor. Further, CAS knew or should have known the problems existed. The Defendant Ashby failed to properly warn and inform the minor's parents of the problems they knew or should have known existed. Clearly, this machine had a history of malfunctioning which was not properly repaired and allowed to stay at the market place.

The opinions given above are made to a reasonable degree of engineering certainty.

William M. L. [Signature]

SWORN before me this 1st day

ENCLOSURE (6)



Notary Public for
My Commission Expires

STATE OF SOUTH CAROLINA	)	IN THE COURT OF COMMON PLEAS
	)	CIVIL ACTION NO 08-CP-38-826
COUNTY OF ORANGEBURG	)	
	)	
KAREEM J GRAVES and	)	
TARA GRAVES, individually and as duly	)	
appointed personal representatives of the	)	
ESTATE OF INDIA IYANNA	)	
GRAVES,	)	
	)	
Plaintiffs,	)	
	)	
vs	)	
	)	
CAS MEDICAL SYSTEMS, INC ,	)	
AMERICAN HEALTHCARE	)	
RESOURCES, INC d/b/a ASHBY	)	
MEDICAL and STEVE M ELLIOTT	)	
or any business entity d/b/a ASHBY	)	
MEDICAL, and PALMETTO HEALTH	)	
ALLIANCE,	)	
	)	
Defendants	)	

SUPPLEMENTAL AFFIDAVIT OF MAC LIVELY

PERSONALLY APPEARED BEFORE ME THE UNDERSIGNED, who being duly sworn, deposes and states as follows

- 1 My name is William M Lively I am a Professor of Computer Science at Texas A&M University I obtained my Ph D in Computer Science and Electrical Engineering from Southern Methodist University in 1971 I obtained my M.S in Electrical Engineering from Southern Methodist University in 1967
- 2 I am a licensed Software Engineer and a licensed Electrical Engineer in the State of Texas I have participated in the design and implantation of numerous software systems, including those for use in the medical field
- 3 My qualifications are further set out in my CV which has previously been provided.
- 4 I make the within statements based on my personal knowledge except where otherwise stated

- 5 I have been asked to review the software system for the AMI infant apnea monitor. I have reviewed specifications, the design documentation, the testing documentation, the software code, and various incident reports concerning the AMI monitors.
- 6 I am familiar with the minimum standards required to make a software system safe and reliable. Additionally, I am also familiar with concepts set forth by the FDA that reflect the properties of ensuring adequate software as reflected in *General Principles of Software Validation, Final guidance for Industry and FDA Staff January 11, 2002 (GPSV)*.
- 7 I have reviewed the software system for the AMI device. The software system for the AMI device is inadequate, unreasonably dangerous, and falls below the software engineering standard of care in its design. The faulty design of the software is the cause of the multitude of audible alarm problems that have been experienced with the device. Further, the faulty design of the software system does not allow the errors causing the failures to be found and corrected. As a result, the device is unreasonably dangerous by reason of the defect in its software design and the defect was the cause of the software failure on April 11, 2004 while being used on India Graves.
- 8 This affidavit is intended to supplement and explain my previous opinions. It is not intended to change any opinions that I have previously offered.
- 9 It is my understanding that CAS contends that there is no defect in the software code because none of the experts have identified a particular line of code that is incorrect. Dijkstra states "software testing only shows presence not absence of errors," hence there is no exhaustive testing for software. This is a fundamental misunderstanding of my testimony and software in general.
- 10 Software can be defective due to an incorrect set of values in a line of software code. This error can lead to software malfunction. However, software can also be defective due to its design and structure. Software that is improperly designed and has inadequate structure is prone to random errors that cause devices running the software to malfunction. No change to a single line of code will correct the design and structure. This type of defect is even more troublesome and defective than software that has a single line of code that is in error.
- 11 The software system used in the AMI is not appropriately designed and falls below the standard of care. It can best be classified as "spaghetti code" due to its unorganized structure. "Spaghetti code" is a term used to describe software that has a complex, tangled structure, and defective flow of control that is not conducive to finding and correcting errors. Spaghetti code uses extensive loops instead of a structured format. The extensive loops create a situation

where the possibilities of error are endless. In "spaghetti code" there will most likely be errors that occur, either frequently or rarely, but are intermittent and impossible to correct and find. When the AMI was developed, the industry standard was structured programming, not "spaghetti code."

12 My review of the relevant material has led to my opinion that the 'spaghetti code' is a direct cause for the alarm to malfunction. The information that I have reviewed indicates the following:

- a. First responder Anita Kelly testified that
 - i. when she arrived the alarm was not sounding. However the download from CAS indicated that human events were in place and that the alarm was sounding.
 - ii. The monitor was on, and the loose lead light was the only light on. However, the download from CAS indicates the monitor was off.
 - iii. That while she was there India was taken down stairs so life saving measures could be performed. Still there was no alarm heard.
- b. The Plaintiffs have testified that no alarm was heard.
- c. Dr. Wilkins has testified that if the alarm was heard that either India would have awoken from the sound of the alarm, or the parents would have awoken and then in turn awakened India, thus ending the apnea event, and thus saving her life.
- d. That other incidents of the alarm not being heard had been reported to CAS, yet no measures were taken to correct the issue, nor was any review of the code done.
- e. That no evidence of hardware malfunction was documented during the Defendants review of the monitor and no evidence of misconduct on the part of the parents has been testified to.
- f. I am of the opinion that the events of the evening allowed the software to follow a path through the code which did not trigger the necessary hardware to have an audible alarm sound from the subject monitor, resulting in the passing of India Graves, due to the code not being designed and/or redesigned in a logical structure as called for in the GPSV 5.2.3 which states in part:

"5.2.3 Design

In the design process, the software requirements specification is translated into a logical and physical representation of the software to be implemented. The software design specification is a description of what the software should do and how it should do it. Due to complexity of the project or to enable persons with varying levels of technical responsibilities to clearly understand design information, the design specification may contain both a high level summary of the design and detailed design information. The completed software design specification constrains the programmer/coder to stay within the intent of the agreed upon

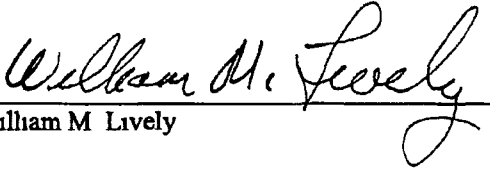
requirements and design. A complete software design specification will relieve the programmer from the need to make ad hoc design decisions.

The software design needs to address human factors. Use error caused by designs that are either overly complex or contrary to users' intuitive expectations for operation is one of the most persistent and critical problems encountered by FDA. Frequently, the design of the software is a factor in such use errors. Human factors engineering should be woven into the entire design and development process, including the device design requirements, analyses, and tests. Device safety and usability issues should be considered when developing flowcharts, state diagrams, prototyping tools, and test plans. Also, task and function analyses, risk analyses, prototype tests and reviews, and full usability tests should be performed. Participants from the user population should be included when applying these methodologies." (emphasis added)

- 13 To further support this opinion there is also evidence that there are complaints including but not limited to the monitor's audible alarm would not stop sounding. This is also due to the structure of the code, in which certain events have led the code down a path in which the monitor was not functioning as it should.
- 14 The structure of the code in the AMI is a design flaw and a breach in the engineering standard of care and is the most likely source of the dozens of alarm failures that cannot be explained by either hardware problems or complaint errors. However, the structure is so poor for the software that the errors cannot be fixed or located with any certainty. Therefore, the software used in the AMI should have been completely redesigned and formed in a structured fashion so that the intermittent errors are eliminated. This software redesign and formation would be economically feasible for the Defendant to complete as was testified to in my deposition. The redesign of the software and implementation could likely be completed within an economically feasible time period, if competent and knowledgeable engineers were hired. To the contrary it would not be economically feasible to find each of the inherent errors that would occur in this code, and would much more cost effective and less time consuming to rewrite the code in the correct logical structure as called for in the FDA, GPSV 5 2 3 as stated above, and attached. When dealing with the life of a baby and the impending litigation that could arise this redesign of the software is without a doubt economically feasible.
- 15 Within a reasonable engineering probability, the design of the AMI software code falls below the standard of care, thus causing a failure of the audible

alarm during the events that led to the death of India Graves The software defect would be economically feasible to remedy redesigning the software

16 The opinions given above are made to a reasonable degree of engineering certainty


William M Lively

SWORN before me this 13th day of March __, 2009

 (L S)
Notary Public for SC
My Commission expires 9/21/2015

STATE OF SOUTH CAROLINA	)	IN THE COURT OF COMMON
	)	PLEAS
COUNTY OF ORANGEBURG	)	
	)	CIVIL ACTION NO 2008-CP-38-826
KAREEM J GRAVES and TARA	)	
GRAVES, individually and as duly	)	AFFIDAVIT OF ROGER S
appointed personal representatives of	)	PRESSMAN
the ESTATE OF INDIA IYANNA	)	
GRAVES,	)	
	)	
Plaintiffs,	)	
v	)	
	)	
CAS MEDICAL SYSTEMS, INC.	)	
	)	
Defendant.	)	

Personally appeared before me the undersigned, who being duly sworn,
deposes and states as follows.

10 The comments contained within this Affidavit are intended to address only the content of the Affidavits of Walter Daugherty and William Lively, with an emphasis on Dr Daugherty's Affidavit. I have made no attempt to examine any other evidence in this case.

20 I received a Ph.D in engineering from the University of Connecticut. Over my 40-year career, I have been a software engineer, a manager with responsibility for the development of engineering/scientific and real-time software, a Professor of Computer Engineering at the University of Bridgeport, the founder of R.S Pressman & Associates Inc., a software engineering consulting firm, and a widely recognized author (CV is attached)

In my 28 year career as a consultant, I have worked with many Fortune 1000 companies with a specific emphasis on software engineering process and methods in the engineered systems domain. I have consulted with a number of companies that developed real-time medical system software including General Electric Medical Systems Phillips Medical Systems, and others

I am the author of eight books, including the world's most widely used book on software engineering, *Software Engineering: A Practitioner's Approach*, now in its seventh edition. The book has sold well over one million copies and has been translated into eight languages

30 I have reviewed the Affidavits of Walter Daugherty and William Lively at the request of CAS Medical Systems, Inc. The comments that follow are intended to put the aforementioned affidavits into proper software

engineering context. The statements I make in this Affidavit are based on my personal knowledge except where I indicate otherwise

4.0 Dr Daugherty states that he has used "engineering and computer engineering standards and practices" as his "methodology" for arriving at his conclusions. It is important to note that an engineering methodology often begins with a hypothesis. If a hypothesis is proposed, it must be proven with empirical evidence and specific real-world experimentation. In a software engineering context, the *experimentation* is often targeted software testing that has been designed to prove or disprove the hypothesis.

5.0 It appears that Dr Daugherty has developed a hypothesis—that the program structure of the software in the AMI Plus is the cause of suspected defects—but he has not demonstrated the hypothesis to be correct through experimentation (testing)

As an example, Dr Daugherty suggests that the device logs (showing the presence of an alarm) "cannot be considered reliable with any degree of engineering probability." If, in fact, the logging software is flawed, an engineering approach dictates that tests be designed to demonstrate that information is not being logged correctly. Dr Daugherty makes no reference to such tests. Hence, his contention that the logging function is not reliable is hypothesis only and not a complete engineering analysis.

6.0 Dr Daugherty correctly states that "Software is never considered to be error free and certainly never considered to be error free because it has passed testing." However, testing is an accepted quality control mechanism that is mandated for companies that build all types of software. Although those companies cannot guarantee that no errors exist, competent and comprehensive tests provide confidence that the software complies with its stated requirements and performs correctly.

7.0 In stating his hypothesis that program structure is the cause of alleged errors in the AMI Plus software, Dr Daugherty dismisses the results of testing that has been performed on the software. Yet he provides no evidence that testing was poorly executed, improperly conducted or otherwise incorrect.

He hypothesizes that testing is unreliable solely because of perceived structural flaws in the software and argues that further testing is fruitless because the program structure invalidates the result.

He makes no attempt to differentiate between general product testing that is used to validate a complete product and targeted testing that is used to prove/disprove a specific error hypothesis. Since the alleged error is specific (i.e., suspicion that the alarm did not sound), it is probable that experimentation (in the form of testing) could be designed to either prove or disprove existence of the error. This has not been done.

- 80 Dr Daugherty asserts that "spaghetti code is "categorized [sic] by intermittent failures that are virtually impossible to fix . ." His use of the phrase "spaghetti code" is a subjective determination. A program that uses unconditional branches in an effort to facilitate logical flow or reduce internal logical complexity is not necessarily "spaghetti code" and does not necessarily exhibit demonstrably poor logical flow (see additional discussion in paragraphs 90, 100, and 120)

Furthermore, Dr Daugherty provides no experimental evidence (i.e., targeted testing) to support his hypothesis nor does he provide references to independent studies that directly indicate that intermittent errors are highly correlated with the localized logical structure of a program.

- 90 Dr Daugherty asserts that the software uses "unconditional branching (goto) statements" and alleges that by their nature, these statements cause the code to execute in "unpredictable and uncontrollable ways " Also, he alleges that the use of such statements makes testing unreliable.

He does not provide sufficient context for the nature of the decades-old debate within the computer science and software engineering communities regarding the use of unconditional gotos and the underlying *structured programming* philosophy

In referring to the "linear" nature of program flow, he alludes to the 'maintenance of functional domain' that is a key tenet of structured programming philosophy. Unconditional gotos violate maintenance of functional domain. However, what Dr Daugherty fails to mention is that there are many other practical issues that competent software engineers must consider when software is built and gotos are used

In many cases, dogmatic maintenance of functional domain (i.e., the absolute avoidance of unconditional branching statements) can create software that has a convoluted logical structure that is exceedingly difficult to review and also difficult to test. The avoidance of unconditional gotos may force a developer to use extraneous Boolean flags that are themselves a potential cause of errors. In addition, the avoidance of unconditional gotos can increase the number of logical tests required to exit a loop, increasing the complexity of a software component. When this occurs, avoiding the use of gotos actually makes the software *less* reliable, not more reliable

- 100 Dr Daugherty notes that the AMI Plus software is written in assembler language. Because assembler language is implemented at a very low level of abstraction, implementation of constructs that adhere to the maintenance of functional domain (see paragraph 90) requires direct and frequent use of unconditional branching instructions (gotos). A competent software engineer must balance the need to maintain functional domain against the potential hazard of adding additional and potentially unnecessary statements (which themselves could be error prone and difficult to test)

solely to adhere to structured programming dogma. Therefore, the use of unconditional branching statements within the AMI Plus software is not, in and of itself, an indication that (1) the code is unreliable, or (2) the code somehow results in intermittent errors.

Dr. Daugherty further notes that a component named `ledalarm.asm` "contains 35 goto statements" using the BR mnemonic. He does not indicate, however, how many of these BR statements are used to create effective if-then-else or looping constructs, both legitimate constructs within structured programming. He also does not indicate how many of these BR statements have been used to avoid the potential reliability problems associated with dogmatic (and unthinking) adherence to the "no unconditional branches" rule he advocates (see paragraph 9.0). The presence of BR statements in an assembler language module is not, in and of itself, an indication of reliability problems within the module.

11.0 Dr. Daugherty returns to his discussion of unconditional gotos by alleging: "Spaghetti code causes lines of code to not follow their intended path and not reach their intended destination." It would be relatively simple to develop tests that would demonstrate this, yet there appears to have been no attempt to do so, and no evidence presented in the Affidavit that the intended path of the AMI Plus software was executed incorrectly.

12.0 In support of his Affidavit, Dr. Daugherty references two books. It is interesting to note that on p. 115 of *C by Dissection*, the authors illustrate the goto debate discussed in paragraph 9.0. After an admonition against using the goto, the authors state: "However, in some instances, which should be carefully documented, goto can make a program significantly more efficient. In other cases it can simplify flow of control."

It is reasonable to assert that experienced programmers use gotos for the reasons cited by the authors of the book referenced by Dr. Daugherty.

13.0 In his Affidavit, Dr. Lively, like Dr. Daugherty, asserts that "Software that is improperly designed and has inadequate structure is prone to random errors that cause devices running the software to malfunction." Dr. Lively's hypothesis that "inadequate structure is prone to random errors" must be proven experimentally via targeted testing that would demonstrate that the hypothesis is true in the case of AMI Plus software. There is no evidence that this has been done.

14.0 Dr. Daugherty and Dr. Lively assert that program structure is the cause of a suspected intermittent error that causes the AMI Plus alarm not to sound and the AMI Plus software log to record the alarm as having sounded.

Based on my reading of their Affidavits and my limited knowledge of the facts of this case, I conclude that their assertion is a hypothesis only. Dr. Daugherty and Dr. Lively have not proved their hypothesis either by: (1) designing targeted tests to uncover the intermittent error, (2) designing

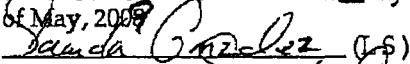
targeted tests to demonstrate errors in the log function, or (3) designing targeted tests to prove that the AMI Plus software does 'not follow [its] intended path and not reach [its] intended destination."

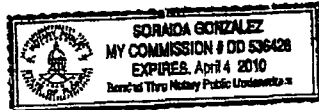
Dr. Daugherty and Dr. Lively have not demonstrated a direct, causative relationship between AMI Plus program structure and suspected intermittent errors. Further, their assertion that AMI Plus program structure makes adequate testing impossible does not relieve them of the duty to prove their hypothesis in a complete manner. I do not believe they have done so.


Roger S. Pressman

State of Florida
County of Palm Beach

SWORN TO BEFORE ME this 20 day
of May, 2009


Notary Public for Soraida Gonzalez
My Commission Expires 4-4-2010



IN THE COURT OF COMMON
PLEAS

COUNTY OF ORANGEBURG

CIVIL ACTION NO 2008 CP 38-826

KAREEM J GRAVES and TARA
GRAVES, individually and as duly
appointed personal representatives of
the ESTATE OF INDIA TYANNA
GRAVES

**SUPPLEMENTAL AFFIDAVIT OF
ROGER S PRESSMAN**

Plaintiffs,

v

CAS MEDICAL SYSTEMS INC

Defendant

Personally appeared before me the undersigned, who being duly sworn,
deposes and states as follows

- 10 This supplement to my Affidavit (dated 20 May 2009) has been prepared after review of a rough draft flow chart of the **ledalarm asm** component prepared by Walter Daugherty attached hereto. My comments are based solely on the **program flow** illustrated in the flowchart.

The statements I make in this Affidavit are based my knowledge, education, training and experience as outlined in my original Affidavit

I hold the opinions contained in this supplemental Affidavit like those in my original Affidavit to a reasonable degree of software engineering certainty

- 20 The flow chart represents a program component with a level of logical complexity that is commensurate with a component that must test and act on the presence of well over 20 event flags. A flag represents the presence or absence of a special operating condition such as the WV_HRH_FLAG which implies the presence of high heart rate.
- 30 It is important to note that the rough draft flowchart of **ledalarm.asm** could be revised in a manner that reduces its visual complexity.
- 40 The rough draft flowchart of the **ledalarm.asm** component is not a test case or a test specification, but rather a graphical representation of program logical flow.
- 50 The **ledalarm.asm** component is driven by a lengthy 'case' construct that occurs at the **alarm** tick entry point and looks for the presence of a variety of flags.

CAROLINA

The case construct is a common logical sequence in structured programming. Because of its constrained logical flow, test cases can be designed to fully exercise the 'case' construct control logic for ledalarm.asm

- 60 Although the rough draft flowchart of the ledalarm.asm component indicates that there are situations in which the designer has chosen not to maintain dogmatic adherence to functional domain, the conclusions stated in my original Affidavit in paragraphs 80 through 120 remain unchanged and can be applied to these situations
- 70 While it is true that the ledalarm.asm component cannot be exhaustively tested, it is important to note that this is true of virtually every meaningful program. Exhaustive testing is not a reasonable criterion to use for the testability of a program
- 80 It is my opinion that the ledalarm.asm component can be adequately tested in its current form using (1) white-box testing techniques to ensure statement coverage and (2) black box methods that are not sensitive to flow complexity. By combining these two approaches, a complete testing regime for the ledalarm.asm component can be achieved

Further deponent sayeth not

State of Florida
County of Palm Beach


Roger S. Pressman

SWORN TO BEFORE ME this 1 day

of 13th 2009
(LS)

Notary Public for Florida
My Commission Expires 4-4-2010



STATE OF SOUTH CAROLINA	)	IN THE COURT OF COMMON
	)	PLEAS
COUNTY OF ORANGEBURG	)	
	)	CIVIL ACTION NO 2008-CP-38 826
KAREEM J GRAVES and TARA	)	
GRAVES, individually and as duly	)	SUPPLEMENTAL AFFIDAVIT OF
appointed personal representatives of	)	ROGER S PRESSMAN
the ESTATE OF INDIA IYANNA	)	
GRAVES	)	
	)	
Plantiffs,	)	
v	)	
	)	
CAS MEDICAL SYSTEMS INC	)	
	)	
Defendant	)	

Personally appeared before me the undersigned who being duly sworn,
deposes and states as follows

1 0 This supplement to my Affidavits (dated 1 September 2009 and 20 May 2009) has been prepared after review of a Supplementary Affidavit prepared by Walter Daugherty, attached hereto

The statements I make in this Affidavit are based my knowledge,
education, training and experience as outlined in my earlier Affidavits

I hold the opinions contained in this supplemental Affidavit like those in
my other Affidavits, to a reasonable degree of software engineering
certainty

2 0 In his Supplemental Affidavit, paragraph 5 Dr Daugherty correctly notes
that I did not review the AMI source code In preparing the
Supplementary Affidavit to which Dr Daugherty refers, I used prevailing
software engineering practice and principles to evaluate the conclusions
drawn by Dr Daugherty in his Affidavit and to put them in proper
context My goal was to determine whether the arguments presented by
Dr Daugherty were based on a solid software engineering foundation
Because the core of Dr Daugherty s argument was the unstructured
nature of the software design, it was instructive to review his flowchart,
labeled 'ledalarm asm to ascertain the degree of structure of a
representative component A detailed examination of the source code was
not necessary to accomplish that goal

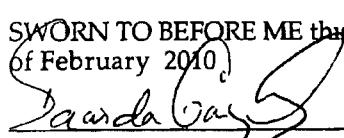
3 0 As Dr Daugherty correctly states, I explicitly indicated that my
assessment was based solely on the program flow illustrated in the flow
chart That is exactly the assessment that I conducted The term

component refers only to the program flow illustrated in the flow chart labeled ledalarm.asm by Dr Daugherty

- 40 Dr Daugherty states that the defect in the code is the lack of structure. Lack of structure may not be desirable, but it is not inherently a defect. If it were, thousands of fully operational human-rated systems would be considered defective, because those systems make use of unstructured code. In some cases, lack of structure is a design decision, implemented for reasons that I have discussed in Paragraphs 8, 9, and 10 of my original Affidavit dated 20 May 2009.
- 50 Dr Daugherty correctly quotes from my book on software engineering: "You can't test unstructured loops effectively. Redesign them." But he fails to note the context of this statement. The 'advice' comment he quotes is presented within the context of a white box testing method called "loop testing." Loop testing is only one of a number of white box testing methods that are used by industry professionals. If other white-box methods were used (and they almost always are used) the loops can be tested even if they are unstructured.
- 60 Dr Daugherty further states that since the AMI software is replete with unstructured loops, the tests described by Dr Pressman are ineffective. In my Supplemental Affidavit, specific tests for the AMI software were never enumerated. Rather, I noted two important and effective test case design categories—black box and white-box. Many specific methods exist within each category and these methods are used to design tests. If used properly and in combination they would lead to thorough testing of the AMI software. Dr Daugherty provides no evidence that these test categories would be 'ineffective.' In fact, methods within these testing categories have been used effectively to test thousands of human-rated applications that exhibit less than perfect 'structure.'
- 70 Dr Daugherty claims that I argue that 'any testing criteria will show the absence of a defect' [his words]. I never made that statement. Dr Daugherty provides no quote of mine to substantiate his claim.
- 80 Dr Daugherty also states that "Testing can show the presence of certain bugs, not the absence of them." That is true, but he fails to mention that the testing of even a perfectly structured program cannot guarantee the absence of errors.
- 90 In his Supplemental Affidavit, paragraph 6, Dr Daugherty correctly notes that bugs can be intermittent, unpredictable and completely unreplicable and that the nature of their unpredictability can make them difficult to locate. He further contends, however, that the unstructured nature of AMI software makes it almost certain that an intermittent error will not be found. He does not quote any engineering study to substantiate this claim and provides no anecdotal cases in which this has been found to happen. As I stated in my earlier Affidavit: Dr

Daughterity s argument that an intermittent error exists in the AMI software is an unproved hypothesis In engineering a hypothesis must be proved to give it credence Dr Daughterity has not provided any clear technical evidence that would prove his hypothesis


Roger S Pressman

SWORN TO BEFORE ME this 3rd day
of February 2010,
 (LS)
Notary Public for Boca Grande
My Commission Expires 4-4-2010



**AFFIDAVIT OF
CATHRYN ADAMS SCHLESINGER**

STATE OF TEXAS §
COUNTY OF HARRIS §

PERSONALLY APPEARED BEFORE ME THE UNDERSIGNED who being duly sworn, deposes and states

1 My name is Cathryn Adams Schlesinger I am a lawyer licensed to practice in the State of Texas and practice in Houston, Harris County, and surrounding counties,

2 I was counsel to CAS Medical Systems, Inc , in the *Smith v CAS Medical Systems, Inc , et al* case and make the statements herein of my own knowledge,

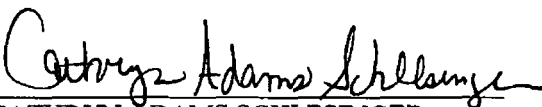
3 I understand that counsel for the Graves asserts that experts Daugherty, Lively and perhaps Painter were "admitted" by the court in the *Smith* case and that CAS then settled the case,

4 This is incorrect as to each of these witnesses The court heard no motions and made no rulings as to the admissibility of their testimony,

5 A Daubert-type motion to strike had been made by co-defendant Nellcor Puritan Bennett/Mallinckrodt but had not been ruled on by the court when that party settled out of the case

6 Had the case continued against CAS Medical Systems, Inc , I likewise would have filed a motion to strike and exclude these experts based on the unreliability of their opinions under Texas Rule of Evidence 702

Further deponent sayeth not


CATHRYN ADAMS SCHLESINGER

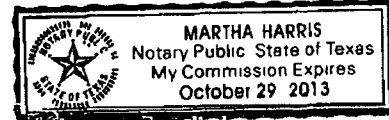


SWORN TO AND SUBSCRIBED BEFORE ME ON

This 2nd day of September, 2009

Martha Harris
Notary Public of Texas

My Commission Expires October 29, 2013



STATE OF SOUTH CAROLINA	)	IN THE COURT OF COMMON
	)	PLEAS
COUNTY OF ORANGEBURG	)	
	)	CIVIL ACTION NO 2008-CP-38-826
KAREEM J GRAVES and TARA	)	
GRAVES, individually and as duly	)	SUPPLEMENTAL AFFIDAVIT OF
appointed personal representatives of	)	ROGER S PRESSMAN
the ESTATE OF INDIA IYANNA	)	
GRAVES,	)	
	)	
Plaintiffs,	)	
v	)	
	)	
CAS MEDICAL SYSTEMS, INC	)	
	)	
Defendant	)	

Personally appeared before me the undersigned who being duly sworn,
deposes and states as follows

1 0 This supplement to my Affidavits (dated 1 September 2009 and 20 May 2009) has been prepared after review of a Supplementary Affidavit prepared by Walter Daugherty, attached hereto

The statements I make in this Affidavit are based my knowledge, education, training and experience as outlined in my earlier Affidavits

I hold the opinions contained in this supplemental Affidavit, like those in my other Affidavits, to a reasonable degree of software engineering certainty

2 0 In his Supplemental Affidavit, paragraph 5, Dr Daugherty correctly notes that I did not review the AMI source code In preparing the Supplementary Affidavit to which Dr Daugherty refers I used prevailing software engineering practice and principles to evaluate the conclusions drawn by Dr Daugherty in his Affidavit and to put them in proper context My goal was to determine whether the arguments presented by Dr Daugherty were based on a solid software engineering foundation Because the core of Dr Daugherty s argument was the 'unstructured' nature of the software design, it was instructive to review his flowchart, labeled 'ledalarm.asm' to ascertain the degree of structure of a representative component A detailed examination of the source code was not necessary to accomplish that goal

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STATE OF SOUTH CAROLINA	)	IN THE COURT OF COMMON
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GRAVES, individually and as duly	)	SUPPLEMENTAL AFFIDAVIT OF
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the ESTATE OF INDIA IYANNA	)	
GRAVES,	)	
	)	
Plantiffs,	)	
v	)	
	)	
CAS MEDICAL SYSTEMS, INC	)	
	)	
Defendant	)	

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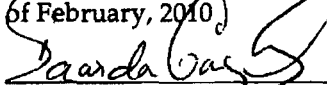
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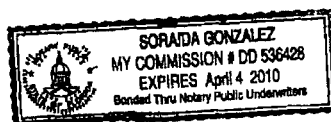
component' refers only to the program flow illustrated in the flow chart labeled 'ledalarm.asm' by Dr. Daugherty

- 40 Dr. Daugherty states that "the defect in the code is the lack of structure." Lack of structure may not be desirable, but it is not inherently a defect. If it were, thousands of fully operational human-rated systems would be considered defective, because those systems make use of unstructured code. In some cases, lack of structure is a design decision, implemented for reasons that I have discussed in Paragraphs 8, 9, and 10 of my original Affidavit dated 20 May 2009.
- 50 Dr. Daugherty correctly quotes from my book on software engineering: "You can't test unstructured loops effectively. Redesign them." But he fails to note the context of this statement. The "advice" comment he quotes is presented within the context of a white box testing method called "loop testing." Loop testing is only one of a number of white box testing methods that are used by industry professionals. If other white box methods were used (and they almost always are used), the loops can be tested even if they are unstructured.
- 60 Dr. Daugherty further states that since the AMI software is replete with unstructured loops, the tests described by Dr. Pressman are ineffective. In my Supplemental Affidavit, specific tests for the AMI software were never enumerated. Rather, I noted two important and effective test case design categories—black-box and white-box. Many specific methods exist within each category and these methods are used to design tests. If used properly and in combination, they would lead to thorough testing of the AMI software. Dr. Daugherty provides no evidence that these test categories would be "ineffective." In fact, methods within these testing categories have been used effectively to test thousands of human-rated applications that exhibit less than perfect "structure."
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- 80 Dr. Daugherty also states that "Testing can show the presence of certain bugs, not the absence of them." That is true, but he fails to mention that the testing of even a perfectly structured program cannot guarantee the absence of errors.
- 90 In his Supplemental Affidavit, paragraph 6, Dr. Daugherty correctly notes that bugs can be "intermittent, unpredictable, and completely unreproducible" and that the nature of their "unpredictability" can make them difficult to locate. He further contends, however, that the unstructured nature of AMI software makes it "almost certain that an intermittent error will not be found." He does not quote any engineering study to substantiate this claim and provides no anecdotal cases in which this has been found to happen. As I stated in my earlier Affidavit, Dr.

Daugherty's argument that an intermittent error exists in the AMI software is an unproved hypothesis. In engineering, a hypothesis must be proved to give it credence. Dr. Daugherty has not provided any clear technical evidence that would prove his hypothesis.


Roger S. Pressman

SWORN TO BEFORE ME this 2nd day
of February, 2010
 (L.S.)
Notary Public for Boca Raton
My Commission Expires 4-4-2010



DAUGHERITY BROTHERS, INC

**c/o Dr. Walter C. Daugherty
10895 Lakefront Drive
College Station, TX 77845-3078
(979) 774-3548**

March 1, 2010

Mr. Thomas W. Winslow
Bell Legal Group
232 King Street
Georgetown, SC 29440

Dear Mr. Winslow,

The depositions and affidavits I have submitted in this case address different questions in different contexts, and thus may require different answers, but taking all the testimony I have submitted as a whole, I believe my testimony is consistent.

For example, regarding the event log (pages 32, 33, 52, and 54 of the 2/4/2010 transcript) there are three things which must be distinguished and treated separately: the logging routine, the internal log itself, and the external log interpretation program.

1. The logging routine should be called by various other modules to add items to the internal event log. It is possible that the logging routine might not be called when it should be, which would result in an event's not being recorded in the log. It is also possible that the logging routine is called for an event and the event is recorded in the log, but the event is not handled properly after logging. I described one scenario in which this might occur.

2. The internal log is in effect a list of numbers which encode various information such as the state of the program or the transducer input.

3. The external log interpretation program, run on another computer (not the computer inside the device), interprets the numeric codes in the log and produces a report which includes, among other things, alarm failures and reconstructed waveforms. It is this program which I was told prints asterisks when the log shows the alarm was instructed to sound. However, the asterisks are not direct evidence the alarm sounded, but rather produced by the external log interpretation program when it thinks the alarm should have sounded.

Thus the "raw events" recorded in the log (such as the 14 alarm failures submitted as evidence and referred to on pages 74-76 but denied on pages 7 11 14, 9 8, and 53 22-23) are reliable. However, as noted in item 1 above, logged "raw events" may not have been handled properly after logging. Conversely, any "raw events" not recorded in the log, as noted in item 1 above, would make the log incomplete and therefore unreliable in the sense that the log would not be a complete record of the device's activity. Finally, the external log interpretation program, run on another computer, is reliable to the extent that it correctly reports the meaning of the numeric codes in the (possibly incomplete) log, but may be unreliable if the device did not create the log according to the specification, or if the assumptions on which the external log interpretation program was based did not always hold (see item 3 above).

Similarly, with regard to spaghetti code, the quotation (page 31, top) was a concise statement on which I elaborated at length elsewhere. When taken together with all the testimony I have submitted as a whole, the meaning of this concise statement is clear, namely, that the use of spaghetti code, a substandard practice, leads to convoluted programs which are more likely to contain bugs such as the flow of control's not following the path intended by the specification and not reaching the required destination, and that in spaghetti code programs of this size, such bugs will almost certainly make the program fail in unpredictable ways at unpredictable times.

Similarly, with regard to GOTO statements (pages 31-32, 43-44), it is necessary to consider all the testimony I have submitted as a whole. As I stated, it is not the GOTO statements themselves which are necessarily a problem (although I discussed where and when they would be a problem), it is how they got there. To summarize, instead of writing substandard spaghetti code with an excessive use of GOTO's, the programmers should have followed best industry practice (as documented in a number of learned treatises I cited, and agreed to by both the CEO and the Director of Engineering) and never written a GOTO statement themselves. They should have instead used at least the structured programming tool supplied by NEC, the manufacturer of the computer chip in the device. This tool would then mechanically translate the structured programming statements they should have written (containing no GOTO's) into assembly language (possibly containing GOTO's). The structured program would then be better testable and maintainable.

At 9 19-20, this is not true. The software did fail when a different brand of memory was used, and it was determined that a variable in the program was uninitialized. This software bug was fixed and an ECN (Engineering Change Notice) issued. I asked if they then looked to see if there were any other uninitialized variables in the software but

never received a reply

At page 55, this is not true Hardware failure software failure, and reporting error were all considered, as noted on pp 87ff and in other testimony

In conclusion, as stated above, it is necessary to consider all the testimony I have submitted as a whole, and recognize that different questions in different contexts may require different answers With that taken into consideration I believe my testimony is consistent, and would be happy to answer any further questions the court may have in person subject to scheduling constraints for the classes I am teaching

Sincerely,

Walter C Daugherty

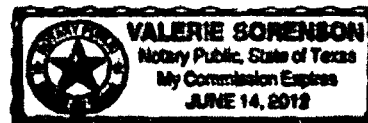
Walter C Daugherty

STATE OF TEXAS
COUNTY OF BRAZOS

Before me, Valerie Sorenson, a Notary Public in and for said County and State, on this day personally appeared Walter C Daugherty, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he executed the same for the purposes and consideration therein expressed

Given under my hand and seal of office this 1st day of March, 2010

Valerie Sorenson
Notary Public's Signature



STATE OF SOUTH CAROLINA	)	IN THE COURT OF COMMON
	)	PLEAS
COUNTY OF ORANGEBURG	)	
	)	CIVIL ACTION NO 2008-CP 38-826
KAREEM J GRAVES and TARA	)	
GRAVES, individually and as duly	)	
appointed personal representatives of the	)	
ESTATE OF INDIA IYANNA GRAVES	)	AFFIDAVIT OF CARL E HUNT,
	)	M D
Plaintiffs	)	
v	)	
	)	
CAS MEDICAL SYSTEMS INC	)	
	)	
Defendant	)	

PERSONALLY APPEARED BEFORE ME THE UNDERSIGNED who being duly
sworn deposes and states as follows

1 My name is Carl E Hunt M D I am a resident of Chevy Chase, Md I am
Professor of Pediatrics at the Uniformed Services University of the Health Sciences

2 I am a pediatrician and have been involved in SIDS research, including home
monitoring studies for many years and consider myself an expert in the areas of SIDS,
SIDS research and home monitoring A copy of my CV is attached as Exhibit 1 hereto

3 I make the statements below based on my personal knowledge and experience
except as otherwise indicated

4 I hold my opinions below to a reasonable degree of medical certainty They are
based on my knowledge of the body of research and literature on this subject

5 I have also reviewed the pertinent medical records of India Graves including the
monitor download that includes April 11 2004 the morning she died as well as five
medical articles that I understand were recently provided to the court by plaintiffs

6 I have been asked to give my expert opinion on whether India Graves could have
been resuscitated from her SIDS event had she received appropriate caregiver attention at
the point when her apnea monitor began alarming, or should have begun alarming,
assuming it did not

7 There is no medical evidence that any home infant monitor on the market can
prevent sudden unexpected death in infants

8 There are about 50 reported cases in the medical literature in which an infant died of SIDS while on a home memory monitor equivalent to the one being used for India Graves. The terminal recordings in these infants are very similar to the ones we have on India. In no instance was a monitor malfunction found.

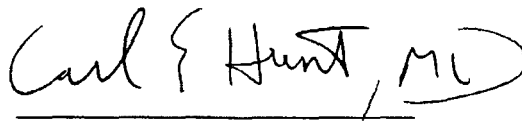
9 There is a body of data to suggest that in infants destined to die of SIDS resuscitation will not be effective regardless of the timeliness of the resuscitation, in other words that SIDS infants are non resuscitatable. This conclusion is consistent with the reports of infants who have died of SIDS while under continuous surveillance in an inpatient hospital setting.

10 For the most part, the medical articles provided to the court by plaintiffs are not responsive to the key question 'Can or do home monitors PREVENT SIDS?' Of note however, in Chapter IV from the Guntheroth monograph at the bottom of page 247 there are highlighted lines that are in reference to the NIH Consensus Conference report from 1986. I attended this conference and was a speaker. The sentences following the highlighted lines make clear reference to the conclusions of the consensus panel that there are no reports of scientifically designed studies of the effectiveness of home monitoring. The clear consensus then was that there is no evidence that home monitors save lives (prevent SIDS) and there has been no subsequent evidence to the contrary.

11 Four of the five publications are all dated 20+ years ago and the last is dated 1992. All were published at a time when we hypothesized or hoped that home monitoring would prevent SIDS. However, no data has been forthcoming since the 1986 consensus conference to change in any way the conclusions of this expert panel.

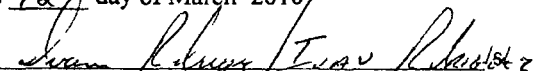
12 There has never been a case report or other published study of a home monitor in which an alarm threshold was reached but the audible alarm did not occur due to an alarm malfunction.

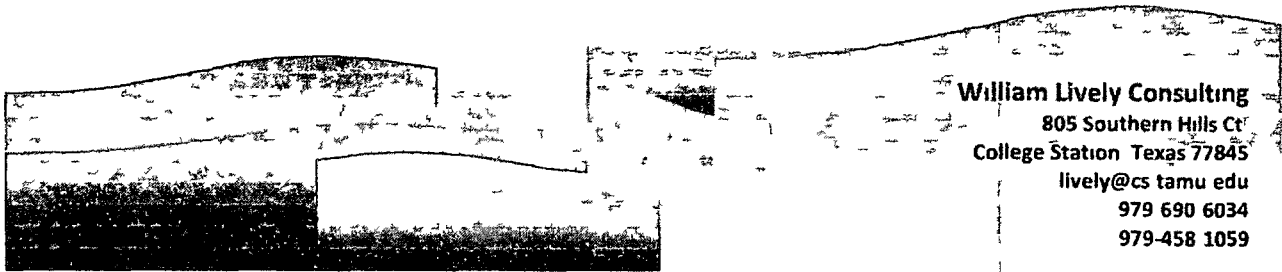
FURTHER DEPONENT SAYTH NOT


Carl E. Hunt, M.D.

SWORN TO AND SUBSCRIBED BEFORE ME

This 12th day of March 2010


Notary Public of Maryland #0905097951
My Commission Expires 03/26/10 03/26/2010



Spaghetti Code, GOTO's and Structured Code

Spaghetti code refers to a type of software program development. This type of code is characterized by many goto's and no discernible easy to follow flow of control. This haphazard collection of goto's and associated code create a software program that is difficult to maintain. Maintenance requires an understandable structure so the process can be performed. Maintenance consists of fixing errors in a software program and/or enhancing the software program i.e. adding additional functionality. Maintenance is usually reported to be over 70% of the cost of a software program for its life history.

Spaghetti code is not the source of software failures (errors) but the execution of the actual instructions in the software program cause the error. Control flow refers to the sequence in which instructions are executed in a software program. Normal execution of a software program is sequential with certain structured conditional loops and structured conditional branch statements. With these three constructs a programmer can more easily create structured code i.e. software programs whose errors are easier to fix and the program enhanced.

A goto is an unconditional branch and hence is not limited in its destination. Programmers take advantage of this concept and hence create unstructured software programs. How important is structure? The software program with proper structure is much easier to visualize, test and enhance.

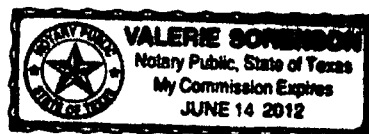
Consider a WalMart store that randomly places the merchandise on the shelves. The toilet paper is next to the watches, the camera film is located in lingerie, and so on. Shopping would be a disaster and might take many hours.

Suppose a C-17 giant cargo plane, has the components scattered randomly on the tarmac. The engineers might not be able to put the plane together.

The point is that structure is necessary for many human endeavors and certainly so for software programs.

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EDUCATION AND TRAINING

FELLOWSHIP

1968 1970 Fellowship, Pediatric Cardiology/Neonatal-Perinatal
Medicine University of Minnesota Minneapolis
Minnesota

RESIDENCY

1965 1968 Pediatric Residency University of Minnesota Minneapolis
Minnesota

M D 1965 Yale University, New Haven Connecticut
A B 1961 English (With Honors)
University of Rochester New York

PRIOR APPOINTMENTS AND EMPLOYMENT

January, 2007-December, 2009
Research Scientist
National Center for Research Resources NIH



Bethesda, MD
January, 2006-January, 2007
 Special Assistant to the Director
 National Heart Lung and Blood Institute NIH
 Bethesda MD

January, 2001 January, 2006
 Director National Center on Sleep Disorders Research
 National Heart Lung, and Blood Institute NIH
 Bethesda MD

1988-January, 2001
Medical College of Ohio
 Co Chair Curriculum Implementation Committee 1997 1999
 Chair, Years 1 2 Curriculum Subcommittee 1999 2001
 Course Director, Integrated Pathophysiology II
 (Year 2 PBL course) 1998 2001
 Member, Curriculum Governance Committee 1997 2001
 Professor of Pediatrics 1988 2001
 Chair Faculty Committee on Governance 1989 1992

Department of Pediatrics
 Chair, Department of Pediatrics 1988 1997
 Chief Pediatric Services
 Medical College Hospitals 1988 1997

October, 1996-July, 1997
Sabbatical Scholar in Residence
 Division of Medical Education
 Association of American Medical Colleges (AAMC)

1975-1988 Northwestern University Medical School
 Associate Professor of Pediatrics
 Professor and Vice Chair of Pediatrics
 Chief Division of Neonatology & Director NICU
 Children s Memorial Hospital Chicago IL

1970-1975 University of Minnesota
 Assistant Professor of Pediatrics
 Director of NICU

CERTIFICATIONS/LICENSURES

American Board of Pediatrics No 15536
 American Board of Pediatrics Sub-Board of Neonatal/Pennatal Medicine
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Medical License Maryland D0057209
Inactive medical licenses in Minnesota Illinois, and Ohio

HOSPITAL STAFF PRIVELEGES

National Naval Medical Center, Bethesda, MD (2002 Present)

PROFESSIONAL SOCIETIES MEMBERSHIPS

American Pediatric society
American Thoracic Society
American Academy of Pediatrics
International Society for the Study and Prevention of Infant Death
Society for Pediatric Research

PROFESSIONAL SOCIETIES ACTIVITIES

American Thoracic Society	
Chairman Pediatric Assembly	1982 1983
Member Program Committee	1977 1979
	1982 1984
Midwest Society for Pediatric Research	1973 2001
President	1981 1982
Chicago Thoracic Society	
President	1984-1985
Member	1975 1988

OTHER PROFESSIONAL ACTIVITIES (Partial)

American SIDS Institute	
Board of Directors	2007 Present
March of Dimes Birth Defects Foundation	
Social and Behavioral Sciences Research	
Advisory Committee	1977-1994
Clinical Research Advisory Committee	1985-1994
Basil O Connor Starter Research Advisory Committee	1990 1993
SIDS Global Strategy Task Force	
Member International Working Group	
Developmental Physiology	1994 Present
Chairman Developmental Physiology Working Group	1994 1996

AWARDS

Recipient of first Annual Annenberg Center at Eisenhower Apnea of Infancy Award, for
contributions to SIDS research 1994

EDITORIAL SERVICES

Ad hoc reviewer for the following journals (current partial listing)

American Journal of Respiratory and Critical Care Medicine
Archives of Diseases of Childhood
Archives of Pediatric and Adolescent Medicine
JAMA
Journal of Neonatology
Journal of Pediatrics
Neonatology
Pediatric Research
Pediatrics
Pediatric Pulmonology

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- 3 Hunt CE Castaneda A and Moller JH Close of ventricular septal defect and removal of pulmonary arterial band Results in eight children Am J Cardiol 36 345 350 October 1970
- 4 Formanek G Hunt CE Castaneda A Moller JH and Amplatz K thickening of pulmonary artery banding A preliminary observation Radiology 98 75 78 January 1971
- 5 Formanek G Hunt CE Moller JH Castaneda AR and Amplatz K Pulmonary artery valve thickening A late complication of pulmonary artery banding Annales de Radiologie 14(3-4) 177 181 1971
- 6 Hunt CE Formanek G Levine MA Castaneda A and Moller JH Banding of the pulmonary artery Results in 111 children Circulation 43 395-406 March 1971
- 7 Weintraub WH Cuderman BS Hunt CE Stauffer WM Roback SA and Leonard AS Computer monitoring of cardiodynamics in the newborn J Pediatr Surg 6 372 380 October 1971
- 8 Nicoloff DM Zamora R Castaneda AR Moller JH Hunt CE and Lucas RV Jr Transatrial close of high-pressure high-resistance VSD J Pediatr Surg 6 650 656 October 1971
- 9 Castaneda AR Zamora R Nicoloff DM Moller JH Hunt CE and Lucas RV Jr High pressure high resistance ventricular septal defect Surgical results of closure through right atrium Ann Thorac Surg 121 29-38 1971
- 10 Hable KA Matsen JM Wheller DJ Hunt CE and Quie PG Klebsiella Type 33 in an infant intensive care unit J Pediatr 80 920 June 1972
- 11 Mathis RK Freier EF Hunt CE Krivit W and Sharp HL Alpha 1 Antitrypsin in the respiratory distress syndrome N Engl J Med 288 59 64 January 11 1973
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- 14 Harrod JR L Heures P Wangenstein OD and Hunt CE Long term follow up of severe respiratory distress syndrome J Pediatr 84 277 286 February 1974
- 15 Hunt CE The high risk newborn Minnesota Medicine 57 405-412 May 1974
- 16 Hunt CE Matalon S Wangenstein OD and Leonard AS Mass spectrometer evaluation of ventilation perfusion abnormalities in RDS Pediatr Res 8 612-627 June 1974
- 17 Roback SA Foker J Frantz ID Hunt CE Engel RR and Leonard AS Necrotizing enterocolitis - an emerging entity in the regional infant ICU Arch Surg 109 314-319 August 1974
- 18 Hill HR Hunt CE and Matsen JM Nosocomial colonization with Klebsiella Type 26 in a neonatal ICU associated with an outbreak of sepsis meningitis and necrotizing enterocolitis J Pediatr 85 415-419 September 1974
- 19 Neal WA Lucas RV Jr Bessinger FB and Hunt CE Patent ductus arteriosus complicating respiratory distress syndrome J Pediatr 86 127 131 January 1975
- 20 Frantz ID III L Heures P Engel RR and Hunt CE Necrotizing enterocolitis J Pediatr 86 259-263 February 1975

- 21 Greene and Hunt CE Paralysis of the diaphragm Am J Dis Child 129 1402 1405 December 1975
- 22 Pyle RB Helton WC Johnson RW Hornung JR Hunt CE Trumbull HR Lindsay WG and Nicoloff DM Clinical use of the membrane oxygenator Arch Surg 110 966 August 1975
- 23 Matalon SV Ewald RG Hunt CE and Leonard AS An in vivo catheter-mass spectrometer system for the continuous monitoring of PO₂ and PCO₂ J Pediatr Surg 11 987 991 December 1976
- 24 Lock JE Lindsay WG Burke B L Heures P Nicoloff D and Hunt CE Prolonged membrane oxygenator support in a child with severe respiratory insufficiency J Pediatr Surg 12(5) 751 754 October 1977
- 25 Boros SJ Matalon SV Ewald R Leonard AS and Hunt CE The effect of independent variations in inspiratory expiratory ratio and end expiratory pressure during mechanical ventilation in hyaline membrane disease J Pediatr 91(5) 794 798 November 1977
- 26 Matalon SV Manning PJ Bernie BJ Eichorst BC Hunt CE and Seeds AE The effects of changes in maternal PaO₂ and PACO₂ on the fetal PaO₂ and PaCO₂ - in vivo study Respir Physiol 32 51 61 1978
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- 32 Raffensperger JG Luck SR Inwood RJ Gora P and Hunt CE the effect of over distention of the lung on pulmonary function in beagle puppies J Pediatr Surg 14 757 760 December 1979
- 33 Ilbawi MN Hunt CE DeLeon SY and Idnss FS Diaphragmatic pacing in infants and children Report of a simplified technique and review of experience Ann Thorac Surg 31 61-65 January 1981
- 34 Vileisis RA Inwood RJ, and Hunt CE Laboratory monitoring of parenteral nutrition associated hepatic dysfunction in infants J Parenteral and Enteral Nutrition 5 67-69 January February 1981
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- 94 Hunt CE Sudden infant death syndrome *J Neonatol* 1 25-36 March 1994

- 95 Hunt CE Commentary infant sleep position and SIDS risk A time for change
Pediatrics 94 105 107 July 1994
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siblings Pediatrics 95 430-32 March 1995
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Practices Network A community based survey of infant sleep positioning
Pediatrics 98 5 893 896 1995
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Saturation Events in Normal Infants A Study of Home Documented monitoring
Pediatr Res 39 216 222 1996
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CE Corwin MJ Levenson SM and the CHIME Steering Committee Assessment of
Compliance of Home Cardiorespiratory Monitoring in infants at risk for SIDS J
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- 100 Hunt CE Prone Sleeping in Healthy Infants and SIDS Victims (Editorial) J Pediatr
128 594-596 May 1996
- 101 Hunt CE and Puczyński MS Does supine sleeping cause asymmetric heads?
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- 102 Brooks LJ DiFiore JM Martin RJ and the CHIME Study Group Assessment of tidal
volume over time in preterm infants using respiratory inductance plethysmography
Ped Pulmonol 23 429-433 June 1997
- 103 Crowell DH Brooks L Colton T Corwin MJ Hoppenbrouwers T Hunt CE et al
and The Collaborative Home Infant Monitoring Evaluation (CHIME) Steering
Committee Infant Polysomnography Reliability Sleep 20(7) 553-560 1997
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infancy a prospective longitudinal assessment JAMA 280 336 340 1998
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CE Neuman MR Willinger M Crowell DH Colton T and the Collaborative Home
Infant Monitoring Evaluation (CHIME) Study Group Agreement Among Raters in
Assessment of Physiologic Waveforms Recorded by a Cardiorespiratory Monitor for
Home Use Pediatr Res 1998 44 682-690
- 106 Hunt CE Kallenberg GA and Whitcomb ME Transformation of medical
student education Implications for pediatrics Arch Pediatr Adolesc Med 1999
153 297 302
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ambulatory care setting Background paper 1 of the Medical School Objectives
Project Academic Medicine 1999 74 289 296
- 108 Hunt CE Expanded Back to Sleep recommendations Hospital based safe
sleeping
practices Position Statement of the SIDS Global Strategy Task Force J Sudden
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assessment of hemoglobin O₂ saturation and sleep position in healthy infants during
early infancy J Pediatr 1999 135 580 586
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Neuman MR Martin RJ Brooks LJ Davidson Ward SL Lister G Willinger and the
CHIME Study Group Comparison of CHIME monitor identified apnea with end tidal
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Hoppenbrouwers T and the CHIME Study Group The effect of epoch length and

- smoothing on infant sleep and waking state architecture for term infants at 42-46 weeks postconceptional age *Sleep* 2000 23 893 899 112 Hunt CE Sudden infant death syndrome and other causes of infant mortality
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Cardiorespiratory events recorded on home monitors Comparison of healthy infants with those at increased risk for SIDS *JAMA* 2001 285 2199 2207
 - 114 Hunt CE Commentary Familial small upper airways and sleep disordered breathing Relationship to Idiopathic apparent life threatening events *Pediatr Res* 2001 50 3 5
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Physiologic Measurement 2001 22 N1 N12
 - 116 Hunt CE Durham J Guess S et al and the CHIME Study Group Telephone subsidy is an effective incentive for successful participation home memory monitor study *Archives Ped Adolesc Med* 2001 155 954 959
 - 117 Neuman M Weese-Mayer D Baird T Tinsley L et al and the CHIME Study Group
Cardiopulmonary monitoring at home The CHIME Monitor Physiologic Measurement 2001 22 267-286
 - 118 Crowell DC Kulp TD Kapuniai LE Hunt CE Brooks L Weese-Mayer DE Silvestri J Davidson Ward S Corwin M Tinsley LR Peucker M Infant polysomnography Reliability and validity of infant arousal assessment *J Clin Neurophysiology* 2002 19 469-483
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Activity based sleep-wake identification in infants *Physiol Meas* 2004 25 1291 1304
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Cardiorespiratory events detected by home memory

- monitoring and one year neurodevelopmental outcome J Pediatr 2004 145 465 471
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 - 137 Somers VK White DP Abraham WT Amin R Costa F Culebras D Floras JS Hunt CE Pickering TG Russell R Woo M Young T Sleep apnea and cardiovascular disease An American Heart Association/American College of Cardiology Foundation Scientific Statement From the American Heart Association Council for High Blood Pressure Research Professional Committee Council on Clinical Cardiology, Stroke Council and Council on Cardiovascular Nursing Council Circulation 2008 118 1080 1111
 - 138 Hunt CE Hauk FR Gene and gene-environment risk factors in sudden unexpected death in infants Current Pediatric Reviews 2010 in press
 - 139 Hunt CE, Corwin MJ Weese-Mayer DE Lister G Ward SLD Tinsley LR Neuman MR Ramanathan R Rybin D and the CHIME Study Group Longitudinal assessment of oxygen saturation in preterm and full term infants during the first six months of age in preparation

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- 2 Inwood RJ and Hunt CE The high risk neonate Compr Ther 3(9) 8-17 September 1977

ROGER S PRESSMAN—CURRICULUM VITAE

Roger S Pressman is an internationally recognized consultant and author in software engineering. He received a B S E (cum laude) from the University of Connecticut, an M S from the University of Bridgeport, and a Ph D in engineering from the University of Connecticut, and has 40 years of industry experience, holding both technical and management positions with responsibility for the development of software for engineered products and systems.

As an industry practitioner and manager, Dr Pressman worked on the development of CAD/CAM systems for advanced engineering and manufacturing in aerospace applications. He has also held positions with responsibility for scientific and systems programming.

In addition to his industry experience, Dr Pressman was Bullard Associate Professor of Computer Engineering at the University of Bridgeport and Director of the University's Computer-Aided Design and Manufacturing Center.

Dr Pressman is President of R.S Pressman & Associates, Inc., a consulting firm specializing in software engineering methods and training. He serves as principle consultant, specializing in helping companies establish effective software engineering practices. He developed the RSP&A software engineering assessment method, a unique blend of quantitative and qualitative analysis that helps clients assess their current software process.

In addition to consulting services rendered to many Fortune 1000 clients, Dr Pressman developed a state-of-the-art video curriculum, *Essential Software Engineering*, which was among the industry's most comprehensive treatments of the subject. Another product, *Process Advisor*, is a self-directed system for software engineering process improvement that has been used at hundreds of companies. He has also been working in conjunction with QAI (EdistaLearning) in India to develop a Web-based curriculum in software engineering.

Dr Pressman is the author of many technical papers, is a regular contributor to industry periodicals, and is author of eight books. His book, *Software Engineering: A Practitioner's Approach* (McGraw-Hill, 7th edition, 2009), is the world's most widely used software engineering textbook. His book (co-authored with David Lowe), *Web Engineering* (McGraw-Hill, 2009), is among the first to address this important new technology. Another award-winning book, *A Manager's Guide to Software Engineering*, uses a unique Q&A format to present management guidelines for instituting and understanding the technology. Among his other books are *Making Software Engineering Happen*, the first book to address the critical management problems associated with software process improvement, and *Software Shock*, a treatment that focuses on software and its impact on business and society. Dr Pressman has been

on the Editorial Boards of *IEEE Software* and *The Cutter IT Journal* and was editor of the "Manager" column in *IEEE Software*

Dr. Pressman is a well-known speaker, keynoting a number of major industry conferences. He has presented tutorials at the International Conference on Software Engineering and at many other industry meetings. He has been a member of the ACM, IEEE, and Tau Beta Pi, Phi Kappa Phi, Eta Kappa Nu and Pi Tau Sigma.

BIOGRAPHICAL DATA SHEET

LIVELY, William M

July,2007

Professor of Computer Science
Department of Computer Science
Texas A&M University
College Station, TX 77843

Phone (979) 845-5480
E-mail lively@cs.tamu.edu

Birth date April 10, 1941	Citizenship U S
Birthplace Dallas, Texas	SSN 463-62-4100
Security Clearance Expired Secret	
Registered Professional Engineer, Texas #37033 (Software Engineering, Electrical Engineering)	

EDUCATION

Ph D , Computer Science and Electrical Engineering, Southern Methodist University, 1971

M S , Electrical Engineering, Southern Methodist University, 1967

B S , Biology, Southern Methodist University, 1962

PROFESSIONAL INTERESTS

Software Engineering Software Development Methodologies (Object Oriented) and
Environments, Computer-Human Interfaces, AI Approaches to Software Engineering

Computer Applications to Medical Differential Diagnosis, Medical Instruction and Modeling

EXPERIENCE

Educational

Professor, Computer Science Department, Texas A&M University, 1992

Director, Laboratory for Software Research, Texas A&M University, 1987

Associate Professor, Computer Science Department, Texas A&M University, 1977

Assistant Professor, Computer Science Division, Texas A&M University, 1972-1977

Teaching Assistant, Computer Science Center, Southern Methodist University, 1968-1971

Teaching Assistant, Biology Department, North Texas State University, 1964-1965

Industrial

Member Technical Staff, Advanced Scientific Computer (ASC), Texas Instruments, Inc , 1971-1972

Design Engineer, Government Equipment Group, Texas Instruments, Inc , 1967-1968

Consultant

Penton Learning Systems

Micro-Mode, Inc

Navarro County Hospital

Dr Charles Fenner

Bickel and Brewer

IBM

JB Ringer Global Credential Evaluators

Research

SSIIP for teaching and developing Capstone College Courses,
IBM, Intel and AvNET

Co_PI's Dick Simmons and William Lively	2004-6	\$573,000

Design and Implementation of a Scheduling and Information System for the Operating Rooms
at Scott and White Memorial Hospital

Department of Anesthesiology Texas A&M College of Medicine

PI – W M Lively	1993-1999	\$430,671

Four students funded

HALS/S Parser in Java/JavaCC

United Space Alliance, Inc

PI – William Lively	Jan – Dec 1998	\$42,000

One student funded

PInternet and Intranet Training Templates

United Space Alliance, Inc

PI – William Lively	Sept – Dec 1996	\$15,000

One student supported

Path Plus” Automation of Software Test Path Coverage

United Space Alliance, Inc

PI – William Lively One student supported	Sept – Dec 1996	\$10,000
Undergraduate Laboratory for Software Engineering		
National Science Foundation Principal Investigator	1991-1993	\$156,000
Structured Methods for Information Integrated Engineering and Manufacturing Systems Phase IV		
United States United States Air Force Co-Principal Investigator	1990	\$279,000
Four students funded		
Structured Methods for Information Integrated Engineering and Manufacturing Systems Phase III		
United States Air Force Co-Principal Investigator	1989	\$299,000
Four students funded		
An Optimal Replacement Methodology Augmented with a Knowledge Based System Texas Advanced Technology Program		
Co-Principal Investigator	1988-1990	\$106,000
Two students funded		
Structured Methods for Information Integrate Engineering and Manufacturing Systems Phase II		
United States Air Force Co-Principal Investigator	1988	\$280,000
Four students funded		
Neural Networks for Intelligent Data Display General Dynamics Electronics Division		
Project Director	1988	\$28,000
One student funded		
Formal Specifications Derived from Visual Images Lockheed Missile and Space Phase III		
Project Director	1987-1989	\$95,000
Four students funded		
Structured Methods for Information Integrated Engineering and Manufacturing Systems Phase I		
United States Air Force Co-Principal Investigator	1987	\$260,000
Four students funded		

Formal Specifications Derived from Visual Images		
Lockheed Missile and Space Phase II		
Co-Principal Investigator	1987	\$160,000
Four students funded		
Knowledge Based Integrated Information Systems Development Methodologies		
United States Air Force		
Research Investigator	1987	\$100,000
A Field Diagnosis Expert System for the S-1500		
Texas Instruments, Inc		
Principal Investigator	1986	\$22,000
One student funded		
A Field Service Intelligent Operations Systems		
Texas Instruments, Inc		
Co-Principal Investigator	1986	\$55,500
Four students funded		
Formal Specifications Derived from Visual Images		
Lockheed Missile and Space Phase I		
Co-Principal Investigator	1986	\$99,000
Four students funded		
A Mitral Valve Model for Diagnosis of Prolapse		
United States Air Force		
Principal Investigator	1978-1979	\$80,000
Two students funded		
CODAP System Design and Development		
United States Navy		
Co-Principal Investigator	1978-1979	\$116,000
Three students funded		
Impact of Microprocessors on Health Care Delivery		
National Science Foundation		
Co-Principal Investigator	1977-1979	\$40,600
One student funded		
Research Investigator – VA Vehicle Simulation, 1976-1977		
Research Investigator – CAI in Medicine, 1975-1976		
Research Investigator – NASA Software Reliability, 1974-1975		
Research Investigator – NASA Automatic Documentation, 1973-1974		
Research Investigator – Metabolic Modeling, 1972-1973		

SOCIETY MEMBERSHIPS

Institute for Software Engineers (co-founder)

Institute for Electrical and Electronic Engineers

Association for Computing Machinery

IEEE-Computer Society

Chapter Activity Newsletter, Editor, 1973-1974

Vice Chairman for Chapter Activities in Southwestern Area, 1973-1974

Chairman for Chapter Activities in Southern Area, 1974-1975

Software Engineering Technical Committee Newsletter, Editor, 1975-1976

National Coordinator for Student Activities, 1975-1976

SIGBIO (special interest group in biomedical computing)

SIGART (special interest group in artificial intelligence)

SIGOPS (special interest group in operating systems)

SIGPLAN (special interest group on programming languages)

SIGARCH (special interest group on architecture)

SIGMICRO (special interest group for micro-programming)

SIGSOFT (special interest group for software engineering)

Sigma XI

Eta Kappa Nu

American Society for Engineering Education

American Association for the Advancement of Science

Upsilon Pi Epsilon

PROFESSIONAL ACTIVITIES AND COMMITTEES

National

Consultant for Texas PE examination in Software Engineering

IEEE Computer Society Standards Committee (Software Engineering) 2005-7

Society for Software Quality National Debate, "Customer Involvement Beyond the Requirements Phase Unnecessarily Impact Software Schedules," San Diego, Jan 28, 1993

United States Army Proposal Review 1990

NSF Proposal Review 1990

Alpha Test for Knowledge Base Software Assistant Consortium, Rome Air Development Center, University Representative, Sept 1988-1990

SEI University Affiliates Program, University Representative, Sept 1988-present

Reviewer, IEEE Software, 1988-present

Fall Joint Computer Conference Program Committee, 1987

Fall Joint Computer Conference, Conference Committee member, 1987

Fall Joint Computer Conference, Conference Committee member, 1986

Invited participant by American Professional Resources for China to help develop a graduate degree in Computer Science, 1985

IEEE Computer Society, member Software Engineering Technical Committee on Software Engineering Taxonomy, appointed national committee, August 1985-present

IEEE Computer Society, member Software Engineering Technical Committee on Software Design Descriptions, appointed national committee, August 1985-present

National Committee to evaluate DoD METHODMAN efforts, member, 1984-1985

IEEE Computer Society, member Software Engineering Technical Committee on Test Documentation, appointed national committee, April 1982-present

IEEE Computer Society, member Software Engineering Technical Committee on Terminology Standard, appointed national committee, November 1981-present

IEEE Computer Society, member Software Engineering Technical Committee on Quality Assurance Standards, appointed national committee, January 1981-present

American Federation of Information Processing, member NCC Programming Contest Committee, national appointed office, November 1976-June 1977

IEEE Computer Society, National Coordinator for Student Activities, appointed national office, January-December 1976

Texas A&M University

Coordinator, ABET and CSAB visits for Computer Engineering and Computer Science Programs, respectively, 1997-1998, 2003-2004

Chairman, Computer Science Undergraduate Curriculum Committee, 1990-1999

Coordinator, ABET Focus Visit for Computer Engineering Program, November 1995

Chairman, TQM Effort for Undergraduate Advising, 1994-1995

Member, Promotion and Tenure Committee, 1993-1999

Member, Faculty Search Committee, 1994-1998

Member, College of Engineering 20X Committee, 1994-1995

Chairman, Computer Science Accreditation, ABET and CSAB, 1991-1995
Coordinated both first time visits in Fall 1992

Chairman, Computer Science/Electrical Engineering Computer Engineering Curriculum Committee, 1991-1995

Chairman, Computer Science Faculty Search Committee, 1989-1990

Head, Software Systems Area of Graduate Program, 1989-1991

Member, Endowed Chair Search Committee, 1990-1991

Member, Colloquium Committee, 1989-1990

Member, Graduate Advisory Committee, 1989-1991, 1995

Member, General Computing Advisory Committee, 1989-1991

Member, Department Development Council, 1989-1991

Member, Committee on Computer Science/Electrical Engineering Relations, 1989-1991

Chairman, Computer Science Department Equipment Committee, 1988-1989

Computer Science Department Graduate Advisor, 1975-1987

Department of Computer Science Committee on Developing Computer Engineering Curriculum, 1986

Senate Election Committee, 1986

Senate Personnel & Welfare Committee, 1986

University Core Curriculum Committee, member, 1984-1985

College of Engineering Graduate Curriculum Committee, 1983-1987

Faculty Senator (charter member), 1983-1987

Faculty Sponsor for Campus Crusade for Christ, 1983-present

College of Engineering Innovative Teaching Committee, 1982-1983

TEES Committee on Computer Science Research, 1982-1983

College of Engineering Search Committee for Computer Science Department Head, 1983

Department of Industrial Engineering Enrollment Committee, 1983

Mentors Program, 1980-1981

University Undergraduate Fellows Program, 1979-1980

Computer Science Faculty Selection Chairman, 1977, 1989

Faculty Sponsor ACM, 1977-1978

Industrial Engineering Goals Committee, 1977

Engineering Faculty Advisory Council (EFAC) Representative, 1975-1978

Organized and Faculty Sponsor IEEE-Computer Society Student Chapter, 1975-1985

Computing Science Division Head Selection Committee Chairman, 1975

Industry Liaison Committee Chairman, 1975

Faculty sponsor Upsilon Pi Epsilon, 1974-1976

PUBLICATIONS

Journals

- “Principled Modeling and Automatic Classification for Enhancing the Reusability of Problem Solving Methods of Expert Systems, John Yen, Swee Hor The and William Lively, *Applied Intelligence – International Journal of AI Neural Networks and Complex Problem Solving*, Vol 8, No 2, 1998
- “Selecting System Functionality’s for Interface Evaluation,” Deborah Mitta, Catherine Delk, W M Lively, *Human Factors*, Vol 37, No 4, pp 817-834, December 1995
- Using Comments and Token Names to Predict Software Readability, R B Dubbs (PhD thesis), W M Lively and D B Simmons, accepted to *Journal of Computer and Software Engineering*
- ‘Undergraduate Software Engineering Lab Experiences,’ W M Lively and M Lease, *International Journal of Engineering Education*, Vol 11, No 4 & 5, pp 277-286, 1995
- ‘Design Considerations and Analysis Techniques for Medical Expert Systems,’ C E Williams, W M Lively and W A Hyman, *Medical Service Technology*, May 1992
- “The Development of an Integrated Mathematical and Knowledge-Based Maintenance Delivery System,” R M Feldman, Tom Slade and W M Lively, *Computers and Operations Research*, Vol 19, No 3, pp 425-434, October 1992
- “On the Use of Neural Networks in Intelligent Tutoring Systems, S Mengel and W M Lively, *Journal of Artificial Intelligence in Education*, Vol 2, No 2, pp 43-56, Winter 1990/1991
- A Survey and Analysis of Non-programming Approaches to the Design and Development of Graphical User Interfaces, J DeSot and W M Lively, *Information and Software Technology*, June 1991
- ‘Using an Issue Based Hypertext System to Capture the Software Life Cycle Process,’ M Lease, W M Lively and J Leggett, *Hypermedia Journal*, Vol 2, No 1, pp 28-45, 1990

- “A Graphical Environment for User Interface Design,” J DeSol, W M Lively, M Lease, Tom Slade and Sallie Sheppard, *The Software Engineering Journal*, Vol 5, No 5, pp 289-299, September 1990
- “A Graphical Specification System for User Interface Design,” Andy Harbert, W M Lively and Sallie Sheppard, *IEEE Software*, Vol 7, No 4, pp 12-20, July 1990
- ‘Software Function Allocation Methodology,” Michael O’Neal, W M Lively and Sallie Sheppard, *Software – Practice and Experience*, Vol 19(8), pp 775-786, August 1989
- “Accommodating the Software Engineering Evolution in Education,” W M Lively and Sallie Sheppard, *Issues in Software Engineering Education*, pp 324-345, Springer-Verlag, 1988
- “Computer Systems for Augmentation and Management of the Medical Practice for the 1990’s,” W M Lively, B Childs and C E Fenner, *Software in Healthcare*, Vol 3, No 5, pp 52-58, October/November 1985
- “Modeling Systolic Mitral Valve Motion A Tool for Clarifying Mitral Valve Prolapse,” J Hunter, W M Lively and J Miller, *Texas Journal of Science*, Vol 25, No 1, pp 5-36, 1983
- A Note on Mitral Valve Mechanics A Pre-stressed Leaflet Concept,” J Miller, W M Lively and J Hunter, *Journal of Biomechanics*, Vol 14, No 5, pp 373-375, 1981
- “The Effect of Microcomputer Based Medical Equipment on Hospital Cost Containment,” W A Hyman and W M Lively, *Hospital Topics*, Vol 58, No 4, pp 33-36, 1981
- “Microcomputers and the Cost of Medical Care,” W A Hyman and W M Lively, *Texas Hospitals*, Vol 35, No 7, pp 24-25, December 1979
- “Modeling Techniques for Medical Diagnosis II Differential Diagnosis of Neonatal Hepatitis and Biliary Atresia,” C E Mize, W M Lively and S A Szygenda, *Computers and Biomedical Research*, Vol 9, No 3, pp 1-7, 1976
- ‘Heuristic Models in Medicine,” C E Mize, W M Lively and S A Szygenda, *Clinical Research*, Vol 21, No 1, January 1973
- Modeling Techniques for Medical Diagnosis I Heuristic and Learning Programs,’ W M Lively, C E Mize, and S A Szygenda, *Computers and Biomedical Research*, Vol 6, No 4, August 1973

Other Publications

- D B Simmons, Chris Nelson, Joe Urban and William Lively, ‘Rapid Insertion of Leading Edge Industrial Strength Software into University Classrooms”, Handbook of Research on Open Source Software Technological, Economic, and Social Perspectives, Fall 2006 – Book Chapter

Sang Eun Kim, William Lively, and Dick Simmons, "An Effort Estimation by UML Points in Early Stage of Software Development , *The 2006 International Conference on Software Engineering Research and Practice*, June 26-29, 2006, Las Vegas, USA) Academic Co-Sponsors The Massachusetts Institute of Technology's (MIT) Media Lab and Texas Advanced Computer Center of University of Texas at Austin

Flores-Mendoza, A E , and Lively, W , "Weval A Web Usability Evaluation Tool and Model," *The 2002 International Conference on Software Engineering Research and Practice*, June, 2002

Teaching CS/1 Courses in a Liteiate Manner, S B Childs, D Dunn and W M Lively, *Proceedings of the TEX Users Group Conference*, St Petersburg, Florida, July 1995

Automation of SW Effort Estimation, F Fisher, D Hicks and W Lively, *International Symposium on Applied Corporate Computing*, Monterrey Mexico, October, 1994

"Principled Modeling and Automatic Classification for Enhancing the Reusability of Problem Solving Methods of Expert Systems," J Yen, S Teh and W Lively, *Seventh International Conference on Industrial and Engineering Applications of Artificial Intelligence and Expert Systems*, Austin Texas, 1994

"Heuristic Modeling Guidelines for Expert System Reuse," See Hor The, J Yen and W M Lively, *Proceedings of Florida AI Research Symposium (FLAIRS-94)*, May 1994

"Principled Modeling and Automatic Classification of Functional Requirements for Improved Reusability of the Design of Knowledge-Based Systems," J Yeh, S H Teh and W M Lively, *Proceedings of CAIA 1994*

Customer Involvement Beyond the Requirements Phase Unnecessarily Impacts Software Schedules," W M Lively, *Proceedings of Achieving Quality Software III*, San Diego California, January 1993

Undergraduate Software Engineering Laboratory at Texas A&M University, ' W M Lively and Mark Lease, *Software Engineering Institute 6th Annual Conference on Software Engineering Education*, October 1992

Using CASE Tools to Teach Software Design in an Undergraduate Software Engineering Lab," W M Lively and Mark Lease, *Proceedings ASEE Annual Conference*, June 1992

'On the Use of Neural Networks in Intelligent Tutoring Systems, ' S Mengel and W Lively, *Proceedings of the 1992 ACM/SIGAPP Symposium on Applied Computing*, Volume II, pp 669-676, 1992

"Safety Issues for Expert Systems which 'Learn'," W A Hyman, W M Lively and C E Williams, *Tenth International System Safety Conference*, July 1991

- “User Perspectives and Design Considerations for Medical Expert Systems,” Clay Williams and William Lively, *Proceedings IEEE Conference on Engineering Medicine and Biology*, Chicago Illinois, October 1990
- ‘ A Software Development Environment to Generate External Interfaces for Microcomputer-Based Expert Systems,” Harry M Mathis, Sallie V Sheppard and William M Lively, *Proceedings IEEE Conference on Managing Expert System Programs and Projects*, pp 193-200, Washington, D C , September 1990
- “Graphical Specification of User Interfaces with Behavior Abstraction,” I F DeSai, W M Lively and S V Sheppard, *Proceedings CHI 98 Conference – Human Factors in Computing Systems*, pp 139-144, April 1989
- Where AI/KB Techniques Fit into Software Development/Engineering,” W M Lively, *Proceedings of the 13th Annual COMPSAC Conference*, p 777, 1989
- “Comparing Production System Architectures,” Mark Lease and W M Lively, *Computer Architecture News*, Vol 16, No 4, pp 108-116, September 1988
- ‘ Automatic Development of Parallel Simulation Models in Ada,” C K Davis, S V Sheppard and W M Lively, *Proceedings of the 1988 Winter Simulation Conference*, pp 339-344, 1988
- “Architectural Design Methodology for Supporting High Level Programming Languages,” S O Aletan and W M Lively, *Proceedings of the International Conference on Computer Languages* 88, October 1988
- “Executable Graphical Specifications for User Interfaces,” with Tom Slade, W M Lively, Sallie Sheppard, John DeSai, Randall Duncan and Mark Lease, *Proceedings of the 3rd Annual User-System Interface Conference*, pp 209-216, February 1988
- “Alternative Software Design Paradigms,” W M Lively, *Proceedings of the Fall Joint Computer Conference*, p 2, October 1987
- ‘ Insuring Software Safety in Robot Control,” Peter Wetterlind and W M Lively, *Proceedings of the Fall Joint Computer Conference*, pp 34-38, October 1987
- Express Rapid Prototyping and Product Development via Integrated, Knowledge-Based, Executable Specifications,” Phillip Topping, John McInroy, W M Lively and Sallie Sheppard, *Proceedings of the Fall Joint Computer Conference*, pp 3-10, October 1987
- ‘ The ATMAda Environment An enhanced APSE,” Ed Matthews and W M Lively, *Ada Letters*, Vol VI, No 3, pp 61-64, May 1986
- “Syntax-Directed Editing Revisited,” J Heyman and W M Lively, *Software Engineering Notes*, Vol 10, No 3, pp 24-27, July 1985

- ‘Multiprocessor/Multiarchitecture Microprocessor Design,’ S Aletan and W M Lively, *Proceedings Computer Science Conference*, March 13-14, 1985
- ‘Medical Practice Management Systems Should Manage More than Financial Data,’ W M Lively, B S Childs and E E Fenner, *Proceedings AAMSI Congress*, Vol II, pp 92-96, May 20, 1984
- “A Mitral Valve Model for Studying Prolapse, W M Lively, G E Miller, J Hunter and D L Stoner, *Texas Engineering Experiment Station Technical Bulletin*, No 80-1, pp 19-25, January 1980
- ‘Workshop Report I Microprocessor Impact in Health Care,’ W A Hyman and W M Lively, *Proceedings of the 12th International Conference on System Sciences*, Vol III, pp 272-276, January 1979
- ‘A Proposed Study to Assess the Impact of Microprocessors on Health Care Delivery,’ W M Lively and W A Hyman, *AFIPS Conference Proceedings – 1977 National Computer Conference*, Vol 9, pp 309-312, June 1977
- “A Multi-Lingual High Level Language Computer Architecture, P L Crews, W M Lively and D B Simmons, *Spring COMPCON 77 Digest of Papers*, February 1977
- “A Computer Assisted Instruction Program To Teach Medical Diagnosis,” L Thompson, W M Lively and D B Simmons, al , *Proceedings 3rd Texas Computing Conference*, November 1974
- “Computer Methods for Medical Differential Diagnosis,” W M Lively, C E Mize and S A Szygenda, *1973 SWIEECO Record of Technical Papers*, Houston Texas, April 1973
- “Dissertation Heuristic and Learning Program Applications to the Differential Diagnosis of Neonatal Hepatitis and Extrahepatic Biliary Atresia, W M Lively, *Computing Reviews*, Vol 13, No 8, August 1972
- “Modeling Techniques Utilizing Heuristics and Learning Programs for Medical Diagnosis of Infant Liver Abnormalities, W M Lively, C E Mize and S A Szygenda, *IEEE Proceedings of the Islands of Application Conference*, Tokyo Japan, June 1972
- “Computer Models for the Differential Diagnosis of Neonatal Hepatitis and Extrahepatic Biliary Atresia,” W M Lively, C E Mize and S A Szygenda, *Proceedings of the San Diego Biomedical Symposium*, February 1972
- “Analysis of Modeling Techniques for the Differential Diagnosis of Neonatal Liver Malfunctions,” W M Lively, C E Mize and S A Szygenda, *Proceedings of the Ninth Annual Symposium on Biomathematics and Computer Science in Life Sciences*, Houston Texas, March 1971

Graduate Students

Masters students graduated – 70

Ph D students graduated - 18

Technical Reports

Knowledge Based Integrated Information Systems Development Methodologies Plan, United States
United States Air Force, May 1987

An Evaluation of ART, KEE and Knowledge Craft on the Texas Instruments Explorer, October 1986

Final Report A Characterization of Expert System Development Tools for Manufacturing
Applications, United States United States Air Force Contract #F33615-82-C-5060

Final Report Mitral Valve Model, United States United States Air Force
Contract #D33615-75-D-0629

Final Report The Impact of Microprocessors on Health Care Delivery, NSF Grant MCS 77-02191

Automatic Documentation System Extension to Multi-Manufactures' Computers and to Measure,
Improve and Predict Software Reliability, NASA Contract No NAS 5-20715

Lectures and Presentations

Society for Software Quality National Debate, "Customer Involvement Beyond the Requirements
Phase Unnecessarily Impacts Software Schedules," San Diego California, January 28, 1993

CASE88 Workshop, "CASE Tool Education – Professional, Senior/Executive," Boston Massachusetts,
July 14, 1988

Carnegie-Mellon's Software Engineering Institute Symposium on Software Engineering Education,
"Industry/Academia Interfaces," April 30, 1987

Dunbar High School for Engineering Professions, Artificial Intelligence, Fort Worth Texas, April
28, 1984

Round Rock JETS Meeting, "Artificial Intelligence," November 16, 1983

Las Vegas JETS Meeting, 'Artificial Intelligence,' October 19, 1982

IBM Employee Educational Development Seminar, Software System Specifications," October 1981

NIH Consensus Development Conference, "The Use of Microprocessor-based Intelligent Machines in
Patient Care," 1980

Needville JETS Meeting, 'Microprocessors in Health Care,' April 17, 1979

Orange Science Symposium, "Microprocessors in Health Care," March 10, 1979

Micro-Expo, 'Microprocessors in Biomedical Engineering,' March 3, 1979

Stratford JETS Meeting, 'Microprocessors in Medical Care,' February 19, 1979

16th Annual Science Symposium, "The Microprocessor – Current Trends in Computers and Applications," March 11, 1978

Westchester High School, "The Ubiquitous Microprocessor," February 14, 1978

Stratford High School, "Artificial Intelligence – Will Computers replace Man?," November 22, 1976

Mt Carmel High School, "Computers in Medicine," November 22, 1976

John Jay High School, "The Computing Milieu," January 22, 1975

Spring Wood High School, "The Computing Science Milieu," December 17, 1974

Central Texas Science Symposium, "Computing Science in Medical Science," February 16, 1974

Extension

ITESM – Objected Oriented Software Design, Monterrey Mexico, Summer 1992

Computer Science Fundamentals, IBM, October 1984

Computer Architecture, IBM, April & June 1984

Computer Science Fundamentals, IBM, November 1982

Networks and Databases, Summer Faculty Development Program for the Mexican Regional Institute of Technology, 1981

Software Engineering, Moody College of Marine Sciences, Texas A&M University, May 1975

Programming Minicomputers, Texas A&M University, July 1974

Conference and Session Chairman

Fall Joint Computer Conference, Alternative Software Development Paradigms, October 1987

12th Hawaii International Conference on System Science, The Impact of Microprocessors on Health Care Delivery, January 1979

Workshop on the Impact of Microprocessors on Health Care Delivery, September 18-19, 1978
ACM '76 National Conference – Computers in Medicine

Walter C. Daugherty
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Caldwell, TX 77836-7285
(979) 272-6057 (Home)
(979) 845-1308 (Office)
Walter.Daugherty@post.Harvard.edu

OBJECTIVE

A responsible position which will make full use of my professional and administrative qualifications to solve new and challenging problems creatively, *e g* ,
associate professor with tenure

EDUCATION

Ed D , Mathematical Education, Harvard University, Cambridge, Massachusetts,
1977 Dissertation ' On the Ordering of Topics in the Teaching of
Mathematics ' Advisor Marc Lieberman

M A T , Mathematics, Harvard University, Cambridge, Massachusetts, 1967 (age 20)

B S , Mathematics Oklahoma Christian College Oklahoma City Oklahoma 1966 (3
years) Minors Physics and chemistry, German Grade point average 3.68 on
a 4.00 scale

EXPERIENCE

1973 to present	Daugherty Brothers, Inc , (Computer consultants), Bethany, Oklahoma Co-founder, chairman, and president Clients include IBM Federal Systems Division, New York Times, Washington Post, Los Angeles Times, Cheyenne and Arapaho Tribes of Oklahoma, Southwestern Bell Telephone, Fulbright & Jaworski (Houston), Texas Department of Agriculture, Phonogram B V (Amsterdam), and U S Customs Service

1987 to present	Texas A & M University, College Station, Texas Visiting Assistant Professor/Senior Lecturer, Departments of Computer Science and Electrical and Computer Engineering, College of Engineering

Curriculum Vitae of Walter C Daugherty, 3/29/2005

1989-91	Texas A & M University System, College Station, Texas Director, Knowledge Systems Research Center, Computer Science Division of the Texas Engineering Experiment Station
1984-87	Blinn College, Brenham, Texas Computer science instructor Part-time 1984-86, full-time 1986-87
1978-80	Rose State College, Midwest City, Oklahoma Data processing instructor (part-time)
1971-73	ECRM, Bedford, Massachusetts Systems programmer
1970-71	Harvard Computing Center, Cambridge, Massachusetts Telecommunications specialist
1969-70	Computer-Aided Instruction Laboratory, Harvard University, Cambridge, Massachusetts Systems programmer
1968-70	Harvard University, Division of Engineering and Applied Physics, Cambridge, Massachusetts Teaching fellow (for George Mealy and Thomas Bartee)
1967	Driscoll Junior High School, Brookline, Massachusetts Mathematics teacher
1967	University of Oklahoma Medical Center Computing Facility, Oklahoma City, Oklahoma Programmer
1966	University of Central Oklahoma Data Processing Center, Edmond, Oklahoma Programmer
1965	Oklahoma Christian University of Science and Arts, Oklahoma City, Oklahoma Statistical programmer
1963	University of Oklahoma Computer Center, Norman, Oklahoma Lab instructor

RESEARCH AND DESIGN

1 Refereed Publications

Daugherty, W C , and Coulson, R N , ‘ Knowledge Engineering for Sustainable Agriculture Management,” *Proceedings of ICAST 2001 Conference* (Beijing, China, November 2001), 2 266, 2001

Curriculum Vitae of Walter C Daugherty 3/29/2005

Coulson, R N , Saunders, M C , Saarenmaa, H , Daugherty, W C , and Rykiel, E J ,
“A Knowledge System Environment for Ecosystem Management,” book chapter in
Klopatek, J and Gardner, R (eds), *Integration of Cultural and Natural Ecosystems
Across Landscapes Applications of the Science*, Springer-Verlag, 1997 (in press)

Coulson, R N , Daugherty, W C , Rykiel, E J , Saarenmaa, H , and Saunders, M C ,
‘The Pragmatism of Ecosystem Management Planning, Problem Solving and
Decision Making with Knowledge-Based Systems,” *Proceedings of Eco-Informa 96
Conference* (Lake Buena Vista, Florida, November 1996), 10 342-50, 1996

Coulson, R N , Fitzgerald, J W * , Daugherty, W C , Oliveria, F L , and
Wunneburger, D F , “Using Spatial Data for Integrated Pest Management in Forest
Landscapes,” *GIS World* (accepted)

Daugherty, W C , Harris, C E , Jr , and Rabins, M J , ‘Introducing Ethics and
Professionalism in REU Programs,’ *Proceedings of the 1995 World Conference on
Engineering Education* (Minneapolis, Minnesota, October 1995)

Coulson, R N , Daugherty, W C , Vidlak, M D * , Fitzgerald, J W * , Teh, S H * ,
Oliveria, F L , Drummond, D B , and Nettleton, W A , Computer-based Planning,
Problem Solving, and Decision Making in Forest Health Management An
Implementation of the Knowledge System Environment for the Southern Pine Beetle,
ISPBEX-II,” *Proceedings of the IUFRO Symposium on Current Topics in Forest
Entomology* (Maui, Hawaii), 1995

Yen, J , Daugherty, W C , Wang, H * , and Rathakrishnan, B * , Self-Tuning and
Self-Learning Fuzzy Systems, book chapter in Yen, J , Langari, R , and Zadeh, L
(eds), *Industrial Applications of Fuzzy Logic and Intelligent Systems*, IEEE Press,
1995

Daugherty, W C , Video review of *Introduction to Biological and Artificial Neural
Networks for Pattern Recognition* by Steven K Rogers, in *IEEE Transactions on
Neural Networks*, Vol 5, No 5, 1994

Teh, S H * , Daugherty, W C , and Coulson, R N , A User-Centric Methodology
for Building Usable Expert Systems,” *Proceedings of the 7th International
Conference on Industrial and Engineering Applications of Artificial Intelligence and
Expert Systems* (Austin, Texas, May-June 1994), 45-48, 1994

* Graduate Research Assistant I funded

Curriculum Vitae of Walter C Daugherity 3/29/2005

Daugherity, W C , ' A Neural-Fuzzy System for the Protein Folding Problem," *Proceedings of the Third International Workshop on Industrial Fuzzy Control & Intelligent Systems (IFIS 93)* (Houston, Texas, December 1993), 47-49, 1993

Daugherity, W C , "A Partially Self-Training System for the Protein Folding Problem," *Proceedings of the World Congress on Neural Networks (WCNN 93)*, (Portland, Oregon, July 1993) Invited paper

Yen, J , Wang, H * , and Daugherity, W C , Design Issues of Reinforcement-Based Self-Learning Fuzzy Control," *Proceedings of the World Congress on Neural Networks (WCNN 93)*, (Portland, Oregon, July 1993)

Daugherity, W C , ' Characterizations of Fuzzy Operations,' *Proceedings of the Second International Workshop on Industrial Fuzzy Control & Intelligent Systems* (College Station Texas, December 1992), 234 1992

Yen, J , Wang, H * , and Daugherity, W C Design Issues of a Reinforcement-Based Self-Learning Fuzzy Controller for Petrochemical Process Control,' *Proceedings of North American Fuzzy Information Processing Society* (Puerto Vallarta, December 1992), 1992

Yen, J , Wang, H * , and Daugherity, W C , 'An Adaptive Fuzzy Controller with Application to Petroleum Processing,' *Proceedings of IFAC Workshop on Intelligent Manufacturing Systems* (Dearborn, October 1992), 1992

Yen, J , Daugherity, W C , and Rathakrishnan, B * , "Fuzzy Logic and Its Application to Process Control," *Proceedings of CAPA Technology Conference* (Houston, May 1992), 78-86, 1992

Daugherity, W C , Rathakrishnan, B * , and Yen, J , Performance Evaluation of a Self-Tuning Fuzzy Controller," *Proceedings of the IEEE International Conference on Fuzzy Systems (FUZZ-IEEE)* (San Diego, March 1992), 1992

Daugherity, W C , "An Application of Geometrical Reasoning to a Combinatorial Problem," *Proceedings of the Seventh Annual Conference on Applied Mathematics* (Edmond, Oklahoma, April 1991), pp 226-232, 1991

Daugherity, W C , Review of *Data Communications Dictionary*, by Charles J Sippl, in *Computing Reviews*, Vol 17, No 9, pp 335-336, 1976

Daugherity, W C , ' Circuits for Dial-up and Local Use of a Stand-alone PDP-8," *Proceedings of the Digital Equipment Computer Users Society*, Vol 2, No 2 (Los Angeles, December 1975), pp 413-414, 1976

* Graduate Research Assistants I funded

Curriculum Vitae of Walter C Daugherty, 3/29/2005

Daugherty, W C , Review of *Effective Use of ANS COBOL Computer Programming Language*, by Laurence S Cohn, in *Computing Reviews*, Vol 16, No 10, p 441, 1975

Manwell, T , Daugherty, W , Desch, S , and Stolurow, L , ‘ Tom Swift and His Electric Bilingual Grandmother,’ *ACM SIGCUE Bulletin*, Vol 7, No 1, pp 5-17, 1973

Daugherty, W C , ‘ A Telephone Amplifier,’ *Transactions of the Oklahoma Junior Academy of Science*, Vol IV, pp 130-132, 1961

2 Other Publications

Daugherty, W C , ‘Honors Section,’ in Rabins, M J , and Harris, C E Jr (eds), *Engineering Ethics Teaching Manual*, 1997

Daugherty, W C , ‘Honors Section,’ in Rabins, M J , and Harris, C E Jr (eds), *Engineering Ethics Teaching Manual*, 1996

Allen, G D , Nelson, P Jarvis, R D , and Daugherty, W C , ‘ System Impact of Hit Assessment Capability for NPB Discrimination Analysis of the Case of No-Hit Assessment,’ *Weapons Lab/TALN Technical Report*, Kirtland Air Force Base, May, 1990

3 Other Conference Papers and Presentations

Coulson, R N , and Daugherty, W C , ‘ A Knowledge Engineering Approach for Ecosystem Management,’ 11th Annual Landscape Ecology Symposium, International Association for Landscape Ecology - Integration of Cultural and Natural Ecosystems Across Landscapes Applications of the Science Galveston, Texas, 1996

Coulson, R N , and Daugherty, W C , ‘ Decision Support Systems for Forest Pests Where Do All the Knowledge-Based Systems Go?’, North American Forest Insect Work Conference, San Antonio, Texas, 1996

Daugherty, W C and Coulson, R N , SPBEBE (Economic and Environmental Impact Assessment for Southern Pine Beetle Suppression Projects), computer code, developed for the USDA Forest Service, Forest Health Protection, 1996-1997

Coulson, R N , and Daugherty, W C , ‘Knowledge System Environment for Ecosystem Management,’ Global Studies Seminar, Battelle Pacific Northwest Laboratories, Richland, Washington, 1995

Curriculum Vitae of Walter C Daugherty, 3/29/2005

Daugherty, W C and Coulson, R N , ISPBEX-II (Integrated Southern Pine Beetle Expert System), computer code, developed for the USDA Forest Service, Forest Health Protection, 1994

Daugherty, W C , and Yen, J , ‘ Tutorial on Neuro-Fuzzy Systems,” Third International Workshop on Industrial Fuzzy Control & Intelligent Systems Houston, Texas, December 1993

Daugherty, W C , “Introduction to LISP with an On-line Demonstration,” Houston Geotech '91, Houston, Texas, 1991

Daugherty, W C , ‘ The Universal Classification Problem,” South Central Regional Conference of the Association for Computing Machinery, Austin, Texas, 1984

4 Research Projects

“Remote Laboratory Data Entry and Retrieval System,” Texas Department of Agriculture, Walter C Daugherty, 1986, \$3,000 (Daugherty 100%)

Electrochemical Modeling of a Sinter Plate, Sealed Design Nickel-Cadmium (Ni-Cd) Battery Cell, National Aeronautics and Space Administration, Ralph E White, Walter C Daugherty, 1 graduate student, 1989, 25% of my salary 1989-90 (Daugherty 100%)

‘Application of Reasoning under Uncertainty to Process Control,” Texaco, Walter C Daugherty and John Yen, 1 graduate student, competitive and peer-reviewed, September 1990, \$18,000

Design of a Computational Classroom, ' Texas A & M University, Walter C Daugherty, September 1990-May 1991, \$60,000 (Daugherty 100%)

“Design of a Second Computational Classroom,” Texas A & M University, Walter C Daugherty, January 1991-December 1992, \$153,000 (Daugherty 100%)

Development of Honors Courses in Artificial Intelligence and Analysis of Algorithms, ' Texas A & M University, Walter C Daugherty, James Abello and Arkady Kanevsky, 2 graduate students, competitive, September 1991-May 1991, \$11,000 (Daugherty 50%)

‘ Integrated Southern Pine Beetle Expert System”, USDA Forest Service, Robert N Coulson, Walter C Daugherty, and Jeffrey W Fitzgerald, 5 graduate students, competitive and peer-reviewed, 1985-1992, \$974,120

Distributed Data-Base Support for the ISPBEX Expert System’ , USDA Forest Service, Robert N Coulson, Walter C Daugherty, and Jeffrey W Fitzgerald, 1 graduate student, competitive and peer-reviewed, 1992-93, \$35,000

Curriculum Vitae of Walter C Daugherty, 3/29/2005

“Integrated Southern Pine Beetle Expert System II”, USDA Forest Service, Robert N Coulson, Walter C Daugherty, and Jeffrey W Fitzgerald, competitive and peer-reviewed, March 1993-February 1994, competitive and peer-reviewed, \$170,000

“Ecological Modelling of Regional Responses to Global Changes A Knowledge System Environment for Planning, Problem-Solving and Decision Making”, Battelle Pacific Northwest Laboratory, Robert N Coulson and Walter C Daugherty, competitive and peer-reviewed, June-December 1995, \$39,996

Fitness of a Genetically Modified *Gliocladium virens* in Soil and Rhizosphere”, USDA Cooperative State Research Service, Charles M Kenerley and Walter C Daugherty, 1 senior associate, 2 graduate students, and 1 undergraduate student, competitive and peer-reviewed, September 1996-August 2001, \$254,450 (Daugherty 50%)

‘ The Texas Imported Fire Ant Survey The Fire Ant Spatial Information Management System (FASIMS)”, Texas Agricultural Experiment Station, Robert N Coulson (PI) and S Bradleigh Vinson, Maria D Guzman, Douglas F Wunneburger, and Walter C Daugherty (Co-PI’s), competitive and peer-reviewed, January 1998-December 1998, \$50,000

“Special Topics in Computer Science Concepts and Programming”, Academy for Advanced Telecommunications and Learning Technologies, Walter C Daugherty, competitive and peer-reviewed, June 1998-May 1999, \$5,000 (Daugherty 100%)

Object Modeling Techniques Support for National Simulation Center Tactical Directorate”, U S Army through prime contractor Cubic Applications, Inc , Walter C Daugherty, James A Wall, and Jose Salinas, competitive, September 1998-April 1999, \$74,498 (Daugherty 20%)

Evaluating the Impact of Southern Pine Beetle on Ecologically Sustainable Forest Management”, USDA Forest Service, Robert N Coulson and Walter C Daugherty, 1 graduate student and 1 undergraduate student, competitive and peer-reviewed, 2000-2003, \$90,000

Honey Bee Initiative”, State of Texas, Robert N Coulson (PI), Walter C Daugherty (Consultant), 2 graduate students, competitive, September 2001-August 2002, \$40,000

“Increasing Computer Science Retention by Developing and Deploying Self-Paced Learning Modules”, State of Texas, Jennifer Welch and Frank Shipman (Co-PI’s), Lawrence Petersen, Walter C Daugherty, and Lauren Cifuentes (Key Personnel), 10 undergraduate students, competitive, June 2002-August 2004, \$422,692

Curriculum Vitae of Walter C Daugherty, 3/29/2005

‘Facilitating the Transition to Java in High School Computer Programming Classes’, Texas A&M University System Academy for Educator Development, Walter C Daugherty, 1 graduate student, competitive and peer-reviewed, December 2003-September 2004, \$2,966 (Daugherty 100%)

Instructional Technology Enhancements for Computer Teaching Labs,” Texas A&M University, Walter C Daugherty, competitive, January 2004-August 2004, \$20,000 (Daugherty 100%)

“Increasing Computer Science Retention with Peer Teachers and Learning Modules”, State of Texas, Valerie Taylor and Jennifer Welch (Co-PI’s), Lawrence Petersen, Walter C Daugherty, and Joseph Hurley (Key Personnel), undergraduate students, competitive, September 2004-August 2005, \$173,158

Cumulative total \$2,608,550

5 Research Proposals

Note Funded proposals are listed in section 4 above

‘Automated Support for VLSI Standard Cell Optimization,” Texas Advanced Technology Program, Walter C Daugherty, competitive and peer-reviewed, July 1989, not funded, \$233,887

Integration of Computer Software Models for NiCd Battery Design,” National Aeronautics and Space Administration, Ralph E White and Walter C Daugherty, competitive and peer-reviewed, 1990, not funded, \$125,000

“Innovative Use of Supercomputers and Parallel Computers in Grades K-8, Department of Energy, Paul Nelson, Walter C Daugherty and Bahram Nassersharif, competitive and peer-reviewed, December 1990, preproposal submitted, \$885,000

Integration of Texas Junior Colleges into State and National Computer Networks,’ Texas Advanced Technology Program, Walter C Daugherty and Charles H Beard, competitive and peer-reviewed, July 1991, not funded, \$174,219

“Adaptive Fuzzy Control for Industrial Processes,’ Texas Advanced Research Program, John Yen and Walter C Daugherty, competitive and peer-reviewed, July 1991, not funded, \$177,064

‘Development of a Fuzzy Logic Tuner for a PID Controller,” Texaco, John Yen and Walter C Daugherty, 1992-93, not funded, \$200,000

National Center For Ecological Analysis and Synthesis,” National Science Foundation, Robert N Coulson, Walter C Daugherty *et al* , competitive and peer-reviewed, July 1994, not funded, \$10,000,000

Curriculum Vitae of Walter C Daugherity 3/29/2005

“Development of a Fungal Growth Model for Risk Assessment,” Texas Advanced Research Program, Charles M Kenerley and Walter C Daugherity, competitive and peer-reviewed, July 1995, not funded, \$203,792

Intelligent Vehicle Navigation System,” Texas Advanced Technology Program, Walter C Daugherity and Jeffrey W Fitzgerald, competitive and peer-reviewed, July 1995, not funded, \$195,058

“Innovative Programs to Increase the Enrollment in Computer Science,” Texas Technology Workforce Development Grant Program, Valerie Taylor and Frank Shipman (co-PI's), Lawrence Petersen, Walter C Daugherity, and Joseph Hurley (Key Personnel), competitive and peer-reviewed, March 2005, pending, \$69,760

6 New Design Methods, Techniques, or Concepts Developed

Null Modem

I independently invented the null modem in 1969 and constructed one for Harvard University (which is still operational!)

Computer Keyboard National Standard

As a member of the Harvard-MIT Terminal Committee, I participated in the development of the national standard for computer keyboards (*e g* , putting braces above brackets for the benefit of programming languages) Nearly every computer terminal and keyboard since then (*e g* , VT100, PC) uses this layout

Integrated User Training

I invented the method of training users about additional features of an application program by integrating the information with the operation of the program (see Manwell, Daugherity, *et al* under Publications, above) This is now widely adopted, *e g* , by Microsoft for its Windows operating systems in the Getting Started panel

Object-Oriented Database

I independently invented and implemented an object-oriented database to support arbitrary combinations of data types

Self-Organizing Fuzzy Controller

In collaboration with Balaji Rathakrishnan (a Graduate Research Assistant I funded) and John Yen, I developed a new systematic methodology for constructing and tuning fuzzy logic controllers The research project was funded by Texaco (see the preceding section for details) for use in its refineries

TEACHING

1 Teaching Effectiveness

Please see Appendix for student comments

2 Educational Development

New Courses Developed

CPSC 111/211/311 Java and C-based sequence - Member of curriculum subcommittee, taught 111 and 211
CPSC 210 (Honors) - Data Structures
CPSC 320 (Honors) - Artificial Intelligence
CPSC 489 - Object-Oriented Programming, Systems, and Languages
CPSC 635 - Natural Language Processing (taught by Dr P Mayer)
CPSC 689 - Symbolic and Algebraic Computation (not taught)
ENGR/PHIL 482 (Honors) - Ethics and Engineering
PHYS/ELEN 674 (with David Church [PHYS]) - Special Topics in Quantum Computing (the first course at Texas A&M in quantum computing, and, to the best of my knowledge, the first course in quantum computing anywhere in Texas), taught Spring, 2005, for the fifth time
A Distance Learning section of CPSC 601 - Programming in C and Java, taught Spring, 2003
Two sections of CPSC 111 - Computer Science Concepts and Programming taught with student peer teachers as assistants, Fall, 2002
Honors section of CPSC 111 - Computer Science Concepts and Programming taught with student peer teachers as assistants, Fall, 2004
Developed (with Lawrence Petersen) an intensive summer training program in Java and Software Engineering for high-school computer science teachers, taught Summer, 2003
Developing an intensive summer training program in Data Structures for high-school computer science teachers, taught Summer, 2004, I was also completely responsible for recruiting teachers, getting them admitted, arranging for housing, and so on

New Computational Classrooms

Designed, obtained \$213,000 in funding for, and coordinated two new university computational classrooms (Bright 116 and Zachry 006) These are equipped with a total of 43 NeXT computers While there are several comparable computer labs on campus, none has been equipped or set aside for instruction before These computational classrooms enable lectures to include complex demonstrations and on-the-spot experimentation with each new topic or technique the instructor introduces Classes in Aerospace Engineering, Bioengineering, Business Analysis, Chemical Engineering, Computer Science, Mathematics, Music, Nuclear Engineering, and Philosophy have used these computational classrooms
Wrote a successful proposal for \$20,000 in Engineering Equipment Access Fee funds to equip 4 instructional computer labs with ceiling-mounted projectors

Curriculum Vitae of Walter C Daugherty 3/29/2005

Honors Program

- Wrote a successful proposal which received \$11,000 in funding from the University Honors Program to develop a CPSC 320 Honors course and for James Abello and Arkady Kanevsky to develop a CPSC 311 Honors course
- Two graduate students were funded from this grant
- Developed honors versions of CPSC 210 (Data Structures), CPSC 320 (Artificial Intelligence), and ENGR/PHIL 482 (Ethics and Engineering)
- Have also taught the honors section of CPSC 120E (Structured Programming II for Engineers)
- Adviser for six senior Honors theses (Clint Fincher, Dave Walvoord, Deidre Kramm, Bryan Armstrong, Robin Dowell, and Steven Sensarn)
- Reviewer of senior Honors thesis proposals and the final theses, including ranking them for awards
- Gave an invited talk to the Lechner Honors Overnight Express (a group of potential honors students at Texas A&M) entitled "Pythagoras, Bach, and Steve Jobs"
- Developed two positions for the Summer Honors Invitational Program "Pharmochem Grand Debate," involving 4 groups of 25 students each who are National Merit semifinalists (high school seniors in September) and considering A&M when they graduate Summers of 1994, 1995, 1996, and 1997
- Gave an invited talk to the Lechner Honors Overnight Express (a group of potential honors students at Texas A&M) entitled "The *Challenger* and Pinto Blowups Ethics and Engineering"
- Invited by Honors students to talk to their Pizza-N-Prof's sessions
- Coordinated 4 discussion groups of 20 students each who are National Merit semifinalists (high school seniors in September) and considering A&M when they graduate, for the Summer Honors Invitational Program Summers of 2001 and 2003
- Named to represent the College of Engineering on the University's Honors Program Advisory Committee (3-year term)
- Nominated as Honors Fellows Advisor of the Year
- Nominated for Honors Teacher-Scholar Award

Multimedia

- Online and standalone computer demonstrations with projector in classroom
- Animated color graphics computer presentations of my research at conferences
- Produced videotape describing one of my research projects
- Participated with my students in live interactive satellite presentations
- Supervised honors students developing sophisticated World-Wide Web pages
- Use electronic news and e-mail to communicate assignments, seminar announcements, course information, etc , to students

Curriculum Vitae of Walter C Daugherity 3/29/2005

Professional Development

- ‘Winning at Work’ seminar, Dallas, Texas, February 1995
- ‘Seven Habits of Highly Effective People’ seminar, College Station, Texas, Spring 1995
- First Things First seminar, College Station, Texas, January 1996
- Participated in the CPSC 665 Advanced Network Security class, 1999-2002
- Attended a 128-hour training seminar on Neuro-Linguistic Programming at my own expense in order to improve my communication skills as a teacher (Spring 2002), and received practitioner certification from INLPTA, the International NLP Trainers Association
- Named by the TAMU System to The Academy for Educator Development, a major component of The Texas A&M University System’s Regents’ Initiative for Excellence in Education (one of only two faculty members selected from the entire College of Engineering)
- Participated in three conferences of The Academy for Educator Development sponsored by the Texas A&M University System
- Participated in the Center for Teaching Excellence s seminar “How to Effectively Manage Your Large Class ’

Departmental Assistance

- Completed courses when instructors left in midterm CPSC 206 (2 sections), CPSC 210, and CPSC 464

3 Courses Taught

A Graduate

- CPSC 601 Programming in C and Java
- CPSC 614 Computer Architecture
- CPSC 625 Artificial Intelligence
- CPSC 632 Expert Systems
- CPSC 681 Graduate Seminar
- CPSC 685 Problems
- CPSC 691 Research
- PHYS/ELEN 674 Quantum Computing (co-teacher)

B Undergraduate

- CPSC 111 Computer Science Concepts and Programming
- CPSC 111H Computer Science Concepts and Programming (Honors)
- CPSC 120 Programming II
- CPSC 120H Programming II (Honors)
- CPSC 203 Introduction to Computing
- CPSC 206 Structured Programming in C
- CPSC 210 Data Structures
- CPSC 210H Data Structures (Honors)
- CPSC 211 Data Structures and Implementations
- CPSC 211H Data Structures and Implementations (Honors)
- CPSC 285 Special Topics - Data Structures for Teachers

Curriculum Vitae of Walter C Daugherty 3/29/2005

CPSC 289 Special Topics - Java and Software Engineering for Teachers
CPSC 311 Analysis of Algorithms
CPSC 320/420 Artificial Intelligence
CPSC 320H/420H Artificial Intelligence (Honors)
CPSC 321 Computer Architecture
CPSC 464 Integrated Systems Design Automation
CPSC 485 Problems
CPSC/ELEN 485H Problems (Honors theses)
CPSC 489 Object-Oriented Programming, Systems, and Languages
ENGR/PHIL 482H Ethics and Engineering (Honors)

4 Student Research Advising (Cumulative)

Have funded 19 graduate students and two undergraduate students

Committee co-chair, 1 Master's degree student

Committee member, 13 Doctor's and 23 Master's degree students

Adviser for 6 senior Honors theses

Adviser, Research Careers for Minority Participation (RCMS)

University Mentor many students contact me for advice and help,

including many students who are not in my classes When the Department assigned me a group of students, I contacted each of them by e-mail and then responded to their questions 5-10 students per day contact me, in person, by phone, or by e-mail

5 Teaching Improvement

Teaching Portfolio seminar, Center for Teaching Excellence

Attended a 128-hour training seminar on Neuro-Linguistic Programming at my own expense in order to improve my communication skills as a teacher (Spring 2002), and received practitioner certification from INLPTA, the International NLP Trainers Association

Participated in three conferences of The Academy for Educator Development, sponsored by the Texas A&M University System

Participated in the Center for Teaching Excellence's seminar "How to Effectively Manage Your Large Class "

SERVICE

1 Professional Service

Computing Reviews, reviewer, appointed, 1975-76

Reviewer, numerous textbooks, journal articles, and conference papers

Consultant on mathematics portion of the Texas Academic Skills Program test

Association for Computing Machinery, Intercollegiate Programming Contest

Director, appointed, South Central Region (Texas, Oklahoma, Arkansas and Louisiana), 1990-92

Curriculum Vitae of Walter C Daugherty 3/29/2005

2 University and Community Service

Have funded 16 graduate students and one undergraduate student
Committee co-chair, 1 Master's degree student
Committee member, 13 Doctor's and 23 Master's degree students
Adviser for 6 Honors theses
ACM/IEEE-CS Student Chapter
 Faculty cosponsor, 1988-95
 Directed TAMU Scholastic Programming Contest and wrote problems, 1988-92
 Coached, sponsored, and accompanied winning TAMU team to regional Scholastic Programming Contest, 1988-91
 Directed Scholastic Programming Contest and wrote problems for South Central Region (Texas, Oklahoma, Arkansas and Louisiana), 1991 and 1992
Organized a Symbolics Users' Group elected President 1989-90
Organized a NeXT Users' Group, elected Vice-President 1990-91, faculty sponsor 1991-93
Coordinated Computational Classroom planning for the University (two classrooms with \$213,000 in equipment)
Member, University Network Operations Planning and Evaluation Committee, 1991-95
Member, University Computer Users Group Executive Board
Member, University Honors Program Advisory Committee (3-year term)
Member, Faculty Senate Subcommittee on Non-tenured/Non-tenure-track Faculty, 2004-present
Mentor (University program)
Mentor (Departmental program) - From 5 to 10 students a day contact me
Candidate for Faculty Senate
Reviewer for Honors theses
Chairman, Departmental Display Committee, 1990-93
Member, Departmental Committee on a Center for Fuzzy Logic and Intelligent Systems
Member, Departmental Equipment Committee, 1988-89, 1993-95
Member, Departmental Computing Services Advisory Committee, 1996-present
Member, Departmental Colloquium Committee, 1991
Administrative chair, International Workshops on Industrial Applications of Fuzzy Control and Intelligent Systems, 1991 and 1992
Publicity chair, International Workshops on Industrial Applications of Fuzzy Control and Intelligent Systems, 1993
Developed new Honors sections for CPSC 210 CPSC 320, and ENGR/PHIL 482
Participated in the Honors Scheduling Colloquium, 1990, 1991, 1992
Developed CPSC 320 (Artificial Intelligence) section of ABET/CSAB accreditation report, 1991-92
CPSC 120 Honors, 320, 489 (OOP), 625, and 632 - Selected textbooks
CPSC 485, 685 and 691 supervision
Taught CPSC 681 as an overload (fourth course) for Spring, 1991
Taught ENGR/PHIL 482 as an overload (fourth course) for Spring, 1994
Obtained \$4,000 in matching funds for the Departmental workstation program

Curriculum Vitae of Walter C Daugherty, 3/29/2005

Arranged for the Department to receive one of the first new NeXTstation demonstrations in the country
Participated in the selection of the MasPar parallel computer
Arranged Career Day display for the Department, 1989, 1990, 1991
Arranged TAME Day display to recruit Hispanic students, 1991
Drafted a graduate student recruitment poster for the Department
Helped coordinate activities for the dedication of the Harvey R Bright Building, 1990
Organized a computer checkers contest (with Craig Boyle), 1991
Investigated software packages for ENGR 109
Represented the Center for Fuzzy Logic at MCC
Arranged Departmental program for 12 visitors from Texaco's Advanced Technology Group
Prepared a videotape of my research for the Department head to present to the Texas Engineering Experiment Station
Represented the Department at the Motorola University Symposium, Austin, 1988
Recruited National Science Foundation grantee Anne Breene to the Department
Assisted faculty and staff with electronic mail, MACSYMA, etc
Assisted Professor Cannon (Department of English) with a computerized etymological dictionary
Hosted a delegation from Kazan, U S S R
Hosted international professors and assisted them in locating positions in the U S
Hosted campus visits by faculty and staff from Texas A&I and Abilene Christian University
Recruited for graduate students at Central State University (Edmond, Oklahoma) and Oklahoma Christian University
Advised building proctor on problems with conditioned power isolated ground system
Made presentation on the NeXT computer to Petroleum Engineering
Represented the Department at University Parents' Social
Taught computers to gifted and talented 5th-8th-graders in the Summer Engineering Enrichment Seminar, June 1993
Member official Texas A&M delegation to ICAST 2001, Beijing, China, chaired a session and presented a paper
Briefed the Core Curriculum Revision Committee on computer-related course options, 2002
Volunteered as a judge at St Michael's Academy Science Fair, 2004

PROFESSIONAL OUTREACH

1 Knowledge Systems Research Center

Director, Knowledge Systems Research Center

Hired and supervised 6 employees, including 2 Hispanic and 1 other minority
Secured \$115,500 in TEES funding for September 1989-December 1990,
managed fiscal 1990 budget down to 0.1% accuracy (\$114 balance)

Curriculum Vitae of Walter C Daugherity 3/29/2005

Planned approximately 200 seminars and short courses (and delivered about 20 myself) to approximately 2000 faculty, staff and students

Saved the University approximately \$320,000 in software discounts, etc

Obtained commitments for \$21,000 from four departments to help fund KSRC

2 Invited Significant Seminars or Lectures

Daugherity, W C , "Computers and Privacy," Phi Theta Kappa Honor Society State Convention, Blinn College, Brenham, Texas, 1985

Daugherity, W C , and DeSai, J F , "Objected-Oriented Programming," Second Annual Texaco Artificial Intelligence Symposium, Houston, Texas, 1989

Daugherity, W C , "A Self-Tuning Fuzzy Controller," ARRI Conference on Fuzzy Logic, Arlington, Texas, March 1992

Daugherity, W C , Yen, J , and Langari, R , "Tutorial on Fuzzy Logic," Second International Workshop on Industrial Fuzzy Control & Intelligent Systems, College Station, Texas, December 1992

Daugherity, W C , "A Partially Self-Training System for the Protein Folding Problem," World Congress on Neural Networks, Portland, Oregon, July 1993

Daugherity, W C , "Neuro-fuzzy Systems," Third International Workshop on Industrial Fuzzy Control & Intelligent Systems, Houston, Texas, December 1993

Daugherity, W C and Harris, C E , "Ethics and Engineering," NSF Research Experience for Undergraduates, College Station, Texas, Summer 1994

Daugherity, W C and Harris, C E , "Ethics and Engineering," NSF Research Experience for Undergraduates, Austin, Texas, Summer 1994

Daugherity, W C and Harris, C E , "Ethics and Engineering," NSF Research Experience for Undergraduates, College Station, Texas, Summer 1995

Daugherity, W C and Harris, C E , "Ethics and Engineering," NSF Research Experience for Undergraduates, Austin, Texas, Summer 1995

Daugherity, W C , "Public-Key Cryptography Meets Quantum Computing Why Secret Agencies are Quaking in their Boots " Quantum Computing Seminar, Texas A&M University, April 9, 2001

Daugherity, W C , "Quantum Computing 101 How to Crack RSA " DcfCon X, Las Vegas, NV, August 4, 2002

Daugherity, W C , "Computer Ethics " ENGR 482 Ethics and Engineering, Texas A&M University, April 14-16, 2003

Curriculum Vitae of Walter C Daugherty, 3/29/2005

Daugherty, W C , Incorporating Computer Ethics into an Engineering Ethics Course " University of Texas Ethics Conference, Austin, Texas, April 16, 2004

Daugherty, W C , "Computer Ethics " ENGR 482 Ethics and Engineering, Texas A&M University, November 8-10, 2004

3 Review of Papers

Reviewer, numerous textbooks, manuscripts, journal articles, and conference papers

4 Consulting

St Joseph's Hospital, Bryan, Fall 1990, at no charge

Other clients include IBM Federal Systems Division, New York Times, Washington Post, Los Angeles Times, Cheyenne and Arapaho Tribes of Oklahoma, Southwestern Bell Telephone, Fulbright & Jaworski (Houston), Texas Department of Agriculture, Phonogram B V (Amsterdam), and U S Department of the Treasury

5 Other Professional Outreach

Center for Fuzzy Logic, Robotics, and Intelligent Systems Research

Founding member, treasurer, and administrative chair for the First International Workshop on Industrial Applications of Fuzzy Control and Intelligent Systems
This workshop, held November 21-22, 1991, in College Station featured most of the leaders in the field (including Lotfi Zadeh and a number of Japanese researchers), and attracted an international audience of over 200

Administrative Chair, International Workshop on Industrial Applications of Fuzzy Control and Intelligent Systems, 1991 and 1992 Publicity Chair, 1993

Designed conference brochure

Coordinated registration

Organized student volunteer workers

Arranged for computers and videotaping

Selected menus suitable for international attendees

Hosted invited speakers

Designed (with J Ycn) remodelling plan for the Center for Fuzzy Logic and Intelligent Systems Research

Appeared as a computer expert on the nationally-broadcast "Richard Hogue - Sunday Night" television show (Trinity Broadcasting Network), February, 1985

HONORS AND AWARDS

Oklahoma Junior Academy of Science, elected to membership, 1961, Oklahoma State University
National Science Foundation, Institute for High Ability Secondary School Students, 1962, University of Oklahoma
Westinghouse, Science Talent Search national finalist, 1963
National Merit Scholarship test, highest score in Oklahoma, 1963
Frontiers of Science, scholarship, 1963, Oklahoma City, Oklahoma
Engineering Club of Oklahoma City, award, 1963, Oklahoma City, Oklahoma
Oklahoma Christian College, full scholarship (top entering freshman), 1963, Oklahoma City, Oklahoma
National Science Foundation, Undergraduate Research Participation Program, 1965, University of Oklahoma, Norman, Oklahoma
Alpha Delta Tau, National Honor Society, 1966
Who's Who in American Colleges and Universities, 1966
Graduate Record Exam in Mathematics, scored 800, 1966
Harvard University, Prize Fellowship, 1966
National Science Foundation, Academic Year Institute, 1967
Phi Delta Kappa, National Honor Society, 1967
Harvard University, Class Marshal for the Graduate School of Education, 1967
Harvard University, Bowdoin Prize, bronze medal and cash award for outstanding writing, 1973
Association for Computing Machinery, selected as a reviewer for *Computing Reviews*, 1975
Blinn College, Faculty Council Secretary-elect, 1985, Brenham, Texas
Harvard University, 350th Anniversary Choir, 1986, Cambridge, Massachusetts
Abilene Christian University, Department of Computer Science Visiting Committee, 1993, Abilene, Texas
Association for Computing Machinery, Outstanding Regional Intercollegiate Programming Contest Director Award, 1993, Indianapolis, Indiana
World Congress on Neural Networks, Invited speaker, 1993, Portland, Oregon
World Congress on Neural Networks, Neural Systems Session Co-chair, 1993, Portland, Oregon
Graduate Student Council, 1997 Outstanding Graduate Faculty Award citation "For your time and dedication to graduate students at Texas A&M"
Named by the TAMU System to The Academy for Educator Development, a major component of The Texas A&M University System's Regents Initiative for Excellence in Education, 2003 (one of only two faculty members selected from the entire College of Engineering)
Winner, \$500 cash prize, Texas A&M University Academic Integrity Week Essay Competition (Faculty Category), 2004

DIVERSITY ACTIVITIES

- 1 Honors thesis adviser, 3 minority and/or female students
- 2 Adviser, Research Careers for Minority Participation
- 3 As Director of the Knowledge Systems Research Center, hired 6 staff members, of whom 3 were Hispanic and/or female
- 4 Arranged TAME Day display to recruit Hispanic students, 1991
- 5 Facilitated discussion sections for the Summer Honors Invitational Program, approximately 1500 students over 6 years, of whom two-thirds were minority and/or female
- 6 Developed a fictional ethics case study for the Summer Honors Invitational Program involving a pharmaceutical company's "exploitation" of indigenous tribes, used 4 years
- 7 Co-taught the engineering ethics portion of National Science Foundation Research Experience for Undergraduates programs at Texas A&M University and The University of Texas at Austin, about two-thirds of the participants were minority and/or female, 3 years
- 8 Informed other faculty of the need to schedule around Jumah
- 9 Nominated a female computer scientist as a Distinguished Lecturer

REFERENCES

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Texas A&M University
4242 TAMU
College Station, TX 77843-4242
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Texas A&M University
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O Robert Mitchell
Dean, College of Engineering
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(Previously Head, Department of Electrical Engineering, University of Texas-Arlington)

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Professor, Department of Quantitative Methods and Computer Science
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(Previously Vice Provost for Information Systems and Computing, University of Pennsylvania and Founding Director, Minnesota Supercomputing Institute)

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(References continued on next page)

Lawrence 'Pete' Petersen petep@cs.tamu.edu
Senior Lecturer and Undergraduate Advisor, Department of Computer Science
Texas A&M University
3112 TAMU
College Station, TX 77843-3112
(979) 845-8871

Bjarne Stroustrup bs@cs.tamu.edu
Professor and Holder of the College of Engineering Chair in Computer Science
Texas A&M University
3112 TAMU
College Station TX 77843-3112
(979) 845-4094
(Inventor of C++)

APPENDIX

Some student comments (1995)

Object-oriented Programming, Systems, and Languages

“This is one of the most exciting courses we have ever taken. Your excellent lecture materials and your very organized lecturing style have helped us greatly in mastering the OOP techniques. I am happy that I took this course which was very useful. I learnt a lot and certainly now appreciate the power of Object Oriented Language. I have a suggestion: write your own [book]. Thanks for offering this course.”

“Thank you so much for all the very useful information sent by e-mail. Also I enjoyed your class on OOP.”

“I’m in your 489 OOP class (enjoying it too). Thanks for the help, and thanks for taking the time to pass along job info to us.”

Ethics and Engineering (Honors)

“I also wanted to tell you that I really enjoyed the class. I learned a lot about how to handle certain real-life situations. I have recommended the class to other engineering majors because this was my favorite class.”

Data Structures (Honors)

“I just wanted to tell you that I really enjoy class. Yours is the only 8 00 I have this semester, and you really make it enjoyable.”

I want you to know you are a great instructor. Thanks.”

“The class was great, and I hope to take a few more classes from you in the future. Thanks for a great semester.”

Artificial Intelligence (Honors)

“Doesn’t make AI a dry topic.”

‘Great course!’”

I most liked his knowledge. He knows everything.”

Knows tons of info on this subject and related subjects.”

Well versed in subject. Cares about students.”

“Very friendly, very knowledgeable.

He seems interested and enjoys the subject matter.”

He knows so much about everything.”

Friendly, good at communicating ideas.”

Analysis of Algorithms

“He made a very uninteresting class at least somewhat interesting Gives very fair tests ’

‘ He addressed practical, implementation issues even in a theory-heavy class ’

“He introduces current topics related to the course into his lectures This makes the class more interesting and gives the students some useful knowledge ”

‘ He’s clear in lectures and very fair in testing ”

“I particularly liked the way Dr Daugherity stressed *practical* aspects of programming instead of a lot of useless mathematical rhetoric ”

“Easy-going attitude, related examples, and past experience give a ‘bright’ effect to the class Jokes were a plus ”

Computer Architecture

‘Enthusiastic ”

“I most liked his ability and willingness to answer questions ”

“Good effort and interesting lectures ”

“He knows the information very well, and conveys it in a good manner ”

“Interesting, enjoys sharing with students, enjoys talking to students--rare in [the Department of Computer Science] ”

“Good job! Always loved Dr D’s classes!”

Former students

“I remember your class vividly -- as you were truly an inspiration to myself (and judging from my peers’ reactions, a great inspiration to many) This was at a time when I was considering dropping school completely and joining the ranks of the working population ”

I really enjoyed your class you are a great instructor, it s a shame you won t be teaching 210 [non-Honors] any more (this view would be reflected by a number of my peers) ’

Some student comments (1996)

Object-oriented Programming, Systems, and Languages

‘Good teaching style (rather excellent) and friendly atmosphere ’

‘ I like the class participation and the way of teaching ”

I like the professor’s systematic teaching ”

“I like the capability and knowledge of the professor ’

The lecture format is clear and does a good job of condensing the material--very informative Also, OOP is a very interesting topic and the lectures capture that ”

This class provides a great learning environment ”

“I like the breadth of the class ”

“Professor covers leading-edge technology and theoretical view of OOP ”

‘ I like the discussion in class about the big picture ’

“I like the easy and informative way of teaching ”

The lecturer explains the concepts very clearly There is a lot of interaction and discussion in class, which is very helpful ”

It is a very informative class and presents OOP techniques which are in demand on the current job market ’

“Organization is very good Teaching is excellent ’

‘I like the way Dr Daugherty teaches, by explaining the practical cases, in order to clarify many points He makes the class very interesting, making it one of the few courses at Texas A&M that is worth the money ”

Interesting topic, proficient instructor ”

Data Structures (Honors)

“I really think you are a good teacher You seem like you have been around and dealing with computers your whole life and you are very knowledgeable about them ’

The lectures have been good ’

“Interesting lectures keep me awake in the morning ”

‘ Your lectures are fresh and interesting, I particularly enjoy the extensive mathematical background you bring to this class ”

I find the lectures enjoyable and interesting as well as challenging mentally ’

‘ Lectures are interesting and informative Dr Daugherty is very approachable and helpful inside and outside the classroom ”

Artificial Intelligence (Honors)

“I like the programming assignments

‘I like the small, open atmosphere provided by the fact that this is an honors class ”

Discussion is very interesting and insightful ’

‘I like the interesting stories that relate to the subject matter ’

‘The professor is a captivating lecturer with unique anecdotes ”

“The programming assignments are fun ”

“I like your lecture style It keeps the student interested the entire class ”

Former students

“Thanks for the class I enjoyed it ’

‘I have taken one of your classes before, and found your teaching style one of the easier ones in the department for me to learn from, so I have been looking for the chance to take another course from you ’

Great computer ethics lecture, by the way ”

Some student comments (1997)

Object-oriented Programming, Systems, and Languages

“Great professor ’

I like the instructor’s concern for student questions, mastery of the subject matter, detailed explanations, and concern for an overall view of OOP, not just one language ”

‘I like the knowledgeability, politeness, and understanding of the professor ”

‘The instructor is very friendly--good feedback ’
 Good lecture material and presentation ’
 Lectures are well prepared and delivered in an entertaining yet informative manner ”
 “Interesting topics, taught so that students can understand with ease ”
 “Teaching is excellent Encourages student participation ”
 “The teaching and the way each concept is explained is excellent The instructor thoroughly knows what he is teaching ”
 “I like the instructor’s interaction with students ”
 “I believe this will prove to be one of the most important classes that I take at A&M ”
 ‘I like the relaxed, open lecture style ”
 “Good explanation ”
 “Good lecture ”
 The instructor is very much willing to help students understand Very fair, willing to help His way of teaching is excellent The class is never boring ’
 “He’s terrific, knowledgeable, and great!”
 “Instructor simplifies concepts to make it understandable ”
 Interesting course Instructor is good at teaching ”
 “Knowledgeable ”
 I enjoyed the class Very good teacher I learned a lot ”
 “I liked the instructor’s availability and willingness to help ”
 ‘ The professor was awesome!’
 “Instructor is good in communicating with the students and clear in putting through the concepts ”
 “I like his patience ”
 “Very diverse knowledge Instructor is too smart!”
 Terrific fellow Great lecturer Superlative!”
 I liked the instructor’s willingness to answer questions ”
 ‘It is a very good course and a good instructor His class is interactive and lively ”
 “I like the structured approach followed by the instructor ’
 Very practical and simple approach to grasping OOP basics ”

Data Structures (Honors)

‘ The lectures are well put together The atmosphere of the class makes asking questions easy ”
 “It’s extremely interesting ”
 ‘ Friendly atmosphere You are always helpful when we have questions ”
 “I like the discussion and the inclusion of relevant current topics ”
 “Very interesting ”

Artificial Intelligence (Honors)

‘ He shared lots of interesting facts The lectures were very informative Dr Daugherty is very intelligent ”

“I like the real-life examples/situations that are occurring in recent AI research and the instructor’s knowledge of information from everyday work and examples ”

Ethics and Engineering (Honors)

Great computer ethics lecture, by the way ”

Former students

In three years as a graduate student at A&M, your OOP course was the very best course I had ”

“I have taken one of your classes before, and found your teaching style one of the easier ones in the department to understand, so I have been looking for the chance to take another course from you ’

‘ Thank you for being a great and kind professor ”

Your ENGR 482 ‘Ethics and Engineering’ class was the single best class I took--it prepared me for my coop experience ”

I really enjoyed your class and the OOP concepts helped me in my interviews ”

Science, Technology & YOUth Symposium participants (1997)

3.67 on a 4.00 scale

Graduate Student Council, 1997 Outstanding Graduate Faculty Award citation

‘ For your time and dedication to graduate students at Texas A&M ’

Some student comments (1998)

Object-oriented Programming, Systems, and Languages

‘ I enjoyed your class. You are a very good teacher and I learned a lot. Although I am not a CS major I did not feel lost in the class (which means I was not asleep because you held my attention) ”

Artificial Intelligence (Honors)

I’m learning a lot about AI ”

Relaxed environment, fun professor ”

Computer Science Concepts and Programming

The professor does a really good job of explaining the things he goes over ”

It is not boring and the prof is accessible and answers questions ”

‘ I think the class atmosphere is very open and friendly ’

I like the lecture. It is always interesting and informative ’

Some student comments (1999)

C and Java

“That’s a very good course and I learned a lot from it ”

‘ Thank you very much for your excellent teaching. In fact, your teaching was very [impressive] to me in many aspects ’

“Very good, informative, interesting ’
I like his teaching method ”
‘ He has a good understanding of programming ”
“A very pleasant teacher ’
He talks about unusual things of C, history and tricks ”

Artificial Intelligence (Honors)

“Good speaker ”
“Discussed interesting topics ”
‘ Instructor is very experienced in the field Knows a lot about the subject ”
I liked his enthusiasm for the subject matter ”

Data Structures and Implementations

“Willing to answer questions ’
Professor has wide knowledge base ”
‘ He talks about interesting and new things ”
‘He explains material well ”
Entertaining ”
Friendly ”
‘Has complete knowledge of every aspect of Java, C, and computer science in general ”

Some student comments (2000)

C and Java

Your lectures are very clear, much better than the book Thank you ”
I have enjoyed taking this course and the project ”

Data Structures and Implementations

You are the best computer science professor I have ever had I plan to take your section of CPSC 320 a year from now ”
I wish I had been on ‘Who Wants to be a Millionaire?’ the other day because I knew the answer to ‘What was the first computer bug?’ thanks to your frequent bits of history and knowledge ”
“I appreciate your professionalism in [handling a possibly copied homework], and the amount of aid you provided to me over the semester ”
I learned more in the first week of your class than I did all last semester in [CPSC] 111!”

Former student

“I was your student in CPSC 489, graduated with my Masters in Dec 1998 and joined Microsoft PS I benefited very much from your OOP class - thanks - and I do think they should bring it back as a regular class ”

Some student comments (2001)

C and Java

Credit goes back to you, because you taught well I had 'zero' knowledge on C and Java before getting in the class It was a nice experience to take this class despite several warnings from friends "

I like the class very much and it establishes a good foundation for my future career I really appreciate it "

I consider your lecture the best I have ever had "

Artificial Intelligence

Thanks for making the class so interesting, you teach my only class that I hate to miss a day in "

"I just want to say thanks for a great semester Your class was my favorite this semester I especially liked all the interesting facts that I would pick up, it made for very interesting lectures

Some student comments (2002)

Computer Science Concepts

"I would like to thank you for your sincere effort in helping me learning this course Your help during the class and your immediate response via email is highly appreciated Especially the off and on jokes you used to crack during the class gave vent to our imaginations towards the humor part of the Computer Science field Once again thanks for all your support during the semester "

' enjoyed it "

C and Java

"I really enjoyed it your coverage of object-oriented programming was excellent "

Thanks a lot for all help you provided me all this while I really appreciate your efforts to help me out for this CPSC 601 I have learned a lot from you all this time Thanks again '

Quantum Computing

"I enjoyed your class "

Artificial Intelligence

' I have really enjoyed your lectures so far I look forward to your class "

Former student

‘ I remember taking your intro CPSC class my first semester at A&M and really enjoying it In the fall I am going to grad school at CMU, studying robotics ’

Some student comments (2003)

C and Java

thank you so much for leading me into the programming world ”

Data Structures

“ really enjoyed it ”

Distance Learning

The lecture recordings are very clear, I’ve enjoyed them Looking forward to the rest of the semester ”

I appreciate all your help and patience this semester ”

Quantum Computing

I also wanted to say that I really enjoyed your class Although it was pretty tough for me, I learned so much and found it extremely interesting I appreciate all your hard work for the class

Artificial Intelligence

“ Thanks for you help and realize this was only a concern I really enjoyed the class and learned much Thanks for a great semester ”

Engineering Ethics

‘ Your guest lecture on computer ethics was the best lecture in this class the entire semester!’

‘ I was really impressed by your presentation regarding network safety Along with many other students, I agreed upon the fact that yours was the only lecture throughout the entire semester which made any sense I hope I get to attend some of you classes in [near] future Thank you ’

(Course coordinator) I m excited to learn that Dr Daugherity will be the instructor for the course this spring He has come highly recommended ”

Former students

“ I had you for both 211 and 320 (now 420 so I hear) and enjoyed them both ”

I wish I could come hear you lecture again--I always enjoyed your lectures, which is the only class I can say that about ”

Will you be teaching any CPSC electives/489’s next semester? (Please say Yes!)”

Some student comments (2004)

Computer Science Concepts and Programming

“[My program] works great now Thanks for your continual support ”

Thanks for teaching!’

‘ The aside stories are sometimes nice Also, the instructor is very enthusiastic, and tends to keep my attention ”

Computer Science Concepts and Programming (Honors)

‘ I am really enjoying the lectures

I like the thoroughness with which we are taught the Java language ”

‘Interesting material, in-depth background info, willing to answer even the just curious questions

C and Java

I want to say Thank you for your instructions for the whole term Your teaching is easy to understand and make[s] me understand the basic language You cultivated my strong interest in programming, although in my undergraduate study, [I] have taken C/C++, But that time I don’t have deep understanding of it ”

“Course is extremely well organized and interesting Instructor is very friendly, knowledgeable and interactive with students My best teacher in A&M so far! Fabulous teacher!’

“Instructor is easy to understand, willing to answer questions thoroughly (even stupid questions) Was patient with students who had a hard time understanding the material ”

Quantum Computing

[Instructor is] enthusiastic about subject, knows a lot about material, [is] very helpful outside of class ”

Artificial Intelligence

Thank you so much for your time I really appreciate your help even when it was not your office hours I am so glad to be in your class ”

I really appreciate you[r] going out of your way to accommodate me Everything that you’ve done is really appreciated by me and has helped me a ton Thanks ”

Thanks for everything this semester! I really enjoyed the class ”

Ethics and Engineering

Your lectures are engaging (as opposed to the rather dry lectures from the other professors) and very informative ”

“He brings the lectures to life and is genuinely excited about knowledge. He is very knowledgeable and often shows how what [we] are learning in class relates to several day-to-day events/situations ’

“Great lecturer, good speaker

“He s willing to spend time to help you ”

Former students

“I remember when taking your class, 211, that we were all convinced that you are one of the smartest professors we’ve ever seen. You seem to know a lit[tle] bit about everything out there

Great to know that you are teaching 211. I would have loved to [have] taken this course with you, but I already took 211 H last semester ”

I really enjoyed your 111 Honors class in fall 03 and the learning experience was wonderful. I m from India, and I had no trouble understanding you and I really appreciate the kind of learning atmosphere I got. I would have really loved to know this news before I took my course. Well thanks !!”

FRANK R. PAINTER

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EDUCATION

MS Mechanical Engineering/Biomedical Engineering, SUNY at Buffalo, 1975
Non degree coursework, Massachusetts Institute of Technology, Summer 1974
BS Mechanical Engineering, Clarkson College of Technology, Potsdam, NY, 1971

CERTIFICATION

Certified in Clinical Engineering (June 1977) - certification recognized and listed by the Healthcare Technology Certification Commission (June 2004)
Certified Engineer in Training for the professional license by the State of New York (January 1972)

ACADEMIC APPOINTMENTS

UNIVERSITY OF CONNECTICUT, Storrs, CT 7/00 to Present

Clinical Engineering Internship Program Director & Adjunct Assistant Professor
Biomedical Engineering Graduate Program, Department of Electrical & Computer Engineering
Instructor for graduate courses: Clinical Engineering Fundamentals, Human Error and Medical Device Accidents, Engineering Problems in Hospitals, and Medical Instrumentation in Hospitals. Course work covers hospital safety, incident and accident investigation and medical device failure analysis. Direct graduate student internships in several central Connecticut area hospitals. Advisor to 10-14 engineering graduate students.

UNIVERSITY OF CONNECTICUT, Storrs, CT 1996 to 2000

Adjunct Assistant Professor,
Biomedical Engineering Graduate Program, Department of Electrical & Computer Engineering
Guest lecturer in the course Clinical Engineering Fundamentals. Supervise graduate students in a two year clinical engineering internship at Bridgeport Hospital.

TRINITY COLLEGE - RINECLAIR POLYCLINIC INSTITUTE-HARTFORD GRADUATE CENTER, Hartford, CT 1990 to 1996

Clinical Instructor / Lecturer, Department of Biomedical Engineering, Masters Degree program in Clinical Engineering
Guest lecturer in the course Clinical Engineering Fundamentals. Supervise graduate students in a two year clinical engineering internship at Bridgeport Hospital.

STATE UNIVERSITY OF NEW YORK AT BUFFALO, Buffalo, NY 1977 to 1980

Assistant Professor and Clinical Instructor, Department of Medical Technology
Clinical Instructor overseeing clinical internships of Medical Technology seniors. Lecturer - basic electronics and principles of laboratory instrumentation for undergraduate and graduate Medical Technology students.

PROFESSIONAL EXPERIENCE

TECHNOLOGY MANAGEMENT SOLUTIONS LLC Trumbull, CT 199 to Present

Clinical Engineering Consultant

Healthcare Technology Management consultant for healthcare provider organizations, insurance companies and the legal profession. Services include medical device related patient injury, accident investigation, technical litigation support, risk management consulting, technology acquisition and service management consulting.

NOVAMID Bridgeport, CT (A Bridgeport Hospital For Profit Affiliate) 1987 to 1999

Director / Executive Director Biomedical Technology Services

Managed clinical engineering consultation activities including incident investigation, risk reduction and accident prevention programs, clinical staff training, medical device and equipment acquisition, medical device reliability and safety evaluations, medical device codes and standards compliance, medical gas system evaluations and environmental contaminant testing.

Led the technical team to evaluate over 30 medical accidents and injuries at multiple facilities.

Developed a program to manage service on high end medical equipment that improved service quality and performance, providing a technical resource to over 100 healthcare organizations.

BRIDGEPORT HOSPITAL Bridgeport, CT 1982 to 1992

Director of Biomedical Engineering

Directed a department providing technical support to Bridgeport Hospital. Managed technical services provided on all medical equipment. Provided medical equipment pre-purchase selection consulting, incident investigation, and inservice training for clinical and professional staff. Active member of hospital's Laser Safety and Quality Assurance Committees. Laser Safety Officer, Critical Care Monitoring Committee and Product Standardization Committee Chairman.

IMMERGENCY CARE RESEARCH INSTITUTE Plymouth Meeting, PA 1980 to 1982

Regional Manager of Western Pennsylvania

Managed all clinical engineering service activities in 30 hospitals (6500 beds). Supervised inspection and repair services. Provided technology consulting, medical equipment use and electrical safety training for clients.

MILLARD ELLIMORE HOSPITAL Buffalo, NY 1975 to 1980

Director of Biomedical Engineering

Managed a department responsible for the medical equipment support for a 520 bed teaching hospital, a 200 bed suburban satellite hospital and four shared service client hospitals (670 beds).

PROFESSIONAL AFFILIATIONS

American College of Clinical Engineering (since 1991) Founding Fellow, President (96-98)

American Society of Healthcare Engineering (since 1978)

American Society of Mechanical Engineering (since 1972) Senior Member

Association for the Advancement of Medical Instrumentation (since 1978)

American Society for Healthcare Risk Management (since 2001)

American Society for Materials (since 2000)

International Certification Commission for Clinical Engineering and Biomedical Equipment Technology Board of Directors (since 1996) Vice-Chair (since 2003)

International Federation of Medical and Biological Engineering, Clinical Engineering Division Board of Directors, Member (since 2001)

Healthcare Technology Certification Commission Chairman (2002-present)
 New England Society of Clinical Engineering (since 1982) Secretary (84-85) Treasurer (98-00-01-03)
 American Association of University Professors (since 1999)

PROFESSIONAL ACTIVITIES

Member of the Healthcare Technology and Training Task Group of the International Union for Physical and Engineering Sciences in Medicine (since 2006)

AAMI Human Factors Engineering Standards Committee Member (since 2003) developing updated standard AAMI HF 48 Human Factors engineering guidelines and preferred practices for the design of medical devices authored standards chapter on medical connectors

ACCE Healthcare Technology Foundation Board of Directors (since 2001) Professional Credentials Committee Chairman (since 2002)

Institute of Electrical and Electronics Engineers Engineering in Medicine and Biology Society 42nd Annual Meeting Technical Program Committee and Track Chair Telemedicine Clinical Engineering and Healthcare Systems Track 2002-2003-2006

World Congress on Medical Physics and Biomedical Engineering Clinical Engineering Track Chairman Chicago IL July 2000

Pan American Health Organization Project Advisor Clinical Engineering Development in Latin America (since 1994)

Journal of Clinical Engineering Editorial Review Board (since 1991)

ECRI Health Devices Magazine Technical Reviewer (1998-2001)

AAMI Healthcare Technology Management Committee (1984-present)

Lecturer and instructor in Clinical Engineering Management and Healthcare Management at multiple national association conferences in the United States Also taught clinical engineering workshops in Santiago Chile Mexico City Mexico Moscow Russia Capetown South Africa Beijing China Lima Peru Dubai UAE Guatemala City Guatemala Sao Paulo Brazil and Riyadh Saudi Arabia

Advisor and technology management instructor for Carelift International Bala Cynwyd PA an international medical relief organization providing medical equipment to hospitals in third world countries

Attained Clinical Engineering Certification (1979) elected to the Clinical Engineering Certification Board of Examiners (1985) chaired the Board of Examiners (89-91) Member of International Certification Commission for Clinical Engineering Certification (since 1995) Vice Chair of International Certification Commission (since 1999)

PUBLICATIONS AND PRESENTATIONS

Results of the IIMBI Worldwide Survey on Clinical Engineering Painter F, Cahil S, Nascimento J Medicon 2007 11th Mediterranean Conference on Medical and Biological Engineering and Computing Ljubljana Slovenia June 26-2007

How to Avoid Anesthesia Machine Incidents and Failures A Human Factors Perspective Painter F Presenter AAMI Annual Meeting Boston MA June 16-2007

Connectors and Connections Chapter in AAMI Standard H175 Human Factors Engineering Design of Medical Devices draft standard submitted for committee comment on April 17, 2007

Managing External Services Financial Management of Healthcare Technology Case Study of Regional Blood Banks Technology Management Issues presentations WHO/PAHO/ACCI Advanced Healthcare Technology Management/Clinical Engineering Workshop Florianopolis Brazil November 27-December 1, 2006

Identification of Human Errors During Device Related Accident Investigations, Pamter F., Shepherd M., Dwyer T., Barettich M. (2004) Engineering in Medicine and Biology IEEE Engineering in Medicine and Biology Magazine 23(3): 66-72

Healthcare Technology Codes and Standards presentation New England Society of Clinical Engineering Northeastern Healthcare Technology Management Symposium Southbridge MA October 12, 2005

An Integrated Healthcare Safety Program Human Factors Use Errors and Incident Investigations Clinical Engineering Education presentations WHO/PAHO/ACCI Advanced Healthcare Technology Management/Clinical Engineering Workshop Cartagena Columbia July 11-15, 2005

Human Error and Medical Device Accidents The role of Human Factors Engineering in Patient Safety session chair and presenter AAMI Annual Meeting Tampa FL May 14, 2005

Defibrillator Safety A Summary of the FDA MAUDE Database Session co chair and presenter AAMI Annual Meeting Tampa FL May 16, 2005

Human Factors Engineering and Medical Device Accidents Clinical Engineering Certification BIOMEDFA III HMPF University of Stuttgart Stuttgart Germany September 25-29, 2005

Healthcare Technology Management Postgraduate Clinical Engineering Education PAHO-ACCI Advanced Clinical Engineering Workshop Santiago Chile August 25, 2005

Codes and Standards Safety in the Healthcare Facility F.R. Pamter short course presented at the Northeastern Biomedical Symposium Sturbridge Massachusetts November 2001

User Error What's the Problem? Presentation to the New England Society of Clinical Engineering membership meeting October 15, 2001

Human Error and Medical Device Accidents A graduate level semester course presented to students in the Biomedical Engineering Division Department of Computer and Electrical Engineering University of Connecticut September-December 2001 September-December 2003

Healthcare Technology Management Elements of an Equipment Control Program Risk Based Approach to Equipment Management Medical Gas and Vacuum Systems F.R. Pamter workshop coordinator technical presenter and lecturer Pan American Health Organization Advanced Clinical Engineering and Healthcare Technology Management Workshop Curitiba Brazil March 2001

Acquisition of Medical Equipment a two workshop on assessment, acquisition installation and management of medical equipment workshop leader World Congress on Medical Physics and Biomedical Engineering Chile 10-11 July 2000

Quality Management in Healthcare F.R. Pamter & J.M. Ludd presentation HealthTech 2000 Annual Conference for the Management Service Support and Integration of Healthcare Technology Dallas Texas May 2000

Reducing Medical Equipment Risk Healthcare Technology Management Managing Outside Service Providers Medical Error and Medical Equipment Medical Gas Distribution Systems F.R. Pamter workshop coordinator technical presenter and lecturer Pan American Health Organization

- Advanced Healthcare Technology Management Workshop, Santo Domingo, Dominican Republic, March 2000
- Preventing Device Related Incidents and Conducting Device Related Investigations, F. R. Painter, Site Medical Device Seminar, Connecticut Hospital Association, Wallingford, CT, January 1992
- Design of Clinical Engineering Quality Assurance and Risk Management Programs, F. Hertz, O. Keil, F. R. Painter, et al. Published by Association for the Advancement of Medical Instrumentation, 1990
- Technology Trends: Managing a Y2K assessment Program, Utility Systems Maintenance, F. R. Painter, technical presentation, 9th Advanced Clinical Engineering Workshop, Capetown, South Africa, November 1999
- Quality Improvement Programs: ICAHO Approach, F. R. Painter, technical presentation, 5th Advanced Clinical Engineering Workshop, Moscow, Russia, September 1999
- Laboratory Equipment Maintenance, Two day Course, 34th AAMI annual meeting, Boston, MA, June 1999
- ICAHO Environment of Care Compliance in Technology Management, F. R. Painter, presentation, 16th Northeastern Biomedical Symposium, Waltham, MA, October 1996
- Medical Technology Maintenance and Service Management, F. R. Painter, H. David B. Wang, 3rd Advanced Clinical Engineering Workshop, One week Workshop, Beijing, China, November 1995
- The Role of Clinical Engineering in Healthcare, F. R. Painter, 2nd Annual Brazilian Symposium in Clinical Engineering, Sao Paulo, Brazil, August 1995
- Introduction to Clinical Laboratory Instrumentation, R. L. Morris, F. R. Painter, Two day Course, 30th Annual AAMI Meeting, Anaheim, CA, May 1995
- Clinical Engineering and Technology Management, F. R. Painter, A. Hernandez, A. Videsquez, Annual Meeting, Ministers of Health and Chief Engineers of the Health Ministries of the Seven Central American Countries on Strengthening Engineering and Maintenance in Healthcare, Guatemala City, Guatemala, May 1995
- ICAHO Environment of Care Standards for Medical Equipment, F. R. Painter, 14th Annual Northeast Symposium on Health Care Technology, Albany, NY, November 1994
- Technology Management: Assessment, Planning, Procurement and Replacement, F. R. Painter, Tutorial, World Congress on Medical Physics and Biomedical Engineering, Rio de Janeiro, Brazil, August 1994
- 'Maintenance Management: A Practical Risk Based Approach', F. R. Painter, 2nd Advanced Clinical Engineering Workshop, Sponsored by the World Health Organization, Pan American Health Organization and the American College of Clinical Engineering, Boston, MA, May 1993
- Equipment Replacement Planning, F. R. Painter, First Middle East Symposium in Management of Hospital Technology, Riyadh, Saudi Arabia, March 1992
- Technology Quality Assurance: The ICAHO Approach, O. Keil, F. R. Painter, R. Steifel, First Middle East Symposium in Management of Hospital Technology, Riyadh, Saudi Arabia, March 1992
- Risk Management: Quality Assurance and Personnel Management in Clinical Engineering: A U.S. Model, F. R. Painter, Advanced Clinical Engineering Workshop, Sponsored by Pan American Health Organization, World Health Organization and American College of Clinical Engineering, Washington, D.C., May 1991

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Fee Schedule

Review of documents discovery discussion conference and report preparation in
Trumbull office

Hourly rate \$250

Investigation deposition and trial away from the office

Hourly rate \$325 plus expenses

Retainer Fee \$2500

To be paid in advance applied against work performed

Billing

All subsequent fees are payable within 30 days of billing. After 30 days late fees
apply

Tax ID number 06-154-0066

Curriculum Vitae

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Indiana University Medical School 1975 MD

Residency Pediatric Residency Methodist Hosp Indpls, In 1975-1977
Neonatology Fellowship Methodist Hosp 1977-1979

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Delaware County Health Officer Nov 1988--present

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Neonatal-Perinatal Medicine Dec 1983

License Indiana #01026405

Memberships American Academy of Pediatrics
Delaware-Blackford Co Medical Society
Indiana State Medical Association

STATE OF SOUTH CAROLINA) IN THE COURT OF COMMON PLEAS
COUNTY OF RICHLAND) CIVIL ACTION NO 06-CP-40-7398
)
KAREEM J GRAVES and TARA)
GRAVES, individually and)
as duly appointed)
personal representatives)
of the ESTATE OF INDIA)
IYANNA GRAVES,)
Plaintiffs,)
)
VS)
)
CAS MEDICAL SYSTEMS, INC ,)
AMERICAN HEALTHCARE)
RESOURCES, INC , d/b/a)
ASHBY MEDICAL and STEVE)
M ELLIOTT or any)
business entity d/b/a,)
ASHBY MEDICAL, PALMETTO)
HEALTH RICHLAND MEMORIAL)
HOSPITAL and PALMETTO)
HEALTH ALLIANCE,)
Defendants)

ORAL DEPOSITION OF
WILLIAM MCCAIN LIVELY, III, Ph D
MAY 23, 2008

ORAL DEPOSITION of WILLIAM MCCAIN LIVELY, III, Ph D ,
produced as a witness at the instance of DEFENDANT, CAS
MEDICAL SYSTEMS, INC , and duly sworn, was taken in the
above-styled and numbered cause on Friday, MAY 23, 2008,
from 8 08 a m to 12 50 p m , before Suzanne G
Saulsberry, RPR, CSR in and for the State of Texas,
recorded by machine shorthand, at the offices of
Hastings Law Firm, P C , 616 FM 1960 West, Suite 725,
Houston, Texas, pursuant to the South Carolina Rules of
Civil Procedure and the provisions stated on the record
or attached hereto, the deposition shall be read and
signed before any notary public

1 and the fact that these alarm problems have been
2 occurring with the monitors for ten years or more, one
3 would have to conclude that it is the software The
4 fact that it is spaghetti code means the maintenance of
5 that code is very difficult In other words, following
6 the various paths through the code is very difficult and
7 therefore it's very difficult to fix the alarms

8 So -- well I've just started off and ran
9 like the dickens on that question So I think, yes the
10 software is the problem

11 Q All right Well, are you saying that the fact
12 that the code is, as you characterize it, spaghetti
13 code --

14 A Uh-huh

15 Q -- actually causing the alarm not to go off or
16 is that keeping you from finding the problem?

17 A The spaghetti code is preventing me from
18 finding the problem and fixing the code

19 Q Okay And so you think there is a problem
20 within the code itself?

21 A Within the software

22 Q Okay And what do you call that kind of
23 problem? I've heard the term "bug" used, but you may
24 have another term Are you familiar with the term
25 "bug"?

1 A If people can die through the use of the
2 monitor that this software drives, then it's dangerous ,

3 Q I'm not sure that answers my question I'm
4 going to let her read it back

5 (The requested portion was read)

6 A I'm applying the various discussions we've had
7 about the software system.

8 Q (BY MR DuBOSE) Okay Are you applying a
9 software engineering standard or a legal standard?

10 A I think the two here are the same

11 Q Well tell me what the software engineering
12 standard is?

13 A It's the things that we've talked about in
14 terms of specif- -- requirements, specification,
15 abstraction, understandability those kinds of things

16 Q Do you know what the legal standard for
17 unreasonably dangerous is in South Carolina?

18 A If people die from using the device, then it's
19 unreasonably dangerous

20 Q Is that the legal standard in South Carolina of
21 unreasonably dangerous Dr Lively?

22 A I would bet -- I would bet that's what a jury
23 would say

24 Q Well, the question was not what a jury will
25 say, Dr Lively The question is whether you know what

1 Q Are you aware of any other infant monitors on
2 the market that use a backup alarm that is intended to
3 sound if a primary alarm does not go off?

4 A Isn't that the same question you just asked me?

5 Q No sir, it's not But if I need to clarify
6 it -- I want to make sure you understand my question and
7 give me the answer --

8 A Like I said, I looked at some monitors, but I
9 don't know

10 Q Are you comfortable that you understood my
11 questions?

12 A That's okay Yeah

13 Q Does the fact that code branches define it as
14 spaghetti code?

15 A I'm sorry, I didn't hear what the first thing
16 was you said

17 Q Does the fact that computer code has branches
18 in it define it as spaghetti code?

19 A No

20 Q Well, what is then the test for spaghetti code?
21 I'm still not clear on that

22 A Good structured code starts at the top and
23 flows down to the bottom Flow by -- by that means the
24 control of various branches and so forth So structured
25 code might have branches in it and still it's not

1 AMI Plus monitor?

2 A They're not

3 Q They are not what?

4 A They are not included appropriately

5 Q Are they inappropriate go-to statements in the
6 AMI Plus software?

7 A That's what creates the spaghetti code,

8 Q Explain that to me if you would

9 A The go-to statements just allow -- cause me to
10 branch throughout the program

11 Q Are go-to statements permitted to be used with
12 assembly code?

13 A You have to

14 Q You have to use go-to statements in assembly
15 code?

16 A Uh-huh

17 Q "Yes"?

18 A Correct Yes

19 Q Thank you

20 Are go-to statements properly used with the
21 NEC processor used in the AMI Plus monitor involved
22 here?

23 A That's a function of the software that's
24 written and we've said that they are not appropriately
25 used

1 Q We're going to label the universal document, I
2 believe; Exhibit 10 and then the other box the brown
3 box will No 11

4 (Marked Lively Exhibit No 10 and 11)

5 Q (BY MR DuBOSE) Dr Lively, have we covered
6 all your opinions that you're presently intending to
7 express at the trial of the Graves case?

8 A Correct

9 Q Have we covered all of the bases for your
10 opinions?

11 A Correct

12 Q And your opinions -- never mind Strike that
13 MR DuBOSE I don't have anything further

14 E X A M I N A T I O N

15 BY MR WINSLOW

16 Q Doctor, two questions The only way to fix
17 would be to write this program in a structure fashion?

18 A Uh-huh

19 Q Is that a "yes" or "no" to that?

20 A Yes Yes

21 Q Is that what you were referring to earlier when
22 you said it would cost around 300- to 400,000?

23 A Correct Yes

24 MR WINSLOW All right

25 MR DuBOSE Nothing further Doctor I

STATE OF SOUTH CAROLINA IN THE COURT OF COMMON PLEAS
COUNTY OF RICHLAND

- - - - - x

KAREEM J GRAVES and TARA GRAVES,
' individually and as duly appointed
personal representatives of the
ESTATE OF INDIA IYANNA GRAVES,

Plaintiffs,

vs

CV # 06-CP-40-7398

CAS MEDICAL SYSTEMS, INC ,

Defendants

- - - - - x

Deposition of FRANK R PAINTER, taken
pursuant to the South Carolina Rules of Civil
Procedure, at the offices of Scribes, Inc ,
445 George Street, New Haven, Connecticut,
before Frances L Doran, License No 00192,
Notary Public in and for the State of
Connecticut, on Thursday, July 10, 2008, at
9 40 a m

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1review?

2 MR WINSLOW Object to the form He's
3 asked and answered that many times

4 A That's correct I didn't really look for
5problems when I was reviewing the code itself

6 Q So is it fair to say your opinion is that
7there were no problems with the code, is that correct?

8 A That's correct

9 Q But you also testified that you have not
10looked for problems in the code?

11 A That's correct

12 Q Thank you Tell me what problems you believe
13exist in the code and how they got there

14 A There are a certain set of sequences set up
15in the software in this monitor, and the monitor does
16not perform as it was originally specified to perform

17 Q Where are they located in the code? Let me
18rephrase that

19 Where are these sequences that you refer to
20that exist in the code that preclude the monitor from
21operating or being set up as intended to operate?

22 A Well, I think perhaps you misunderstood what
23I said The sequences are external events They're
24inputs to the code itself, and so when certain
25sequences happen when the code is receiving certain

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1inputs there's some unknown sequence which sets up a
2situation where the code malfunctions and it does not
3perform the way it should

4 To answer your question -- to answer your
5question specifically, those -- it's my opinion that
6the problem is in the alarm module somewhere, that is,
7the alarm module in the software

8 Q Mr Painter, have you examined the software
9in the alarm module of the Am1 or Am1 Plus monitor?

10 A No, sir

11 Q Mr Painter, have you tested the software in
12the alarm module in the Am1 or Am1 Plus software?

13 A No I think that it would almost be
14impossible to test it to create a test that would be a
15valid test having the information that I have

16 Q The answer to the question then, Mr Painter,
17is you have not -- is it correct rather that you have
18not tested the alarm module in the Am1 or Am1 Plus
19monitor?

20 A That's correct I know it would be nearly
21impossible for me to create a valid test to do so, so I
22did not do it

23 Q What are the sequences or inputs that you
24claim caused the Am1 or Am1 Plus monitor to
25malfunction?

1 A It could have been a variety of things, a
2 combination of many things, but it could be a loose
3 lead alarm It could be a low battery alarm It could
4 be a low heart rate alarm All of these would
5 contribute to what's in the sequence, and the length of
6 the events create a certain situation in the software
7 code that allows it to malfunction I do not know what
8 it is but I do know that at certain times these
9 external inputs appear in a certain sequence and cause
10 the problem

11 Q Do you consider an apnea alarm or a low
12 battery alarm an external input?

13 A Yes ,

14 Q Explain that to me I thought the alarm was
15 internal to the machine?

16 A Well, do you mean the vent rather than the
17 alarm? It's a whole series of things It has to do
18 with the physiological parameters of the baby It has
19 to do with the settings of the alarm itself It has to
20 do with the length of the alarm All of those things
21 are events of variable duration that provide input to
22 the software

23 Q Have you been able to identify any external
24 inputs that cause the Am1 or Am1 Plus monitor to
25 malfunction?

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1 internal people are convinced there is no problem

2 I mean, it's ridiculous statements like that
3 given by Harry Triebel that he's not aware of problems
4 and that there is no investigation going on, there's no
5 analysis of the software being there to confirm
6 problems, so it's not a responsible approach to this
7 whole issue

8 Q Do you know whether --

9 A Go ahead

10 Q No, I didn't mean to interrupt

11 A In the 50 MDR reports that are very, very
12 similar in nature to the ones we have, CAS had
13 discounted all 50 of them That is irresponsible

14 Another criticism I have of CAS is the way
15 CAS analyzes data inside their organization in their
16 service department is unreliable at best

17 Q Explain to me your thinking about that

18 A I'm about to The monitors come into the
19 service department, are documented and routed to a
20 service technician to analyze The director of
21 regulatory affairs relies on the service technicians to
22 provide trending information about the monitors and the
23 monitor problems, and there is no formal method to
24 document and analyze and quantify the problems that are
25 reported or the problems that are found

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1first one, and there are two separate ones I'm going
2to try to identify these This is a manufacturer's
3report that ends in 005, and it says, "Monitor did not
4alarm when it should have "

5 This is a manufacturer's report that ends in
6015 It says, "Monitor's audio alarm is not working
7all the time "

8 Within this binder at tab number 1,
9"allegation of no apnea alarm Infant turned blue and
10taken to the hospital

11 Tab 2 "Incorrect brady alarms LED without
12audible alarm or delayed audible alarm "

13 Q Not to interrupt, but if you're going to
14simply read the narrative portion of that report --

15 A I'm going to tell you there's a trend I'm
16going to tell that you all 50 of these reports all say
17the monitor had the LED light lit The users were
18expecting an audible alarm because there was an alarm
19condition, and no audible alarm sounded That to me is
20a trend

21 Q All right That answers my question

22 A Yes, it does Yet CAS doesn't identify it
23It's inappropriate that they didn't acknowledge the
24trend

25 MR DuBOSE Move to strike. There was

1 was functioning -- functioned for the Graves according
2 to -- in the way in which the software directed it to
3 function, that the software in this monitor and the
4 software in all of the other monitors given that set of
5 inputs functions the way it was designed to function -
6 The design criteria may not have the desired kind of an
7 outcome because of faulty software The result was
8 this kind of an outcome

9 Q I want to focus on the word intentionally I
10 think we've covered it, but I want to make it more
11 clear-

12 You're not saying that monitor intentionally
13 or the design intentionally created a monitor that
14 would not audibly alarm under the conditions India
15 Graves intended, are you?

16 A No, sir

17 Q Thank you- Is it your expert testimony that
18 the alarm on the Graves' monitor, India Graves'
19 monitor, did not go on the night she died?

20 A That's my opinion

21 Q And what in your opinion caused the alarm on
22 India Graves' monitor not to go off while she was
23 declining on the night of April 14th, 2004?

24 A Faulty software

25 Q More specifically, if you could please tell

1me what triggered the software not to work as intended
2on that night?

3 A A certain set of sequences that set the
4software up to fail, set the software up to create this
5condition

6 Q Okay And do you know what those sequences
7were with regard to India Graves on that night?

8 A Well, I know what the sequences were from
9that printout, but exactly what one of those and in
10what order caused this failure, I don't know

11 Q We know what in order they occurred by
12looking at this timed printout, correct?

13 A Right

14 Q Are there any other factors external to the
15patient and the monitor that you believe contributed to
16the alleged failure?

17 A I don't I guess I really don't know It's
18possible that power quality or humidity or temperature
19or, you know something else, the events of the day
20where they unplugged the monitor and the battery
21depleted to a low level and when the system was plugged
22back in the battery charging set up some sort of
23scenario

24 But as I said, one point on the graph in this
25sequence of events from the Graves won't give us the

1answer we need nor the data that to graph it, so I
2can't tell you if it was an external factor versus the
3monitor and patient combination

4 Q Well, the factors that you're talking about,
5were they factors over a long period of time or
6something that happened in a split second or so that
7caused the monitor to take a wrong turn? Tell me what
8you're referring to, and maybe I can look along with
9you

10 A Yeah,

11 Q Are you looking at the downloads?

12 A I'm looking at the downloads I'm looking at
13Exhibit 5 to the Elliott deposition I'm looking at
14the study that starts on -- well, end of April 12th
15I'm looking at the events on April 10th

16 Q April 10th and 11th?

17 A April 10th and 11th So we know it was Tara
18Graves' practice to unplug and turn the power down to
19the monitor before she plugged it in or power down the
20monitor

21 Q You don't mean plug the patient in, you mean
22the monitor?

23 A I'm talking plugging it in the wall

24 Q Okay

25 A So those things happened It powered down at

1 talk about it's disorganization

2 Q And so when you talk about the design of the
3 system being unreasonably dangerous and constitutes a
4 defect, that's based on their testimony with regard to
5 the opinion they have that it's disorganized?

6 A No It's based on the pattern of failure
7 from the MAUDE reports

8 Q You're not basing the opinion on what you've
9 been told by Lively and Daugherty in person or by
10 their depositions?

11 A You're talking about the last sentence?

12 Q Yes

13 A No, that's my independent opinion

14 Q Have you charted the complaints about the Am1
15 monitor year by year or in any other periodic fashion
16 to determine whether they're steady complaints or
17 whether they've tapered or increased for that matter?

18 A I thought I did Just a second, please I
19 have them in chronological order, I can give you a
20 verbal graph,

21 Q Okay,

22 A There were two in '98, seven in '99, 12 in
23 2000 I have eight in 2001, but my data only goes up
24 to August It appears from my analysis there is a full
25 year of data missing between August '01 and July of

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STATE OF SOUTH CAROLINA) IN THE COURT OF COMMON PLEAS
COUNTY OF RICHLAND) CIVIL ACTION NO 06-CP-40-7398
))
KAREEM J GRAVES and TARA)
GRAVES, individually and)
as duly appointed)
personal representatives)
of the ESTATE OF INDIA)
IYANNA GRAVES,)
Plaintiffs,)
))
VS)
))
CAS MEDICAL SYSTEMS, INC ,)
AMERICAN HEALTHCARE)
RESOURCES, INC , d/b/a)
ASHBY MEDICAL and STEVE)
M ELLIOTT or any)
business entity d/b/a,)
ASHBY MEDICAL, PALMETTO)
HEALTH RICHLAND MEMORIAL)
HOSPITAL and PALMETTO)
HEALTH ALLIANCE,)
Defendants)

ORAL DEPOSITION OF
WALTER C DAUGHERITY
MAY 22, 2008

ORAL DEPOSITION of WALTER C DAUGHERITY, produced as a witness at the instance of DEFENDANT, CAS MEDICAL SYSTEMS, INC , and duly sworn, was taken in the above-styled and numbered cause on Thursday, MAY 22, 2008, from 1 01 p m to 5 52 p m , before Suzanne G Saulsberry, RPR, CSR in and for the State of Texas, recorded by machine shorthand, at the offices of Hastings Law Firm, P C , 616 FM 1960 West, Suite 725, Houston, Texas, pursuant to the South Carolina Rules of Civil Procedure and the provisions stated on the record or attached hereto, the deposition shall be read and signed before any notary public

1 Q (BY MR DuBOSE) Do you understand, Doctor?

2 A Yes Could you ask again?

3 Q I can let her read it back

4 (The requested portion was read)

5 MR WINSLOW I'll object and ask you to
6 allow for an answer from the witness

7 MR DuBOSE I'm asking the question to get
8 an answer Mr Winslow

9 MR WINSLOW Then allow him to answer it

10 Q (BY MR DuBOSE) Doctor, could you go ahead and
11 answer the question please?

12 A Yes

13 Q Can you show me where the bugs exist in this
14 case, sir

15 MR WINSLOW I'm going to object to that
16 question What's bugs or defects?

17 Q (BY MR DuBOSE) Do you understand my question?

18 A If you're asking where are bugs or defects in
19 this code, the defect is in the overall design

20 Q All right sir

21 And explain that to me, if you will

22 A Okay In a piece of software of this
23 magnitude, which has over 800 modules some of them are
24 larger than ledalarm asm alarm_tick, some are smaller,
25 but there are over 800 modules In a piece of software

1 of this complexity it's important to use good design
2 principles in order to produce a program which meets the
3 specifications, is testable, and is maintainable

4 The approach which is evidenced by the code
5 under discussion is one where, instead of using best
6 industry practice of the time of structured or
7 object-oriented programming, results in the lines of
8 flow of control of execution being a rather tangled
9 mess, like a bowl of spaghetti, which is why it has the
10 name "spaghetti code "

11 Q You've given it that name, "spaghetti code,"
12 correct?

13 MR. WINSLOW Object to the form

14 A That's not my term, that's an industry term

15 Q (BY MR. DuBOSE) But you've applied to it this
16 software?

17 A Yes

18 Q You and Dr. Lively?

19 A Yes

20 Q Has anyone else applied that term to this
21 software, that you know of?

22 A I don't know

23 Q What is your source of what the industry
24 standards were for creation of medical device software
25 in the mid 1990s?

1 A No

2 Q Have you asked for them?

3 A Yes

4 Q Who did you ask for that?

5 A I asked Mr Hastings, and he asked CAS Medical
6 They said they didn't have them

7 Q Did you ask Dr Lively?

8 A I don't remember

9 Q But as you sit here today, can you point me to
10 any line of code or communication between portions of
11 the code that is defective?

12 A Well it depends on the environment so if --
13 let's say, for example, the environment in which this
14 module is functioning calls LED alarm_tick with
15 interrupts on, then that calls alarm_tick The first
16 test is to test for the very low battery condition If
17 that's false, that is, it's not in a very low battery
18 condition, then it goes to the next test to see if the
19 alarm1_failed_flag has been set But if interrupts are
20 on then it's possible that another external event could
21 interrupt the processing at this point so that it would
22 never complete the path and end up to the point -- let
23 me see -- to the point right here that would turn the
24 alarm on

25 So if the environment in which it's

1 operating had interrupts on and an external interrupt
2 occurred after it had entered this routine but before it
3 got to the alarm on point, then the alarm would fail to
4 sound

5 Q What type of external interrupt are you
6 referring to?

7 A Well, there are a number This is basically a
8 device that has an inverted flow of control, so the
9 computer itself does not -- sorry -- the program itself
10 does not determine the order in which the modules are
11 executed, that's determined by the external inputs, such
12 as the power on/off button, the reset button, a signal
13 from the leads, that would be current that was passed
14 through the subject's body, there's a clock tick, when
15 the clock ticks, there's an internal Watchdog timer and
16 there's an external Watchdog timer

17 So all of these things are outside the
18 program's control, and the program has no way of knowing
19 in what sequence or order any of those external events
20 will occur because they're asynchronous or the length
21 of time between them

22 Q All right So if one of those -- all these
23 things on this monitor work together all the time, do
24 they not?

25 A I'm sorry?

1 A What do you mean?

2 Q Have you talked to any of the complainants?

3 A No

4 Q Have you done any research on any of the
5 complaints other than looking at them?

6 A I have looked at the logs that were provided in
7 the depositions

8 Q Have you looked at complaints, other than what
9 we have here on the table today, attached to the
10 depositions?

11 A Yes

12 Q Did you bring them with you today?

13 A No Dr Lively has that

14 Q You no longer have that?

15 A Right

16 Q Well, the Graves' complaint aside, have you
17 researched any of the other complaints you're referring
18 to?

19 A The file that Dr Lively has -- there was just
20 one copy that we shared and he has it -- covered,
21 roughly, 50 alarm failures And I skimmed through that
22 file to see how they were identified and what action was
23 taken about it There was a small number of them, I'd
24 say maybe two or three, where they could not determine
25 the cause of the failure and replaced the entire

1 motherboard

2 But most of them were alarm faults that a
3 condition arose where the alarm should have sounded and
4 it did not And so I would say, roughly, 50 -- I
5 skimmed through, roughly 50 reports of alarms failing
6 to sound

7 Q All right And you take those reports as
8 being -- every one of them being a valid complaint?

9 A I believe they were from CAS and the FDA I
10 have no reason to question them

11 Q Do you know whether the FDA -- these were all
12 medical device reports to the FDA, is that correct?

13 A I think there was a combination of medical
14 device reports to the FDA and incident reports from the
15 service department at CAS Medical logs that were
16 provided by dealers, so it was a collection of
17 information that for simplicity, I would just call
18 alarm failure incident reports

19 Q And do you know whether any of those claimed
20 alarm failures were confirmed, other than ones involving
21 hardware?

22 A I don't recall

23 Q Are you relying on these reports as part of
24 your opinion?

25 A Yes

1 you if you could focus on my question and answer that,
2 I think we'll get through this a lot quicker

3 A Okay

4 Q All right Now, I've got to remember where we
5 are

6 Because you have not found any specific
7 computer bug in this code, would you agree with me that
8 you cannot say whether or not that bug actually exists?

9 A It's more likely that it's a software error
10 than it's some other cause

11 Q Would you agree with me however, that because
12 you have not found a bug, that you cannot say more
13 likely than not that a bug exists in this code?

14 A No I think it is more likely to be a software
15 failure than a hardware failure or an error in
16 reporting

17 Q And you base that on what?

18 A On my examination of the documents that I
19 described

20 Q And that is the -- which of them particularly,
21 are you referring to?

22 A This -- let's see -- Exhibit 3 --

23 Q Okay What else?

24 A -- for example

25 There was also an ECN -- actually two ECNs

1 this is very serious

2 Q On many -- let's put a number with it, rather
3 than a characterization.

4 A All right We have -- okay We have 11 front
5 alarm not heards in this log and four rear alarm not
6 heard

7 Q What do you -- what significance do you ascribe
8 to those events which are reported in the log?

9 A Well, this is very serious because it's
10 basically the device is reporting that it's defective
11 The design of the monitor -- well let me back up
12 The purpose of the device is to alert a
13 parent or caregiver when a potentially life-threatening
14 event occurs That's the purpose of the monitor, is to
15 provide alarms And so because that's the purpose of
16 the device and it's intended to alarm for potentially
17 life-threatening events, there's a backup system
18 designed in the device so that if a potentially
19 life-threatening event occurs such as apnea of longer
20 than the 20 or 25 second timeout period fast heart
21 rate, slow heart rate then the computer is supposed to
22 turn on the front alarm, which is a piercing beep

23 Because there's -- as I said of the
24 seriousness of the consequence of any failure, there is
25 a feedback sensor, an internal microphone in the device

1 is not the whole code, I calculated -- where is that
2 exhibit -- I calculated over 34 billion paths through
3 the code So there are clearly too many paths through
4 this code to test it properly or to maintain it
5 properly

6 Q And that's considering all 800 modules -- or
7 800 plus modules as you described it?

8 A No, that's just this one module

9 So you'd have to multiply 34 billion times
10 itself 800 times if the 35 branch paths is an average of
11 over all the modules, which I don't know that it is

12 Q All right Well let me draw you back, if I
13 can, to my question, and that is whether there is an
14 objective yardstick for measuring whether code is
15 spaghetti code or not?

16 A The two objective yardsticks are number of
17 paths through the code and with the best possible
18 rearrangement For example, I pointed out this poster
19 is a rough draft, but with the best possible
20 rearrangement, if I replaced all of these lines by a
21 single line if I moved this diamond from the right side
22 to the left side to minimize the number of lines of flow
23 of execution intersecting as possible, then count the
24 remaining lines So those would be two objective
25 measures of if you want to call it, the degree of

1 your opinion on

2 Is your opinion any different than

3 Dr Lively's?

4 A No

5 Q Are they congruent opinions?

6 A Yes

7 Q We may have to come back

8 What other opinions do you hold in this
9 case, Doctor?

10 A I think we've pretty well covered it

11 Q Okay Why don't we enumerate them one by one
12 to make sure we have a clear and complete list Can we
13 do that?

14 One, the code is poorly written and
15 spaghetti code? I don't mean to put words in your
16 mouth I'll let you go

17 A Well that's all right

18 Okay The code is poorly designed The
19 implementation is insuff- -- or is inadequate for proper
20 testability The code was not properly maintained and
21 consequently, I consider the software to be defective in
22 design and inappropriate to be relied on in a
23 life-critical system

24 Q Is that it?

25 A Yes

1 defect within the code?

2 A Well, the defect is in the overall design,

3 Q My question's a little different than that

4 You have not located a defect within the

5 code or a bug or whatever you want to call it

6 What term do you like to use?

7 A Well "bug" is fine

8 Q "Bug" is good?

9 A Yes

10 Q So we can agree on "bug"?

11 A Okay

12 Q Okay I'll go with "bug "

13 And how do you define "bug"?

14 A It's -- in this case, it's an error in the

15 code

16 Q That causes a malfunction of the machine?

17 A Right

18 Q And you have -- and we've talked about this --

19 haven't found a bug in the machine and the question is

20 whether you've talked to plaintiff's counsel about the

21 fact that you've not found a bug in the machine and what

22 that might mean?

23 A To some extent

24 Q Tell me about that, if you would

25 A It was with regard to the Smith case

1 when you execute that instruction

2 Q Is that an instruction that is appropriate to
3 be used -- that type of instruction, rather, is that
4 appropriate to be used with that NEC component?

5 A It can be It's available

6 Q Okay

7 A So it's an option

8 Q Do you have an opinion whether go-to statements
9 used in this particular code are proper or improper?

10 A I haven't looked at all of the code, but
11 there's a basic -- I'm not sure what you'd want to call
12 it -- principle that code is more easily tested and
13 maintained if it does not contain a lot of go-to or
14 unconditional branch instructions

15 So there was a famous article by Edsger
16 Dijkstra E-d-s-g-e-r, D-i-j-k-s-t-r-a, in the late
17 '60s that introduced the idea of structured programming
18 in an article that was entitled "Go-to Considered
19 Harmful " That wasn't the title he put on it, that's
20 the title the journal put on it And for about the next
21 six months, there was a raging battle between letters to
22 the editor about, "Oh, no You have to use a go-to to
23 do this "

24 And then Dijkstra would respond the next
25 month, "No you don't You can do it like this without

1 to that opinion?

2 A No, but I concur

3 Q And what standard do you use to get to that
4 view?

5 A That there are over 50 reports of device
6 failure --

7 Q Let me interrupt just to say -- and you may be
8 going there anyway My question is what standard do you
9 use not what facts do you rely on?

10 A In determining whether software is dangerous?

11 Q In determining whether the software in this
12 monitor is unreasonably dangerous?

13 A By comparing it to best industry practice for
14 the time it was developed That it was not developed
15 using best industry practice or state of the art at the
16 time

17 Let me give you --

18 Q Let me ask you a question, first. It may get
19 us to the same place If not, let me know

20 By best industry practice do you mean best
21 computer software writing industry practice?

22 A Yes

23 Q Or best medical device computer software
24 writing practice?

25 A Well, the latter is a subset of the former So

1 If you-all have any questions --

2 MR WINSLOW I'm going to take a break
3 real quick

4 MR DuBOSE That will be fine
5 (Break from 5 41 p m to 5 47 p m)

6 MR DuBOSE I don't think I have anything
7 further I appreciate your coming in today and
8 answering my questions Mr Winslow might have a
9 question or two

10 MR WINSLOW Just a couple

11 E X A M I N A T I O N

12 BY MR WINSLOW

13 Q The lawyer used the term "bug " and that the
14 bug caused the alarm not to sound What is the defect
15 in this programming?

16 A Well we discussed that in several of my
17 answers, that the defect is an overall defect of poor
18 quality design, poor testability, and poor maintenance
19 The term "bug" is usually used to refer to a specific
20 line or lines of code which are incorrect and have to be
21 replaced by the correct lines of codes

22 Q Did that defect, as you describe it, cause the
23 monitor alarm not to sound?

24 MR DuBOSE Object to the form

25 A Most likely As I said --

1 Q (BY MR WINSLOW) More likely than not?

2 A More likely than the other possible causes that
3 I considered

4 Q And is this programming that was used, this
5 spaghetti code was that what a reasonable and prudent
6 programmer would have used in this device of this kind?

7 MR DuBOSE Object to the form,

8 A No not at that time

9 As I said, structured programming began in
10 the late 1960s and was gradually adopted But certainly
11 before 1994 when the device was -- was initially
12 developed, structured programming or object-oriented
13 programming, which is an extension of the structured
14 programming, should have been used as good industry
15 practice by a computer professional a professional
16 computer programmer

17 MR WINSLOW I'm done Clarke?

18 FURTHER EXAMINATION

19 BY MR DuBOSE

20 Q I want to make sure I understand one thing you
21 told him directly in the context of what we've been
22 talking about this afternoon

23 Assuming the correctness of your testimony
24 that this code is too convoluted -- spaghetti code, to
25 use your term -- as I understand your testimony, that in

STATE OF SOUTH CAROLINA) COURT OF COMMON PLEAS
COUNTY OF ORANGEBURG) C/A NO 06-CP-38-421

Kareem J Graves and Tara
Graves, individually and as
duly appointed personal
representatives of the estate
of India Iyanna Graves,
Plaintiffs,

v

CAS Medical Systems, Inc ,
American Healthcare Resources,
Inc d/b/a Ashby Medical and
Steve M Elliott or any
business entity d/b/a Ashby
Medical, Palmetto Health
Richland Memorial, and
Palmetto Health Alliance,
Defendants

DEPOSITION OF
TARA P GRAVES

Tuesday, February 20, 2007
9 09 a m - 12 50 p m

The deposition of TARA P GRAVES, taken on behalf of the Defendant, Palmetto Health Richland Memorial, at the offices of Sowell Gray Stepp & Laffitte, L L C , 1310 Gadsden Street, Columbia, South Carolina, on the 20th day of February, 2007 before Karen L Yearwood-Cole, Court Reporter and Notary Public in and for the State of South Carolina, pursuant to Notice of Deposition

CREEL COURT REPORTING, INC.
1230 Richland Street / Columbia SC 29201
(803) 252-3445 / (800) 822-0896

- 1 Q So in April of 2004
- 2 A We were upstairs in my bedroom
- 3 Q And where in relation to your bedroom was the
- 4 room that the triplets were in?
- 5 A They slept right next to my bed
- 6 Q Oh, they were in your bedroom?
- 7 A Oh, in my bedroom
- 8 Q And where was April Simmons sleeping?
- 9 A Downstairs in that bedroom
- 10 Q And where was Monica Rolley sleeping?
- 11 A Her and my daughter was in a bedroom upstairs
- 12 to the left of us
- 13 Q Had you ever slept through any alarms?
- 14 A You can't
- 15 Q Why is that?
- 16 A They're too loud
- 17 Q Now, when you got home from the doctor, and I
- 18 know the time's, you know, not specific, but
- 19 did you ever when you got home from the
- 20 doctor on Saturday, April the 10th, did you
- 21 leave your house to go anywhere?
- 22 A Yes It seems like I recall well, I know
- 23 I got the prescription filled and I had to pick
- 24 Paris up from my mom's But his mom, Kareem's
- 25 mom, was at the house with the babies at that

CREEL COURT REPORTING, INC.

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1 had her propped up on my pillow in the bed
2 And as I continued to iron his shirt, I looked
3 over and she had fell asleep Her little head
4 went to the side So I picked her up and laid
5 her in the bassinet and set the monitor up
6 under the bottom where I always kept each one
7 of their monitors under every, each baby's bed
8 and that was it
9 Q Now, all three children were in your bedroom?
10 A Yes They slept right next to my bed
11 Q Had Mr Graves already gone to sleep?
12 A Yes He was already sleeping
13 Q Was he sleeping in that bedroom with the
14 children?
15 A Yes
16 Q Now, the children had three separate cribs?
17 A Three individual bassinets
18 Q How were they in your room? Do you want to
19 draw me a picture?
20 A This is my bed
21 Q Wait a minute I'm going to get you to draw a
22 picture, if you don't mind
23 A This is the door to the room, door to the
24 bathroom This is the bed in the room And
25 this is India's bassinet This is Asia's

- 1 A I'm under Medicaid, too
- 2 Q You're Medicaid?
- 3 A Yes
- 4 Q What about your husband, Kareem?
- 5 A He doesn't have anything
- 6 Q Is he covered by Medicaid?
- 7 A No, he's not
- 8 Q He's just uninsured?
- 9 A Yes
- 10 Q Now, you told me India fell asleep on the bed
- 11 Was the monitor attached to her at that time?
- 12 A Yes, it was
- 13 Q And did you pick her up and put her in the
- 14 is it a bassinet?
- 15 A Yes
- 16 Q Put her in the bassinet?
- 17 A Uh-huh (affirmative response) Yes, sir
- 18 Q And about what time was that?
- 19 A It was still one something I'm not sure like
- 20 the actual it was shortly after feeding her
- 21 she fell asleep I'm not, not the exact on the
- 22 time It was one something
- 23 Q And then you ironed a shirt?
- 24 A Yeah By that time when I put her in the
- 25 bassinet, I was finished ironing his dress

1 shirt

2 Q And after you ironed the shirt you went to bed?

3 A I went to bed

4 Q And you think that's around 2 00 a m ?

5 A Yeah, I guess about 2 00

6 Q Now, were you awakened by something?

7 A I had a bad dream that somebody was doing

8 something to my children and I jumped up And

9 when I jumped up, I actually went to the

10 children that was furthest away, which was

11 Lelah in the room and his sister, and I saw

12 that they were okay Then I came back in the

13 bedroom, and I shook Paris and she jumped I

14 shook Asia and she jumped And when I went to

15 shake India, she didn't move So I, you know,

16 shook her a little more, like, you know, moved

17 her And she was wrapped in a blanket They

18 loved to be wrapped snug So I just, you know,

19 did her like that and she still didn't move

20 So then I flipped the light on and I picked her

21 up, and I realized she wasn't breathing I

22 screamed out to my husband and I said call 911,

23 India's not breathing I right then and there

24 started CPR, and I kept CPR going until they

25 got there

1 A Uh-huh (affirmative response)

2 Q So when you said that there were lights

3 blinking on the monitor, what did you mean by

4 that?

5 A The lights all the lights was on Every

6 light was on

7 Q Were the lights blinking?

8 A I can't recall if they were flashing They

9 were on I know they were all lit up in red

10 Q They were all red?

11 A Except for the green power

12 Q When you say in these Answers to

13 Interrogatories did you review these

14 responses to these questions before your

15 attorney sent them to us?

16 A I don't remember I mean, she came out to

17 visit which wasn't him Somebody else was on

18 the case that's not with them anymore She

19 asked the questions and we answered I got a

20 copy later I don't know if it was before you

21 guys got it or what

22 Q Well, do you contend that the lights were

23 blinking on the monitor?

24 A The lights were on I can't recall whether

25 they were blinking They were all lit up I

- 1 Q And so you made a second phone call?
- 2 A Yes
- 3 Q From the time you first called 911 until the
- 4 time the ambulance arrived, do you know what
- 5 time elapsed?
- 6 A Too long to me I can't give you the exact
- 7 minutes, but it seemed like it was forever
- 8 Q While you were waiting for the EMS to arrive,
- 9 did you turn the machine, the monitor off?
- 10 A I didn't touch it
- 11 Q Did anybody turn the monitor off?
- 12 A No
- 13 Q So you never turned the monitor off?
- 14 A We never turned it off, even 'til the time Mr
- 15 Elliott got there That's when it got turned
- 16 off, when he came to pick it up
- 17 Q And when did Mr Elliott come pick it up?
- 18 A Sometime that Sunday I can't recall exactly
- 19 what time it was
- 20 Q When EMS arrived, do you remember what they
- 21 did?
- 22 A They came in She asked me to continue the
- 23 CPR She pulled out her machine She took the
- 24 straps from up under the, up under her, and she
- 25 started the oxygen, you know, the squeezing

1 thing on her face herself And she checked her
2 for a pulse, and she said that this child has
3 no life She wanted me asked me did I want
4 her to continue CPR and I told her yes And I
5 ran downstairs at this time to get some shoes
6 on and grab jogging pants out of the dryer so
7 I could get in the ambulance with her As I
8 came back up the stairs, EMS was coming down
9 the stairs with the baby They took her out to
10 the truck They called the hospital The
11 hospital advised them to put lines in And
12 they, they never even put the lines in They
13 pronounced her dead, called the coroner, and
14 that was it

15 Q Did India go to the hospital?

16 A No She never went to the hospital

17 Q Do you know the names of the EMT, EMS?

18 A No I guess it could be in the report I'm
19 not sure

20 Q Did anybody with the EMS turn the monitor, the
21 apnea monitor off?

22 A No I recall them she asked me where it
23 was She took it from out of the bottom of the
24 bassinet and sat it on the floor, but they
25 never was turned off

1 that some of the doctors, some of the
2 neonatologists says there was a lot of risk in
3 having babies born at a gestational age of
4 twenty-seven weeks

5 A Uh-huh (affirmative response) Yes

6 Q And what did they tell you the risks were?

7 A Wouldn't be able to walk, wouldn't be able to
8 see, wouldn't be able to talk, feeding tubes
9 Actually, Paris, they told me she wasn't going
10 to make it through the first night, she had a
11 lung disease That's about it

12 Q Do you believe the care that your children
13 received at Palmetto Richland helped them

14 A Oh, yeah They were outstanding, yes

15 Q be normal children?

16 A Yes

17 Q Do you have any idea what happened that caused
18 India to stop breathing?

19 A No more than just what the autopsy said, SIDS

20 Q Sudden infant death syndrome?

21 A Yes, going to sleep and just passing away

22 Q When you put her down, did you put her on her
23 did she sleep on her back or her stomach or
24 her side?

25 A Yeah She sleeps on her she sleeps on her

1 back

2 Q Had she turned over or well she wasn't able

3 to turn over at that

4 A No They didn't have no

5 Q Who have you talked to about India's death?

6 Have you talked with any physicians about

7 India's death?

8 A No, I haven't

9 Q Have you talked to any nurses about India's

10 death?

11 A No

12 Q Have you talked with anyone who has any

13 expertise in apnea monitors?

14 A No, I haven't

15 Q Have you talked with anyone who has any

16 expertise in apnea?

17 A No, I haven't

18 Q The ambulance, the EMS took India to the

19 coroner that morning?

20 A No The coroner came to the house

21 Q Who's the coroner?

22 A David Farr

23 Q Was there an autopsy performed?

24 A Yes, it was

25 Q And that was by Dr Janice Ross?

- 1 Q At the daycare
- 2 A Oh, from five weeks old to twelve years old
- 3 Q And do you have any other jobs you're doing?
- 4 A No
- 5 Q Now, currently, has your husband moved out?
- 6 A Yes
- 7 Q Where has he moved to?
- 8 A Right around the corner
- 9 Q Is he involved in caring for the children?
- 10 A Oh, yes, yes
- 11 Q What jobs does and we're going to question
- 12 him next, but I'm going to go ahead and get a
- 13 little primer
- 14 A Okay
- 15 Q What jobs does he have now?
- 16 A He has a logging business, and he has a new and
- 17 used tire shop
- 18 Q Any other businesses or jobs, any other jobs?
- 19 A No, no
- 20 Q So he's self-employed?
- 21 A Yes
- 22 Q In April of 2004, where was he working?
- 23 A Orangeburg Ford
- 24 Q What did he do for them?
- 25 A Car salesman

1 to feed at different times?

2 A Yes

3 Q Like if you fed India at 1 00, would it have

4 been 2 15 that Asia wants to feed?

5 A Uh-huh (affirmative response)

6 Q Is that yes?

7 A Yes

8 Q And so I'm just wondering when you were

9 sleeping I mean, how would you get any sleep

10 at all?

11 A All my help came in during the day, and I

12 basically slept during the day while they would

13 watch the children Nighttime was basically my

14 shift And whoever would come to help me,

15 whether it be my sister, his mother or my mom,

16 would normally take one of the children and

17 have them downstairs with them, and I would

18 just have two upstairs

19 Q And on the night of this incident, if India

20 went to bed around 7 30 or 8 00, you do not

21 recall any alarms going off between then and

22 her death?

23 A None

24 Q How about on the other monitors?

25 A None Huh-uh (negative response) Nobody

1 seems to be a different pitch

2 Q Do you listen

3 A I mean, to turn it on it just beeps that one

4 time That's a constant beep with the apnea

5 and heart slow and heart fast

6 Q And that beep is part of the indication that

7 the machine is working properly?

8 A Yes

9 Q And if you don't

10 A That it self checked

11 Q And is that something that you listen for when

12 you turn it on to make sure it's working right?

13 A Yes

14 Q And if you hadn't heard that, you would have

15 taken action, would you?

16 A Yes

17 Q As far as you know, had the audible alarm

18 worked on this machine on every other occasion?

19 A As far as I know

20 Q If you had left I know you told me you

21 didn't do this, but if you had been downstairs

22 and the machines alarmed upstairs, would you

23 have been able to hear that alarm?

24 A I believe so I mean, I guess depending where

25 I am

- 1 Q Did you ever test that?
- 2 A No, because I never leave them unattended
- 3 Q Did the machine alarm when you had a loose
- 4 lead?
- 5 A Oh, yeah
- 6 Q And I think you said that some of the alarms
- 7 were different Rather than me trying to dig
- 8 out of my notes, was the loose lead alarm
- 9 different than the apnea alarm or the other
- 10 alarm on the machine?
- 11 A Oh, yes
- 12 Q Was it louder or softer?
- 13 A A whole lot louder, louder
- 14 Q The loose lead was louder?
- 15 A Yes It was steady Once it's loose it's
- 16 just noise until you correct it
- 17 Q And in contrast, the apnea and heart rate
- 18 alarms are beeps
- 19 A Beeps
- 20 Q per second, correct?
- 21 A Beep, beep, yes
- 22 Q Did the alarms ever wake you up in the middle
- 23 of the night?
- 24 A Oh, yes
- 25 Q Did there ever come a time where you put a

STATE OF SOUTH CAROLINA) COURT OF COMMON PLEAS
)
COUNTY OF ORANGEBURG) C/A NO 06-CP-38-421

Kareem J Graves and Tara)
Graves, individually and as)
duly appointed personal)
representatives of the estate)
of India Iyanna Graves,)

Plaintiffs,)

v)

CAS Medical Systems, Inc ,)
American Healthcare Resources,)
Inc d/b/a Ashby Medical and)
Steve M Elliott or any)
business entity d/b/a Ashby)
Medical, Palmetto Health)
Richland Memorial, and)
Palmetto Health Alliance,)

Defendants)
_____)

**DEPOSITION OF
KAREEM J. GRAVES**

Tuesday, February 20, 2007
1 00 p m - 2 19 p m

The deposition of KAREEM J GRAVES, taken on behalf of the Defendant, Palmetto Health Richland Memorial, at the offices of Sowell Gray Stepp & Laffitte, L L C , 1310 Gadsden Street, Columbia, South Carolina, on the 20th day of February, 2007 before Karen L Yearwood-Cole, Court Reporter and Notary Public in and for the State of South Carolina, pursuant to Notice of Deposition

CREEL COURT REPORTING, INC.
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1 A No, sir

2 Q Tell me when you got woke up what happened,
3 what you remember

4 A I remember like raising up in the bed Well,
5 she yelled out, Jabal, get up, you know So
6 when I raised up, I'm looking, and she kind of
7 like, you know, got the baby there So I
8 I'm trying to figure out what, you know, what
9 in the world's wrong She says India not
10 she's not breathing, call, call the paramedic
11 But she says call the ambulance or whatever
12 So I tried to get the phone And by me I
13 guess by the time I grabbed the phone and
14 started to dial, I mean it's like something
15 just came over me I don't I can't explain
16 exactly It's you have to experience it
17 yourself It's like a weakness I just got
18 weak all of a sudden, you know And I don't
19 to be honest with you, I don't even
20 remember calling 911

21 Q I was going to ask you, did you call 911?

22 A I remember trying to dial the number and saying
23 something To be frankly honest with you, I
24 can't remember They may have me on, on the
25 if they've got the recording I'm sure

1 and open the door for, for the paramedics
2 That's I remember that
3 Q Did you do that?
4 A Yes, sir
5 Q Do you remember anything about what the monitor
6 was doing?
7 A I don't remember Once everything had kind of
8 like cleared up or whatever, I looked at the
9 monitor And I mean all I I seen like
10 I said, I seen the lights on it And I mean
11 for my understanding or what have you, she more
12 or less was the one that, you know, fiddled
13 with that
14 Q Do you remember anything about what the lights
15 were doing?
16 A All I I remember just seeing a bunch of
17 lights That's it
18 Q Do you remember whether they were flashing,
19 solid, red, yellow, green?
20 A I'm going to just say solid I remember seeing
21 just a bunch of lights All the lights were
22 on That's all I seen I mean, again, I say
23 I felt like just a weak, a weak feeling where
24 I wasn't really good for nothing
25 Q Do you remember that you had stopped using the

1 got me confused I'm baffled

2 Q Where did your family prepare for Easter
3 morning for the kids?

4 A Where did we prepare?

5 Q Yes Were you to have Easter morning for your
6 family that morning?

7 A Yeah We were going to church

8 Q Did you have like any at the house prepared,
9 any baskets or Easter egg hunt, that kind of
10 stuff?

11 A I can't recall that I don't think we had like
12 no Easter baskets I think we had just some
13 eggs or something Somebody had did some eggs
14 or something that we were going to hide out in
15 the yard for, you know, the older kids

16 Q The night of the incident, at any time from
17 8 00 when you said you went to bed, or around
18 8 00 or 8 30, did you hear any alarms at all
19 that night?

20 A No I didn't hear any alarms

21 Q No alarms at all?

22 A No, sir The last alarm I heard was, was her
23 mouth

24 Q And is it you're a part of this lawsuit as
25 well Your name's on it as well as your

- 1 you So I mean once I, I guess just instinct
2 or something and then lay right back down, you
3 know, unless she tells me help me out, do this
4 or go downstairs and do this Because we kept
5 little bottles we've got a little
6 refrigerator upstairs And we would keep the
7 little bottles in there Then she had what
8 they call like a bottle warmer and put it in
9 there and do that little stuff Then I would
10 I'd get up and do a little something,
11 whatever she asked me to do Then of course I
12 would lay back down because I've got to get up
13 in the morning
- 14 Q Did you ever sleep through any of the alarms
15 that went off?
- 16 A You can't sleep through the alarm I mean even
17 the chirping, even if it's like say if one
18 of them messed around and rolled over or
19 something and that little plug or something,
20 the thing come out from under their little
21 thing, you can't sleep through that
- 22 Q I guess if you had slept through it, you
23 wouldn't have known whether it had gone off or
24 not
- 25 A No I'm not a heavy sleeper, I mean

April Simmons August 8, 2007

Page 1

STATE OF SOUTH CAROLINA

COURT OF COMMON PLEAS

COUNTY OF RICHLAND

KAREEM J GRAVES and TARA GRAVES individually and
as duly appointed personal representatives of the
ESTATE OF INDIA IYANNA GRAVES

Plaintiffs

vs

CASE NO 06-CP-38-421

CAS MEDICAL SYSTEMS INC AMERICAN HEALTHCARE
RESOURCES INC d/b/a ASHBY MEDICAL and STEVE M
ELLIOTT or any business entity d/b/a ASHBY MEDICAL
PALMETTO HEALTH RICHLAND MEMORIAL HOSPITAL and
PALMETTO HEALTH ALLIANCE

Defendants

DEPOSITION OF APRIL SIMMONS

DATE August 8 2007

TIME 11 35 a m

LOCATION Law Offices of
Haynsworth Sinkler Boyd PA
1201 Main Street 22nd Floor
Columbia South Carolina

TAKEN BY Counsel for the Defendant

REPORTED BY ANGELA D ZUVER
Court Reporter

Computer-Aided Transcription By

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95688c05-f292-4ff9-b550-f13f6a881bea

000721

1 Q And India died on the morning of
2 April 11th?

3 A Yes, sir

4 Q Which was an early Sunday morning?

5 A Yes Easter

6 Q Were you staying at the house that
7 night?

8 A Yes

9 Q Why were you staying there that night?

10 A To help Tara because that was going to
11 be the first time the girls was going to church and
12 I was going to help her get the girls ready that
13 morning, because we attend eight o'clock service

14 Q On the other nights prior to that when
15 you stayed at your sister's house you were there to
16 help out?

17 A Yes

18 Q Okay What kind of help did you
19 provide?

20 A I would keep maybe one of the girls or
21 two of the girls downstairs with me and she would
22 have one, or I would have one and she would have
23 two I spent the night to feed them, change them,
24 wake up

25 Q By keep you mean they would be in the

1 walk in, you go to the left When you turn in
2 there was a dresser here and there was a little
3 thing that was built in, like a cabinet They
4 might have used it for like a living room so there
5 was a little white -- it had like, I want to say,
6 glass right there, or shelves, just on this side,
7 on the right-hand side And then the bed was
8 facing this way and there was a dresser on the
9 right side (Indicating)

10 Q So there was room in that room for a
11 big bed, a dresser and this built-in --

12 A Yes A little cabinet on the side,
13 like for China or something like that It looked
14 like somebody had a living room there probably, or
15 a dining room

16 Q Was there enough room to walk around
17 with all that furniture in the room?

18 A Oh, yeah And the door was also --
19 there were two You would walk in one and there
20 was a door leading to the kitchen

21 Q So there are two doors in and out of
22 the room, one from the front hall and one from the
23 kitchen?

24 A Yes

25 Q What other rooms were downstairs

1 besides that bedroom and the kitchen?

2 A The kitchen was here, there was another
3 sitting area where the table was, and then the den
4 When you first walk in, it was a little -- another
5 area They had like the computer there, and
6 just -- not a den Maybe the living room or
7 sitting room It was more of a living room, I
8 would say

9 Q Is there a bathroom on that floor?

10 A The kitchen, there's a little walkway,
11 washing machine and dryer, then the bathroom's
12 right there

13 Q And where are the stairs leading
14 upstairs?

15 A As soon as you walk through the door
16 you make a left and the stairs are right there

17 Q All right How many rooms are
18 upstairs?

19 A Three

20 Q So it's all --

21 A And the bathroom

22 Q Three bedrooms and one bath?

23 A Three bedrooms and one bath

24 Q Where is the bathroom in relation to
25 Tara's bedroom?

1 A You go up the stairs, the bathroom is
2 straight and then Tara's room is to the left

3 Q Just to the left?

4 A Yeah She has one -- well, she has a
5 bathroom in her room, but it's to the left When
6 you go straight upstairs you walk straight to the
7 bathroom, a full bath, and then her room is right
8 to the left

9 Q Is there a bathroom off of her bedroom
10 too?

11 A Yes

12 Q Do you know how big of a house it is in
13 square feet?

14 A No, I don't

15 Q How long had she lived there, do you
16 know?

17 A They got that house in 2003 Because
18 they were in an apartment and then Tara found out
19 she was pregnant and they had to get another house
20 So they -- in 2003 Well, the same year the girls
21 was born they was in there already December,
22 yeah, '03 I don't remember the month, though

23 Q All right The house was fully
24 furnished?

25 A Yes

1 triplets had not slept in the room with you when
2 you were there?

3 A No, that wasn't the first time I mean
4 when I was there I would help out, whether it was
5 me being downstairs and going upstairs when they
6 woke up, but -- they would be in the room with me
7 sometimes, sometimes they wouldn't, but I was there
8 to help out

9 Q Did you get up during the night before
10 you heard your sister screaming, as you put it, to
11 help out with any of the triplets?

12 A No

13 Q They were still at the point where they
14 were waking up in the night needing to be fed and
15 changed, is that correct?

16 A Yes

17 Q They were not very old?

18 A No

19 Q But they hadn't woken up yet that
20 night?

21 A Not that I know of

22 Q Did you hear any of the alarms going
23 off that night?

24 A No, I didn't

25 Q Do you know whether you could always

1 hear the alarms down in that bedroom where you were
2 if they went off?

3 A I sure did I could hear upstairs and
4 Tara could hear downstairs and we would get up If
5 I would hear it I would say, Tara -- I'd go to the
6 steps and call or either I would go up there, and
7 if she would hear it downstairs she would call me
8 from the steps or either come down But you could
9 hear it

10 Q Did you hear any of the alarms going
11 off that night?

12 A No, I didn't

13 Q Have you ever slept through any of the
14 alarms?

15 A No

16 Q Of course, I guess you wouldn't know if
17 you slept through them because -- you wouldn't know
18 whether you had or not, would you?

19 A You couldn't sleep through them if they
20 was going off It was just that loud

21 Q I've heard them I know how loud they
22 are

23 A Especially if they was disconnected
24 There was no way of sleeping through that Maybe
25 if you're a -- I'm a light sleeper Maybe if you

STATE OF SOUTH CAROLINA

COURT OF COMMON PLEAS

COUNTY OF ORANGEBURG

KAREEM J GRAVES AND TARA

GRAVES INDIVIDUALLY AND AS

DULY APPOINTED PERSONAL

REPRESENTATIVES OF THE ESTATE

OF INDIA IYANNA GRAVES,

Plaintiffs

vs

CASE NO 2008-CP-38-826

CAS MEDICAL SYSTEMS INC ,

Defendants

DEPOSITION OF ANITA KELLY

DATE March 4 2009

TIME 10 02 AM

LOCATION Law Offices of Williams & Williams
370 St Paul Street, N E
Orangeburg SC

TAKEN BY Counsel for the Defendants

REPORTED BY AMY R TINGBERG
Court Reporter

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1 understand that?

2 A Yes sir I understand

3 Q When you were doing your look around in

4 the room, did you notice whether India had been

5 hooked up or had the use of an infant monitor?

6 A I noted that there were infant monitors

7 present but no I did not know whether she was

8 attached to that device -- to have seen her

9 attached to that no I did not when we were out

10 there

11 Q Did you inspect any of the monitors?

12 A It would have been something that I

13 would have done, but can I absolutely testify that

14 I did, no, I did not My report states that there

15 was a monitor but it says patient was on an apnea

16 monitor at the time Negative signs of trauma

17 negative petechia to eye/skin Alarm showing

18 loosely negative alarm mother states so

19 Q You got that from the mother?

20 A Yes

21 Q One thing we haven't talked about here

22 is you indicate patient has cyanosis to hands and

23 feet Explain what that is, please?

24 A Cyanosis is a blue discoloration of the

25 skin secondary to lack of oxygen And in

1 Q What does negative alarm showing loose
2 lead, do you know what that means?

3 A It's a reading of what --

4 Q The monitor said?

5 A Exactly

6 Q And how do you know that?

7 A Well, my concern with this report is
8 two things One yes, it would have been
9 reasonably anticipated that I would have looked at
10 this machine The second concern I have is that if
11 this had been information given to me by the mother
12 there would have been italics around it and there
13 are not

14 Q And it also -- it looks like -- and I'm
15 just going to finish the sentence -- showing loose
16 lead negative alarm And it looks like there is a
17 period there?

18 A That is correct

19 Q And then after that it says Mother
20 states?

21 A Mother states baby on her back

22 Q So is it likely or possible that you
23 actually saw this?

24 MR DUBOSE Object to the form

25 THE WITNESS Reading the report it is

1 A That is correct or is not documented

2 It would have been documented

3 Q And so looking at this monitor the only

4 light that was on was the loose lead light from -

5 what time was that 10 30?

6 MR DUBOSE I'm going to object to the

7 form

8 BY MR WINSLOW

9 Q Sure Was that 10 30 that evening?

10 A That is the last one that I see

11 documented

12 Q And then after that what two events

13 also occurred? There's a lot of them but there

14 were only two of them?

15 A Heart slow and apnea

16 Q And those you did not see or you would

17 have recorded them?

18 A That is correct

19 Q And when you arrived at 4 01 you saw

20 Kareem Graves he said go upstairs, we need help

21 Did you hear anything else?

22 A No

23 Q No loud alarm?

24 A Not that I recall, no, sir

25 Q No buzzing no chirping no anything?

1 during that meeting was that a concern to you
2 anymore?

3 A No

4 Q Did you have any other concerns?

5 A Looking at the form again was lack of
6 italics around the bottom line here of you know,
7 that monitor

8 Q And why would that -- why would that
9 concern you because if you wrote what was true at
10 the time five years ago why would that concern you?

11 A Not concern -- as far as to testify to
12 say yes I absolutely looked at that monitor I
13 remember it like yesterday no I cannot say that
14 Looking at my report the way it's written makes me
15 think yes I did Because had it been I responded
16 to your home and you had given me this information
17 generally that information would have italics(sic)
18 on the outside of it meaning it was coming from
19 another source and my source for all of my
20 information was the mother Mrs Graves So
21 looking at that you know it was okay yes I did
22 look at the monitor But can I sit here and tell
23 you yes I remember looking at that monitor no
24 sir I do not

25 Q Looking at your report from five years

Page 1

STATE OF SOUTH CAROLINA)
)
COUNTY OF RICHLAND)

IN THE COURT OF COMMON PLEAS
CIVIL ACTION NO 06-CP-40-7398

KAREEM J GRAVES and TARA)
GRAVES Individually and as)
duly appointed personal)
representatives of the)
ESTATE OF INDIA IYANNA GRAVES)
)
Plaintiffs)
)
vs)
)
CAS MEDICAL SYSTEMS INC)
)
Defendants)

THE VIDEOTAPED DEPOSITION
UPON ORAL EXAMINATION OF

DONNA ALFORD WILKINS M D

a witness produced and sworn before me
Mary Beth Schafer RPR a Notary Public at
large in and for the State of Indiana taken
on behalf of the Defendant at Ball Memorial
Hospital 2401 University Avenue Maria Bingham
Building Conference Room 1033, Muncie
Delaware County Indiana on July 25 2008
commencing at approximately 9 00 a m pursuant
to the South Carolina Rules of Civil Procedure

Muncie, Indiana

SMITH REPORTING
info@smithreporting net

765-284-7836

b19f2b5a-9fef-4ac3-ab72-93107c7a3850

1 A No

2 Q Let me get your full name and address for the record,
3 please

4 A Donna Alford Wilkins, W-I-L-K-I-N-S My home address
5 is 601 North Bittersweet Lane, Muncie, Indiana

6 Q And you're a medical doctor, is that correct?

7 A Correct

8 Q And where are you employed?

9 A At Ball Memorial Hospital and the Delaware County
10 Health Department

11 Q In Muncie, Indiana?

12 A Yes

13 Q Give us, if you would your educational background
14 starting with college

15 A Graduated from Hanover College in Hanover, Indiana, in
16 1971 Graduated from Indiana University Medical School
17 in '75 And then did a pediatric residency and
18 neonatology fellowship at Methodist Hospital in
19 Indianapolis Then came here in 1979 and became
20 director of the nurseries here at Ball and have been
21 here since that time

22 Q Is that your title, director of the nurseries?

23 A Yes

24 Q And are you board certified in any area?

25 A In pediatrics and in -- here's my -- and

Muncie, Indiana

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765-284-7836

b19f2b5a-9fef-4ac3-ab72-83107c7a3850

1 neonatal-perinatal medicine

2 Q You've handed me your board certifications?

3 A Correct

4 Q What is neonatal-perinatal medicine?

5 A It's the certification for a neonatologist which means
6 taking care of sick newborns in an intensive care unit

7 That's my specialty It's a subspecialty of

8 pediatrics In order to do that you have to a

9 pediatric residency first and then you go on and do a
10 subspecialty

11 Q I have here a copy of what appears to be your CV Is
12 that you?

13 A That's me

14 Q Okay Is this CV up to date?

15 A Yes, appears to be

16 Q Why don't we mark that as Exhibit 1

17 (Defendant(s)' Deposition Exhibit(s) 1 marked
18 for identification)

19 Q And, Doctor, so you've been practicing neonatology for
20 how long?

21 A Coming on 29 -- well, here almost 29 years

22 Q And before here?

23 A Well, it's just my fellowship That really --

24 Q That was part of your training?

25 A That's still training

1 education with regard to sudden infant death syndrome?

2 A I mean we're taught in medical school and then during
3 pediatric residency, we're just -- that's one of the
4 things that we're taught especially in neonatology
5 since it's more likely in a preterm infant to have --
6 to be a SIDS death than a full-term baby

7 Q And since your initial training as a physician, have
8 you attended any courses where sudden infant death
9 syndrome was part of the course of study?

10 A I can't recall particular ones, but it's often one of
11 the topics in neonatology seminars, conferences

12 Q Has it been a topic in seminars or conferences that you
13 have attended?

14 A I can't recall right now I'd have to think back I
15 don't -- not off the top of my head, I can't think of
16 any in particular

17 Q Is sudden infant death syndrome an area that you
18 personally have engaged in any particular study in?

19 A No

20 Q Do you read articles on sudden infant death syndrome
21 from time to time?

22 A Oh, yes

23 Q Do you keep up with the research on sudden infant death
24 syndrome?

25 A Yes And the American Academy of Pediatrics is very

1 much on keeping parents informed That's when they
2 started the Back to Sleep Program and the American
3 Academy of Pediatrics is very much on keeping up with
4 the latest research on SIDS and causation factors

5 Q Is SIDS a -- do you call it a disease or a condition or
6 how is it described in the field?

7 A It's kind of a diagnosis of exclusion When you can't
8 find any other cause of death in an infant at the time
9 of an autopsy, it's kind of written off as a SIDS

10 Q And is -- it sounds like then that SIDS itself is not
11 fully understood as a disease process or a condition?

12 A That is correct

13 Q Okay So the knowledge of SIDS is an evolving area, is
14 that correct?

15 A Yes

16 Q And what journals or other publications do you follow
17 with regard to SIDS research?

18 A There's Journal of Pediatrics and American Journal of
19 Perinatology, another journal of Perinatology, and then
20 the Pediatric Clinics of North America I subscribe to
21 it and often they'll have -- they'll take a topic and
22 have the whole journal, for instance, about that
23 particular subject

24 Q Now you subscribe to all three of these journals?

25 A Yes

1 Q And do you read them regularly?

2 A Yes

3 Q Are there any more that you subscribe to?

4 A No, not right now

5 Q Are there any publications that you read with any
6 regularity whether you subscribe to them yourself or
7 not?

8 A I'll often read the OB journals occasionally when it
9 has something related to, you know, neonatology,
10 preterm births or that kind of thing.

11 Q Anything else?

12 A No

13 Q You are involved and have been through your career, do
14 I understand correctly, with child infant care,
15 neonatal care within the hospital setting?

16 A Yes

17 Q Have you ever been involved with neonatal care in the
18 home setting?

19 A Only the first probably three years When I came,
20 Dr Jack Alexander was a pediatrician who was in
21 private practice by himself, and so when I came in
22 November of '79 for about the next three years I would
23 take call with him And he got a partner in January of
24 '80, and so between Mike Burt and Jack Alexander and I
25 would take call, and then I would see the babies that

1 the parents that the monitor did not audibly alarm
2 Had it alarmed, there was an hour -- I mean with
3 repeated alarms, they could have responded, and I think
4 the baby would be alive today had the alarm worked
5 audibly that they would have gone in and resuscitated
6 the baby I mean they have said in the depositions,
7 you know, to go and, you know, flick their foot
8 Usually just move them a little bit, that will correct
9 whatever they're alarming for, and I think that would
10 have happened in this case had they heard it They're
11 not going to lay there in bed for an hour listening to
12 this alarm going off in their room and lay there in bed
13 and do nothing

14 Q Right Well, assuming the alarm went off and assuming
15 they heard the alarm, what basis is there for an
16 opinion that resuscitative efforts would have saved the
17 baby?

18 A They had responded before and the baby didn't die I
19 mean they had responded to all of their monitor alarms
20 at one time or another

21 Q Have you looked at all the monitor alarms to determine
22 their --

23 A No

24 Q Let me finish if I may I'll start over Doctor, have
25 you reviewed the -- all of the downloads to India

1 A This page right here, okay

2 Q At what point in your opinion did she progress to the
3 point where she could not be resuscitated or would not
4 have been resuscitatable?

5 A Probably here when she -- which is on 01 54 27 I would
6 say more likely when she became asystolic, when she
7 really had no heart rate

8 Q So 01 54 27?

9 A It's event No- 25

10 Q Okay That is the time shown on this download?

11 A 01 52 57

12 Q And what page is that on? You don't have a page?

13 A See, I don't have a page

14 Q So it's 01 54 28 is the time?

15 A In the corner, in the corner

16 Q So that's page 21 for the record of Exhibit 3 If you
17 refer to this exhibit, I think it actually has the page
18 numbers on the bottom of it, which will help

19 A Can I look at this for just a second?

20 MR DUBOSE Sure Let's go off the record
21 for a moment, please

22 THE VIDEOGRAPHER Going off the record
23 It's eleven o'clock

24 (A brief recess is taken after which the
25 following proceedings are had)

1 Graves to determine how quickly the parents responded
2 to the alarms?

3 A No

4 Q Doctor, have you reviewed the downloads for the other
5 two children to determine how quickly the parents
6 responded to the alarms?

7 A No

8 Q Is there any literature on which you base your opinion
9 and by literature I mean scientific literature on which
10 you base your opinion, that India Graves would have
11 survived had her parents attended to her when she went
12 into distress and the monitor indicated at least that
13 it alarmed?

14 A No My basis is the fact that she died over a period
15 of over an hour So that's why I think she would have
16 been resuscitatable because it wasn't just that she
17 suddenly died, it alarmed and she died within the next
18 ten seconds This was an hour of hypoxia, bradycardia,
19 not breathing, becoming more hypoxic, and, finally,
20 cardiac arrest because it went on so long

21 Q Let me get you to look at Exhibit 3 which you have in
22 front of you on page 2 which I think you have in front
23 of you as well It's the summary of events when India
24 was declining I think it's the first page you have
25 right there

1 Graves' household when it was discovered that India was
2 not breathing?

3 A Oh, absolutely

4 Q I would too And that would explain some of the
5 inconsistencies that we've seen in the testimony?

6 MR WINSLOW Object to the form

7 A Dad was in the bathroom throwing up Yes

8 Q Do you know whether the decreased usage requirement for
9 the monitor that you identified as being suggested on
10 April 5th was ever communicated to the parents before
11 India died?

12 A I'd have to look back in Castles' deposition I don't
13 recall if he told them I can't --

14 Q Well, if they weren't -- if they weren't told that and
15 thought they were supposed to have the child on, then
16 the fact that they didn't have the child on would give
17 some indication of their intent or their ability to
18 comply, would it not?

19 A Yes

20 Q Are you able to assign a percent of likelihood that
21 India would have survived if the parents had responded
22 to her condition quicker than they did?

23 A I think legally you can say, you know, more than 51
24 percent Isn't that what -- that's what Indiana does
25 I don't know what South Carolina does

STATE OF SOUTH CAROLINA

COURT OF COMMON PLEAS

COUNTY OF ORANGEBURG

KAREEM J GRAVES and TARA GRAVES
Individually and as Duly Appointed
Personal Representatives of the
Estate of INDIA IYANNA GRAVES

Plaintiffs,

vs

CASE NO 06-CP-38-421

CAS MEDICAL SYSTEMS INC AMERICAN
HEALTHCARE RESOURCES, INC d/b/a
ASHBY MEDICAL AND STEVE M ELLIOTT
or ANY BUSINESS ENTITY d/b/a ASHBY
MEDICAL and PALMETTO HEALTH ALLIANCE

Defendants

DEPOSITION OF C GUY CASTLES III M D FAAP

DATE May 30, 2007

TIME 3 05 p m

LOCATION Law Offices of
Haynsworth Sinkler Boyd PA
1201 Main Street 22nd Floor
Columbia South Carolina

TAKEN BY Counsel for the Defendant CAS
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Court Reporter

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Page 2

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(Appearances continued on next page)

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10 mtodd@sowell com

11 ALSO PRESENT

12 Steve M Elliott

13 (INDEX AT REAR OF TRANSCRIPT)

Page 4

1 STIPULATIONS

2 It is stipulated by and among Counsel
3 that this deposition is being taken in accordance
4 with the South Carolina Rules of Civil Procedure,
5 Rule 30, that all objections as to Notice of this
6 deposition are hereby waived, that all objections
7 except as to form are reserved until the time of
8 trial, and that the deponent waives reading and
9 signing of this deposition

10 * * * * *

11 C GUY CASTLES, III, M D , FAAP
12 being first duly sworn, testified as follows

13 EXAMINATION

14 BY MR DUBOSE

15 Q You are Dr Guy Castles?

16 A I am

17 Q And you're a pediatrician in Columbia,
18 South Carolina?

19 A (Nodding head)

20 Q Let me give you a couple of the ground
21 rules that I need to give you for a deposition
22 You may well have been deposed before One of them
23 is, if you have any question about my question, or
24 any of the lawyers' questions, ask us to clarify
25 the question so we make sure that we're talking

1 about the same thing The other thing is that the
2 court reporter can only indicate a nod of the head
3 or a shake of the head and it isn't very clear when
4 she takes what she is recording and is typing it
5 up, so if you could, give a verbal response in
6 every instance, and I'll remind you of that It's
7 natural not to, but it's better if you do

8 Dr Castles, what is your business
9 address?

10 A 14 Medical Park, Suite 410, Columbia,
11 South Carolina

12 Q I'm Clarke DuBose We've met before
13 I represent CAS Medical Systems, which manufactured
14 the child apnea monitor involved in this case As
15 I think you know, but just to make sure, this is an
16 action brought by the parents of India Graves
17 regarding her death

18 Dr Castles, just briefly give us your
19 educational background with regard to your medical
20 training and how long you've been in practice

21 A I graduated University of South
22 Carolina and the Medical University of South
23 Carolina School of Medicine I graduated there in
24 1988 I completed an internship and a residency at
25 the Medical University of South Carolina Children's

Page 6

1 Hospital I subsequently am board certified and a
2 fellow of the American Academy of Pediatrics I've
3 been in practice for 17 years and I am now
4 re-certified in pediatrics

5 Q Is your practice limited to pediatrics?

6 A Pediatrics and adolescents

7 Q Were you the doctor for India Graves,
8 Paris Graves and Asia Graves, triplets born at the
9 end of 2004?

10 A Yes, I was

11 Q Did you have a prior relationship with
12 their parents or any of their siblings?

13 A I did not

14 Q How did you come to be their doctor?

15 A We have triplets ourselves, and I have
16 an enormous amount of triplets in my practice,
17 probably because we have them, and it is very
18 common for me to be referred triplets that are born
19 in this catchment area because I have them and have
20 experienced a lot of the complications of triplet
21 birth and am very familiar with just the overall
22 stress of bringing three babies home at one time

23 Q So you became these children's doctor
24 when they were discharged from Richland Memorial?

25 A Right, from the neonatal intensive care

1 unit

2 Q After they were born they were kept in
3 the hospital for a period of time in the neonatal
4 intensive care unit?

5 A Oh, yeah They were premature babies
6 so they were in there

7 Q Do you know how premature they were?

8 A I can tell you I saw them for the
9 first time at six weeks of life, so they were in
10 the neonatal intensive care unit for the first six
11 weeks They were born at 28 weeks, which is a very
12 viable infant in this time, anything above 25 weeks
13 does generally very well The babies remained in
14 the hospital for six weeks, which I would say
15 with -- they had the normal complications of a 28
16 week old baby

17 Q And that was going to be my next
18 question You anticipated it What are the normal
19 complications for children of that age?

20 A Well, most of them are low birth
21 weight, so we have to make them gain weight They
22 usually have eye and brain problems The brain
23 problems include apnea, which means you stop
24 breathing because your brain doesn't send the lung
25 the message to take a deep breath or to actually

Page 8

1 even breathe You do grow out of apnea We think
2 at six, seven or eight months you have pretty
3 much -- your brain has matured to the point that it
4 tells your lungs to breathe Anemia is another
5 common problem that they shared They were very
6 difficult feeders They all had milk protein
7 intolerance and some degree of reflux, which again,
8 is a very common problem associated with 28 week
9 old babies

10 Q You just said they were difficult
11 feeders and they had trouble feeding or eating?

12 A Difficult feeders That was one of the
13 major delays in getting them out of the hospital,
14 gaining weight India had reflux as well as a milk
15 protein intolerance, and she was on two medications
16 for that, Zantac and Reglan

17 Q All right Now, I noticed you're
18 referring to your medical records You have
19 produced to us the records for India, and I know
20 you've brought with you today, at our request, the
21 records for the other two triplets, and I wanted to
22 let you know you're free to refer to those as
23 needed

24 A I have everybody's records

25 Q I think you've already told us the

1 condition of India when she came into your care
2 How was she relative to her two sisters at that
3 point?

4 A All the babies were basically the same
5 I don't think that one was -- India was the smaller
6 of the children, but I don't think that there was
7 anything different from the other two children that
8 singled her out

9 Q Do the records reflect that you put all
10 three children on apnea monitors?

11 A Well, I didn't

12 Q Was that the hospital?

13 A That's done at the hospital The way
14 that works is that a baby that -- apnea is a well
15 known diagnosis of a very premature baby and
16 sometimes without even demonstration of apnea
17 children go home, just because they were born at 28
18 weeks, with an apnea monitor An apnea monitor is
19 a device that has a belt that goes around the chest
20 or leads that stick onto the chest and they monitor
21 respiration and heart rate If the baby stops
22 breathing for a period of 20 seconds, that is
23 considered to be an apneic event If you stop
24 breathing for five seconds or seven seconds, that
25 is considered to be a pause That is not

Page 10

1 considered to be true apnea An event would also
2 be 20 seconds without breathing and then
3 subsequently the heart rate would go down I mean,
4 a true event would have other circumstances other
5 than just you not breathing

6 The most common cause of an apnea event
7 on a monitor is the leads are loose, the baby
8 became unhooked from the machine And, you know,
9 the machines are not foolproof in that if the belt
10 slips down on the chest -- the belt is designed to
11 go under the arms It's a very tight-fitting belt
12 In fact, to listen to the heart, you have to take
13 the belt off because you can't examine -- the
14 babies are so small and you've got this Velcro belt
15 on them -- but if the belt actually slips down
16 below the level of the diaphragm or the ribs, then
17 the machine doesn't work It doesn't pick up the
18 respiratory effort

19 Q Will it alarm at that point?

20 A It should alarm with loose leads
21 because it's not picking anything up In fact,
22 lots of babies will have developed this rash under
23 their arms where the belt is so tight around the
24 baby's chest

25 So they have a belt on and it hooks to

1 the machine, and the machine has two leads on it,
2 too, that are monitoring heart rate, and actually,
3 the machine is so sophisticated that it can
4 actually tell you the baby's heart rate You can
5 ask it -- it has a memory in it and you can ask it
6 to produce a strip and it will actually print out,
7 at exactly what time you want it to -- you know, if
8 you wanted it to print out at 12 o'clock on
9 Thursday, it will print you out that exact moment,
10 providing the machine was on and operating and the
11 belt was on

12 Q As I understand it, the machines have
13 various settings that are adjustable as far as
14 detecting different pulses?

15 A Right As the baby gets older, you cut
16 down the heart rate For example, when the baby is
17 first coming home and they're in the six week,
18 eight week -- when they're about two months old,
19 you may choose a setting of a heart rate around
20 100, and then when the baby starts to go to sleep
21 at night that heart rate will start to drop because
22 that's physiologically normal and then you down set
23 it to 80, then you down set it to 60, and by time
24 they're coming off the monitor -- the monitor's
25 lowest setting is 40, and that's where you would

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1 be Because when the baby goes to sleep, the heart
2 rate goes down and if you've got a normal baby and
3 the thing is set at 80, it will go off all the time
4 and drive the mother crazy So you have to change
5 the settings, but the sensitivity never changes
6 You're changing the setting of the heart rate

7 Q Is that changing of the settings
8 something that you would prescribe?

9 A I would do that, that's right

10 Q And do you also change the periods of
11 time when the child is to be on the monitor?

12 A No My theory is if you're on a
13 monitor, you're on it 24/7 I don't ascribe to the
14 theory of naps and night There are some people
15 that will tell you that you only need to wear a
16 monitor for naps and night, but you just don't know
17 when the baby is going to fall asleep in the car
18 seat, and that kind of thing, so I will tell
19 parents to use the monitor 24/7 -- which was a
20 significant problem with the Graves

21 Q Tell me about that, if you would

22 A They did not use the monitor 24/7 The
23 grandmother had a very integral part as a caregiver
24 and she didn't understand the monitor, nor would
25 use it correctly, and so what happens after a

1 period of time -- and I'm sure you've got these in
2 the records -- is that we call the company and they
3 send out the -- for the Smart Monitor -- and they
4 send out the download -- and I believe these were
5 being done in Greenville?

6 Q They were

7 A These were being done in Greenville --
8 and a neonatologist reads them in Greenville and
9 they send me back a typed report of exactly when
10 the monitor was being used, how many hours it was
11 on, you know, how it was being used, compliance
12 issues

13 Q Let me show you a rather hefty document
14 and ask you if that's the type of report from the
15 Greenville doctor you're referring to

16 A Right This is exactly what -- now, we
17 would not normally get -- and I have seen this
18 particular report This has got your tracings
19 because this is showing the child dying

20 Q That's got the entire download on it
21 for that period of time?

22 A For this period of time But this
23 is -- we would just get the first two typed pages
24 of compliance and how much apnea, and it would come
25 with a recommendation This is a neonatologist

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1 that's reading this, or a pediatric pulmonologist
2 At some places neonatologists read it and some
3 places pediatric pulmonologists read it, and
4 they -- this one, of course, doesn't have it
5 because this is the death one, but it comes with a
6 recommendation You need to down set the monitor
7 to a heart rate of 60 and reload and -- not reload,
8 download in two weeks And the monitor is actually
9 being managed by, in this particular case, the
10 Children's Respiratory Center Other places, they
11 have their own attendings that do that

12 But this is the report that I would
13 get So when I would see the mother, I would say,
14 Gee, you only use this monitor like 20 percent of
15 the time I have all that information because the
16 monitor knows when it's on and knows when it's off
17 and it tells you in the report

18 Q All right And the particular report I
19 showed you -- and I'm not going to mark this, it's
20 been marked in, I think, Dr Gwinn's deposition --
21 is from Dr Gwinn in Greenville at the Children's
22 Respiratory Center

23 A Right

24 Q And it has in clear detail the complete
25 download from the last download for India Graves'

1 monitor?

2 A I'm not sure whether the download is
3 complete, but that doesn't matter This is a
4 complete detailed analysis of the report, the typed
5 part

6 Q Thank you Why is it that the monitor
7 report would go to a doctor like Dr Gwinn rather
8 than directly to you?

9 A Well, because they have subsequent
10 training on how to read the monitors They are
11 generally specialists I could get the monitor
12 hard copy if we wanted it, but we rely on somebody
13 who is an expert in apnea to give us the guidance
14 on how long to use the monitor Quite frankly, I
15 see that as a legal issue We're always a little
16 nervous when we stop the monitor You know, if
17 you're taking the monitor off of a six month old
18 and they, you know, die of an apneic episode two
19 weeks later, you know, and somebody says, Well,
20 gee, if you had that monitor on maybe that child
21 wouldn't have died, I think there's a little backup
22 for us legally, to have another opinion on when to
23 stop the monitor I really use them more for when
24 am I ready to take the baby off the monitor

25 And there is no published data on when

Page 16

1 to remove a baby from a monitor, there is no
2 published data that says a monitor has ever saved a
3 baby's life, there is no published data that says
4 that monitors are necessary They're all things
5 that have been created to help us to improve the
6 quality of care Now, we would like to think that,
7 but there is, of course, no controlled study
8 Nobody's going to take a 28 week old baby and pull
9 them off a monitor to do a study

10 Q That would be a tough study to do with
11 any of those

12 A That would be a very tough study But
13 there are no controlled studies to back that up

14 Q Let me show you what was produced to us
15 from your office as the complete medical file on
16 India Graves and ask you to thumb through that and
17 confirm that we do have her file here

18 A I would think that you do, but I
19 brought the records from my office, if you'd like
20 to compare them

21 Q Well, we may do that at a break or at
22 the end just to make sure I'm going to go ahead
23 and mark this as Exhibit 1

24 A But I do have the whole folder
25 (DEF EXH 1, MEDICAL RECORDS

1 PERTAINING TO INDIA IYANNA GRAVES, marked for
2 identification)

3 BY MR DUBOSE

4 Q This is a question you may well not
5 know the answer to, but on the discharge summary
6 the baby is referred to as India Simmons -- do you
7 see that at the top?

8 A Uh-huh

9 Q And we're referring to Exhibit 1 here,
10 your medical records on India Graves In your
11 records is a copy of the discharge summary from
12 Palmetto Richland, correct?

13 A Correct

14 Q And there she's referred to as India
15 Simmons

16 A That's because that's the mother's
17 name

18 Q All right And when you took her in as
19 a patient she became India Graves, from what I can
20 tell?

21 A That's right It's -- well, in South
22 Carolina the baby has the mother's name at birth

23 Q Even if --

24 A It makes no difference what the daddy's
25 name is When you go home from the hospital you

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1 have the right to call your child anything you want
2 to If you want to call them Green, that's fine as
3 long as you put that on the birth certificate, but
4 when the baby is born and in the hospital they,
5 retain the mother's name

6 Q Well, if the mother's legal name was
7 Graves and not Simmons, how should the child have
8 been named?

9 A Graves That was not the mother's
10 legal name

11 Q Is that something you know for a fact,
12 or are you assuming that from the records?

13 A Well, we have -- I can tell you we have
14 some issues, and they all go down to payment and
15 insurance issues, because if you file claims under
16 Graves, for example -- and I don't see any -- it
17 depends on what you -- we usually require a birth
18 certificate to change the name in our office I
19 was looking for the

20 The mother, on her -- I think that's
21 the original intake sheet for the office -- listed
22 her name as Graves and they filed her name with
23 Medicaid as Graves If we file the charges under
24 Simmons, they'll be rejected as a fraudulent claim
25 because the names don't match up So we call the

1 baby now whatever is on the Medicaid card, whatever
2 that is

3 Q And I understood the mother was Tara
4 Graves by the time she gave birth as well, and I
5 was wondering, really, why the child was named
6 Simmons in the hospital rather than Graves, if you
7 know

8 A If she didn't -- the only way would
9 have been if she didn't change her name But this
10 is the child of Ms Simmons, there's no question
11 about that

12 Q I understand And I really wasn't
13 going in that direction

14 A Okay It's a very confusing thing We
15 have a lot of financial -- insurance companies will
16 deny claims because mom's name is Jones, dad's name
17 is Smith and they call the baby Smith, but the baby
18 is on the mother's insurance and so they don't
19 match

20 Q Sure

21 A So that's -- I don't know That's an
22 issue in our office, so -- but whatever the
23 insurance card says the name is on there is what
24 we're going to call the baby

25 Q Can you tell from your file what the

Page 20

1 insurance card was in this case? Is that what you
2 showed me a moment ago?

3 A That was it, yes

4 Q And that was a Medicaid card?

5 A That's it, a Medicaid card, and the
6 baby's name was Graves That's a copy of that

7 Q And which child's file was that
8 documented in? Asia, it looks like

9 A This is in Asia's record We try to
10 put one in all of them, however, when you have
11 triplets, having the mama fill the paper out three
12 times is kind of a pain

13 Q I can imagine

14 A There's not one in there

15 Q That tells me what I needed to know
16 I'm going to shift gears a little bit and talk
17 about Mrs Graves and the monitor She had a
18 monitor for each of the three triplets, is that
19 correct?

20 A That is correct

21 Q Before India died did Mrs Graves ever
22 mention to you having a problem with any of the
23 three apnea monitors?

24 A No The issue was the use of the apnea
25 monitor, not did they work or was there a problem,

1 or things like that, with the monitors, and we
2 didn't get anything in any of the reports from
3 Greenville that we had a malfunctioning monitor,
4 from the Children's Respiratory Center If we have
5 a malfunctioning monitor, we -- the report tells us
6 that -- and the reports are in her file -- and we
7 didn't have an issue

8 Q Did Ms Graves ever mention -- and you
9 may have covered this, but to be clear, after India
10 died did Ms Graves ever mention anything to you
11 about a problem with any of the monitors?

12 A No She called me on -- it was Easter
13 Sunday I remember exactly when it was

14 Q And you're talking about the day India
15 died?

16 A The day India died She called me
17 around noon, or a little after -- because we had
18 just gotten home from church and we were getting
19 ready to eat lunch I remember it clearly because
20 it was distressing to me She told me that India
21 had been seen by an Orangeburg pediatrician
22 Saturday morning and she was told that the baby had
23 a cold, and that she put the baby to bed and for
24 some reason she woke up and went into the room
25 where the baby was and found the baby gone And,

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1 of course, she was tearful -- and I have to admit I
2 was very tearful, you know -- and we talked for a
3 little while about, you know, the baby And the
4 main call -- the main purpose of her call to me was
5 to, A, of course, notify me of her death, but B is
6 that Mrs Graves did not want an autopsy done on
7 the child

8 Q Did she explain to you why she did not
9 want an autopsy?

10 A She felt like that the child had great
11 suffering in the NICU, multiple lines, lots of
12 sticks They are a very religious family and she
13 felt like the baby had suffered and that she did
14 not want anyone to cut her baby, I believe were
15 pretty much her exact words So I in turn called
16 Patsy Habben, who is the head of the children's
17 SLED -- which SLED immediately becomes involved --
18 I guess you know that -- with the death of any
19 child that dies at home -- and asked him to please
20 waive the autopsy Then I talked to the coroner in
21 Orangeburg, and the agreement was that if I would
22 sign, and of course put my medical license on the
23 line, that there was no foul play involved, that
24 this would be a SIDS death, and that -- and if I
25 would be willing to sign the death certificate,

1 the coroner I was pulling out people that were
2 personal friends to kind of honor the wishes of a
3 mother that had a dead child

4 Q Now, when you were talking to
5 Ms Graves, particularly the first time -- let's
6 focus on that call, midday on Easter Sunday -- did
7 she mention to you whether the monitor's audible
8 alarm had gone off?

9 A No There was no conversation on the
10 monitor at all I remember the conversation like
11 we were sitting here today She said she called --
12 she woke up for no reason -- and I really thought
13 the reason was the monitor alarm would be going
14 off -- she went into the room where the baby was
15 and found the baby dead

16 Q Did she --

17 A And then we talked about the fact she
18 had seen Dr Kilgore that morning and she was very
19 critical of Dr Kilgore -- you know, Dr Kilgore is
20 a very well respected pediatrician in Orangeburg
21 He's run the Orangeburg Health Center for many,
22 many years He is board certified -- and I told
23 her that if Dr Kilgore thought the baby had a
24 cold, then I would -- of course I would examine the
25 baby, but I would trust whatever Dr Kilgore said,

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1 that I didn't think the baby had pneumonia You
2 know, we talked about, you know, could there be
3 other things and that's how we then got onto the
4 subject of -- because the baby had reflux, was on
5 medicine for reflux Then she asked could I
6 intervene in some way to stop the autopsy or stop
7 from having an autopsy That's how that
8 conversation went on

9 Q But during that conversation she never
10 mentioned the monitor at all?

11 A Never mentioned the monitor at all

12 Q So specifically she never claimed at
13 that point that the monitor malfunctioned?

14 A No, sir

15 Q And you talked to her not that long
16 thereafter, when you found out that her family had
17 authorized the autopsy after all At that time,
18 did Mrs Graves indicate to you that she thought
19 the monitor had malfunctioned in any way?

20 A No She was grieving It was more a
21 supportive conversation She did not -- and in the
22 background, you know, you could hear wailing I
23 asked her did she want me to come to Orangeburg
24 She did not want me to come to Orangeburg We
25 talked about the other two children, you know,

1 that they would forgo an autopsy on the baby

2 I called her back She was very
3 appreciative Again we cried

4 Later on that day I received a call
5 back from the coroner with the preliminary autopsy
6 report, and I was very surprised I figured that
7 somewhere in this process -- because the state's
8 very clear on the need for children's autopsies
9 that have died at home to rule out wrongful death
10 and, you know, things like that He said that a
11 request had come from the grandfather of the child,
12 who is in the funeral business, to have an autopsy
13 and they just felt like with the circumstances
14 around the death at home that they should perform
15 an autopsy

16 So I called the mother back at that
17 time and talked to her Of course, everything was
18 preliminary and everything preliminarily looks like
19 it was a SIDS death, respiratory arrest, which
20 subsequently later on was confirmed with this
21 download, and she -- her exact words to me at that
22 point were, Yeah, my father felt like that we
23 needed an autopsy because when all this is over
24 we're going to sue somebody

25 Q When did you have that conversation

Page 24

1 with her? How long after the child died?

2 A Within the first 24 hours The first
3 day I talked to her multiple times I can't tell
4 you how many times I talked to her, but I talked to
5 her many times

6 Q Just so I'm clear, and the record is
7 clear, you talked to her about midday on Easter
8 Sunday, the day the child passed away, and you
9 talked to her for a while that day, but one thing
10 she told you was that she did not want an autopsy?

11 A That's correct

12 Q And was it later that same day that you
13 heard from the coroner with a preliminary result of
14 an autopsy?

15 A Right

16 Q And then you talked to her, when she
17 told you that her father had told her she needed
18 one because she was going to sue somebody, either
19 that day or the next day?

20 A Well, no She's -- I think the exact
21 words were, We may need to sue somebody over this,
22 or, We need an autopsy It was not necessarily
23 that day, but -- and that was very shocking
24 because, understand, I had made phone calls to
25 SLED, and it was Easter Sunday, and I had talked to

1 could this child have something contagious that
2 maybe the other two children could get I
3 suggested that they bring the children up to
4 Columbia the following day to be examined -- which
5 they did and they were fine We talked about those
6 kinds of issues, but the main thrust of the
7 conversation was that she had walked in and -- out
8 of her bed into another room and found the baby
9 deceased, which is a very awful situation for any
10 mother, so -- but specifically malfunctioning of
11 the monitor was not mentioned

12 Now, I honestly can't remember when I
13 called you in the situation I don't know if he
14 can --

15 Q No This is only you today

16 A We made a call to the monitor company
17 to get the download to, first of all, A, see if it
18 was on, it was being used, and, B, to see exactly
19 what happened at the event I honestly don't think
20 that that was on Sunday I think that was on
21 Monday I don't know I'm sorry But I can tell
22 you that within 24 hours I had this download in my
23 hands

24 Q Did you review the download at that
25 time?

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1 A Absolutely I had the hard copy
2 download before it went to Greenville

3 Q Okay And of course, we know it was
4 reviewed in Greenville by the doctor there as well,
5 Dr Gwinn

6 A I really think it was the next morning
7 I think it was the very next morning because we had
8 made immediate contact with the Ashby Medical I
9 really think it was that following morning Of
10 course, they had to get it downloaded, and then I
11 think at that meeting is when I learned that there
12 was questioned -- I'm sure of that now -- that
13 possibly the monitor malfunctioned

14 Q By, That meeting, you mean you had a
15 meeting with Ashby Medical, is that correct?

16 A I did

17 Q And you think that was the day after
18 the child died?

19 A I'm sure of that now

20 Q Who raised the issue that the monitor
21 perhaps malfunctioned?

22 A The monitor company The
23 representatives that were there from the monitor
24 company

25 Q Was that a suspicion or did they have

1 something they were pointing to to potentially
2 indicate that?

3 A I think they had been approached by the
4 parents that there was the possibility that the
5 monitor did not function properly, did not go off
6 when the child died, and what they were doing was,
7 because of the questioning of this, bringing me the
8 hard copy of the monitor to overlook And you
9 could see on the monitor strips -- you actually
10 watched the baby die You could see the apnea
11 event happening -- and every time the monitor
12 alarms, it puts a black dot on the strip

13 Q Were those black dots where they
14 belonged while the child was declining in health
15 while she died?

16 A They were So every time you get an
17 alarm, you get a dot And then as the QRS
18 complexes spread out and as the baby was dying, you
19 could see that the monitor was functioning
20 absolutely appropriately

21 I was actually surprised the monitor
22 was on

23 Q Why is that?

24 A Because there had been major compliance
25 issues with the family about using the monitors

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1 You've got to remember you've got three babies,
2 you've got three car seats, and all of a sudden
3 you've got three monitors that are in suitcases,
4 and anytime you go anywhere you have to take a semi
5 to move them anywhere, so it's very difficult for
6 anybody to keep all those things on all the time

7 Q That reminds me I want to go back to
8 something you said a little while ago You
9 mentioned that one of the grandmothers was a
10 primary caregiver for the children Which
11 grandmother was that, do you know?

12 A I don't know

13 Q You don't know whether it was the
14 father's mother or the mother's mother?

15 A I'm sorry, I don't

16 Q Let me show you pages 1 and 2 --
17 they're marked, actually, Children's Respiratory
18 Center 0004 and 0005 -- and get you to tell us what
19 that is and what it shows

20 A Well, it shows that --

21 Q Before you do that, let me ask you, is
22 that part of the download from India Graves'
23 monitor on the night she died?

24 A Yes, it is Yes, this is it Well,
25 first of all, the first thing that this particular

1 thing tells you is that the monitor is not being
2 used appropriately because it has a low battery I
3 mean the machine is telling you that On 4/1 it
4 tells you Battery getting low On 4/1 Battery
5 very low -- and the machine is telling the parents
6 that, too, through lights You can just see that
7 starting on 4/1 through -- I have brand-new
8 glasses -- 4/10 there are just all these notes
9 throughout this download that says, Battery getting
10 low, Battery very low, which tells you that the
11 monitor is not being charged and maintained like
12 it's supposed to be by the family, and then the
13 event, of course, showing the slow heart rate and
14 the apnea, and then, of course, the monitor being
15 turned off at 2 50 a m

16 Q And that was the night of the 13th and
17 14th of April, is that correct?

18 A That is correct, but you may find some
19 issues with the dates I believe that's addressed
20 in your -- with the daylight savings time

21 Q Right She indicated that the clock
22 had not been -- she, Dr Gwinn, indicated that the
23 clock had not been reset to daylight savings time

24 MR TODD I think it's April 11th and
25 12th

Page 32

1 MR DUBOSE It's the 11th and 12th?

2 Okay

3 THE WITNESS It's the 11th and the
4 12th, and there are some time issues because of
5 daylight savings time But none of that is
6 important from this download What is important is
7 the issue of compliance, which is -- for me to say
8 that mama's telling me, I'm not using the monitors,
9 they're cumbersome, and I'm getting the downloads
10 that say, You're not using the monitors, you need
11 to use them -- but when you get a report like this,
12 this demonstrates that you're not using the
13 monitors because they're not being charged, the
14 batteries are low -- and this is not in one
15 particular incident on one day This is -- just in
16 this week there are eight references to low
17 batteries, and it also shows the monitor being cut
18 on and being cut off and lapses of time where the
19 monitor is not being used

20 Now, just so you know this, when you
21 turn the monitor off, there -- you cannot
22 accidentally turn the monitor off There is a
23 series of controls where you have to hold two
24 buttons down, it makes a piercing, loud sound, and
25 then you have to subsequently push another button

1 again to turn it off So there's a failsafe In
2 other words, you can't take the monitor and bump up
3 against the chair and it turns off, there's a
4 mechanism by which you have to turn -- and if the
5 monitor is still on and not connected to the baby,
6 it would sound as apnea and it's reported here as
7 loose leads That's what loose leads means, the
8 baby, for some reason, is not connected to the
9 monitor

10 BY MR DUBOSE

11 Q The wires are not hooked up tight?

12 A Right

13 Q Let me turn your attention to Bates
14 number 0005, the second page of this report, and
15 direct you to the area at about Item Number 51,
16 where it begins with a heart slow and then various
17 apnea and heart slow event Does it show the
18 length of time that each event occurred?

19 A Yes

20 Q And that's the very last column on the
21 right, is that correct, the time length?

22 A That's going to be the time length of
23 the -- the duration that this happened, yes

24 Q And before that there is another column
25 that in some places is blank but in other places

Page 34

1 there is a column of asterisks

2 A That's correct

3 Q Do you know what that column of
4 asterisks represents or what each individual one
5 represents?

6 A That's the monitor alarming

7 Q Is that an indication that the alarm
8 actually went off?

9 A Yes, it is

10 Q For each of the events that India
11 Graves underwent from what is shown on here as
12 1 39 56 a m forward until the alarm or the monitor
13 was cut off, does the report show that the audible
14 alarm sounded?

15 A It does

16 Q Is that true for each event that the
17 child underwent?

18 A That is You'll also find that printed
19 on the strips There's a black

20 Q Let me show you another part of this
21 same report that shows what appear to be
22 electrocardiographs

23 A These are monitor alarms

24 Q Is that under the heading Alarm
25 Activity?

1 A I don't know Yes, it is under the
2 heading Alarm Activity

3 Q And the black vertical bars you're
4 referring to show that the alarm actually went off?

5 A The alarm went off

6 Q I know you've looked at these in the
7 past, and please refresh your memory if you need
8 to, but for India Graves, during the period we're
9 talking about, when she went through about a two or
10 three hour decline ultimately leading to her death,
11 did these documents also show that the alarm went
12 off on every occasion?

13 A The documents show that the alarms went
14 off -- I'm not sure I understand your question

15 Q I used the word occasion and that
16 probably wasn't the right word Each event --

17 A In each event the alarmed sounded,
18 that's correct

19 Q Did you ever talk to Mrs Graves about
20 the fact that the alarm went off and whether she
21 had responded to the alarm that night or not?

22 A No I told Mrs Graves when we talked
23 that the monitor -- that I had reviewed the monitor
24 personally, that I'd had the monitor
25 representatives in my office, I had seen the

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1 report, and that the monitor functioned perfectly
2 And I recommended to the monitor company that they
3 take that monitor and lock it in a safe in their
4 office

5 Q I take it you were satisfied after
6 looking at the report that monitor malfunction was
7 not the issue here?

8 A It was not And one of the things that
9 we agreed on is that the monitor would go to a
10 testing facility and be tested that it worked, in
11 other words, that if you had an apnea event that
12 the thing would actually go off

13 Q The audible alarm would go off?

14 A The audible alarm would go off

15 Q And did you hear of any results of the
16 that testing, or was that --

17 A I was reported back from the monitor
18 company that the testing had been completed, that
19 that had already been initiated without request
20 And the reason that I thought the monitor ought to
21 be locked in the safe is because I didn't want
22 anybody to say that somebody had switched out the
23 monitor or, you know, they had taken a faulty one
24 and thrown it away You know, this had to be
25 really proven that this was her monitor Which it

1 was It was tested It did work

2 Q That's what you were told?

3 A That's what I was told

4 Q Did you see physical test results?

5 A No And I wouldn't be able to That's
6 not my realm

7 Q Did Mrs Graves respond to you on the
8 issue of the monitor when you told her you had
9 looked at the download and it indicated that the
10 monitor operated properly?

11 A No It was still, again, a very
12 emotional time No, there was no doubting or -- I
13 just presented it as a statement of fact, the
14 monitor functioned properly We've had it tested
15 and I want you to know that

16 Q And she didn't comment on it one way or
17 the other?

18 A No, sir

19 MR DUBOSE Before we go any further,
20 I'm going to mark these pages from the Children's
21 Respiratory Center Report as Exhibit 2

22 (DEF EXH 2, EXCERPT FROM THE REPORT
23 FROM CHILDREN'S RESPIRATORY CENTER, BATES STAMPED
24 0005 AND 0004, marked for identification)
25

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1 BY MR DUBOSE

2 Q It looked like, going through your
3 records, that SLED contacted you for a copy of your
4 file on the child, or a part of your file?

5 A That's an absolute within -- I think
6 the date will be on the SLED note, 4/22, so -- they
7 send a subpoena for every child that dies SLED
8 has an intensive child death center, I guess -- I
9 don't know the exact name of it -- where any child
10 that dies at home, they immediately investigate
11 I'm not sure, but that might even be a state law
12 They come into your office with a subpoena, they
13 verify your records, your records are copied, you
14 turn them over to them It's very standard of
15 care It's a whole division of SLED

16 Q So there was nothing unusual about this
17 child's death that triggered that, that's what they
18 do in every child death?

19 A Any child that dies at home, that
20 happens I don't know the age cutoff on it, but I
21 think it's 16

22 Q Without considering the monitor for a
23 moment and just taking the child's condition that
24 night that she passed away, is there anything
25 unusual, given her age and health, about the way

1 she passed away?

2 A I don't think so She died from what
3 would be a common complication of prematurity,
4 which is apnea She had been seen by a reputable
5 physician just that morning and so I think that you
6 would call that an act of God I was convinced it
7 was not an act of neglect on the mother's part I
8 was also convinced from knowing these two parents
9 that there would have been no foul play involved,
10 that neither parent would have harmed the children
11 and so that is why I had no problem in recommending
12 that an autopsy not be done

13 Q And the diagnosis for the postmortem
14 was Sudden Infant Death Syndrome?

15 A Well, apnea, which is Sudden Infant
16 Death Syndrome Sudden Infant Death Syndrome is a
17 syndrome that no one actually knows what causes it,
18 it could be reflux or apnea The word syndrome
19 means no specific cause of death

20 Q But that fits in with what you believe
21 happened to the child?

22 A It does There was in no way that I
23 thought that any type of foul play would have been
24 involved with these two parents I'm absolutely
25 sure of that

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1 Q You mentioned that when she talked to
2 you at around noon on Easter Sunday, the day the
3 child died, that she told you she had gone into
4 another room where the children were sleeping,
5 where these triplets were

6 A Correct

7 Q And that is something that you remember
8 very clearly, her telling you that?

9 A Very clearly

10 Q Did you have an understanding
11 independent of that of the sleeping arrangements
12 between her and the children?

13 A I don't know My standard
14 recommendation for triplets is that you swaddle
15 them and put them in the same crib so that they
16 touch They seem to sleep a whole lot better that
17 way I can just tell you that's what I recommend

18 Q Can you do that with kids on monitors
19 like this?

20 A Absolutely

21 Q But you don't recall talking with her
22 about what practice she actually followed?

23 A I don't

24 Q How are the other two children doing
25 last you heard? Did they have any questionable

1 incidents in their history?

2 A Yes After India died -- you have to
3 understand that reflux can be a cause of apnea If
4 you throw up stomach contents into your larynx, you
5 can irritate it and you can actually become apneic,
6 like a choking episode, and stop breathing and
7 trigger reflux One of the other children had
8 very, very significant reflux, and that child's
9 name was Asia, A-s-i-a, and I was very concerned
10 about the fact -- and they were on -- this child
11 was on Zantac and Reglan, which are two medicines
12 for managing reflux, and the reflux seemed to be
13 getting worse, so we got a surgical opinion about
14 operating on Asia

15 After she had been admitted -- we
16 admitted her to the hospital because her monitor
17 was going off all the time, she was having multiple
18 monitor alarms -- this is Asia We had them
19 documented, we knew they were going off, so I put
20 her in the hospital, put her into a monitored bed
21 situation, and she was absolutely having apnea
22 secondary to her reflux There was no question
23 about that We had a PH study done, which is a
24 tube that's placed down the nose that sits in the
25 esophagus, and every time acid comes up out of the

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1 stomach and hits the probe it tells us, you know,
2 how many apnea events -- I mean how many reflux
3 events happened and how severe it is, and we noted
4 that this child's reflux went all the way up to the
5 thoracic inlet, which is terribly, terribly severe

6 We recommended surgery by Dr Glasser
7 Dr Glasser saw the child in consult and the
8 surgery was to be the following day The mother
9 called our office and said that -- again I talked
10 to her for a very long time She did not want a
11 procedure done to the child She thought the
12 children had suffered enough She had lost a
13 child They were going to go to the Medical
14 University of South Carolina in Charleston, where
15 she had been a patient before She enjoyed her
16 care there She knew a lot of people there She
17 felt very comfortable there and she had an
18 appointment in 48 hours for this child to be seen
19 there

20 I called the Medical University to
21 verify the appointment and to talk to the surgeon
22 that was going to see the baby in consultation and
23 they had no appointment made for the child

24 I finally got the mother around ten
25 o'clock at night and she stated that her husband

1 had made the appointment and that it was going to
2 be the following day at the Medical University
3 She would talk to him -- he was at church --
4 because she didn't know who the doctor was

5 The following day she called me back
6 and told me the appointment was with Robyn Hatley
7 I went to the Medical University and I had never
8 heard of Robyn Hatley She asked me to fax the
9 information to him I called the Medical
10 University, I looked him up in the book, and I
11 found out that he was not a surgeon at the Medical
12 University of South Carolina I subsequently
13 called the mother back and she said, no, she wasn't
14 sure where he was She called me back and she told
15 me that he was in Augusta So I actually called
16 him on the telephone and I talked to him

17 The mother told me at that time she was
18 in favor of the surgery, but the daddy had
19 significant problems with the surgery and they just
20 needed to go get another opinion They went -- and
21 I talked to him at great length He felt this
22 child needed the surgery So we had an opinion
23 from the University of South Carolina School of
24 Medicine, Dr Glasser, a pediatric surgeon, we had
25 an opinion from Dr Robyn Hatley from the

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1 University of Georgia that the baby needed the
2 surgery

3 The surgery was actually scheduled by
4 Dr Glasser in Columbia and the mother called and
5 canceled the surgery We then had a partner
6 meeting about this, already going through a death
7 with this family, and we felt that with an opinion
8 from the University of Georgia and an opinion from
9 the Medical University that we could no longer
10 provide care for these children, so we notified the
11 mother that we would not care for them anymore I
12 called Dr Kilgore on the telephone and he accepted
13 the children in transfer, and that was the end of
14 our involvement

15 Q And you have provided us -- and I know
16 you're looking at it in your file -- a memo of
17 June 16, 2004 that's reflective of what you just
18 testified to

19 A Well, this memo was written prior to
20 getting the opinion from the Medical University of
21 Georgia, but that subsequently came

22 MR DUBOSE I'm going to mark that
23 memo as our next exhibit, please

24 (DEF EXH 3, DICTATED NOTE BY C GUY
25 CASTLES, III, M D , FAAP FOR THE CHART OF ASIA

1 GRAVES, DATED JUNE 16, 2004, marked for
2 identification)

3 THE WITNESS Now, remember that is
4 from Asia

5 BY MR DUBOSE

6 Q Correct And I think you have her name
7 at the top of it For the chart of Asia Graves

8 A Right That took place July 12, 2004

9 Q What took place on that date?

10 A That's when we dismissed them from our
11 practice

12 Q Dr Castles, is it the practice of your
13 office to record if a call in from a patient
14 needing advice, for example, if they're out of town
15 and unable to bring the children into your office?

16 A No, sir, it is not Between midnight
17 and 6 00 a m if a call comes, it goes into our
18 service where it is actually logged in and the
19 mother's verbatim transcription is printed, but
20 that is only between 12 00 midnight and 6 00 a m

21 Q During regular office hours you
22 wouldn't keep a memo of that type of call?

23 A No We give telephone advice to
24 hundreds of people every day The conversation
25 that I had with Mrs Graves, for example, I

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1 remember I was sitting on my patio at home on
2 Easter Sunday and there is no transcription of
3 that

4 Q Sure Were these children on any type
5 of travel restriction during the time right before
6 India died?

7 A Not as far as I was concerned Once
8 you've had your shots at two and four months, you
9 feel like those children are pretty safe to be in
10 the community It was also the summertime Babies
11 are a lot healthier in the summer than they are in
12 the winter

13 MR DUBOSE Dr Castles, I don't think
14 I have anything further right now I'm sure these
15 other lawyers have a few questions for you as well

16 EXAMINATION

17 BY MR TODD

18 Q Dr Castles, I'm Monty Todd We know
19 each other from having children who are the same
20 age and various other reasons One thing is, we
21 deposed Dr Gwinn, who is with Children's
22 Respiratory Center, and questioned her about her
23 download and interpretation of the monitor, but I
24 think you indicated you have triplets yourself so
25 you probably have some firsthand experience with

1 using monitors Do you know what brand monitor you
2 used when you had your triplets? I guess that was
3 seven or eight years ago, or more

4 A You know, I have no idea I can tell
5 you how monitors are chosen

6 Q All right

7 A Monitors are chosen by your insurance
8 company For example, I have Carolina Care Plan,
9 and if I wanted to have a monitor for myself, then
10 we would call the insurance company and ask them
11 who provides their DME, designated medical
12 equipment -- which an apnea monitor would be one --
13 and then they would give us a list of companies
14 And they are not all in Columbia Some of them
15 operate out of Orangeburg, and we've got one we
16 have to use that's actually out of Spartanburg
17 Those would be nebulizers, apnea monitors, any kind
18 of durable medical equipment

19 There are several of those companies
20 that we have relationships with Ashby Medical is
21 actually one of them, although we did not pick them
22 to do this monitor In other words, you kind of
23 know who gives you good service and who is going to
24 take care of the patient and if the thing breaks at
25 two o'clock in the morning, they're going to take

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1 another one out, that kind of thing

2 So we're given the choice of usually
3 two or three companies that provide durable medical
4 equipment and then we send them an order, and the
5 order would read apnea monitor with the settings,
6 and that would be it

7 Q Is Ashby Medical one of the companies
8 that you're comfortable using when you have a
9 choice?

10 A Absolutely

11 Q And it's a company that, you know, you
12 would recommend to one of your patients or to a
13 mother or a father?

14 A Yes And we do We do all the time

15 Q Now, one of the things you said is that
16 you can't turn these apnea monitors off by
17 accident, it takes a deliberate, conscious act to
18 turn off the apnea monitor

19 A Correct

20 Q Now, when you're getting these
21 readouts, and I think I've got a copy of what
22 you're looking at -- actually, there are page
23 numbers on them at the bottom of the page that have
24 been put on there by lawyers They're Children's
25 Respiratory Center 00050 through, I think, 109

1 When the monitor is downloaded, it contains a
2 number of data I'm looking at it and it has pulse
3 rate, O2 sat, heart rate, respirations and the QRS
4 The QRS, is that the heart beat?

5 A That would be the heart beat

6 Q You know, on television we see monitors
7 and they're going beep, beep, beep -- and then a
8 flat line, of course, is a bad thing?

9 A That's correct

10 Q Now, of course, this computer on the
11 monitor kept a record of the QRS, or the heart
12 beat?

13 A Yes, sir

14 Q And it's recording it and showing it?

15 A Right

16 Q Now, if you look at this, I guess --
17 and I don't know how much of this download you got
18 when you reviewed it, but you can look and you can
19 tell whether or not any kind of cardiac
20 resuscitation, or CPR, was done by looking at these
21 things Is that something you can look at and
22 tell, or is that beyond your comfort area?

23 A That is beyond my comfort area I
24 don't see how the monitor would tell you that,
25 quite frankly, except that the heart rate would

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1 pick back up But I think to do full CPR, the
2 first thing I'd have to do is take the monitor off
3 Remember, it's a belt strapped around the baby If
4 you're going to do chest compressions, you can't do
5 that with the belt on You've got to take that
6 off You wouldn't turn the monitor off, you'd just
7 rip the belt off I mean, that's how I would
8 approach it, you know

9 Q Well, the parents testified that they
10 did CPR and they never turned the monitor off,
11 which is why I was asking the question

12 A Well, if you were doing appropriate CPR
13 you would see the heart rate pick back up and you
14 would see the respiratory rate pick back up on the
15 monitor The monitor should pick up that you're
16 doing chest compressions, so that should show as a
17 respiratory effort by the baby Of course, it's
18 being made by an external stimuli, but it should
19 demonstrate it

20 Q If Dr Gwinn at the Children's
21 Respiratory said -- you know, she looked at it and
22 said there was no indication that any kind of CPR
23 was done, would you have any reason to disagree
24 with her interpretation of that?

25 MR FULTON Object to the form of the

1 question

2 BY MR TODD

3 Q Would you defer to her interpretation?

4 A I would

5 MR TODD That's all I have

6 THE WITNESS I don't think that

7 there -- you know, when I was talking to the mom on

8 the phone the next day, her story to me was, I went

9 into the room and found the baby dead, not any

10 details of, you know, we did mouth-to-mouth

11 resuscitation, we did chest compressions, things

12 like that I think at that point we were in a

13 conversation that would have led to that I think

14 she described the baby as cold, I believe

15 MR TODD Thank you

16 MR BESLEY Let's take a two minute

17 break

18 (A recess transpired)

19 EXAMINATION

20 BY MR BESLEY

21 Q I just have a couple questions,

22 Dr Castles My name is Bill Besley, and I

23 represent Ashby Medical in this lawsuit I have a

24 couple questions for you After this baby's death,

25 you continued to see the other two babies, the

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1 other two triplets, until sometime in July, is that
2 correct?

3 A That is correct

4 Q Is it your understanding that the other
5 two babies were on the same exact type monitor as
6 the monitor that was being used for India Graves?

7 A Yeah They were identical monitors,
8 because they were labeled

9 Q Are you aware of any problems
10 whatsoever with the other two monitors or their
11 usage with the other two babies?

12 A No

13 Q Do you in your medical practice still
14 continue to utilize Ashby Medical for monitors, or
15 would that -- what used to be the company known as
16 Ashby Medical?

17 A Yes It's now Longs I have complete
18 confidence in this monitor, and we have -- and in
19 the company, and we continue to have children that
20 are on the monitors, receiving the exact same
21 services We did not alter our ordering of
22 monitors and our companies, et cetera, because of
23 the death of this child because I believe that this
24 monitor functioned appropriately

25 MR BESLEY That's all I have Thank

1 you

2 EXAMINATION

3 BY MR FULTON

4 Q Doctor, my name is Gene Fulton, and I
5 just have a few follow-up questions I was jotting
6 down some notes and I put little checkmarks near
7 some things that I just want to clarify for myself,
8 so these may not be in any certain order I'll
9 just go through them You mentioned that with
10 babies like these three that we've been discussing
11 today that the apnea takes, I think your words
12 were, six, seven, eight months to go away, in that
13 range?

14 A You expect the baby to have outgrown
15 the apnea with brain maturity by at least eight
16 months Most monitors are coming off in the six
17 months range

18 Q And even though these are premature
19 babies, you're talking about six, seven, eight
20 months from birth?

21 A From birth, right You have to
22 remember, a nine month old is crawling, and
23 crawling and dragging a monitor is not a good
24 thing

25 Q What are the different things that will

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1 make the monitors like the ones that those triplets
2 had sound an alarm? What are the different things
3 that would cause an alarm to sound? Breathing
4 frequency?

5 A When the breathing slows There are
6 true apneas and there are alarmed apneas, meaning
7 that if the baby just slowed the respiratory effort
8 with shallow breathing the monitor would alarm
9 The only way to know whether that was a true alarm
10 is to look at the download

11 Q The rest of the data that's coming in
12 from the other systems?

13 A Right, what's in the hard drive But
14 if the monitor's going to go off, most of the time
15 you get by with thumping the baby on the foot and
16 kind of waking the baby up and the baby starts
17 breathing, stops the shallow breathing and starts
18 into a deep breathing pattern

19 Q So the breathing pattern can do an
20 alarm What else?

21 A Heart rate, either fast or slow, and
22 then not being connected to the machine, that would
23 be a loose lead, the thing slipped And again, at
24 each one of those events the first thing you do is
25 look at the baby If the baby's pink and happy,

1 then you look at is the cord plugged in, is the
2 belt in the right place

3 Q Now, based upon your knowledge of these
4 monitors, are there other things that will sound an
5 alarm besides those three things? For instance,
6 you mentioned some low battery readouts Is there
7 an audible alarm for that?

8 A I'm not sure if there's a light on it
9 for sure If there's a light that comes on and
10 whether as time passes it beeps or not, I don't
11 know

12 Q Do you know, if the battery ran out
13 completely and it just plain stopped working, would
14 there be an audible alarm?

15 A I don't know If you ever see one of
16 these things, it looks like something off an
17 aircraft It's got all these lights and things and
18 it's very visual So if it's not hooked up
19 properly and you're getting alarms -- and the
20 machine will tell the parent at home -- for
21 example, if it beeped, you can go to the machine
22 and either the heart rate or the apnea light will
23 be on, one of the two When I tell mom to worry,
24 and when we actually need to see the baby, is when
25 both lights are on That really tells me that you

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1 probably really did have an apnea event, because
2 when you quit breathing eventually your heart
3 starts to slow So if you get both lights, we need
4 the baby

5 Q Now, as far as any other audible
6 signals, are there any others of which you're aware
7 that we haven't discussed?

8 A Turning the machine off

9 Q And you mentioned a kind of a loud
10 shriek that really alerts strongly to that?

11 A When they turn those monitors off in
12 the office -- and I think there's like maybe a
13 little calm beep when it comes on just to kind of
14 let you know that it's on, but you're very aware
15 that it's on because all the lights are flashing
16 There's a light on the front of it that every time
17 the heart beats, you're getting a light It
18 doesn't do that with breathing, but there's a -- on
19 the thing there's just a little pulsating light
20 every time the heart beats, so you know it was on,
21 and you know that you've turned it off because it's
22 complicated to turn it off I've actually had to
23 call the company to find out how to turn one off,
24 because they're all a little different in the
25 sequence of steps to do that

1 Q Do you know if the equipment is
2 designed to have any kind of audible alarm in the
3 case of some kind of malfunction in the equipment
4 itself?

5 MR TODD Objection

6 THE WITNESS I don't know

7 BY MR FULTON

8 Q For instance, if the audible function
9 of the monitor were to have a malfunction so as it
10 would not sound the next time it was supposed to,
11 do you know if the monitors had any way to alert
12 the user of that malfunction?

13 A I do not know that, but I do know that
14 the same alert that goes off on the monitor when
15 you turn the machine off, that same horrible beep,
16 is the same beep that you'd get when the baby had
17 an apnea, so I would think that when you turn the
18 machine off if you didn't get that beep, it would
19 make you worry that -- do you see what I'm saying,
20 that when the apnea -- because it's the same noise

21 Q But if you weren't, say, turning it off
22 to notice that that sound wasn't there or turning
23 it on and somehow noticing that the sound wasn't
24 there when it came on, just if it was left on, do
25 you know of any alarms that were designed to make

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1 an audible sound to indicate some kind of
2 malfunction with the machine itself?

3 A I don't know

4 Q And you can set the alarms for
5 different heart rates and different breathing
6 intervals, is that correct?

7 A No You can only set the heart rate
8 The breathing interval is 20 seconds That is --
9 except on the machine it's going to be ten seconds,
10 but a true apneic event is 20 seconds, and I can't
11 change that setting The setting that we commonly
12 change is the heart rate setting because as the
13 baby gets older you have to lower the heart rate
14 setting, but not the timing on the apnea And I've
15 never -- if you can change it, I've never changed
16 it and I wouldn't change that one That's the
17 important one I think the machine beeps at 10
18 seconds, but a true apnea is 20 seconds

19 Q When you were reviewing with Mr DuBose
20 some of the results of the download earlier on the
21 tracer strip you indicated that there was a mark
22 which indicated where the alarm was supposed to
23 have gone off and on the sheets -- I think they
24 were 003, or 004 and 005 -- there were asterisks
25 Do you know from a technical standpoint -- and you

1 may not -- from an electronic or technical
2 standpoint, if there was a malfunction of the
3 machine wherein the machine would not sound the
4 audible note yet the electronic readings were still
5 there, do you know if the mark could still be made
6 if the alarm didn't actually sound?

7 A I do not know that, but I questioned
8 that That is why this monitor got sent to be
9 tested, to make sure that when the alarm went off
10 that it got a mark, and when the machine was tested
11 it was functioning properly

12 Q In other words, your understanding is
13 that when it was tested, at the places where an
14 alarm was marked or indicated at the machine an
15 actual audible sound sounded?

16 A That's correct

17 Q And you were told that by?

18 A Ashby The company

19 Q And whoever told you indicated that
20 that's what they were told by the testing company?

21 A Yes

22 Q Or was it the company itself that did
23 the testing?

24 A I don't know I know that we discussed
25 that the monitor needed to be tested -- that was

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1 already in place by the time we had even requested
2 that -- and we were told that the monitor
3 functioned perfectly, and that, to my knowledge,
4 was prior to any litigation or anything coming up
5 This was fresh when we had just had a death The
6 first question is What's the deal on the monitor?

7 Q When you were told about the results of
8 the testing that you just discussed, did you see
9 any paperwork about that or you were simply just
10 told about it?

11 A I was just told about it The
12 paperwork that I had was the comprehensive download
13 at the time of the death, and that was actually
14 what was brought very quickly to my office

15 Q And I believe I remember you saying
16 that you had a very high level of confidence in
17 Dr Kilgore and his abilities

18 A Yes

19 Q And you don't have any reason to
20 believe that his assessment and diagnosis of India
21 on that day before was incorrect, do you?

22 A No, I don't

23 Q Is it your opinion, to a reasonable
24 degree of medical certainty, that relatively
25 speaking to India's age and size and her life

1 condition that her health was generally good before
2 the event that took her life?

3 A Well, good is a limited term You have
4 a four month old that has significant reflux that
5 she was on appropriate medicines for, she has
6 abnormal brain development because she has apnea,
7 she had a stage two retinopathy of prematurity --
8 stage zero is none, stage four is you're blind A
9 stage two child usually does generally well with
10 her vision She had the normal complications of a
11 28 week old baby further complicated by the fact
12 that she was a triplet Now, what I would consider
13 myself is an expert in triplets We know that
14 those babies -- if you had a single baby at 28
15 weeks, they do better than a multiple set of babies
16 at 28 weeks

17 Q You're talking about just from a
18 statistical standpoint?

19 A Just from a statistical point of view
20 So I would say that for being a 28 week baby, she
21 was doing well, however, I think she had
22 significant complications that only God would know
23 how they would pan out Would she be able to learn
24 in school, how significantly was her brain, you
25 know, injured, you know, would it mature

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1 appropriately

2 We are the most blessed family because
3 our children have matured and learned Maybe they
4 do have a little physical handicap, but they are
5 functionally normal ten year olds You can't make
6 that statement in a four month old baby I tell
7 parents routinely it's about three or four years
8 before you can make that statement That's when
9 they have an ability to learn kind of what their
10 cognitive development is

11 You don't know whether this child was
12 going to have cerebral palsy or any of those other
13 kinds of deficits that are very common in 28 week
14 births I don't -- I think I can say that she was
15 in good health with her complications, but to speak
16 on vision and brain maturity and ability to learn
17 and those kinds of things -- we know that her heart
18 was normal, we know that her lungs were normal, we
19 know all those things, but I don't think you can
20 say that she would be in the good health that a
21 term, single, four month old baby would be in

22 Q And with that understanding, though,
23 relative to other early babies, other triplets

24 A She was doing well

25 Q Would you agree with me that, more

1 probably than not, had the apneic event which took
2 her life not occurred, there was nothing in her
3 health picture that was likely to have taken her
4 life?

5 A No Or yes, I agree with your
6 statement

7 Q You agree with that

8 A And I think that that's backed up, too,
9 by the fact that I had seen her about a week before
10 and she was gaining weight, and that Dr Kilgore
11 had seen her that morning That tells me that I
12 know she didn't have pneumonia Plus we have an
13 autopsy that says all those things too

14 Q If I may, I'd like to ask a few more
15 questions about your statement about -- I think you
16 termed it compliance issues with the family What
17 was your understanding of exactly what the pattern
18 of practice was in the family day after day with
19 monitor usage?

20 A I don't think there was one That
21 would be my understanding

22 Q That it changed from day to day?

23 A It changed from day to day The mother
24 would be very open with you that she needed help --
25 and you asked me whose mother it was and I would

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1 think, now that I'm talking to you, that it was her
2 mother -- but she was a big help When we talked
3 about the use of the monitors and the day in and
4 day out monitor care, she told me that the
5 grandmother who helped was actually afraid of the
6 monitors They're cumbersome, they're complicated,
7 she was an older lady, and then the fact that when
8 they were in her care they didn't use them because
9 she stayed -- and they spent the night with this
10 grandmother frequently, and when you have triplets,
11 you know, you need some help, you need that
12 nighttime person to kind of take a baby here and
13 there

14 But the grandmother would stay up all
15 night and watch the baby and then subsequently
16 wouldn't use the monitor Well, that might sound
17 good, but you and I both know ultimately that it's
18 physically impossible to actually watch a baby
19 breathe all night long, and that's where we shared
20 some -- not hostility, that's the wrong word, but
21 some direction You need to use the monitor even
22 if they're with grandma And I went as far as to
23 say if grandma couldn't use the monitor, grandma
24 couldn't keep the baby

25 Then, of course, we talked long and

1 hard about the fact that she needed help and that
2 this was -- and she did, that's correct, but the
3 babies were not in the care of grandma the night
4 that the baby died, so I'm not sure that that's
5 even an issue

6 Q Well, did you have an impression that
7 there were, again, to use your word, compliance
8 issues when the grandma was not involved, it was
9 just the parents?

10 A Yes Absolutely

11 Q So that would be other issues not
12 related to the grandmother?

13 A Correct

14 Q Tell me what your understanding was of
15 how that went

16 A You know, I'm doing the best I can do
17 I've got three other children, my husband is gone a
18 lot, I'm kind of by myself and -- and that's true

19 Q Is it your recollection and testimony
20 today that Mrs Graves admitted to you that there
21 were times that she wasn't using the monitor?

22 A That is definitely true And you
23 realize that that's documented by the downloads

24 Q What is your understanding of what I'll
25 call -- and I'll explain it more, if I need to

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1 What is your understanding of the chain of custody
2 of the monitor from the house to the company to the
3 testing site, if you have any?

4 A I think they sent a representative out
5 to the house to pick up the monitor and it was
6 immediately downloaded and I was provided with a
7 copy of the -- that happened so fast I really
8 believe that that happened

9 Q And I think you said you thought that
10 probably happened the next morning?

11 A You can look at the date on it

12 Q Right

13 A It wasn't a long time because we had
14 made phone calls -- they were in my office, I'm
15 sure, before lunch

16 Q Do you have any idea who from the
17 company went and did that?

18 A It may have been -- I don't know who
19 specifically did it, but it was not a flunky I
20 was thinking it was -- we had talked earlier that
21 morning and I knew that they had the monitor You
22 see, at that time the monitor was not at issue
23 The issue was all surrounding the death I wanted
24 the download and I wanted it right then, and that's
25 what was being provided to me It was not an issue

1 of the monitor didn't go off We were still in
2 shock of we had lost a baby

3 Q After the information was downloaded,
4 do you have any knowledge or understanding of what
5 the subsequent chain of custody of the machine was
6 going from wherever it was then to wherever it was
7 tested?

8 A My exact words to the gentleman that
9 brought it over were, This monitor needs to be
10 locked in your safe You know, we need -- because,
11 you see, at this point we had not had a SLED
12 investigation, we had not -- and that happens -- we
13 had not had a -- the coroner had a preliminary
14 report and those kinds of things, and a paranoia
15 from my point is that somebody is going to come
16 back and say mama killed this baby There is no
17 question that Mrs Graves was under incredible
18 stress from just the whole situation Living in
19 Orangeburg, traveling to Columbia to see a doctor,
20 you know, that whole kind of thing So always my
21 first thought in a death at home is, when I know
22 the family, we've got to protect mom and dad We
23 have to, and so -- and I think now in hindsight if
24 y'all or we or whoever has a different perspective
25 on -- what I wanted to know right then was there's

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1 no foul play involved You know, I'm basically
2 putting my reputation on the line for this family,
3 I'm talking to the coroner, SLED, all those kinds
4 of people, so I want to know that nothing happened
5 I want the download I want to see it I've got
6 to know that this was okay

7 Q So you made the suggestion right away
8 that you ought to really keep this monitor safe for
9 further evaluation?

10 A That's correct Because I felt like it
11 was -- I didn't think the machine was going to be
12 the problem I thought somebody was going to come
13 back and question a relative

14 Q Right So my question then is After
15 you said that and made that suggestion, do you know
16 if it was done?

17 A I was told at that time that it was
18 already done

19 Q So you were told it was done?

20 A Right

21 Q By that person that saw you that
22 morning?

23 A Yes

24 Q But you don't remember who it was?

25 A I'm sure it was Ernie Ashby and -- it

1 was the president of the company that was there

2 Q All right So you were told it was
3 done, but you don't necessarily have any personal
4 knowledge that it was done and that the machine
5 that was tested was tested without -- you don't
6 really have any personal knowledge that there was a
7 good chain of custody up until the test, do you?

8 A No, but that would be my

9 Q Right I believe you said that based
10 upon your review of the download sheets that it was
11 your opinion that when little India died that the
12 alarms did go off, is that correct?

13 A Yes

14 Q Okay And was your opinion based upon
15 your reading of those sheets and the noting of the
16 asterisks and the other marks on the strips?

17 A The specific things are the black bars
18 that are on the strips, that's correct

19 Q So if indeed there was a way for the
20 black marks on the strips and the asterisks to go
21 on the readout, but because of a technical
22 malfunction the alarm not actually sound, is it
23 true to assume that you wouldn't necessarily have
24 that opinion that the alarms actually audibly
25 sounded, is that correct?

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1 MR DUBOSE Object to the form You
2 can go ahead and answer

3 THE WITNESS I don't know I mean
4 BY MR FULTON

5 Q Your opinion is based upon the readout,
6 is that correct?

7 A That is correct

8 Q Okay So if the readout can somehow
9 indicate an alarm, but because of a technical
10 malfunction didn't sound, then it's possible that
11 even with the marks on the readout it might not
12 have audibly sounded, is that correct?

13 MR DUBOSE Objection to the form
14 You can go ahead and answer, Dr Castles

15 MR TODD Objection

16 THE WITNESS I guess so I mean, I
17 don't know That's definitely not my area I know
18 that I was brought the original copy We spread it
19 out over a very long table in our conference room,
20 I went through it heart beat by heart beat, looked
21 at each alarm, and like I said, in the 24 to 48
22 hours post death, I was convinced that the baby had
23 exactly what she did die from, a SIDS event or an
24 apnea event and that the monitor was functioning
25 perfectly

1 BY MR FULTON

2 Q Now, you also gave the opinion, I
3 believe, that you felt very confident that it was
4 not an act of neglect by the parents, is that
5 correct?

6 A Yes Act of harm by the parents In
7 other words, I don't think that the parents put a
8 pillow over the baby's face and suffocated the baby
9 or any of those horrible tragedies that you see on
10 TV I don't think the parents intentionally harmed
11 this baby I think this was an act of God She
12 stopped breathing

13 Q Do you believe that the alarms sounded
14 and the parent did not hear it?

15 A I do

16 Q Why do you think that happened?

17 A In the period of weeks coming up I
18 think the mother was overwhelmed When you saw mom
19 she just looked whipped, and I think that in the
20 times that I saw her the stress of having multiple
21 births and just the day in and day out -- you know,
22 we changed a hundred diapers one day in my house
23 That is an enormous chore We boiled 160 bottles
24 one day

25 Q So do you believe she was asleep?

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1 A I do And it is such labor intensive
2 work and there -- you don't hold -- and the way she
3 told me on the phone, she said, I woke up, went
4 into the room with the baby and she was dead The
5 only thing, that to me says -- and you know, when
6 you talk to mothers, mothers inherently wake up I
7 hear that all the time I woke up and the baby
8 hadn't gotten up to eat and I went and woke the
9 baby up and fed the baby I do think mothers just
10 kind of inherently wake up I was under the
11 distinct impression that the mother was probably
12 woken up by the -- I envision this This is me,
13 you know The monitor's going off, she got up and
14 went in the room and then discovered the situation,
15 turned the monitor off, you know, and discovered
16 the baby truly had passed away

17 Q Let me ask this Are the monitors
18 designed to keep sounding the alarm forever until
19 somebody --

20 A Until the battery wears out or until
21 you turn it off

22 Q So if indeed she had been asleep and
23 then woke up and went into the room, the monitor
24 would still be sounding an alarm, is that correct?

25 A That's correct The first thing you'd

1 do -- because it's so awful, the first thing I
2 would do is turn the monitor off

3 Q So if indeed she did go into the room
4 that night and there was no alarm sounding, that
5 would not be consistent with your understanding of
6 how the machine was supposed to work, is that
7 right?

8 A That's correct

9 MR DUBOSE Note my objection to the
10 form of that question, if you would Thank you
11 BY MR FULTON

12 Q Did you say you thought it was your
13 recollection that when you first spoke with her she
14 indicated that the baby was cold when she went in
15 there?

16 A Yeah It was -- we had a very long
17 conversation

18 Q Is that just the best recollection you
19 have?

20 A Just the best recollection I have It
21 was obvious to her when she went into the room that
22 the baby had passed

23 Q How long would it take the baby to get
24 cold under those circumstances?

25 A Not long In a very small four month

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1 old premature baby, I think they would be chilled
2 in an hour Maybe 30 minutes It would not be a
3 long time I'm sure there's somebody who could
4 give you real good data on that, but you remember,
5 this is a very small baby, and exposed to the cool
6 night air it wouldn't take long

7 Q I believe -- and correct me if I'm
8 wrong I just want to make sure I understand this
9 correctly I believe you answered that you did not
10 know whether the machine was designed to give an
11 audible alarm if there was a mechanical problem of
12 some sort with the machine, is that correct?

13 A That's correct

14 MR FULTON Those are all the
15 questions I have Thank you for being with us
16 today Some of these fellows may have some
17 follow-up questions I'm not sure

18 RE-EXAMINATION

19 BY MR DUBOSE

20 Q Dr Castles, I do want to talk to you
21 about one area a little bit more, and that would be
22 your observation of Mrs Graves' condition from
23 having to cope with having three babies to take
24 care of You saw her about every two weeks after
25 the children were let out of the hospital, is that

1 correct?

2 A That's correct Plus I was with her
3 during the -- after the death we hospitalized Asia

4 Q Right You spoke briefly about that
5 Could you elaborate on what you observed in her?

6 A Well, I think she was absolutely
7 exhausted I think -- I got the impression that
8 she was absolutely the primary caregiver, that her
9 husband was very involved in their church The
10 time that I tried to talk to them about the
11 misunderstanding about where the baby was going for
12 the second opinion, which turned out to be the
13 Medical University of Georgia and not the Medical
14 University of South Carolina, she -- when I was
15 talking to her at ten o'clock at night her husband
16 was still not at home because he was at church So
17 that says to me that she really was the primary
18 caregiver

19 We talked a lot about the fact that her
20 mother wouldn't use the -- I hate to say her
21 mother I'm not sure One of the grandmothers who
22 was helping her was afraid of the monitors, didn't
23 want to use them, so she chose to sit up at night
24 and watch them, and I just told her, you know, how
25 silly that was and that nobody could watch a baby

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1 like that And I do think that -- and some of that
2 might be just empathetic on my part, knowing what
3 you are like at four months -- and I think that's
4 why I'm selected to take care of a lot of these
5 triplets because I can empathize You are
6 absolutely very tired when they have been home this
7 length of time and so I don't think that is any
8 slanderous statement toward the mother I think
9 she was a normal mother of triplet babies

10 Q Which is inherently stressful and
11 fatiguing?

12 A Absolutely

13 MR DUBOSE I don't have anything
14 further Thank you

15 MR TODD No more questions

16 RE-EXAMINATION

17 BY MR FULTON

18 Q Doctor, you said that the shriek --
19 that the alarm when it goes off is a loud shriek,
20 is that right?

21 A It is very loud

22 Q Can you imagine sleeping through it, as
23 loud as it is?

24 A You know, I can't, but I can tell you
25 that my wife can sleep through our alarm clock and

1 I cannot imagine sleeping through that

2 Q But this is a shriek that's even louder
3 than an alarm clock, right?

4 A It's a loud noise, but I think if
5 you're tired enough you could sleep through it

6 Q Over all the years that you've been
7 working with these monitors and these babies, have
8 you had any other instances where a monitor has
9 malfunctioned in any other way?

10 MR TODD Objection

11 MR DUBOSE Object to the form You
12 can go ahead and answer, Dr Castles

13 THE WITNESS It's never been the
14 monitor, like the monitor didn't beep or a light
15 burned out, or something like that, it's been the
16 leads that connect the monitor to the baby It's
17 not unusual to have to replace the leads -- they
18 drag on the ground, they get frayed -- but the
19 machine is telling you Loose leads, loose leads
20 So if you say -- if you ask me for my opinion on
21 what's wrong with the monitor, it isn't the box,
22 it's the cable that connects to the baby to the
23 box It's not the instrument I've never had a
24 problem with any of those It's been the
25 connector

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1 BY MR FULTON

2 Q But your understanding is that if
3 there's ever a problem like that, it always gives
4 the loose lead alarm rather than just
5 malfunctioning and not working?

6 A Right, and it's printed on here
7 Everything is printed out When you turn it on and
8 turn it off, or you've got a loose lead, its
9 printed off on here

10 Q So over all the years you've never had
11 an instance where you thought a machine was just
12 not working and not sounding an alarm when it was
13 supposed to?

14 A No

15 Q Okay Was there any indication that
16 there was a lead problem that night with India?

17 A No In fact, as sad as it is, the
18 tracing is beautiful It is a -- you watch the
19 baby die on the leads It's incredibly sad, but --
20 and all that makes me think the monitor was working
21 as it should have been because the QRS complexes
22 are beautiful, they spread out, you can see the
23 baby self stim back up, you get rapid heart beat
24 and then you see it drop back off That is why I
25 personally have a problem with thinking that the

1 monitor is malfunctioning, because we have such
2 perfect strips and then, of course, the ultimate
3 death

4 Q Unless it was just a problem with the
5 actual audible part of it?

6 A Right And I would think you would
7 have noticed that, like I said, in turning it on
8 and turning it off And then one of the things --
9 you know, the testing said it worked You've got
10 to remember when a baby dies at home, the first
11 thing law enforcement looks at is the parents
12 I've had multiple situations where we've had this
13 happen at home -- not involving a monitor, but mama
14 has found her little girl dead -- and, you know,
15 you have to end up justifying to somebody that this
16 person did not harm her child That's the way our
17 society is set up So that was my first thought,
18 not all this other stuff This came later I
19 think that's important And I don't think that
20 this mother -- I have no doubt that the mother did
21 not harm this child

22 MR FULTON All right Well, thank
23 you, Doctor

24 (The deposition was concluded at 4 58
25 p m)

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1 CERTIFICATE OF REPORTER

2

3 I, Angela D Zuver, Court Reporter and
4 Notary Public for the State of South Carolina at
5 Large, do hereby certify that the foregoing
6 transcript, pages 1 through 82, is a true,
7 accurate, and complete record

8 I further certify that I am neither
9 related to nor counsel for any party to the cause
10 pending or interested in the events thereof

11 Witness my hand, I have hereunto
12 affixed my official seal this 14th day of June,
13 2007 at Lexington, Lexington County, South
14 Carolina

15

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18

Angela D Zuver, Court Reporter
My Commission expires
July 2, 2014

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I N D E X

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(No Information Requested)

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2 DEF EXH 3, DICTATED NOTE BY C GUY 44 24
3 CASTLES, III, M D , FAAP FOR THE CHART OF
4 ASIA GRAVES, DATED JUNE 16, 2004

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STATE OF SOUTH CAROLINA) IN THE COURT OF COMMON PLEAS
COUNTY OF RICHLAND) CIVIL ACTION NO 06-CP-40-7398
))
KAREEM J GRAVES and TARA)
GRAVES individually and)
as duly appointed)
personal representatives)
of the ESTATE OF INDIA)
IYANNA GRAVES)
Plaintiffs)
))
VS)
))
CAS MEDICAL SYSTEMS INC)
AMERICAN HEALTHCARE)
RESOURCES INC d/b/a)
ASHBY MEDICAL and STEVE)
M ELLIOTT or any)
business entity d/b/a)
ASHBY MEDICAL PALMETTO)
HEALTH RICHLAND MEMORIAL)
HOSPITAL and PALMETTO)
HEALTH ALLIANCE)
Defendants)

ORAL DEPOSITION OF
WALTER C DAUGHERITY
MAY 22 2008

ORAL DEPOSITION of WALTER C DAUGHERITY produced as
a witness at the instance of DEFENDANT CAS MEDICAL
SYSTEMS INC and duly sworn was taken in the
above-styled and numbered cause on Thursday MAY 22
2008 from 1 01 p m to 5 52 p m before Suzanne G
Saulsberry RPR CSR in and for the State of Texas
recorded by machine shorthand at the offices of
Hastings Law Firm P C 616 FM 1960 West Suite 725
Houston Texas pursuant to the South Carolina Rules of
Civil Procedure and the provisions stated on the record
or attached hereto the deposition shall be read and
signed before any notary public

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000824

1 A Yes, that's a good way to try to understand the
2 flow of control

3 Q Do you believe you could have done a job -- a
4 better job of drawing this diagram in a more linear
5 fashion?

6 A It can be cleaned up a little May I describe
7 the process by which I produced this?

8 Q Well, I'm not really as interested in that
9 right now as I am you telling me what you would clean up
10 if you did it again

11 A Oh, okay

12 There's one section right here, where all
13 of the right-hand exits from the diamonds go to the same
14 point, so I would squeeze those into being a single
15 line

16 But at the time I was drawing it, I
17 didn't I was doing this piece and I didn't know that
18 they all went to the same point, so this was a -- this
19 was a point in the process of trying to represent
20 pictorially what is in the code So I would take all of
21 these lines and make that a single line

22 Q So you would call this a first cut or a first
23 draft?

24 A Yes

25 Q At diagramming the code?

1 A Yes

2 Q Not a final draft?

3 A No No It s preliminary but it is accurate

4 for the portion of the code which I drew, that is,

5 each -- each item on this chart correctly reflects the

6 code

7 Q In other words, the lines go where they should

8 go?

9 A Right Right

10 Q Okay

11 A But this is not all of the -- this is not all

12 of the module

13 Q What is this -- I'm sorry Go ahead

14 A Excuse me

15 What I did was, I started off, this was

16 originally one piece of paper right here

17 Q You re referring to the upper right-hand

18 corner?

19 A The upper right corner So I started off at

20 the top and said, okay, where does that go, and looked

21 at the code, and then started drawing this piece And

22 then when I ran out of space, then I just taped on

23 another piece of paper to the upper left corner and

24 continued from the upper right corner to the upper left

25 corner And then when that ran out of space, I added

1 additional hours

2 Q And what are your charging per hour?

3 A \$250

4 Q How many cases have you been retained as an
5 expert witness in?

6 A This is the second

7 Here's a copy of the invoice dated
8 May 2008

9 Q Thank you

10 MR DuBOSE We'll go ahead and mark that
11 as the next exhibit

12 (Marked Daugherity Exhibit No 5)

13 Q (BY MR DuBOSE) Dr Daugherity, what have you
14 spent your time doing in this case?

15 A Reading depositions and thinking about how they
16 fit into the other information, such as the poster that
17 I prepared

18 Q Are there any more records that you plan on
19 looking at in the case?

20 A No, not unless they are presented to me for
21 examination

22 Q And are there any records that you've asked for
23 that you haven't been given?

24 A No

25 Q Are there any records that you know will be

1 forthcoming to you?

2 A No

3 Q Are you prepared today to give your complete

4 and final opinion in the case?

5 A Yes

6 Q What exactly were you retained to do in this

7 case?

8 A Examine the software code

9 Q In what context were you hired to examine the

10 software code?

11 A Dr Lively was initially engaged on the Smith

12 case and when he reached the point of investigating the

13 detailed assembly code, such as is on the CD and

14 printout, then he brought me into the case to do that in

15 more detail and depth while he focused on the

16 higher-level issues of overall software design, testing,

17 and maintenance

18 Q And do I understand it correctly that your

19 focal point is with the software itself?

20 A That's correct

21 Q And do your opinions go beyond that in this

22 case?

23 A Yes

24 Q Okay Well, we'll get to them one by one in a

25 minute, but I'm trying to understand the general --

1 A No

2 Q Have you asked for them?

3 A Yes

4 Q Who did you ask for that?

5 A I asked Mr Hastings, and he asked CAS Medical

6 They said they didn't have them

7 Q Did you ask Dr Lively?

8 A I don't remember

9 Q But as you sit here today, can you point me to

10 any line of code or communication between portions of

11 the code that is defective?

12 A Well it depends on the environment so if --

13 let's say for example, the environment in which this

14 module is functioning calls LED_alarm_tick with

15 interrupts on, then that calls alarm_tick The first

16 , , , to test for the very low battery condition If

17 that false, that is, it's not in a very low battery

18 condition, then it goes to the next test to see if the

19 alarm1_failed_flag has been set But if interrupts are

20 on, then it's possible that another external event could

21 interrupt the processing at this point so that it would

22 never complete the path and end up to the point -- let

23 me see -- to the point right here that would turn the

24 alarm on

25 So if the environment in which it's

1 operating had interrupts on and an external interrupt
2 occurred after it had entered this routine but before it
3 got to the alarm on point, then the alarm would fail to
4 sound

5 Q What type of external interrupt are you
6 referring to?

7 A Well, there are a number This is basically a
8 device that has an inverted flow of control, so the
9 computer itself does not - sorry -- the program itself
10 does not determine the order in which the modules are
11 executed, that's determined by the external inputs, such
12 as the power on/off button, the reset button, a signal
13 from the leads, that would be current that was passed
14 through the subject's body, there's a clock tick, when
15 the clock ticks, there's an internal Watchdog timer and
16 there's an external Watchdog timer

17 So all of these things are outside the
18 program's control, and the program has no way of knowing
19 what sequence or order any of those external events
20 will occur because they're asynchronous, or the length
21 of time between them

22 Q All right So if one of those -- all these
23 things on this monitor work together all the time, do
24 they not?

25 A I'm sorry?

1 motherboard

2 But most of them were alarm faults that a
3 condition arose where the alarm should have sounded and
4 it did not And so I would say, roughly 50 -- I
5 skimmed through, roughly, 50 reports of alarms failing
6 to sound

7 Q All right And you take those reports as
8 being -- every one of them being a valid complaint?

9 A I believe they were from CAS and the FDA I
10 have no reason to question them

11 Q Do you know whether the FDA -- these were all
12 medical device reports to the FDA is that correct?

13 A I think there was a combination of medical
14 device reports to the FDA and incident reports from the
15 service department at CAS Medical, logs that were
16 provided by dealers, so it was a collection of
17 information that, for simplicity, I would just call
18 alarm failure incident reports

19 Q And do you know whether any of those claimed
20 alarm failures were confirmed, other than ones involving
21 hardware?

22 A I don't recall

23 Q Are you relying on these reports as part of
24 your opinion?

25 A Yes

1 A There are none recorded here Version 14 and
2 are on the CD I could look at the CD and determine
3 that

4 Q Well the mere fact that there are later
5 versions would indicate that changes had been made,
6 would it not?

7 A Yes, but as I said, the changes that were
8 documented were only routine and cosmetic

9 Q What changes needed to be made that weren't
10 made Doctor?

11 A Changes to address the alarm failures

12 Q What would you change --

13 A Well, you first --

14 Q Let me finish my question, please I'm sorry
15 I did pause, but I do that sometimes

16 Doctor, within the code as written -- I
17 know you want to change the entire structure We don't
18 need to go down that path again -- within the code as
19 written, what change would you make to remedy that
20 problem, which I understand you haven't found?

21 MR WINSLOW Object to the form

22 A In order to remedy the problem of the alarm
23 failing to sound, you would first have to locate the
24 portion of the code responsible for those failures

25 Q (BY MR DuBOSE) And you have not done that?

1 have determined that I am defective because the front
2 alarm did not sound when I listened for it "

3 And then when the rear alarm is not heard,
4 either, then that's even more serious

5 Q Do you know whether it s possible, Doctor, to
6 throw a towel over the front of the alarm and make it so
7 the alarm does not sound loud enough for the microphone
8 to hear it?

9 A No the microphone is internal

10 Q I understand that

11 Putting a towel on the outside doesn't affect
12 the sound path from the beeper to the internal
13 microphone

14 Q Have you ever tested that?

15 A I'm sorry?

16 Q Have you ever tested that?

17 A Have I put a towel over the device?

18 Q To find out whether it would register front
19 alarm not heard?

20 A No

21 Q Have you tried putting Duct tape over the
22 little grille that the front alarm speaker or beeper
23 sounds through on the case of the unit to determine
24 whether that will muffle the alarm sufficiently so that
25 it cannot be heard by the unit?

1 A I haven't put Duct tape on it

2 But the alarm is so piercing that it would
3 be extremely difficult to muffle it And the sound path
4 to the microphone is internal, so even if you did put a
5 towel over the outside of the unit, that wouldn't affect
6 the microphone's listening inside

7 Q You haven't tested it, have you, Doctor?

8 A No, I haven't put a towel on it

9 Q You don't know whether you're correct or not
10 do you?

11 MR WINSLOW Object to the form

12 A It is so piercing that a towel would not
13 sufficiently attenuate the sound

14 Because if I put a towel over my head, I
15 can still hear you

16 Q (BY MR DuBOSE) Is that a scientific method of
17 analysis to assume something without testing it when
18 testing is readily available?

19 MR WINSLOW Object to the form

20 A There's actually an infinite number of things
21 that could be tested We could test putting Duct tape
22 on it We could test putting a towel on it, we could
23 test sitting on it, we could test putting it out in the
24 hall There's an infinite number of tests, but there
25 was no reason for me to perform that in order to

1 evaluate the software

2 Q (BY MR DuBOSE) Well, now, you're -- do you --
3 would it surprise you to find out that other users of
4 this monitor have gotten tired of hearing the alarms?

5 A What do you mean?

6 Q Would it surprise you to find out that users of
7 infant monitors get tired of hearing the alarm from the
8 monitor? It is a loud noise, is it not?

9 A It's very loud

10 Q It is interrupting, correct?

11 A Yeah It's designed to get the attention of
12 the caregiver

13 Q And so would it surprise you to find out that
14 people have gotten tired of hearing that alarm?

15 A No

16 Q Would it surprise you to find out that people
17 have taken steps to tone down the alarm so it's not so
18 loud?

19 A It's possible I don't know

20 Q Do you believe on the occasions on the download
21 that we're looking at from the Elliott deposition that
22 when the front alarm is indicated not to have sounded on
23 the download, that it did, in fact, not sound or that
24 the phone, in any event, did not hear it?

25 A That's my interpretation of the download

1 Q In this log, rather?

2 A In this - in this printout of a download log,
3 yes

4 Q And is that an indicator that that portion of
5 the software that is supposed to trigger a front alarm
6 not heard record on the log was functioning properly on
7 that day?

8 A Yes on this day

9 Q And the same would be true for the rear alarm
10 not heard on the dates when that notation was made?

11 A Right

12 But it's a report in the total number of
13 incidents that we counted that the device had determined
14 that it was defective Because this should never occur,
15 you should never see that in the log

16 Q Well, I'm not going to disagree with you or
17 that, but I'm concerned with your value judgment that
18 nothing external occurred -- have you talked to the
19 Graves to find out whether they threw a baby blanket or
20 something over the alarm that day?

21 A No

22 Q Have you talked to anybody the grandmothers,
23 for example, to find out whether they did it that day?

24 A No I was examining the software

25 Q Let's look at Exhibit 7

1 made was -- would be that the indicator of "front alarm
2 not heard would have to have not been indicated on the
3 log?

4 A That would depend on what other error occurred

5 As I indicated before on the poster, if a
6 potentially a life-threatening event was detected, such
7 as Event 51 "heart slow," and the control flow came to
8 the ledalarm_tick module --

9 Q Which it should? Are you saying it should go
10 there?

11 A Yeah, which it should

12 It came here But before it got through
13 this code to the point of turning the alarm on, it was
14 interrupted And by some other external event, for
15 example a clock tick, then in that case, the flag would
16 never have been set to listen for the alarm on

17 So if this routine was interrupted before
18 it - before it got to the point of alarm on, then the
19 alarm would fail to sound but the flag would not have
20 been set to listen for the alarm and therefore, there
21 would be no "front alarm not heard" entry in the log as
22 we saw in the earlier log

23 Q And where in your diagram would that have had
24 its error occurred?

25 A Well, there's several possibilities, but

1 Q Have you looked at all of the logs on India
2 computer?

3 A I read the ones that were supplied to me, which
4 is -- or the exhibits attached to the Steven Elliott's
5 deposition I don't know if that's all the logs

6 Q Have you seen any indication that the logging
7 function of India Graves monitor malfunctioned at any
8 point?

9 A No

10 Q Do you think we can rely on the logging
11 function of India Graves monitor, based on what you've
12 seen?

13 A Not entirely

14 Q Can you say more likely than not that the
15 monitoring -- or the logging function on the India
16 Graves monitor malfunctioned at any time?

17 A My opinion is that most of the time it did not
18 malfunction, but I cannot rule that out

19 Q Can you say more likely than not that it ever
20 did malfunction?

21 A No

22 (Break from 3 04 p m to 3 12 p m)

23 Q (BY MR DuBOSE) Would you agree that for the
24 scenario to be correct -- and the scenario I'm
25 referring to is the time period around their child's

1 A No My understanding is that the program,
2 ... produces this report, is not the program in the
3 software In other words, it's not a matter of the
4 monitor producing the printout The monitor records
5 basically a string of numbers, and then that string of
6 numbers is downloaded to another computer and another
7 program which then interprets those numbers and produces
8 the report

9 Q I cut a corner Let me go back and straighten
10 ... out

11 Do you have any reason to believe that the
12 numerical log created within the monitor that ultimately
13 can be printed out into the form of Exhibit 7 -- is that
14 ...?

15 A Yes

16 Q -- includes an indicator in the form of an
17 asterisk opposite a patient alarm that the alarm was, in
18 fact -- that the alarm, in fact, went off?

19 A I don't know

20 Q You didn't know that the monitor checks to
21 determine whether the alarm went off when a patient
22 event occurs and marks that down on this download?

23 A No, I didn't know that

24 Q Assuming I'm correct, that would be another
25 thing that had to have happened incorrectly for the

1 Graves' scenario to be correct?

2 A If that's what it indicates, yes.

3 Q Could one bug, in your opinion, have caused all

4 of these things to go wrong?

5 A Yes

6 Q But have you found that bug?

7 A No It's what I pointed out a while ago that

8 from the time the ledalarm_tick module is entered till

9 some path reaches alarm on, if it's interrupted before

10 it gets to that point, then all of these other things

11 can fault

12 Q You don't know whether that happened here?

13 A I don't

14 Q Okay And you don't know whether that can

15 happen or not, in fact that's a hypothetical, correct?

16 A That's right

17 Q Okay

18 A This is a possible mode of failure

19 Q Is it your opinion that this code is

20 dangerously defective?

21 A Yes

22 Q Or unreasonably dangerous?

23 A Yes

24 Q Okay And is that to an engineering certainty?

25 A It's more likely than not, yes

1 Q Okay And what standard do you look to to give
2 that testimony?

3 A Well, in the case of life critical software it
4 could be an infant monitor, it could be a nuclear power
5 plant, it could even be the control software for the
6 airplane you're going to fly home on

When it's life critical software, then it's
8 extremely important to use good design method good
9 implementation, good testing, and good maintenance in
10 order to have a reliable product

11 And there's a lot of evidence that that
12 wasn't done in this case

13 Q What evidence is that beyond the code itself?
14 I think we've aired that pretty thoroughly already

15 A Yeah, all the things that I've cited For
16 example, the high number of reports of alarm failures,
17 all the things that I've cited today

18 Q Anything else, other than what we've already
19 talked about?

20 A No

21 Q Is there any authority I could look at that
22 would support what you're telling me?

23 A About what?

24 Q That, for example, the design - not the
25 software but the testing and the maintenance were not up

to engineering standards?

2 A Yes The Stroustrup book Chapter 23, that I
3 cited, and some of the other books, as well

4 Q Have you looked at all the test reports for
5 this monitor?

6 A No

7 Q Have you looked at any test reports for the
8 monitor?

9 A Unless they were provided in these documents --
10 these are the documents I have for the Graves case

11 Q And so I'm correct in saying you haven't looked
12 at any of the test design documents for the monitor?

13 A Well this is one of them This is a test
14 design document, Exhibit 3

15 Q All right I beg your pardon, then
16 And this is a test design for a small
17 portion?

18 A Yes

19 Q Have you looked at any other test design
20 documents for the AMI or AMI Plus monitor?

21 A Yes, Dr Lively has some

22 Q And you didn't bring those with you today?

23 A No, he has them We just had one copy, which
24 we shared

25 Q Have you looked at any of the test reports?

1 A Are you talking about in the test protocol or
2 are you talking about the Graves monitor?

3 Q I m talking about other than monitors that came
4 back in for examination to the company?

5 A Okay Then I'm not --

6 Q So that would be in the design, development,
7 and modification of the monitor?

8 A Yes Dr Lively has some documents about
9 the -- I guess you d call them protocols that were
10 developed for testing the monitor And I think those
11 probably came from Nellcor or Mallinckrodt

12 Q Are you going to render an opinion as to
13 whether those were adequate or not?

14 A The ones that I saw were not adequate

15 Q Would you need to see the complete set to be
16 able to determine whether the testing of the monitor --
17 or the protocols for the testing of the monitor, rather,
18 were adequate?

19 A I saw enough to say that overall -- since the
20 part that I saw was not adequate that overall was not
21 adequate, either

22 Q Well, I ve got a problem in that they're not
23 here and you are and you're rendering an opinion, but we
24 don't have those here to examine you on And that was
25 the purpose of asking you to bring everything you based

1 your opinion on

2 Is your opinion any different than

3 Dr Lively's?

4 A No

5 Q Are they congruent opinions?

6 A Yes

7 Q We may have to come back.

8 What other opinions do you hold in this
9 case, Doctor?

10 A I think we've pretty well covered it

11 Q Okay Why don't we enumerate them one by one
12 to make sure we have a clear and complete list Can we
13 do that?

14 One the code is poorly written and
15 spaghetti code? I don't mean to put words in your
16 mouth I'll let you go

17 A Well, that's all right

18 Okay The code is poorly designed The
19 implementation is insuff- or is inadequate for proper
20 testability The code was not properly maintained and,
21 consequently, I consider the software to be defective in
22 design and inappropriate to be relied on in a
23 life-critical system

24 Q Is that it?

25 A Yes

1 Q Okay Now, the facts you rely on to support
2 the opinion that the code is poorly developed or
3 designed, rather, are the code itself?

4 A Yes

5 Q Okay Anything else?

6 A Well, just, you know, common knowledge of
7 professional programmers

8 Q Are there any other facts on which you rely for
9 your opinion that the code for the AMI Plus monitor is
10 poorly designed?

11 A No

12 Q Are there any other documents you rely on for
13 that opinion?

14 A No

15 Q I'm not quite sure what you mean that the
16 implementation is inadequate for proper testability

17 Could you elaborate on that for me?

18 A Certainly

19 A properly designed program can be more
20 thoroughly tested than an improperly designed program
21 So when a module has, let's say, less than ten paths
22 through the code, then it can be thoroughly tested by
23 going through all ten paths

24 When a module has 34 billion paths through
25 the code, then it can't be properly tested

1 A That's correct

2 Q Have you done any testing of an exemplar
3 monitor?

4 A Yes

5 Q And how many hours did you spend testing an
6 exemplar AMI or AMI Plus monitor?

7 A It wasn't a long time On two or three
8 occasions, probably less than an hour total

9 Q And what did you use to provide input to the
10 monitor?

11 A A patient simulator

12 Q All right Is it the small sort of portable
13 simulator that the home care companies use? I don't
14 know the name of it I apologize

15 A Probably It is a small, portable simulator
16 that plugs into the leads in place of the leads being
17 attached to the patient

18 Q When you ran the monitor on the simulator, did
19 it function properly on every occasion?

20 A Yes

21 Q Were you ever able to make the monitor not
22 function properly?

23 A No

24 Q Going back to the printout on the back of the
25 Elliott deposition that we looked at a little while

1 A No This is -- this is part of one of over 800
2 modules It's a huge amount of code And that's part
3 of the problem, is that with a code that large, it has
4 to be designed in a way that makes it possible to test
5 and maintain and to fix bugs when they occur

6 Q But is it fair to say, then, that your opinion
7 that the monitor contains spaghetti code is only limited
8 to the code displayed on Exhibit 1 to the Triebel
9 deposition your large chart?

10 A No, I've looked at other modules as well, on
11 the CD

12 Q Okay

13 A And they're similar

14 Q How many have you looked at?

15 A I don't know Probably between 30 and 50

16 Q Was it a violation of any standards to use
17 assembly code when coding this monitor?

18 A No Assembly is just an implementation method,
19 that's not a design method

20 I mean, it's like saying, "Can I write a
21 letter in English or French?"

22 Well, the answer is yes, but -- so you can
23 write good programs in assembly and you can write bad
24 programs in assembly And this, unfortunately, is a bad
25 program in assembly

1 Q That will be fine You can tell me about that
2 THE WITNESS Is that all right?

3 MR HASTINGS Sure

4 A Okay Mr Hastings asked me what it would take
5 to find the line or lines of code which were incorrect
6 and repair them And I did some thinking and analysis
7 and gave him a response on that which was, you know, six
8 months to a year and creation of a suite of software
9 that would automatically test the most common paths in
10 the code since the poor design makes testing all the
11 paths in the code impossible, and that that procedure
12 might be able to locate the line or lines in the code
13 which need to be addressed If the code had been
14 properly designed, then it would be much more possible
15 to do that

16 And a good example is in the early '90s,
17 the long-distance telephone switching system was
18 computer controlled and there were bugs in it So there
19 was one big event -- I don't remember the date but you
20 could look it up It was in the early '90s -- when all
21 of New York and New England lost long-distance telephone
22 service because of a bug -- because, basically, a
23 telephone computer crashed, so you could not make a
24 long-distance call And this is millions of people
25 could not make long-distance calls Well, if they can't

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1 A I don't have a strong opinion one way or the
3 other It s -- it's one of many possible choices, and I
4 don't have a -- I don't have a basis for saying that
6 there are other chips that were better or worse

5 Q That's not going to be one of your opinions, in
other words, in this case?

7 A No, I wasn't asked to look at the hardware I
8 mean, I of necessity had to learn something about it in
9 order to understand the assembly but I'm focused on the
10 software

11 Q You talked a little while ago about the ESD, or
12 electrostatic discharge, situation that was remedied in
13 the monitor Do you think that plays any part in the
14 problem that you think exists in the monitor now?

15 A No, that was a hardware problem, and I think
16 the current problem is more likely to be software

17 Q The Graves were using Version 13 of the
18 monitor -- or rather the monitor used Version 13 of the
19 code Do you know when the problem that you think
20 exists in the code got into the code?

21 A Probably at inception I mean, the code was
22 originally designed poorly and so this possibility of
23 paths of execution being interrupted may very well have
24 been in it from the original design It's also possible
25 it was introduced at a later point when other bugs were

1 is, isn't it cause -- isn't itself the bug --
2 A No
3 Q -- in the code?
4 A The bug is some lines of code which are
5 incorrect
6 Q Okay So if we wanted to go find the direct
7 cause of the problem, we'd have to find the bug right?
8 A That's correct
9 Q Okay Does this code in the AMI Plus monitor
10 contain "go-to" statements?
11 A Yes
12 Q Are they called that in assembly code or are
13 they called something else?
14 A Well, different manufacturers call them
15 different things Let me see what NEC calls it
16 (Reviewing document)
17 Okay NEC calls it unconditional branch
18 instruction
19 Q So "unconditional branch instruction" equals
20 "go to"?
21 A Yes
22 Q Okay In what context does that document
23 you're looking at, which is the NEC manual for the
24 processor in the AMI monitor, talk about that?
25 A It just defines the details of what happens

1 when you execute that instruction

2 Q Is that an instruction that is appropriate to
3 be used -- that type of instruction, rather, is that
4 appropriate to be used with that NEC component?

5 A It can be It's available

6 Q Okay

7 A So it's an option

8 Q Do you have an opinion whether go-to statements
9 used in this particular code are proper or improper?

10 A I haven't looked at all of the code but
11 there s a basic -- I'm not sure what you d want to call
12 it -- principle that code is more easily tested and
13 maintained if it does not contain a lot of go-to or
14 unconditional branch instructions

15 So there was a famous article by Edsger
16 Dijkstra, E-d-s-g-e-r, D-i-j-k-s-t-r-a, in the late
17 60s, that introduced the idea of structured programming
18 a article that was entitled, "Go-to Considered
19 Harmful That wasn't the title he put on it that s
20 the title the journal put on it And for about the next
21 six months, there was a raging battle between letters to
22 the editor about, 'Oh, no You have to use a go-to to
23 do this

24 And then Dijkstra would respond the next
25 month, No, you don't You can do it like this without

1 a go-to And at the end of the day, he won in the
2 sense that structured programming became the predominant
3 programming paradigm beginning then, late 60s, into the
4 70s

5 And one of the principles or design goals
6 of structured code is that each module would have one
7 entry point and one exit point, in which case you would
8 not need any go-to statements There are a few
9 situations where a go-to statement makes the code a lot
10 simpler

11 And so it's not a hard and fast rule to say
12 that if a program with 100,000 lines of code has one
13 unconditional branch statement in it, it's not
14 structured But that is one puristic in designing good
15 code is to minimize the use of go-tos, which NEC calls
16 unconditional branch instructions

17 Q Do you find any unconditional branch
18 instructions in the AMI Plus code that caused the alarm
19 not to sound in your opinion?

20 A Yes, there are

21 Q Are there any go-to statements in the AMI Plus
22 code that caused what we would consider to be a bug so
23 that the monitor malfunctioned?

24 A The unconditional branch instruction itself
25 would not cause a bug because all it does is transfer

1 control to another location. However, the excessive use
2 of unconditional branch or go-to instructions leads to
3 the kind of unstructured code, including spaghetti code,
4 that is difficult to test and maintain.

5 Q Is it your professional opinion that there are
6 a lot of unconditional branch instructions in this code
7 for the AMI Plus?

8 A I haven't looked at it. It's over 800 modules
9 mean, there are unconditional branch instructions in
10 here. That's not -- that's not an item that in itself
11 determines the quality of the code as unstructured
12 versus -- structured versus unstructured.

13 Q Is another way of saying that they didn't cause
14 the problem here to the extent that there might have
15 been one, they just make it harder to find the problem
16 if there is one?

17 A That's right.

18 Q Okay.

19 A It makes it harder to test and maintain and
20 find and fix bugs.

21 Q Have you determined whether there are any
22 uninitialized variables in this code that caused the
23 problem you claim exist here?

24 A I have not. But I raised the question because
25 of this Exhibit 3, Section 4.1 -- oh, here's an example

1 ' was alking about computer professional, but that
2 includes medical device programmers

3 Q Okay But you'll agree we've already
4 established that you don't really have any knowledge of
5 what that industry was doing during that time, would you
6 not?

7 A It's a subset of the computer programming
8 industry, yes

9 Q I m not sure that was my question

10 MR DuBOSE Could you read it back
11 please

12 (The requested portion was read)

13 A Well, that's not exactly what I would -- that's
14 not the way I would say it

15 Q (BY MR DuBOSE) All right Well, we've
16 already plowed that ground

17 Have you looked at Dr Barclow's (phonetic)
18 opinion from the Smith case?

19 A I don t remember the name

20 Q All right

21 Dr Daugherity, have we covered all of your
22 professional opinions today --

23 MR WINSLOW Object to the form

24 Q (BY MR DuBOSE) -- in this case?

25 MR WINSLOW Object to the form

1 MR DuBOSE Well, let me state right now
2 we re here to get his opinions If he's got other
3 opinions that he doesn't have, and you think he's
4 skipped them, then I think he should go ahead and lay
5 them on the table

6 MR WINSLOW Well, I'm also saying that if
7 something does develop in the future, he has the right
8 to reform his opinions or develop new opinions So
9 presently, at this time, that might be his opinions, but
10 don't limit him to the opinions he's given

11 MR DuBOSE Well, I thought I asked that
12 that way, but I'll be happy to make that clear

13 Q (BY MR DuBOSE) Dr Daugherity, as of today,
14 have we covered all of the opinion -- professional
15 opinions that you hold in the Graves case and are
16 prepared to testify about?

17 A I believe so

18 Q Now's the time

19 A There may be -- if you -- I mean I answered
20 the questions you asked me If you asked me another
21 question, then, well --

22 Q I am asking you another question

23 And the question is Are there any other
24 professional opinions that at this time you intend to
25 give at the trial of the Graves' case?

1 A I think we've covered it

2 Q Thank you

3 At this point, are you planning to do any
4 more work on this case, prior to trial, other than get
5 ready for trial?

6 A That will be up to the request of the
7 attorneys

8 Q And at this point, do you have any plan -- have
9 you been requested, in other words to do any more work
10 on the case?

11 A No I've been requested to reserve the week of
12 May 15th for the trial

13 Q All right

14 A And I'm sure there will be some preparation
15 involved in that, but I haven't been asked to do
16 anything specifically more

17 Q Okay.

18 MR DuBOSE Well, of course, if he further
19 develops opinions, we'll want to be advised of that when
20 that occurs There are expert interrogatories that
21 would cover that and, of course, they would need to be
22 updated in a timely fashion I'm sure you-all will do
23 that, but I just want to put that on the record

24 I think I'm through, but if you'll bear
25 with me for a minute, I want to run through everything

1 Q (BY MR WINSLOW) More likely than not?

2 A More likely than the other possible causes that
3 considered

4 Q And is this programming that was used, this
5 spaghetti code, was that what a reasonable and prudent
6 programmer would have used in this device of this kind?

7 MR DuBOSE Object to the form

8 A No, not at that time

9 As I said, structured programming began in
10 the late 1960s and was gradually adopted But certainly
11 before 1994, when the device was -- was initially
12 developed, structured programming or object-oriented
13 programming, which is an extension of the structured
14 programming should have been used as good industry
15 practice by a computer professional, a professional
16 computer programmer

17 MR WINSLOW I m done Clarke?

18 FURTHER EXAMINATION

19 BY MR DuBOSE

20 Q I want to make sure I understand one thing you
21 told him directly in the context of what we've been
22 talking about this afternoon

23 Assuming the correctness of your testimony
24 that this code is too convoluted -- spaghetti code, to
25 use your term -- as I understand your testimony, that in

1 and of itself would not cause the alarm to fail It was
2 a bug within the code that would have had to cause the
3 alarm to actually not sound when it should have

4 Do I understand that -- did I get that
5 right?

6 A Yes, that's correct

7 I mean, if you think of bugs like insects,
8 then if you have a bunch of junk piled up in your house,
9 - have a lot more places to hide

10 So spaghetti code, there are a lot more
11 places for bugs to hide than in structured or
12 object-oriented programs

13 Q But it's the bug and not the spaghetti code
14 itself that actually causes the computer to malfunction?

15 A That's correct

16 Q Okay And so you could have spaghetti code
17 that's much worse than this, but if it managed to be
18 perfectly written without a bug in it, then it would
19 function fine?

20 A Yes, and that's possible with simple devices

21 So if you take something like a microwave
22 oven or a traffic light controller, there's a small
23 number of paths through the code So the traffic light
24 controller goes green, yellow, red, green, yellow, red,
25 green, yellow red And then there maybe 100 paths

1 through the code, you test all 100, and even if it's
2 spaghetti code, it can be completely tested and you can
3 be confident that it won't turn crossing traffic green
4 at the same time

5 But when you get to code that's the size of
6 this, we're talking -- you know, I haven't counted, but
7 I would say it's probably on the order of 100,000 lines
8 of code, then the number of paths is so astronomical as
9 I testified, that it's impossible to test thoroughly
10 enough to rely on

11 Q But getting back to my question, it's the bug
12 that is the cause of the malfunction in a computer --

13 A That's --

14 Q -- not the method, the general method in which
15 the code is structured?

16 A That's correct

17 Q Okay

18 A But good design leads to fewer bugs Poor
19 design leads to more bugs

20 MR DuBOSE I don't have anything
21 further Thank you

22 MR WINSLOW I guess we're done

23 (The deposition concluded at 5 52 p.m.)
24
25

1 NO CV 71591
2 JAMIE SMITH, Individually) IN THE DISTRICT COURT
3 and as Next Friend of)
4 KORTNEY SMITH, a Minor,)
5 Plaintiff,)
6 VS) LIBERTY COUNTY, TEXAS
7 CAS MEDICAL SYSTEMS,)
8 INC , and J&B MEDICAL)
9 ENTERPRISES, INC ,)
10 Defendants) 253RD JUDICIAL DISTRICT

11 *****

12 ORAL AND VIDEOTAPED DEPOSITION OF

13 WALTER C DAUGHERITY

14 OCTOBER 16, 2007

15 *****

16 ORAL AND VIDEOTAPED DEPOSITION of WALTER C
17 DAUGHERITY, produced as a witness at the instance of the
18 Defendant, Nellcor Puritan Bennett, L L C and
19 Mallinckrodt, Inc , and duly sworn, was taken in the
20 above-styled and numbered cause on OCTOBER 16, 2007,
21 from 11 09 a m to 4 34 p m , before Donna L LeVasseur,
22 CSR, in and for the State of Texas, recorded by machine
23 shorthand at the offices of the Hastings Law Firm, 616
24 FM 1960 West, Suite 725, Houston, Texas, pursuant to the
25 Texas Rules of Civil Procedure and the provisions stated
on the record or attached hereto, that the deposition
shall be read and signed before any notary public

U S Legal Support, Inc /MillerParker
214 741 6001

1 Q And is it fair to say, sir, that you can't
2 point to any portion of the software that you contend is
3 actually defective?

4 A I cannot show you the line But the reason
5 that that's not possible is because of the substandard
6 design of the software

7 Q Okay Well, we'll talk about that

8 A So if you take a look at the code -- this is a
9 printout of the code (indicating) It's hundreds of
10 thousands -- hundreds of thousands of lines of code

11 Q Okay

12 A If the software had been adequately designed,
13 then it would have been possible to be adequately
14 detect -- tested And when problems were reported --
15 and there's -- since there's 50 cases here that were
16 actually reported, in all likelihood, there are
17 additional cases that -- that were not reported

18 If the software had been adequately
19 designed so that it could be adequately tested, then
20 when the problem occurred, it would be much more likely
21 that it would be possible to locate the specific line of
22 code

23 MR MOELLER Okay I'm going to strike
24 all that as not being responsive to my question

25 Q (BY MR MOELLER) My question is --

1 professional programmers used structured programming
2 instead of spaghetti code

3 Q With respect to objects that rely on software
4 written in spaghetti code, do you agree that the vast
5 majority of the time that programming works very
6 adequately?

7 A It depends on the device, on the object

8 Q And what you need to do in determining whether
9 or not that object is working adequately or
10 appropriately using spaghetti code is to analyze how the
11 object actually, in fact, functions with that software,
12 true?

13 A True

14 Q It would be improper to say simply because an
15 object uses a particular -- a particular type of code,
16 that that object is, per se, dangerous and should never
17 be used, true?

18 A No It depends on the code If you have code
19 that has 10 branch points in it, then 2 to the 10th is a
20 1,024 paths through the code And so you can
21 exhaustively test 1,024 paths through the code If you
22 have tested every one of those 1,024 paths through the
23 code and each of those paths is correct, then you can
24 say, "This spaghetti code is correct, because I've
25 tested every possible path through the code "

1 And a good example of that would be a
2 microwave oven or a traffic light signal controller
3 It's relatively simple code It has a relatively small
4 number of paths You can exhaustively test all the
5 paths through it It's not the ideal way to write it,
6 but you can write it and you can exhaustively test it.

7 With a code of this magnitude, it's
8 impossible to adequately test And, therefore, that
9 constitutes defective design to do something with this
10 complexity that it's impossible to exhaustively test

11 Q In front of you here on the table, is that --
12 is that the printout of the code for the AMI --

13 A Yes

14 Q -- medical device?

15 Is there -- can you tell me Are there
16 any differences -- for example, can you take out of that
17 stack and show me what was added after the submission of
18 this product to the FDA?

19 A Yes You can look -- well, no It -- it says
20 that a change was made, but they failed to document
21 which lines in the code were changed So, you know,
22 like I showed you awhile ago, there's a change log on
23 each module So if you go to that change log, it
24 says -- well, let me look at one here

25 Q You know what, you can do that if you want,

1 Q Okay Okay What else do you have in front
2 of you there? Anything else that we haven't seen in
3 some form or another?

4 A Let's see Yes, this is a description of --
5 really, some case studies primarily in the telephone
6 company, long distance switching systems, about the
7 complexity of large software programs and how proper
8 design can lead to better testing and more rapid repair

9 So they -- you may remember there were
10 several incidents in the early '90s -- the dates are in
11 this article -- January 15th, 1990, was one, and a
12 couple of other times -- when large sections of the
13 country lost all long distance service that was
14 eventually traced to software problems But because the
15 phone company had used structured programming to program
16 it, they were able to find the flaw in the software and
17 fix it and get back to being able to charge people for
18 long distance calls

19 Q And let me -- that brings up a very
20 interesting point Because, really, your issue with
21 spaghetti code is in part that if a problem is reported,
22 it's very difficult to find the source for that problem,
23 right?

24 A Right

25 Q And problems appear with all types of

1 software, true?

2 A Yes

3 Q And we talked about the bathtub curve Even
4 with structured programming or object-oriented program,
5 you'll still see that bathtub curve, true?

6 A True

7 Q And the fact of the matter is is that a big
8 problem you have with spaghetti code is that as a -- as
9 an investigator trying to remedy a report, it makes it
10 hard, in your opinion, to learn the exact location of
11 the software bug or software glitch, right?

12 A Right

13 Q Okay And can you tell me within what I've
14 marked -- strike that

15 Let's do it this way When the -- when
16 the monitor in question picks up a loose-lead alarm
17 condition, what does the controller do in terms of
18 sending signals? Do you understand my question?

19 A I think so

20 Q And -- okay Let me see if I can state it so
21 I understand it a little bit better

22 When a loose-lead condition or -- is -- is
23 determined to exist, the controller is programmed to
24 send out various signals, true?

25 A Yes

1 unlikely, and that leaves the software

2 So then I began examining the software to
3 see where there might be a latent bug in -- in the
4 software, and I described the difficulties in doing that
5 due to the poor design

6 Q Right And so here's -- here's, I guess, what
7 I'm trying to understand You've said -- or in your
8 analysis, there are three possibilities Hardware,
9 software, error in the reporting, right?

10 A Right

11 Q You ruled out the error in reporting based
12 upon what, something that Counsel told you?

13 A Yes

14 Q Okay And you've ruled out hardware And
15 essentially with respect to software, you've simply been
16 unable to determine or haven't spent the time to
17 ascertain whether or not, in fact, there is a defect in
18 the software in that module which controls the
19 loose-lead alarm, true?

20 A True It's impossible because of the
21 astronomical number of paths through the code

22 Q Okay Now, let's go back, then, to the
23 erroneous reporting How many eyewitnesses were there?

24 A I was told five

25 Q Okay And you were told by Counsel that all

1 example You understand it's a little bit silly for you
2 to use a coin flipping example, too?

3 A Oh, not at all, because the coin flip is heads
4 or tails, and each decision box on this flow chart is a
5 left or right, which maps exactly to the heads or tails
6 So the probability of it being one half go left, one
7 half go right -- not probability, but case division, is
8 exactly the same as -- as a coin

9 Q Okay

10 A But the probability -- let me put it this way
11 These are both examples of the same underlying
12 probability

13 Q Okay Show me, though, the path Tell me
14 what the path is for this unit to not alarm That's
15 what I'm trying to understand If it's as simple as a
16 coin flip, wouldn't you be able to go in and tell me
17 where it was heads when it should have been tails and
18 vice versa?

19 A If it had been properly designed If it had
20 been designed with structured programming or
21 object-oriented programming, then there would be a small
22 enough number of paths through the code that I could go
23 through each path and find which one is not working

24 When there are so many paths through the
25 code that if I could check one path a minute, it would

1 take me 196,000 years, then, no, I can't do it

2 Q Right Right But that goes back to my point
3 and that is that your real criticism of spaghetti code
4 is that it doesn't allow you as a programmer to go in
5 and prove or disprove whether a bug exists, true?

6 A True Which is the reason that they shouldn't
7 have used spaghetti code in 1990s

8 Q The -- the reason being that it doesn't allow
9 you as a programmer to go in and prove or disprove
10 whether a bug exists, is that your point?

11 A No Well, see it's both I mean, you've got
12 the development of software A professional programmer
13 does not want bugs He wants to develop software that
14 doesn't have bugs Something this complex, it's not
15 possible And so what you have to do is use the best
16 technique available

17 If you use the best technique available,
18 then you first produce code that has fewer bugs to start
19 with And then the second part of what you said is when
20 there are bugs, you're able to find them and fix them
21 quickly For example, the example that I gave about the
22 long distance telephone switch is that they found that
23 problem and fixed it because it's over a million lines
24 of code, bigger than this It's a million lines of
25 code But they found the problem and fixed it in that

1 Q Okay So you're really speculating about
2 whether or not a -- you -- you know whether or not a
3 manufacturer would or wouldn't make a particular report,
4 true?

5 A I'm confident on the extremes, that a -- I'm
6 confident that a death has to be reported, and I'm
7 confident that a low battery doesn't have to be
8 reported The events in the middle, I don't know what
9 the CFR says

10 Q Okay- And when you say you're confident on
11 the low battery, do you know that based upon reading a
12 Code of Federal Regulation or any other source
13 purporting to summarize that federal regulation or based
14 upon discussions you've had with the lawyer? Or, again,
15 is this -- is this Professor Daugherity, the average
16 citizen, trying to understand something based on common
17 sense?

18 A This is my lay opinion

19 Q Thank you

20 All right Now, with respect to -- is it
21 fair to say, sir, that you, sitting here today, based
22 upon all the facts and information that you know in this
23 case, can neither prove or disprove the existence of a
24 software glitch or a software bug that played any part
25 in the events of the evening in question? Is that fair

1 to say?

2 A Yes

3 MR MOELLER Okay I'm going to pass the
4 witness I'm going to take a look at some notes, and
5 I -- I probably will have a few more questions, but I
6 don't want to take the time to go through things And
7 so -- are you going to start with this?

8 MS ADAMS What is it?

9 MR MOELLER These are the complaints

10 MS ADAMS No

11 MR MOELLER I'd like to look at some of
12 these --

13 MS ADAMS No, I'm not

14 MR MOELLER -- if it's all right

15 MS ADAMS I want to start with his
16 report I'm not sure what exhibit number that is

17 MR MOELLER I think that's No 2

18 MR HASTINGS I need -- I need five
19 minutes

20 MS ADAMS Sure

21 THE VIDEOGRAPHER We're off the record
22 at 3 31_

23 (Break from 3 31 p m to 3 38 p m)

24 THE VIDEOGRAPHER We're back on the
25 record at 3 38

1 EXAMINATION

2 BY MS ADAMS

3 Q Dr Daugherity, my name is Cathryn Adams, and
4 you understand I represent CAS Medical in this case?

5 A Yes

6 Q We've listened to you express a lot of
7 opinions about spaghetti code versus structure code and
8 assembly and all these different opinions about code
9 today Do you have any opinions -- have we covered all
10 your opinions today with respect to CAS Medical?

11 A Well, let me go over my notes here and you can
12 tell me if --

13 MR MOELLER These?

14 A -- I've covered all of them

15 Q (BY MS ADAMS) I guess my point is you
16 haven't really specified any opinions that are -- that
17 were against Mallinckrodt/Nellcor Puritan Bennett versus
18 what -- against CAS, and I'm wondering if you have any
19 opinions that are against one and not the other of if
20 all your opinions are just global opinions

21 A Well, they are global opinions except
22 as regards something that the date in the change log
23 would indicate the change in ownership So where is
24 that software list?

25 MR MOELLER Is that this one?



Southern Reporting, Inc

Transcript of the
Deposition of

Steven Elliott

November 28, 2007

Graves vs CAS Medical Systems, Inc , et al
06-CP-38-421

COPY

Southern Reporting, Inc
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1 and her family, asked what had happened I
2 requested that I come out and check the other
3 monitors, because the other children -- two babies
4 had been discharged at home on monitors as well
5 They were obviously in preparing for the funeral
6 services and family visitation, did not want me to
7 come out then We arranged for her to call me back
8 that day when I could come out, because I wanted to
9 check the other two monitors

10 (Mr Winslow enters the deposition
11 at 11 16 a m)

12 A When she called that afternoon, three or four
13 o'clock, and I went to the home and ran the self-
14 test on all three of the monitors, which they all
15 passed as -- the self-test functions This monitor
16 has that built into it, and made sure those
17 monitors were working properly, took the monitor in
18 question with me The next morning I took it to
19 the office and put it on a simulator and checked it
20 out and sent that result immediately up to a
21 physician to be interpreted Then I took the hard
22 copy of that report over to their local
23 pediatrician, discussed the matter with him,
24 continued to interact with the Graves for the next
25 eight or nine months with their other two children

1 on the monitors, and once they came off a service
2 route had no other interaction with them or contact
3 or seen them until this lawsuit was filed, and I
4 saw them at their deposition

5 Q Okay The training you gave to the Graves, did
6 they -- did you feel like that they were well
7 trained on how to operate and manage and take care
8 of using the equipment?

9 A I did

10 Q Okay The training that you gave them, is that a
11 training that was set up by the manufacturer or
12 maybe -- tell me how that came about Is there a
13 training --

14 A No There's a --

15 Q -- manual?

16 A -- there's a -- we have a -- what we call a
17 "provider care manual," of which the Graves
18 received, which has the instructions and all
19 written in there that's provided by the
20 manufacturer There's also industry standards, and
21 we have a signed check-off list that we go through
22 each category for the patients to sign off that
23 they've been reviewed on the proper care and what
24 to do if an alarm goes off, and so yeah, I -- I
25 felt that they were properly trained

1 unsure We have laptops that are available We go
2 out to the home and -- and download the monitor to
3 the desk -- to the laptop and then come and
4 transfer that information

5 Q Okay

6 A And since the serial numbers never changed on the
7 babies, I'm assuming that's the way that we had
8 done it

9 Q Okay

10 A But we have the option to switch out a monitor and
11 provide them another programmed monitor

12 Q In the second download -- I keep using that as --
13 determine which ones I'm talking about -- does the
14 printout show whether or not, in the apnea events
15 -- I think you said 33 events -- whether there was
16 an alarm and the -- the light? Would it show that
17 if there was -- if there was a problem with the
18 alarm, or is that something that's not reported?

19 A It records that the alarm went off, indicates that
20 the visual and audible alarm occurred when you look
21 at alarm activity and read the bars across Each
22 bar is a second It will tell you how long that
23 alarm --

24 Q Let me mark this --

25 A -- lasted

1 Q -- and look over your shoulder, if you don't mind
2 A Sure
3 Q It's --
4 A Here we --
5 Q Point to what page This is page 7 you're looking
6 at
7 A Okay So at the top of this is two alarms that
8 occurred, and at the top here is alarm activity
9 And so we -- this is a 36-second alarm, so we
10 should have 16 --
11 Q Okay
12 A -- indications of alarm activity here indicating
13 that the alarm is going off This is what it's
14 recording You can see there's no changes in the
15 QRS wave here to indicate -- looks like either
16 someone stimulated the baby or the baby took a big
17 movement there, got back on track, the alarm
18 stopped
19 Q So if I -- let me see if I'm learning how to be an
20 expert in -- in reading these things All right
21 In this particular event, which is the top of page
22 7, this top is the QR wave?
23 A QRS wave
24 Q QRS wave?
25 A Uh-huh

1 Q That's your heart wave?
2 A Uh-huh
3 Q Okay
4 A Which is indicated here
5 Q Okay And looks pretty good -- all the way up to
6 here you have some little things going down?
7 A No Not really changed there I think this may be
8 because we had some stimulation here with the
9 respiratory wave
10 Q Why would the alarm go off before the changes
11 occurred?
12 A Because we had 20 seconds where the monitor's
13 programmed not to go off, then the monitor went off
14 for 16 seconds before any intervention
15 Q But what I'm asking, though, is when it -- this is
16 the beginning of the 20 seconds right here, is that
17 correct?
18 A Correct
19 Q Okay And I'm pointing to this -
20 A Beginning of the alarm period
21 Q All right The alarm period I'm looking at a
22 rectangle box --
23 A Uh-huh
24 Q -- on the top of the page So you have an alarm
25 period right here that started -- can you -- does

1 it say a time or --
2 A Uh-huh It was at 3/20 at 10 32 48
3 Q All right
4 A So 10 32 48 at night
5 Q Okay That would've been the beginning of this
6 rectangle?
7 A That would be the beginning Uh-huh
8 Q All right And that's when the alarm period -- is
9 that what you call it? This?
10 A Correct Uh-huh
11 Q And the audible alarm is shown by the dark black
12 bars --
13 A Uh-huh
14 Q -- above the QRS wave --
15 A Correct
16 Q -- printout?
17 And so this would -- if you -- if everything s
18 working right, the alarm period started at
19 10 32 48 The audible alarm kicked in --
20 A No No This is the apnea period It means you
21 have a 20-second delay, so --
22 Q Okay
23 A -- there would be -- there would be no alarm
24 activity expected to occur until after the
25 20 seconds

1 A I understand that

2 Q Okay Now I understand that you would expect to
3 see in the printout no -- a note if that, in fact,
4 had occurred, wouldn't you?

5 A I would expect there to be in the summary report
6 from the monitor as that indication of the alarm
7 not being heard

8 Q Okay Now, would it be fair to say that you've
9 never heard of an alarm not going off and not being
10 recorded?

11 A I'm -- I'm unaware of that --

12 Q Okay

13 A -- have occurring

14 Q Are you aware of the alarms not going off and it
15 being recorded?

16 A I am not

17 Q Okay So when it says "alarm not heard," that's an
18 alarm not going off, right?

19 A No It -- it means that the -- one of the alarms
20 was not going -- not being heard by the monitor
21 The other alarm was going off, but it's listening
22 internally -- my understanding of the software --
23 for both alarms

24 Q So it has a sensing device that'll sense the
25 audible alarm for the front and the back, and if

1 A Correct

2 Q Do you remember when that piece of equipment was

3 purchased, Steve?

4 A I don't I -- I provided that --

5 Q Okay

6 A -- to the documents, and --

7 Q Was it prior to 2000? Was this a -- a '90s era --

8 A No It may have been 2000/2001 It was -- this

9 piece of equipment was included in that recall, so

10 I'm thinking that this was 2000 that this was

11 purchased and the recall was --

12 Q -- shortly after?

13 A -- December of 2000 or something like that

14 Q All right How many of these apnea monitors did

15 you have?

16 A Approximately 100

17 Q Okay You said a minute ago you -- you brought

18 something up about complaints from customers or

19 patients Have you ever had anybody complain that

20 the audible alarm was not being heard?

21 A Have not Most of the -- you know, the complaints

22 we would get is that -- too many alarms, mainly due

23 to loose-lead alarms

24 Q Okay So when someone looks at the printout and

25 sees "loose leads," that's something that others

1 had problems with as well?

2 A I don't know that there was a problem It's a
3 common occurrence with the use of this type of
4 equipment

5 Q So it's not that someone's using it improperly,
6 it's just a difficult lead to keep on a little,
7 small baby, isn't it?

8 A Well, this is just very sensitive equipment It'd
9 rather err on the side safety

10 Q All right Are you aware of any other child deaths
11 of any of your patients that was using this
12 equipment?

13 A I am

14 Q How many?

15 A One

16 Q And how long ago did that occur?

17 A It may have been in 2002

18 Q They were using the Am1 Plus or whatever?

19 A I don't know if it was the Am1 or the Am1 Plus

20 Q Generally, what happened as far as you recall in
21 that case?

22 A The mother awoke to the alarm going off and the
23 baby was in respiratory distress The mother
24 started CPR and EMS showed up and continued the CPR
25 and the baby didn't make it They were not able to

1 Q Did you at any time -- or did Mrs Graves at any
2 time tell you that the -- she saw the light but
3 didn't hear the alarm, or she woke up and saw the
4 light, but no alarm was going off?

5 A I heard that in her deposition

6 Q Okay Did she tell you that any time that you had
7 a -- a individual conversation with her?

8 A Not that I recall

9 Q Could she have said that and you don't recall it?

10 A Possibly

11 Q Okay You sent the equipment back to the company
12 for a check?

13 A I did

14 Q And what did they tell you?

15 A That everything was working, that it had checked
16 out And so we took the equipment back, waited a
17 while and never heard anything from anyone, put the
18 equipment back into service

19 Q Have you had any problems with the equipment?

20 A Have not

21 Q How many patients have you had use the equipment
22 since you put it back in service?

23 A This particular monitor?

24 Q Yes

25 A Don't hold me to this, but I think it was either

1 four to six, something like that, given the time
2 period This was a couple of years that we
3 continued to use the monitor before we received the
4 lawsuit

5 Q Do you -- did you do printouts and downloads for
6 those patients as well?

7 A I did

8 Q Do you still have copies of those downloads?

9 A I do

10 Q In looking through those downloads, did you find
11 any printout that there were any problems with the
12 audible alarm?

13 A No

14 Q When I say "problems," I'm assuming when it says
15 "audible alarm not heard," I m kind of calling that
16 a problem So did any -- any "alarm not heard"
17 indications?

18 A I'd have to go check

19 Q Okay

20 A I -- I don't recall

21 Q All right I recognize that you had a lot of
22 compassion for Ms Graves and y'all talked about
23 things like that when you met with her and -- and
24 so I'm not trying to delve into those kinds of
25 things, but in your conversations with Ms Graves

1 Q What do they show?

2 A No alarms No -- normal activity_

3 Q Can you tell whether someone's baby is awake or not
4 by looking at the printout?

5 A I -- you can speculate if there's a lot movement,
6 that the baby's probably awake If there's not a
7 lot of movement -- that did not show it -- it
8 appears on the downloads that the babies were
9 sleeping uninterrupted

10 Q Okay I'm looking at a -- I'm assuming we may have
11 gotten this off the Internet or something, but it
12 talks about the recall of the monitors And it
13 says something about December of 2001, and it says
14 (as read) "Infant monitor -- infant apnea monitor
15 may shut down and the audible alarm may fail to
16 sound " Is that different than what you understood
17 your notice said or would we need to look at that
18 notice to -- so you don't -- I'm not trying to
19 confuse you, I mean --

20 A Yeah No I -- again, it's --

21 Q It's --

22 A -- 2001 when I thought it was 2000, so --

23 Q I'm not worried about the date --

24 A Yeah

25 Q -- but --

1 A I'm sure that's the same recall I'm not aware of
2 another one Again, I was under the impression
3 that it was to do with static electricity and
4 alarms, or maybe the monitor would -- would shut
5 down with the static electricity I'd have to look
6 at the -- but obviously, if the alarm shut -- if
7 the monitor shut itself down, that's why the alarm
8 wouldn't be heard

9 MR BELL All right Let's take about a
10 five- or ten-minute break and let me see where
11 we go from here, okay?

12 (Off the record from 12 57 p m
13 until 1 06 p m)

14 EXAMINATION

15 BY MR. DUBOSE

16 Q Steve, we've met before I'm Clarke DuBose I
17 represent CAS Medical in this case, and my only
18 question for you is this You've talked a little
19 bit, not a lot, about how the machine actually does
20 what it does In issues related to that, would you
21 defer to the people from CAS Medical as to how the
22 machine actually performs the functions that it
23 performs?

24 A I would

25 Q Okay Thank you

STATE OF SOUTH CAROLINA
COURT OF COMMON PLEAS
COUNTY OF ORANGEBURG

KAREEM J GRAVES and TARA GRAVES Individually
and as duly appointed personal Representatives of
the Estate of India Lyanna Graves

Plaintiffs,

vs CASE NO 06-CP-38-421

CAS MEDICAL SYSTEMS INC AMERICAN HEALTHCARE
RESOURCES, INC d/b/a ASHBY MEDICAL and STEVE M
ELLIOTT or any Business entity d/b/a ASHBY MEDICAL,
AND PALMETTO HEALTH RICHLAND MEMORIAL HOSPITAL and
PALMETTO HEALTH ALLIANCE

Defendants

DEPOSITION OF JANE V GWINN M D

DATE April 4 2007

TIME 1 07 P M

LOCATION Children s Respiratory Center
58 Bear Drive
Greenville SC

TAKEN BY Counsel for the Defendants

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Court Reporter

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000885

1 nearly -- you know, nearly all the time when you
2 look continuous daytime, nighttime from February
3 16th through February 25th And I didn't have any
4 indication that it was used on the 13th or 14th

5 Q And what was your evaluation of this
6 information, Doctor?

7 A There were only two events that were
8 printed and required my review, and one was for a
9 short bradycardia with a heart rate of 66 with no
10 associated apnea

11 And the other event was what we call
12 low amplitude respiratory tracing, which is really
13 that the infant is breathing, but the monitor is
14 just showing some low amplitude off those grids
15 But when you look at the heart rate at the same
16 time, the heart rate was fine, which tells us that
17 that that looked like an apnea was not a true
18 apnea

19 Q So in your initial review of
20 information from that particular monitor, you
21 didn't see any significant problems?

22 A No, nothing worrisome A good
23 compliance Monitor was used as, you know, the
24 parents had been instructed at the time and there
25 just wasn't anything to alert you that there was

1 anything wrong

2 Q Okay When did you next review or
3 receive any information from the India Graves'
4 monitor?

5 A The next one was, it covered the study
6 period from February 25th to April 1, 2004 And my
7 report was typed on April 5, 2004, and it's listed
8 as Number 0097 at the bottom of this sheet

9 Q Okay And what was your evaluation or
10 interpretation on that date, Doctor?

11 A Again, the monitor was used all the
12 time and this time there were 50 events and all of
13 them were the low amplitude respiratory tracings
14 There was no true apnea and no bradycardia

15 Q And that's a good thing?

16 A That's a good thing, but the lead
17 placement needed to be looked at here because
18 that's probably why they suddenly didn't have the
19 alarms from before and now it's just not picking
20 up The baby is probably bigger and, you know, a
21 little bit of a change in the lead placement would
22 have gotten rid of those false alarms

23 Q And what is a false alarm?

24 A It's when the monitor registers an
25 event, and when you analyze the event you realize

1 for it?

2 A Uh-huh An incident that indicated by
3 the monitor parameters that it was outside of the
4 normal range

5 Q Now, for those of us that don't see
6 these things all the time, that would mean during
7 that time period would be 31 events between April
8 the 1st and April 11th, or are you talking about
9 just the night in question?

10 A No That I would have to look at the
11 exact times on here, but the --

12 Q Well, I don't want to sidetrack you on
13 that, but essentially you looked at 31 hard copy
14 events, which means that 31 times either the baby's
15 heart rate went too fast or too slow --

16 A Right

17 Q -- or respiration stopped --

18 A Right

19 Q -- or breathing stopped?

20 A Right That's correct

21 Q Okay Keep going, please.

22 A And those events first started on April
23 5th, so, you know, the monitor study period
24 started April 1st We first started seeing some
25 events April 5th And I mean, you really have to

1 kind of look through all of this because the first
2 events were not worrisome You know, they were
3 just, you know, alarms for, you know, what -- what
4 was essentially like low amplitude with the heart
5 rate looking okay And that's appropriate to
6 associate those two You know, the heart rate --
7 first of all, let me backtrack a second

8 Children, contrary to adults, typically
9 have a respiratory event before a cardiac event
10 And so when you have something wrong, you know,
11 with your breathing, you know, whether you're not
12 getting good air exchange or not taking an adequate
13 number of breaths, then the slow heart rate comes
14 after that is happening, rather than someone
15 suddenly having a heart block, you know, only
16 that's unusual It's not impossible, but it's
17 unusual

18 Q So typically you see a problem with
19 breathing which might effect the heart rate as
20 well?

21 A Yes

22 Q Okay

23 A And then we see the respiratory thing
24 not picking up well, but the heart rate is nice and
25 strong and steady We don't worry, you know, about

1 that It's all of it happening together

2 Q Okay So tell me -- you said, first
3 the problems or the events were not worrisome, but
4 that changed thereafter?

5 A It did Let me find where it -- on --
6 let me just get to it a second

7 Starting on April 11th, the baby
8 started having some unusual types of breathing
9 patterns that if you just looked at one little part
10 of it you might not be alerted because the heart
11 rate was still okay But there started being a
12 pattern with some deep-looking breaths and then
13 some really shallow-type breathing and that pattern
14 began on April 11th And that pattern kept going,
15 and that -- that would be unusual first of all, you
16 know, to see that

17 And then followed by that, it started
18 getting wider and wider apart You know, what
19 looked like a big breath Let me just find where
20 it gets more and more abnormal Then we started
21 having somewhere the heart rate didn't look as
22 regular It started getting the area where the
23 heart rate spread out more between beats, which
24 essentially would be a bradycardia

25 Q And this is all happening the night

1 before this baby died?

2 A Uh-huh

3 Q You have to say yes for the Court
4 Reporter

5 A Yes, I'm sorry

6 Q All right Keep going

7 A And the pattern just kept getting more
8 and more abnormal, you know, with -- you know, the
9 heart rate pattern becoming abnormal And then it
10 got to where you couldn't pick up any normal
11 respirations And then we started seeing some
12 little, for lack of a better word, little blips in
13 what would be the electrocardiogram The QRS
14 complex, which is what you would see on an EKG and
15 then -- then it disappeared entirely

16 Q And that would be when the baby passed
17 away?

18 A Uh-huh Yes

19 Q We understand your answer, but she
20 doesn't like to interpret

21 A Yes

22 Q Okay Does the data that you looked at
23 on this date indicate that when these events or
24 problems, as you called it, began to become worse
25 and more worrisome, was the monitor itself giving

STATE OF SOUTH CAROLINA) COURT OF COMMON PLEAS
COUNTY OF ORANGEBURG) C/A NO 06-CP-38-421

Kareem J Graves and Tara
Graves, individually and as
duly appointed personal
representatives of the estate
of India Iyanna Graves,

Plaintiffs,

v

CAS Medical Systems, Inc ,
American Healthcare Resources,
Inc d/b/a Ashby Medical and
Steve M Elliott or any
business entity d/b/a Ashby
Medical, Palmetto Health
Richland Memorial, and
Palmetto Health Alliance,

Defendants

COPY

**DEPOSITION OF
TARA P GRAVES**

Tuesday, February 20, 2007
9 09 a.m - 12 50 p.m

The deposition of TARA P GRAVES, taken on
behalf of the Defendant, Palmetto Health Richland
Memorial, at the offices of Sowell Gray Stepp &
Laffitte, L L C , 1310 Gadsden Street, Columbia,
South Carolina, on the 20th day of February, 2007
before Karen L Yearwood-Cole, Court Reporter and
Notary Public in and for the State of South Carolina,
pursuant to Notice of Deposition

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1 A It wasn't doing anything It was up under the
2 bassinet just sitting there
3 Q Were any lights on?
4 A All the lights was on
5 Q All lights?
6 A Uh-huh (affirmative response) All the lights
7 Heart fast, heart slow, apnea, power,
8 everything was lit up
9 Q So the power was the heart slow, what was
10 the heart slow light doing?
11 A Everything was a steady light. Nothing was
12 blinking
13 Q Because in your Answers to Interrogatories you
14 said there was a flashing light Do you recall
15 that?
16 A No
17 Q I'll show you what I'm talking about Do you
18 know what an Interrogatory is? You remember
19 meeting with your attorney to provide answers
20 to written questions?
21 A Uh-huh (affirmative response) Oh, yes
22 Q In answer to Interrogatory thirteen, it says,
23 generally, the Plaintiffs contend that there
24 were lights blinking on the monitor at the time
25 of the incident, but no alarm sounded

- 1 A Never talked to them again
- 2 Q And they were both female?
- 3 A Yes, one black and one white
- 4 Q Now, according to the download, you last
- 5 started up the machine that India was on, the
- 6 monitor that India was on, that night at
- 7 probably around 9 52 Does that fit with your
- 8 recollection?
- 9 A Would you say that \ I mean /
- 10 Q I said according to the download, the monitor
- 11 was last powered up before India passed away
- 12 at, it says 8 52 here, but we know that that
- 13 was not
- 14 A It was nine
- 15 Q That it's really 9 52
- 16 A Uh-huh (affirmative response)
- 17 Q And I'm asking you if that fits with your
- 18 recollection of when you turned the monitor on
- 19 A I don't know I can't recall exactly what time
- 20 I turned it on or
- 21 Q Would it have been around that time?
- 22 A Whenever she went to sleep, definitely So if
- 23 she fell asleep at that time, then it would be
- 24 at that time
- 25 Q And when you turn the monitor on it goes

1 through a self check

2 A Yes

3 Q before you can actually start getting a

4 reading from it?

5 A Yes

6 Q And did the monitor self check work properly on

7 that occasion as far as you know?

8 A Far as I know

9 Q The monitor didn't indicate that it found a

10 problem with itself in any way?

11 A No, not that I know of

12 Q Did Mr Elliott run a, turn the monitor on, or

13 off and on when he came the next day while you

14 were with him?

15 A I'm not sure Just like I say, he was sitting

16 on the floor over there and I was

17 Q I understand I'm just trying to find out what

18 you remember

19 A Yeah I mean I understand

20 Q It's not a test

21 A Yeah, I know I mean, I really cannot tell you

22 exactly because I wasn't even really watching

23 him I was just

24 Q Let me put it this way Assuming he did run,

25 turn the monitor off and back on, do you have

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- 1 A Yes, yes
- 2 Q And the same would be true for a heart rate
- 3 fast or slow?
- 4 A Yes
- 5 Q Now, is it correct that your recollection is
- 6 that on the morning when India passed away, the
- 7 lights were also steadily on rather than
- 8 flashing?
- 9 A Yes
- 10 Q Had you had any problem with India's monitor
- 11 before this? I know we talked about loose
- 12 leads from time-to-time, but had you had any
- 13 problem with the monitor itself?
- 14 A No, sir
- 15 Q As far as you know
- 16 A Not that I recall
- 17 Q it worked perfectly every time?
- 18 A Yes, sir
- 19 Q The medical records from that trip to the
- 20 urgent care facility on Saturday indicated that
- 21 India had fairly severe thrush Do you know
- 22 what thrush is?
- 23 A Yeah, it's in the mouth
- 24 Q How long had she had that?
- 25 A Like a couple of days

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STATE OF SOUTH CAROLINA) COURT OF COMMON PLEAS
COUNTY OF ORANGEBURG) C/A NO 06-CP-38-421

Kareem J Graves and Tara
Graves, individually and as
duly appointed personal
representatives of the estate
of India Iyanna Graves,

Plaintiffs,

v

CAS Medical Systems, Inc ,
American Healthcare Resources,
Inc d/b/a Ashby Medical and
Steve M Elliott or any
business entity d/b/a Ashby
Medical, Palmetto Health
Richland Memorial, and
Palmetto Health Alliance,

Defendants

COPY

**DEPOSITION OF
KAREEM J. GRAVES**

Tuesday, February 20, 2007

1 00 p m - 2 19 p m

The deposition of KAREEM J GRAVES, taken on behalf of the Defendant, Palmetto Health Richland Memorial, at the offices of Sowell Gray Stepp & Laffitte, L L C , 1310 Gadsden Street, Columbia, South Carolina, on the 20th day of February, 2007 before Karen L Yearwood-Cole, Court Reporter and Notary Public in and for the State of South Carolina, pursuant to Notice of Deposition

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1 and open the door for, for the paramedics

2 That's I remember that

3 Q Did you do that?

4 A Yes, sir

5 Q Do you remember anything about what the monitor
6 was doing?

7 A I don't remember Once everything had kind of
8 like cleared up or whatever, I looked at the
9 monitor And I mean all I I seen like
10 I said, I seen the lights on it And I mean
11 for my understanding or what have you, she more
12 or less was the one that, you know, fiddled
13 with that

14 Q Do you remember anything about what the lights
15 were doing?

16 A All I I remember just seeing a bunch of
17 lights That's it

18 Q Do you remember whether they were flashing,
19 solid, red, yellow, green?

20 A I'm going to just say solid I remember seeing
21 just a bunch of lights All the lights were
22 on That's all I seen I mean, again, I say
23 I felt like just a weak, a weak feeling where
24 I wasn't really good for nothing

25 Q Do you remember that you had stopped using the

- 1 out the monitor while he was there?
- 2 A No, sir
- 3 Q Had you all had any problem with India's
- 4 monitor before the night she died?
- 5 A Not to my knowledge I don't know I remember
- 6 like I say, I remember my wife talking
- 7 about the loose leads or something to that
- 8 nature That's about it
- 9 Q But you understood that's something that
- 10 happened every now and then to all of them,
- 11 isn't that correct?
- 12 A Yes, sir
- 13 Q I think you told us this, but were you working
- 14 at the Ford dealership
- 15 A Yes, sir
- 16 Q at that point?
- 17 A Yes, sir
- 18 Q Did you work any other job that day before you
- 19 came home, the Saturday before India died?
- 20 A No, sir I actually know because we was
- 21 like I said, it was preparing for like
- 22 their little Easter whatever So I mean, it's,
- 23 it's crazy, you know You think right before
- 24 Easter that something like that takes place
- 25 Q Let me ask you this Who is your who did

STATE OF SOUTH CAROLINA

COURT OF COMMON PLEAS

COUNTY OF ORANGEBURG

KAREEM J GRAVES AND TARA

GRAVES INDIVIDUALLY AND AS

DULY APPOINTED PERSONAL

REPRESENTATIVES OF THE ESTATE

OF INDIA IYANNA GRAVES

Plaintiffs

vs

CASE NO 2008-CP-38-826

CAS MEDICAL SYSTEMS INC

Defendants

DEPOSITION OF ANITA KELLY

DATE March 4 2009

TIME 10 02 AM

LOCATION Law Offices of Williams & Williams
370 St Paul Street N E
Orangeburg, SC

TAKEN BY Counsel for the Defendants

REPORTED BY AMY R TINGBERG
Court Reporter

A WILLIAM ROBERTS JR & ASSOCIATES

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1 got there?

2 A A gentleman that I assumed to be the
3 father

4 Q And what was his appearance?

5 A Distraught, he pointed us up the stairs
6 and said they were up there

7 Q Can you describe him physically, do you
8 remember?

9 A Black male probably 30s to 40s fairly
10 tall But that s all I remember of him

11 Q So he sent you upstairs?

12 A Yes sir

13 Q And what did you find when you got
14 there?

15 A Okay We went up the stairs and as you
16 entered the room straight in front of us was a bed
17 with the mother performing CPR on the bed on an
18 infant

19 Q What happened then?

20 A We took over care to assess the baby
21 Cammie got out a bag valve mask to start delivering
22 oxygen and breaths to the baby while I got the
23 monitor to do a quick look to check for a heart
24 rate And as we proceeded to start with
25 resuscitative efforts there was a baby cooing

1 because I had turned my back to get something else
2 out of the bag and thought, wow, you know we've
3 got a resuscitation And that's when I realized
4 that there were other babies in the room that were
5 immediately behind me two other bassinets -- there
6 were three lined up together, but there were two
7 other babies in additional bassinets

8 So we decided to go ahead and take that
9 baby out to the truck to get -- so that we didn't
10 have distracting sounds with that so we went on
11 down to the unit from the bedroom

12 Q And how long did that take from the
13 time you got there and began assessing the baby
14 until you figured out you better take her down to
15 the truck?

16 A Pretty immediate because like I said
17 the first concern was that mom had been doing CPR
18 on the bed which is not very effective you really
19 need to be on a firm flat surface with an infant
20 like a changing table or a dresser so that you're
21 getting adequate compressions and breaths So we
22 just kind of -- we re going to do a preliminary
23 right there and then, you know if we thought that
24 this was a workable situation we would continue
25 But as soon as the other baby started making noise

1 we decided to go to the truck So probably our
2 assessment wasn't anymore than a minute at that
3 point

4 Q So within a minute of getting there or
5 about a minute you decided to take the child down
6 to the truck?

7 A That is correct

8 Q And did you take the child down to the
9 truck at that point?

10 A Yes sir

11 Q Do you know whether you hooked the
12 child up to the heart monitor in the room or after
13 you got the child down to the truck?

14 A When you do your initial assessment and
15 you do what's called a quick look where you're
16 looking to see the initial rhythm, you strictly
17 take the paddles and apply them to the chest And
18 you read everything through the paddles so that's
19 what is referred to as a quick look which would
20 have given me the asystole Then after you started
21 getting airway and doing a bag valve mask which
22 was down in the truck we would have attached the
23 three leads to the chest of the child for
24 continuous monitoring

25 Q Is there any time on the run sheet that

1 been made aware by the dispatcher that we had
2 pronounced or that we had terminated efforts

3 Q But in any event your next interaction
4 with either of the Graves was when you had a
5 discussion with her in the den in which you
6 characterized as the den of the home?

7 A Yes sir

8 Q And the coroner was there during that
9 time?

10 A That is correct

11 Q And is that where you got the
12 information contained on your run sheet other than
13 the factual information of your medical findings?

14 A That is correct

15 Q Did you go back upstairs at any time?

16 A Yes sir

17 Q What did you go back upstairs for?

18 A I would have gone back upstairs to look
19 at the room and the scene as well as I remember
20 looking at the other two infants to verify that
21 they were okay

22 Q And when would you have gone back up to
23 the room?

24 A From the time of death being pronounced
25 until the coroner arrived because Cammie remained

1 in the unit with the baby

2 Q And how long would you have been up
3 there do you recall?

4 A No sir

5 Q Would it have been five minutes?

6 A Five minutes or less, yes, sir

7 Q Did you find the other two infants to
8 be okay were they still in their bassinets?

9 A One of the babies was being held by the
10 woman again that I assumed to be the grandmother
11 But they were warm and clean and kept you know in
12 appearance

13 Q So you didn't have any concern about
14 the care of children I take it?

15 A No sir

16 Q Is that one thing you were looking for?

17 A Yes, sir One of the things that I
18 looked at is because as you walked in that room
19 there were three bassinets lined up I looked at
20 the condition of the bassinets I was looking for
21 cleanliness of them I would look to make sure
22 there was adequate blankets that there was nothing
23 like a teddy bear or something that would have been
24 a risk hazard or choking hazard or suffocation
25 hazard And if I had found something of those I

1 would have immediately expressed that concern to
2 the law enforcement officer present

3 Q And do you recall when in the timeframe
4 we've talked about you made that inspection of the
5 room?

6 A Again from 04 16 to prior to the
7 coroner so in the timeframe of 04 16 to 04 45

8 Q Did either of the parents show you
9 around the room or were either of them there with
10 you when you took a look around the room?

11 A The mother was present

12 Q Did she say anything to you during that
13 time that you recall?

14 A Not that I recall

15 Q Did she show you anything during that
16 time that you recall?

17 A Not that I recall

18 Q Was Mr Graves present at any time
19 while you were in the room looking around?

20 A The only encounter I had with
21 Mr Graves was when we first arrived on scene and
22 he was coming down the stairs and told us to go up
23 the stairs And he was in the hallway at one point
24 while we were attempting our initial resuscitation
25 and was pretty distraught and went to a room off to

1 the other side

2 Q Did you have any other interaction with
3 Mr Graves after that?

4 A No

5 Q When he was in the hallway and
6 distraught I guess your focus was on the baby,
7 wasn't it at that point --

8 A That is correct

9 Q -- but you remember him being there?

10 A Yes sir

11 Q Did you have any interaction with him
12 at that point or do you just remember him being
13 there?

14 A I remember him being there but no not
15 as far as to ask him questions

16 Q But he didn't come back into room while
17 you did your looking around?

18 A No

19 Q So you went to the room initially when
20 you answered the call and went back to the room for
21 five minutes or less between 4 16 and 4 45 to do
22 the inspection you've told us about Did you go to
23 the room any other time?

24 A No sir

25 Q By the room I mean the bedroom do you

1 death syndrome/natural causes?

2 A Yes

3 Q So would you have any doubt or reason
4 to believe that Mrs Graves wasn't doing everything
5 that she knew to do trying to save this child's
6 life?

7 A No I would not doubt that

8 Q And when you arrived, going to your
9 report there were no signs of trauma and no signs
10 of improper conduct on behalf of the parents or
11 anything that you saw?

12 A No

13 Q When you looked at the bassinets they
14 looked good to you?

15 A Yes sir

16 Q When you looked inside the bassinets
17 where the babies were sleeping did you see the
18 monitors in there?

19 A I do not remember seeing them

20 Q Do you remember on the bassinets there
21 being a little undercarriage on the bassinets?

22 A Yes

23 Q And when you went back up to see the
24 other two children where did you get those
25 monitors to look at? Were they in that little

1 undercarriage?

2 A One of the babies was being held by
3 what I assumed to be a grandmother, so she was in
4 the bedroom holding that baby And I just examined
5 that baby in her arms And that baby was wearing
6 just like the other one what they call a onesie a
7 sleeper-type device and a diaper And the other
8 baby I don't remember

9 Q Do you remember about the monitor, do
10 you remember if the monitor was actually in the
11 crib because that wouldn't have been safe with all
12 those wires or was it underneath in the
13 undercarriage?

14 A I do not know

15 Q Do you actually remember looking at the
16 monitors attached to the babies?

17 A No it would be something that normally
18 I would do on a scene is to look at them to make
19 sure if they were you know there and on But can
20 I say at this point, no

21 Q And if you had looked at those two
22 other ones you probably would have looked at this
23 one --

24 A If I did yes

25 Q So you can't say for sure whether or

1 not you did?

2 A That's correct

3 Q I mean it's five years ago so you
4 would have remembered then better than now?

5 A That's correct

6 Q And you were also saying to Clarke that
7 when you had to do CPR in the chest area you would
8 have had to remove the straps of the monitor
9 anyway So if Mrs Graves was doing CPR she would
10 have had to have done the same thing?

11 A That's correct

12 Q So that explains why the monitor wasn't
13 hooked up at that time pretty good explanation for
14 it?

15 A Possibly

16 Q And you have no reason to believe it
17 wasn't hooked up?

18 A No

19 Q Because what Clarke showed before and I
20 think you said you hadn't seen it actually shows
21 that it has readings from her showing apnea and
22 heart slow for up -- for an hour all the way up to
23 her death?

24 A That's correct

25 Q And I want to go back on that and I

1 Q But you didn't quote anything in this
2 report that she told you?

3 A Correct

4 Q And that's true even of things that we
5 know you got from her?

6 A Correct

7 Q And so is it fair to say then that the
8 fact that there's no quotation marks around the
9 information regarding the monitor doesn't really
10 mean anything one way or the other?

11 MR WINSLOW Object to the form

12 THE WITNESS That is possible-

13 BY MR DUBOSE

14 Q So where we are at the end of this you
15 might have looked at the monitor but you might not
16 have?

17 A Correct

18 Q Is that where we are?

19 A Correct

20 MR WINSLOW Object to the form

21 BY MR DUBOSE

22 Q Okay Is there anything else we could
23 check or look at to determine whether or not you
24 looked at the monitor?

25 A If we can find Cammie and maybe she

1 BY MR DUBOSE

2 Q Have you -- you talked a little while
3 ago about talking about the case with me and
4 talking about the case with the PI Have you talk
5 about the case with anybody else particularly from
6 the plaintiff's side of this?

7 A No I have not

8 Q Have you looked at India Graves'
9 hospital records?

10 A No sir

11 Q Mr Winslow asked you a series of
12 questions about the monitor being a preventative
13 device Can a monitor prevent the onset of any
14 condition in a child?

15 A Prevent the onset, other than a
16 pacemaker no not the onset But once it detects
17 the onset of a problem the alarm is designed to
18 stimulate the baby into breathing, which should
19 correct the heart rate

20 Q And also stimulate the caregivers to
21 attend to the child correct?

22 A That is correct

23 Q Do you have any reason to believe that
24 the clock times reported on the download from India
25 Graves' monitor that we've looked at, other than

1 The top of it here is kind of describing the child
2 is that how you would kind of describe it?

3 A Yes

4 Q Okay The next part is what you've
5 seen what your synopsis of the events are about
6 how the child is?

7 A Correct

8 Q And in that section is where you list
9 the patient's on apnea monitor And then we have
10 our symbols at that time negative with symbols
11 and your description of the machine?

12 A Correct

13 Q And you told me that a prudent
14 paramedic, which you are because of your training
15 would have looked at the machine and documented
16 what they'd have seen?

17 A Correct

18 Q And do you believe that's what you did?

19 MR DUBOSE Object to the form

20 THE WITNESS I cannot testify that
21 that is what I did but that is what I should have
22 done and likely would have

23 BY MR WINSLOW

24 Q Most likely you looked at the machine
25 and you documented what you saw?

1 Q Was she, she told you India?

2 A India, correct

3 Q But she told you she was the illest of
4 the babies as well?

5 A That is correct

6 MR WINSLOW Object to the form

7 BY MR DUBOSE

8 Q Did you take any photographs at the
9 scene?

10 A No I did not

11 Q Well at the end of this is it correct
12 that you can't testify whether you looked at the
13 monitor or not --

14 MR WINSLOW Object to the form

15 BY MR DUBOSE

16 Q -- you think you probably did based on
17 this but you don't know more likely than not
18 whether you did or not?

19 A Correct

20 MR WINSLOW Object to the form

21 MR DUBOSE Thank you

22 MR WINSLOW Let me follow up with
23 that real quick

24 EXAMINATION

25 BY MR WINSLOW

Scott A Lambert December 16, 2008

Page 1

STATE OF SOUTH CAROLINA
IN THE COURT OF COMMON PLEAS
COUNTY OF RICHLAND
CIVIL ACTION NO 06-CP-40-7398

Kareem J Graves and Tara Graves
individually and as duly appointed personal
representatives of the Estate of India Ryanna
Graves

Plaintiff

-vs-

CAS Medical Systems Inc ,

Defendant

VIDEOTAPED DEPOSITION

OF

SCOTT A LAMBERT

DATE TAKEN 12/16/08 BY Amy L Larson RPR

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000915

1 Q Let me have you look behind tab 11, if you
2 would

3 A (Complies) Okay ,

4 Q And tell the jury, if you would, what that
5 document is

6 A It's a Failure Mode and Effects Analysis, or
7 otherwise referred to as an FMEA And what
8 this document is is analysis of the design,
9 the electrical design specifically, to see
10 what any potential failures of each component
11 could be, what the effect of those components
12 would be were they to fail in that manner,
13 and then what hazard or risk is associated
14 with that particular failure Then all of
15 those failures are ranked priority-wise as to
16 which are more severe and more probable and
17 those - those are looked at to see if those
18 types of failures can be prevented completely
19 or if the severity or probability of those
20 failures can be reduced

21 MR HASTINGS I'm sorry, what was
22 that tab?

23 THE WITNESS Tab 11

24 BY MR D BOSE

25 Q And in all of these documents that we've

Page 25

looked at, we can go back and look at
particular examples for the jury, do you deal
with how the alarm in this monitor was
supposed to work --

A Yes

Q -- and -- and whether it worked that way or
not?

A Yes We had a requirement in the product
requirement specification which then also
went into the software requirements documents
as well that would outline a -- an alarm
system that was fairly unique in that it had
a redundant alarm system in that there was a
primary alarm and a secondary alarm, and also
a microphone that would monitor the alarm
outputs to make sure that when an alarm was
intended to be sounded, that the microphone
actually verified the alarm was working

And if the microphone -- if an alarm was
sounded and the microphone did not detect
that that alarm had occurred, it would then
turn on the secondary alarm in order for it
to be heard and then would listen for that
alarm

Q All right Let me stop you right there a

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1 minute

2 A Sure

3 Q How did the microphone or does the microphone
4 determine whether the alarm actually went
5 off?

6 A The alarm, when it sounds, creates a
7 mechanical sound pressure And that
8 mechanical sound pressure is detected by the
9 microphone which then is turned into a signal
10 that the micro -- that the computer in the
11 monitor can understand

12 Q Okay Is the microphone that you're talking
13 about an electrical device?

14 A It is

15 Q And does it work like the microphone that
16 we're wearing -- we're each wearing today for
17 this deposition so that it'll be picked up
18 for the videographer?

19 A It's very similar to that, yes

20 Q And so the microphone listens for the alarm?

21 A It does

22 Q But what if somebody comes by the monitor and
23 claps their hands real loud or shoots off an
24 air horn, would it pick that up?

25 A It's possible it could, but it would have

Page 27

1 to be very loud The monitors on the
2 Ami Monitor -- or the alarms on the
3 Ami Monitor were specified, as required by
4 the FDA reviewer guidance, to be very, very
5 loud devices And anybody who has heard one
6 knows that they're extremely loud-

7 Q Okay

8 A And so the microphone is tuned so that it
9 will pick up that loud of a sound and won't
10 pick up any extraneous noise unless it was
11 extremely loud

12 Q Well, what happens if, say, a patient -- and
13 just to jump back a minute, what patient
14 functions does this monitor monitor?

15 A It monitors the patient's breathing and the
16 patient's heart rate

17 Q If the patient's heart rate drops too low so
18 that the monitor is alerted to a problem or a
19 potential problem, should the alarm go off at
20 that point?

21 A If the -- the patient's heart rate falls
22 below the limit that's set in the monitor by
23 the -- by the clinician, then the monitor
24 will alarm

25 Q And if that front alarm, I think you called

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it, goes off, the microphone hears that
alarm?

2

3 A That's correct

3

4 Q And what does the microphone do with that
5 information?

5

6 A The microphone turns that mechanical sound
7 pressure into an electrical signal and that
8 electrical signal is fed into the computer
9 inside the monitor and that computer then can
10 tell that the microphone heard the audible
11 alarm sound

10

11

12 Q Does it make note of the fact that it heard
13 the front alarm anywhere?

13

14 A When -- when an alarm is intended to be
15 sounded, the computer looks to see if the
16 microphone heard it When the alarm turns
17 off, the computer looks to see that the
18 microphone stopped hearing it And so
19 whenever an audible alarm is sounded, the
20 computer looks to the microphone to verify
21 that it -- when the alarm is on that it heard
22 it and when the alarm is off that it doesn't
23 hear it

21

22

23

24 Q And I believe you told us a little while ago,
25 Mr Lambert, that if the front alarm does not

25

1 go off, the microphone obviously doesn't hear
2 it and the rear alarm is turned on?

3 A Yeah Then the computer will say -- since
4 the microphone did not hear the front alarm,
5 it will turn the secondary or rear alarm on
6 and then it'll do the same thing, it would
7 look to see when it intended to turn on the
8 alarm did the microphone actually verify that
9 the alarm sounded

10 And when it turns off that alarm -- for
11 example, with physiologic events the alarm
12 beeps once per second It will look to see
13 that the alarm is on when it says it should
14 be on and that it turns off when it -- when
15 the computer intended the alarm to be off

16 Q Are there any other monitors on the market
17 that have a rear alarm?

18 A Not that I'm aware of, no

19 Q Is that rear alarm a backup alarm?

20 A Yes

21 Q All right And whose concept was it to
22 include a rear alarm on this monitor?

23 A That was my concept

24 Q All right And why did you want to put a
25 rear alarm on the Am1 Monitor?

1 go off, the microphone obviously doesn't hear
2 it and the rear alarm is turned on?

3 A Yeah Then the computer will say -- since
4 the microphone did not hear the front alarm,
5 it will turn the secondary or rear alarm on
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21 Q All right And whose concept was it to
22 include a rear alarm on this monitor?

23 A That was my concept

24 Q All right And why did you want to put a
25 rear alarm on the Am1 Monitor?

1 A Well, having a history of apnea monitor
2 development, a typical problem early on in --
3 in early designs of monitors were that there
4 would be a contention that the monitor's
5 audible alarm did not sound when it should
6 have

7 And there was no way to verify that other
8 than to show that the equipment worked
9 properly after the reported event So it was
10 basically the word of the patient or -- or
11 caregiver what -- what came -- came to be
12 that the alarm -- audible alarm wasn't heard
13 versus does the equipment function or not

14 So that -- that -- that was something
15 where there was information lacking to make
16 sure that the equipment was actually working
17 properly, and it also left companies
18 vulnerable to accusations that the alarm
19 didn't work when it may or may not have --
20 have functioned properly

21 So a couple of things were included in
22 monitor designs as the monitor developments
23 progressed One was the inclusion of memory
24 where the computer inside the monitor would
25 record when events occurred so you could tell

1 when things - things like when the monitor
2 was turned off and turned on, and when it
3 detected events like apnea, cessation of
4 breathing or heart slow or heart fast events,
5 things like that

6 And so then if there would be a concern
7 raised that a monitor may not have functioned
8 properly, you could go and look into the
9 memory of the device and find out when
10 specific things had occurred and -- and what
11 the monitor actually said was going on

12 Q Let me interrupt you right there -

13 A Yes

14 Q -- and then I'll let you pick back up Is
15 the memory you talked about something that
16 can be translated into paper format?

17 A Correct

18 Q And is that often referred to as a download?

19 A Yes

20 Q Okay Go ahead Thank you

21 A Yes And Aequitron was not the only company
22 to include memory in their devices So this
23 was something that was adopted industry-wide

24 And it served a couple of purposes One
25 was the aspect of could you tell really what

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1 the -- what the -- what actually happened by
2 looking at what the log said and -- and
3 also it helped the clinician better diagnose
4 the patient's condition, because he could
5 look back and see what events the monitor
6 detected instead of just relying on what the
7 parent thought the alarms were the night
8 before

9 A lot of times these -- these things
10 occur in the middle of the night and the
11 patient -- or the parent is groggy, they've
12 just been woken up by this loud, piercing
13 noise and it's dark and they go in and they
14 -- they want this thing to stop beeping,
15 obviously But they check on the baby and
16 then they'll reset the monitor

17 And when you look at -- typically what
18 would happen is they would come into the
19 clinic the next time they visited the doctor
20 and they would say something like, "I think
21 there was two apnea alarms last night " And
22 when the doctor could look at the log, he'd
23 find out actually it was two heart slow
24 alarms, not two apnea alarms And it may or
25 may not change what the doctor wants to do

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1 with the baby or the care of the baby at that
2 point

3 Q Let me show you another document and ask you
4 if that is an example of a download from an
5 Am1 or an Am1 Plus Monitor

6 A (Reviews document) Yes, it is

7 Q All right And is that the download for
8 India Graves dated April 12, 2004?

9 A Yes

10 MR DuBOSE Why don't we go ahead
11 and mark that as the next exhibit, please,
12 which I believe will be Number 3

13 (Whereupon, Deposition Exhibit 3
14 was marked for identification)

15 BY MR DuBOSE

16 Q Can you tell the jury, please, Mr Lambert,
17 in general terms what the download shows?
18 And you can use Exhibit 3, the India Graves
19 download, as an example of the kind of
20 information that is downloaded off of the
21 monitor reflecting what occurred with the
22 patient and the monitor during the period of
23 time that the monitor was recording

24 A Okay Well, this report has a summary report
25 at the beginning which shows the time of the

1 reporter she'll mark it for us

2 A (Hands document)

3 (Whereupon, Deposition Exhibit 4
4 was marked for identification)

5 BY MR DuBOSE

6 Q And what particular matters does that patent
7 cover?

8 A It covers having a primary and a secondary
9 alarm, as I discussed earlier, and
10 incorporating a microphone as well to verify
11 that when the alarm is sounded that it's --
12 the microphone verifies that it actually
13 heard what was intended to be sounded So
14 that an audible sound is actually emitted and
15 picked up by an independent measurement
16 means, being the microphone

17 Q Instead of using the microphone, why couldn't
18 you just have the monitor tell itself that it
19 was supposed to be alarming and use that as
20 the indicator that the alarm went off?

21 A Well, prior designs actually did that But
22 what - what would occur is you'd still have
23 this point of contention between a claim that
24 the monitor didn't alarm when it should have
25 And the only information in these prior

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1 systems would be that the monitor said it
2 alarmed and showed that it intended for it to
3 alarm, but there was no other way to find out
4 that an actual sound was emitted other than
5 the monitor had intended for it to alarm and
6 then to test the equipment afterwards to show
7 that the equipment functioned properly

8 And so it wasn't as complete a
9 verification as it could be without having
10 some independent means to verify that a sound
11 was actually produced

12 Q All right And how does the microphone give
13 you better verification that the alarm
14 actually did go off?

15 A Well, when the alarm is sounded it creates
16 this mechanical pressure wave, sound, and
17 that is converted by a microphone

18 A microphone is a transducer And a
19 microphone will take one form of energy and
20 transform it into another form of energy
21 That's what a microphone is

22 So a microphone will take this mechanical
23 sound pressure produced by the audible alarm
24 and convert it into an electrical signal that
25 the computer can read

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1 And the signal conditioning that we
2 connect for the -- for the microphone between
3 the microphone and the computer is such that
4 the loudness of the alarm has to be such that
5 it's like the audible alarm in the device,
6 which is very loud And it has to be that
7 loud and that close in order for the
8 microphone to pick it up

9 Q All right And then does the microphone --
10 strike that Let me go back

11 Does the log that we've been talking
12 about reflect whether or not the microphone
13 has heard the alarm?

14 A The log will log when a problem has occurred
15 The event log is just a listing of events
16 that occur, like on/off, apnea, heart slow

17 And one of those things is that if you
18 sound the front alarm and the microphone
19 doesn't hear it, it will log that event as
20 the microphone didn't hear the front alarm
21 It will then sound the second -- secondary
22 alarm, the rear alarm, and will listen for
23 that

24 If that works then it will continue on
25 and it will give an indication on the monitor

1 A This documents the functions or what the
2 software has to do

3 Q And is that something you would have given to
4 Reining to help them in their development of
5 the product?

6 A Yes It's something we would have developed
7 with Reining And this would be based on the
8 requirements that we had defined in the
9 product specification, which was also
10 something we would have given to Reining

11 Q And so this was another step in the
12 development of the documentation for the
13 product?

14 A That's correct.

15 Q For all of this documentation that we've
16 looked at, did Reining ever complain to you
17 that it had too much detail in it?

18 A No It was generally the opposite If
19 something wasn't specified, we may not get
20 what we want So there was always care taken
21 to make sure that what we had specified was
22 complete so that there wouldn't be
23 communication problems in implementing what
24 we expected We wanted to make sure they
25 made what we wanted them to make

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1 Q And is it fair to say that to do that you had
2 to be clear on what you wanted?

3 A That's correct. And sometimes that takes
4 iterations, you've got to try and improve as
5 you go. So throughout the development
6 process there would be changes to these
7 documents where there would be things that
8 are unclear and we would clarify them and
9 then create a new version of the document.

10 Q And is that why some of these documents
11 aren't version 1, but version 5 or version 9?

12 A Correct.

13 Q What version, for example, is the document
14 you're looking at now?

15 A This is revision 9.

16 Q I want to turn now to the India Graves
17 download which I gave you earlier.

18 A Okay.

19 Q And tell the jury again what exhibit number
20 the download is.

21 A Exhibit 3.

22 Q And, again for the jury, tell them which
23 download we're looking at by date.

24 A It's the download from April 12th, 2004.

25 Q All right. And does this download cover the

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1 period from -- including, rather, April 9
2 through April 11, 2004?

3 A It actually covers more than that

4 Q Right It actually starts on what day?

5 A February 13th But the new recording has
6 started on April 1st

7 Q And the patient recording ends on what day?

8 A I believe it's April 12th

9 Q All right Well, is there any patient
10 recording on April 12th -- 12th, rather, or
11 is that only --

12 A Oh, I'm sorry, that's when the -- that's when
13 the -- it was powered up and detection was
14 disabled, so they downloaded Yeah, so it's
15 April 11th

16 Q All right And for the jury's convenience,
17 what is the easiest way to look at this
18 document and see the inclusive dates of the
19 monitoring? What -- what is the heading on
20 the top of the page that you're looking at?

21 A It's, "Preliminary Study Report, Am1 Apnea
22 Monitor Summary Report "

23 Q That's the very first page?

24 A Yes

25 Q All right And then the next page has a

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1 title on the top, "All Study Logs", is that
2 correct?

3 A The third page in says, "All Study Logs,"
4 yes

5 Q All right And what information is captured
6 there?

7 A That is the event log or a -- a series of
8 logged events, meaning events that occurred
9 and then were recorded in the monitor's
10 memory

11 Q And then after that I come to a document
12 called, "Event List " Do you have that in
13 your documents, sir?

14 A I do

15 Q All right And tell the jury what that page
16 indicates or shows

17 A That is a list of the events that were
- captured with waveform data

19 Q And what is waveform data, Mr Lambert?

20 A So this is when you -- when the monitor has
21 detected a physiologic event, like an apnea,
22 which is a cessation of breathing, or a heart
23 slow or a heart fast event

24 And what it does is records all of the
25 physiologic and the monitor information in --

1 in a picture form or a waveform -- form so
2 you can see the actual heartbeat tracing, you
3 can see the respiratory effort tracing, you
4 can see the detections of the monitor where
5 the monitor says it detected a breath and
6 where it detected a heartbeat

7 If there's auxiliary equipment attached
8 you can see -- like a pulse oximeter, you can
9 see that monitor's information recorded in a
10 waveform format and you can also see the
11 alarm response information from the monitor
12 as well

13 Q All right Well, why don't we look at those
14 waveforms -- pardon me Why don't we look at
15 the waveform pages a moment for India Graves

16 A Okay

17 Q You indicated that the download we have here
18 would show whether the alarm went off?

19 A Correct

20 Q And does it show whether the alarm was heard
21 by the microphone or not?

22 A It does

23 Q All right And tell us, if you would,
24 Mr Lambert where on the India Graves
25 download the alarm activity is shown

1 A It's labeled as one of the waveforms and it's
2 labeled as, "Alarm activity "

3 Q And how does the indication appear on the
4 document that the alarm went off?

5 A It appears as a bar that occurs once per
6 second after an event has been detected, like
7 a breathing -- stopping of breathing or if
8 the heart was too slow, then the alarm starts
9 to beep once per second And this alarm
10 activity shows a once per second bar, so a
11 bar every second that the monitor would be
12 alarming

13 Q And looking through the India Graves
14 download, does the bar appear repeatedly
15 throughout the waveform section of the
16 download?

17 A It does

18 Q In the India Graves download, Mr Lambert,
19 does the bar, when it appears, correspond
20 with patient events that were abnormal and
21 above or below the apparent set parameters in
22 the monitor?

23 A It appears to I haven't gone through and
24 looked at each and every one of these But
25 where the monitor has identified an event

1 there is also a corresponding alarm

2 Q And based on your knowledge of this monitor,
3 can that bar appear on this download if the
4 microphone did not in fact hear the alarm
5 going off?

6 A No

7 Q And why do you say that?

8 A Because what the -- what the monitor does is
9 when it detects an event it starts to record
10 these waveforms independent of the detection
11 The detection triggers an event to be
12 recorded, which means it sets in motion that
13 all of these waveforms that I've described be
14 collected on a -- on a sample basis So they
15 take -- they take snapshots of each piece of
16 these waveforms and they record them

17 Q Do the waveforms reflect what is going on
18 with the child being monitored?

19 A It does

20 Q And so they show where the heart rate is,
21 where the respiration is, is that correct?

22 A That's correct

23 Q All right And I interrupted you Why don't
24 you go ahead and give us your explanation

25 A So when a -- an event is detected, the

1 But, for example, if the memory was not
2 filled yet, what it would do is say, "Oh,
3 I've got a heart slow event, I want to save
4 that information so that the clinician can
5 look at it later and diagnose the baby's
6 condition "

7 So what the monitor does is it starts
8 recording -- or starts saving the information
9 that it already had started recording It
10 goes back in time, because you want to see
11 what led up to this event

12 So it records this information from -- I
13 forget the time period, but many seconds
14 before the event started And what it's
15 doing is recording all of this information
16 periodically independent of the event
17 stopping or another event occurring

18 It's just saving this information by
19 looking at the respiratory signal that's
20 being monitored by the computer in the -- in
21 the monitor, the ECG signal that's being
22 monitored by the computer, where -- where the
23 respiration and heartbeats are being detected
24 by the monitor and, in addition, the alarm
25 signal that's being heard by the microphone

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1 is one of those signals that's recorded
2 So it's not recording that it intended to
3 sound the alarm It's recording that the
4 microphone heard an alarm

5 Q Well, could the same thing that told the
6 alarm to go off tell the log that the alarm
7 did go off and, therefore, trigger that bar
8 in the alarm activity channel?

9 A That's not how it's designed, so, no

10 Q Are -- are those two modules connected with
11 each other?

12 A They may be related, but they're different

13 Q Does the LED alarm module control the
14 microphone and what it hears?

15 A It doesn't control the microphone It -- it
16 looks to see if the microphone hears
17 something and it looks to see if the
18 microphone doesn't hear something

19 Q What would have to happen to this monitor
20 for -- for this download to look the way it
21 does? The download shows the events going on
22 with the patient on, for example, 4/11?

23 A Yes

24 Q Is that correct?

25 A Yes

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1 Q And, for example, the download shows that
2 India had apnea events And that just means,
3 doesn't it, that her breathing was not as
4 strong as it should have been?

5 A Or -- or the effort to breathe had stopped

6 Q And it shows that her heart slowed on
7 occasions?

8 A Yes

9 Q And it recorded that information --

10 A It did

11 Q -- did it not? And on the All Study Logs you
12 can tell that it recorded it when it occurred
13 in time and for how long it occurred?

14 A Correct

15 Q And then the waveforms give you, I guess,
16 more detail, is that correct, of how slow the
17 heart was or how slow her breathing was?

18 A Correct.

19 Q And the waveform document shows that the
20 alarm actually went off on -- for those
21 events?

22 A It does

23 Q Is there any way you know of, given your
24 knowledge of this monitor, that these
25 indicators that the alarm was heard by the

1 listening to the microphone

2 So what's being recorded has nothing to
3 do with whether or not the monitor thinks the
4 alarm should or shouldn't be sounded It has
5 to do with whether or not the microphone did
6 or didn't hear an alarm each second when the
7 microphone is looked at

8 So you would have to have a defect not
9 only in the process of sounding the alarm
10 where it -- you intended to sound and it
11 didn't, but you'd also have to have a defect
12 in where the microphone output is being
13 recorded by the computer program and it
14 hears -- the microphone is hearing something
15 that didn't occur and then at the same time
16 functions normally everywhere else And this
17 has to happen over and over and over again
18 every once a second throughout all of these
19 events

20 BY MR DuBOSE

21 Q I want to try clear up the objection that I
22 heard

23 Are you qualified to tell the jury
24 whether or not a computer code defect in the
25 LED alarm module that we looked at a little

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1 while ago, if it existed in that module,
2 could cause the alarm activity bar to appear
3 on the wavelength -- or waveform page,
4 rather, if it did not in fact alarm?

5 A I don't believe a defect could cause that,
6 no

7 Q All right Are you qualified to give an
8 opinion on that?

9 A Yes

10 Q All right What qualifies you to give that
11 opinion?

12 A I have developed software for apnea monitors,
13 for several apnea monitors, and have managed
14 projects for software that included software
15 development, and I've done this for 25 years

16 Q And you were directly involved in this
17 monitor, were you not?

18 A I was

19 Q All right And given that, what is your
20 opinion as to whether or not the alarm
21 activity indicator on the India Graves
22 download could appear if the alarm did not in
23 fact actually go off?

24 A Well, what is recorded in these waveforms is
25 what the microphone heard So if the

1 microphone heard a sound, it would record a
2 mark every once per second If the
3 microphone heard a sound when it wasn't
4 supposed to hear a sound, meaning when the --
5 the computer on the monitor didn't tell the
6 alarm to sound, but it looked at the
7 microphone and the microphone said it did,
8 then it would log that as a failure in the
9 event log And none of those failures are
10 included in this event log

11 Q Well, could a bug, a computer bug if it
12 existed in the LED alarm module, trigger the
13 indicator that the alarm was heard even if
14 the alarm didn't go off?

15 A I don't believe so, no

16 Q And why not?

17 A Because what's being recorded here is
18 recorded in a separate module from the LED
19 alarm module

20 Q Okay So you've got the LED module over here
21 and the module controlling the alarm heard
22 indicator somewhere else?

23 A Correct

24 Q Let me show you a download for India Graves
25 earlier in time and we'll mark that as the

STATE OF SOUTH CAROLINA) IN THE COURT OF COMMON PLEAS
COUNTY OF RICHLAND) CIVIL ACTION NO 06-CP-40-7398
))
KAREEM J GRAVES and TARA)
GRAVES individually and)
as duly appointed)
personal representatives)
of the ESTATE OF INDIA)
IYANNA GRAVES)
Plaintiffs)
))
VS)
))
CAS MEDICAL SYSTEMS INC)
AMERICAN HEALTHCARE)
RESOURCES INC d/b/a)
ASHBY MEDICAL and STEVE)
M ELLIOTT or any)
business entity d/b/a)
ASHBY MEDICAL PALMETTO)
HEALTH RICHLAND MEMORIAL)
HOSPITAL and PALMETTO)
HEALTH ALLIANCE)
Defendants)

ORAL DEPOSITION OF
WILLIAM MCCAIN LIVELY III Ph D
MAY 23 2008

ORAL DEPOSITION of WILLIAM MCCAIN LIVELY III Ph D ,
produced as a witness at the instance of DEFENDANT CAS
MEDICAL SYSTEMS INC and duly sworn was taken in the
above-styled and numbered cause on Friday MAY 23 2008
from 8 08 a m to 12 50 p m before Suzanne G
Saulsberry RPR CSR in and for the State of Texas
recorded by machine shorthand at the offices of
Hastings Law Firm P C 616 FM 1960 West Suite 725
Houston Texas pursuant to the South Carolina Rules of
Civil Procedure and the provisions stated on the record
or attached hereto the deposition shall be read and
signed before any notary public

U S LEGAL SUPPORT - HOUSTON
713-653-7100

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1 the Graves case?

2 Q Yes, sir

3 A Okay Each semester I teach a graduate and
4 undergraduate course in software engineering, so the
5 development of software is my primary area of teaching
6 and research I have developed a number of different
7 systems, I've developed some large systems for the
8 hospital, for Lockheed, for the Air Force, General
9 Dynamics, you know So I have an expertise in large
10 software systems

1 Q As far as any specific material that you've
12 reviewed -- and let's not limit it to this case but
13 let s put all of this in terms of your work in reviewing
14 the CAS AMI Plus software

15 A Uh-huh

16 Q Because you've done it more than one time, I
17 understand

18 A Uh-huh

19 Q Have you looked at any specific background
20 material?

21 A Yeah, I got a couple of text books that I use

22 Q And what are they?

23 A (Tenders books) Those are textbooks that I
24 use

25 Q You've put on the table two books One, the

1 Sixth Edition of Software Engineering, A Practitioner's
2 Approach, by Roger S Pressman?

3 A Correct

4 Q And the other is Software Engineering 8, by
5 Sommerville?

6 A Yeah, that's Version 8

7 Q Version 8

8 Is there any other background material that
9 you rely on for your opinions in this case?

10 A I typically belong to technical societies who
11 disseminate technical information about software
12 systems I use the Web widely, you know, to research
13 various software development topics

14 Oh, by the way, I brought these for you
15 You can have those, if you would like

16 Q I'll read them on the plane on the way home

17 A You know, textbooks today cost over \$100
18 apiece That's probably nothing compared to what law
19 books -- law texts cost

20 Q I think the thing to do is get your name on the
21 spine of one and then you don't mind that high price

22 A (Laughter)

23 Q Doctor, you've mentioned a moment ago that you
24 use the worldwide Web and professional journals and
25 papers that you get?

1 A Uh-huh

2 Q Do you point to any of them, any of either of
3 these sources as support for your opinions about the AMI
4 Plus software?

5 A Not about the AMI Plus software no

6 Q And can we agree that when we talk about the
7 AMI Plus software, we're talking about not only the
8 software itself but the development and testing of that
9 software, as well?

10 A Yeah Yes Yes

11 Q I want a big package so I don't have to
12 delineate it all every time

13 A Yes Yes

14 Q So there's no other background material that
15 you have reviewed or rely on in support of your opinions
16 in this case?

17 A I have had personal conversations with
18 Dr. Daugherty that were not documented

19 Q And we'll talk about those Anything else?

20 A No

21 Q With regard to the two textbooks that you
22 brought, is anything in particular, any pages or
23 chapters that you rely or would point to in supporting
24 your opinions?

25 A An issue which you obviously share in in all

1 your endeavors, is one of communication When you
2 develop software systems, the customer and the developer
3 need to communicate so they can understand each other

4 Well, now, in this case, the developer
5 typically is communicating with very unsophisticated
6 users - children so in that case, they have to find
7 other experts in the field But when I talk about the
8 lack of success with some of the previous systems I
9 discussed with you, communication is always a major
10 issue, either because the customer can't tell the vender
11 what they want or there's just misunderstanding as they
12 talk with one another Now, that's a major problem with
13 software development and that's one of the things that I
14 emphasize I emphasize documentation, that we write
15 things down

16 So those particular issues are not chapters
17 in this book, but they're covered throughout the book
18 You know, they're topics that are covered throughout the
19 book and the testing of software, of course

20 Q Anything else?

21 A Well, a lot of topics in here are important,
22 you know I'm trying to give you what I think are the
23 real highlights, you know, the things that can make a
24 system successful or more successful if they're applied

25 Q It sounds like what you're telling me -- and

1 correct me if I've gotten it wrong, but it sounds like
2 what you're telling me is that you rely on these texts
3 and have brought them today, therefore not for specific
4 bullet points, if you will, but for general discussion
5 of software development and testing?

6 A When you use the term "general," I'm not sure
7 what you mean

8 Q All right Are you saying that you rely on
9 these textbooks for as opposed to specific points
10 general discussions of how that type of work should be
11 done?

12 A I think that would be accurate But I do cover
13 most -- when I use one of these textbooks, I do cover
14 most of the material in it, so

15 Q Most of the material in the book?

16 A Right

17 Q And you're talking about in your teaching now?

18 A That's right I have my teaching plus
19 PowerPoint slides for the various chapters and, of
20 course, they have the textbook

21 Q Item 9 on Exhibit 3, your deposition notice,
22 asked you to bring with you documents related to request
23 for payment and tracking the time you have spent working
24 on this matter Have you brought that material with
25 you?

1 A No, but I can readily provide that to you

2 Q Okay If you would do that, I will be very
3 appreciative

4 How much time have you spent working on the
5 Graves case, do you know?

6 A Oh, 15 to 20 hours

7 Q And I understand that you have looked at this
8 software and related issues before the Graves case Is
9 that correct?

10 A Correct

11 Q How long did you work on it before the Graves
12 case came up?

13 A 120 to 140 hours

14 Q Now, when you keep track of your time do you
15 itemize what you've done or do you simply summarize the
16 number of hours that you've worked?

17 A I have a calendar that I put the hours on, and
18 I don't summarize the work

19 Q Well, if you would, I'd like for you to provide
20 me a documentation of any work you've done in review

21 of AMI, AMI Plus software?

22 A Okay

23 Q No matter whether it was with the Graves case
24 or before the Graves case, if you would?

25 A So you're talking about the Smith case too?

1 A Correct Correct

2 Q Okay Have you attempted independently of him

3 to draw your own diagram?

4 A No, I have not, but I was very trustful of his

5 diagram

6 Q Do you understand that he considers this

7 diagram a draft and not a final version?

8 A This one here?

9 Q Yes

10 A What do you mean by "draft"?

11 Q A draft and not a final version?

12 A You haven't told me what a draft is yet

13 What's a draft? What do you mean by "draft"?

14 Q I'm hesitating, Doctor, because I'm surprised

15 that you don't know what a draft is

16 A I know exactly what a draft is I know exactly

17 what a draft is, but I want to hear what you mean by

18 "draft "

19 Q Well, my understanding from Dr Daugherity is

20 that this was his first attempt at diagramming this and

21 that if he did it again, he could make it cleaner

22 A Correct Correct

23 Q Do you agree with that?

24 A Correct-

25 Q Okay

1 A But, see, when you said 'draft,' I associate
2 incompleteness with draft I don't think that this is
3 incomplete It just can be made cleaner with straight
4 lines and show the crossing of lines to clarify
5 understanding

6 Q Would you defer to Dr. Daugherty on whether
7 it's complete or not?

8 A Yes

9 Q Did you -- is it part of your opinion that
10 there is a glitch or bug in the software that causes the
11 alarm not to audibly sound on certain occasions?

12 A Now what do you mean by 'bug'?

13 Q Well, I think that's a good question and I want
14 to use your parlance, so let me --

15 A Okay

16 Q -- ask you Do you -- what do you think caused
17 the alarm not to go off at the Graves household on the
18 morning of April 11, 2004?

19 A The monitor system is made up of hardware and
20 software The hardware -- remember, I'm an electrical
21 engineer too -- the hardware can be tested pretty fully
22 to see, you know, if there are any problems so that sort
23 of 'leaves us with the software as a possibility

24 When we view code like this, which we call
25 spaghetti code, meaning the flow of control is not clean

1 and the fact that these alarm problems have been
2 occurring with the monitors for ten years or more, one
3 would have to conclude that it is the software The
4 fact that it is spaghetti code means the maintenance of
5 that code is very difficult In other words, following
6 the various paths through the code is very difficult and
7 therefore it's very difficult to fix the alarms

8 So -- well, I've just started off and ran
9 like the dickens on that question So I think, yes, the
10 software is the problem

11 Q All right Well, are you saying that the fact
12 that the code is, as you characterize it, spaghetti
13 code --

14 A Uh-huh

15 Q -- actually causing the alarm not to go off or
16 is that keeping you from finding the problem?

17 A The spaghetti code is preventing me from
18 finding the problem and fixing the code

19 Q Okay And so you think there is a problem
20 with the code itself?

21 A Within the software

22 Q Okay And what do you call that kind of
23 problem? I've heard the term "bug" used, but you may
24 have another term Are you familiar with the term
25 "bug"?

1 A Oh, sure I'm familiar with the term "bug " I
2 got some great stories to tell, but we don't have time
3 for that

4 Q We'll have to do that another day

5 A Okay I would call it either a software
6 ailure or a software error

7 Q Software error, okay Well, why don't we go
8 further

9 You believe there is a software error
10 within the code that causes the alarm not to go off on
11 occasion?

12 A Uh-huh

13 Q What have you done to look for that software
14 error in the AMI Plus code?

15 A I have not done anything, but Dr Daughterity
16 has developed this diagram and he has executed the code,
17 you know, trying to determine where the bug is and we
18 have been - or he has beer unsuccessful in doing that

19 Q So is it fair to say you've delegated the
20 looking for the software error, the looking for the
21 software error to Dr Daughterity?

22 A Well, 'delegate" sounds like he works for me
23 We work together jointly

24 Q But that's been his share of the task?

25 A Uh-huh That's part of what he's done, yes

1 Q Okay And I think you told me this but just to
2 be sure, you individually have not looked for the
3 software error You've relied on Dr Daugherity to do
4 that?

5 A Correct

6 Q And Dr Daugherity has not found the software
7 error?

8 A Correct

9 Q Okay And you do not know where the software
10 error is, assuming it exists?

11 A Not at this time

12 Q Have you finished your work on the project for
13 the Graves case?

14 A My preparatory work, is that the question?

15 Q Beyond actual trial preparation, do you have
16 any more work to do based on the assignment you've been
17 given by counsel?

18 A At the moment there are no other assignments

19 Q Is there any other work that you independently
20 plan to do that you've not yet done with regard to the
21 Am-I software?

22 A I feel we have studied the software
23 sufficiently to come to reasonable conclusions about it

24 Q So is that a "no," there's nothing else you
25 plan to do?

1 A No

2 Q Do you know whether any of the alarm complaints
3 that CAS or its predecessor, Mallinckrodt, received that
4 involved software as opposed to hardware were ever found
5 to be valid?

6 A I don't know

7 Q Do you believe that's something that would be
8 important to you in knowing whether to rely on them or
9 not?

10 A Yes

11 Q Have you seen any documentation of anyone
12 actual finding a software error in the AMI Plus code
13 relative to audible alarm failures?

14 A No

15 Q I think I asked another one of those bad
16 questions, so I'm going to rephrase that.

17 A All right

18 Q Are you -- have you seen any evidence that
19 anyone has found a software error in the AMI Plus or AMI
20 code that caused the alarm -- the audible alarm to
21 malfunction?

22 A My brain is running wild Yes.

23 Q Who found that software error?

24 A We conclude that the software has this kind of
25 a flow problem and when somebody dies, we conclude that

1 it was the software

2 Q But you haven't found the error within the
3 software, correct?

4 MR WINSLOW Object to the form

5 Q (BY MR HASTINGS) The alleged error within the
6 software --

7 MR DuBOSE You're right That was a bad
8 question --

9 MR WINSLOW Software is the problem

10 Q (BY MR DuBOSE) Dr Lively, is it correct that
11 you have not found any software error within the code
12 for the AMI Plus monitor?

13 A I don't know

14 Q Why don't you know that?

15 A Because I don't know every contingency

16 Q But you would know whether you had found a
17 specific error or not, correct?

18 A Oh Correct

19 Q And you have not found that error?

20 A Correct

21 Q Assuming it exists

22 MR WINSLOW Object to the form

23 Q (BY MR DuBOSE) Do you know whether anyone
24 else has found the error that you say exists but have
25 not located?

1 A No

2 Q In your report you say that there are poor and

3 cryptic variable names?

4 A Uh-huh

5 Q Have you had trouble understanding the

6 abbreviations used in the code?

7 A Absolutely

8 Q Which ones do you not understand?

9 A Well, I don't know This is a report here

10 Where's the code?

11 WU high bat flag "

12 Q Think "WU" could mean 'warn user'?

13 A I don't know, but it's a horrible variable

14 Q Let me ask you this Do you know whether any

15 person either designing or maintaining this code has

16 ever had any trouble understanding the variables used?

17 A I don't know I got another one here

18 Q Okay

19 A "AX That's a variable here

20 Q Did the use of variables that you do not

21 understand result in the alleged alarm failure at India

22 Graves' house on 4/11/04?

23 A It might be a contributing factor

24 Q Can you say more likely than not that it is a

25 contributing factor?

1 AMI Plus monitor?
2 A They're not
3 Q They are not what?
4 A They are not included appropriately
5 Q Are they inappropriate go-to statements in the
6 AMI Plus software?
7 A That's what creates the spaghetti code
8 Q Explain that to me, if you would
9 A The go-to statements just allow - cause me to
10 branch throughout the program
11 Q Are go-to statements permitted to be used with
12 assembly code?
13 A You have to
14 Q You have to use go-to statements in assembly
15 code?
16 A Uh-huh
17 Q "Yes"?
18 A Correct Yes
19 Q Thank you
20 Are go-to statements properly used with the
21 NEC processor used in the AMI Plus monitor involved
22 here?
23 A That's a function of the software that's
24 written and we've said that they are not appropriately
25 used

1 monitor "

2 A Yes

3 Q Okay Is that your belief today -- is that
4 your opinion today?

5 A Yes

6 Q All right Is that your opinion despite the
7 fact that CAS Medical did not design the monitor?

8 A They're responsible, yes

9 Q Well, here you say they designed the monitor
10 That's not true, is it?

11 A I say that CAS designed the monitor?

12 Q Let me read and you can look at it It's
13 Exhibit 1

14 A I don't need to look at it

15 Q "To a reasonable degree of engineering
16 certainty, the defendant CAS Medical was negligent in
17 the design of the monitor?"

18 A That is correct That is correct

19 Q It is correct that CAS designed the monitor?

20 MR WINSLOW Object to the form That's
21 not what he said

22 A There was an error in the monitor They didn't
23 correct it That's part of the design

24 Q (BY MR DuBOSE) The error is part of the
25 design, is that what you're saying?

1 NO CV 71591
2 JAMIE SMITH, Individually) IN THE DISTRICT COURT
3 and as Next Friend of)
4 KORTNEY SMITH, a Minor,)
5 Plaintiff)
6 VS) LIBERTY COUNTY, TEXAS
7 CAS MEDICAL SYSTEMS,)
8 INC , and J&B MEDICAL)
9 ENTERPRISES, INC ,)
10 Defendants) 253RD JUDICIAL DISTRICT
11 *****
12 ORAL DEPOSITION OF
13 WILLIAM MCCAIN LIVELY, III
14 NOVEMBER 8, 2007
15 *****
16 ORAL DEPOSITION of WILLIAM MCCAIN LIVELY III,
17 produced as a witness at the instance of the Defendant
18 Nellcor Puritan Bennett, L L C and Mallinckrodt, Inc ,
19 and duly sworn was taken in the above-styled and
20 numbered cause on NOVEMBER 8, 2007, from 9 44 a m to
21 1 13 p m , before Donna L LeVasseur, CSR, in and for
22 the State of Texas, recorded by machine shorthand at the
23 offices of the Hastings Law Firm, 616 FM 1960 West,
24 Suite 725, Houston, Texas, pursuant to the Texas Rules
25 of Civil Procedure and the provisions stated on the
record or attached hereto, that the deposition shall be
read and signed before any notary public

1 Q Do you agree that in different industries and
2 in different areas, different types of software may be
3 more prevalent than others?

4 A Yes

5 Q Okay And when did you first examine
6 software -- strike that

7 You did say that there was structured
8 programming used in the fusion pump, correct?

9 A Correct

10 Q And did it have any branches?

11 A Not in the sense -- well, no

12 Q With respect to -- strike that

13 Do you agree that sitting here today
14 based upon all the information that you've looked at and
15 all the time you've spent in this case and having
16 reviewed all the depositions that you've looked at and
17 all the documents before us, that you can neither prove
18 nor disprove the existence of a software bug or software
19 glitch playing any part in the events at issue in this
20 case? Do you agree with that, sir?

21 A Would you clarify what you mean by "prove"?

22 Q Sure Yeah Can you show me -- can you point
23 me to anything, any software bug or any glitch or any
24 evidence of any software bug or glitch, in the
25 programming of the monitor at issue that you can show

1 played a part in the alleged outcome in this case?

2 A No

3 Q So let me just say -- show that we're -- let
4 me just make a statement that I think will be more
5 clear

6 You would agree, then sir, that you can
7 neither prove nor disprove the existence of a software
8 bug or software glitch in the AMI monitor product line
9 at issue in this case, true?

10 MR HASTINGS Form

11 Q (BY MR MOELLER) Do you agree with that?

12 A True

13 Q Okay And really with respect to what you
14 want to characterize as spaghetti code you're saying
15 that that creates an issue for you as a software
16 engineer in examining this software?

17 A False

18 Q Do you have any knowledge as to the flags that
19 are created by the clock interrupt system on the AmiPlus
20 monitor product line at issue?

21 A Very superficially

22 Q So you have not even gone in and looked at the
23 sequence of flags that are created if a loose lead alarm
24 condition is presented is that right?

25 A That's correct

1 Q Okay And -- so Okay But yet you think
2 you're in a position to come into court and tell this
3 jury information about the -- the alarm module?

4 A True

5 Q And beyond characterizing this as spaghetti
6 code, what else -- I mean, is there more to your
7 opinion?

8 A I mean, a lot

9 Q Okay Well, we'll get through it I just
10 wanted to make sure I thought we were going to get
11 done early

12 A You thought we were through?

13 Q Well I thought maybe we were

14 Okay Have you actually looked at an
15 exemplar monitor?

16 A Yes

17 Q Have you tested it?

18 A Yes

19 Q Did it -- did it perform as the manufacturer
20 intended it to perform?

21 A Yes

22 Q Did you hook a simulator up to it?

23 A Yes

24 Q Did it always alarm?

25 A Yes

1 MR HASTINGS Form

2 A True

3 Q (BY MR MOELLER) And what about the testing
4 done by my client are you critical of? And I'm talking
5 now with respect to just Tab 1

6 A The testing -- okay You just said Tab 1 I
7 put it -- I put it on a bench and run the simulator on
8 it If it passes, then there's nothing wrong with it,
9 seemed to be the way that they reported their testing,
10 which is insufficient You should be testing the
11 software and not strictly the monitor by itself

12 Q Okay Well, what kind of a test would you
13 want to construct? Strike that

14 Let me ask this question Have you
15 constructed a test in this case to test the software?

16 A I had a better answer to the first question

17 Q Okay Try mine please

18 A No, I haven't No

19 Q And have you not had time or have you not been
20 asked to or have you not had the inclination to do so or
21 some other reason?

22 A I haven't been asked to

23 Q Okay Do you think you could do that?

24 A I could certainly describe what a test should
25 be, you know

1 Q Okay Well, what kind of a test would you
2 prepare? Give me -- strike that

3 Give me some characteristics and a
4 description of the test that you would like to run on
5 this software

6 A Testing the software, the first thing you do
7 is a black box test

8 Q What s a black box test?

9 A A black box test looks at the inputs and
10 outputs to various aspects of the circuit It's
11 basically testing the functionality or behavior, okay?

12 Q Okay

13 A Now, once I ve done that, I would do a white
14 box test, which tests the internal structure of the
15 software and sees whether there s any problems with
16 that

17 The next thing that I would do would be a
18 boundary test, you know, around various boundaries of
19 the parameter in the code I would do a structured
20 walk-through, where there is a reviewer and reviewees
21 that are -- walk through the code to see what it -- to
22 see the functioning of the code I could not do an
23 exhaustive test because exhaustive tests, particularly
24 in this case here, are not feasible

25 Q Okay

1 A Okay

2 Q Are those the four categories of testing that
3 you would do on this software if allowed to do such?

4 A Yes

5 Q All right Have you done any aspect of those?
6 For example, have you done the black box test, the white
7 box test, the boundary test, or the -- the fourth
8 category, the structured review? Have you done any of
9 those?

10 A No

11 Q Has any -- has Professor Daugherty done any
12 of those?

13 A I don't know

14 Q Not that you're aware of?

15 A No

16 Q Okay So is it -- is what you're saying
17 the -- strike that You did, in fact, review the
18 validation documents, though, applicable to the AMI,
19 AmiPlus product line while my client held that product
20 line, true?

21 A In a very superficial level, yeah

22 Q But those validation documents exist, true?

23 A True

24 Q And, in fact, there were validation documents
25 submitted to the FDA back in '96 and '97, true?

STATE OF SOUTH CAROLINA IN THE COURT OF COMMON PLEAS
COUNTY OF RICHLAND

- - - - - x

KAREEM J GRAVES and TARA GRAVES
individually and as duly appointed
personal representatives of the
ESTATE OF INDIA IYANNA GRAVES

Plaintiffs

vs

CV # 06-CP-40-7398

CAS MEDICAL SYSTEMS INC

Defendants

- - - - - x

Deposition of FRANK R PAINTER taken
pursuant to the South Carolina Rules of Civil
Procedure at the offices of Scribes Inc
445 George Street New Haven Connecticut,
before Frances L Doran License No 00192
Notary Public in and for the State of
Connecticut on Thursday July 10 2008 at
9 40 a m

SCRIBES, INC

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1 the prior case did you find any defect in the monitor?

2 A In my testing?

3 Q Well let s go back and talk about
4 examination and then we'll talk about testing

5 A I ll compartmentalize I'm sorry In my
6 examination of the monitor I was not able to spend
7 enough time or create all the tests or scenarios
8 necessary to find the defect, but I'm confident that
9 there was a defect in the monitor

10 Q Well in answer to my question when you
11 examined and tested the Am1 Plus Monitor did you find
12 a defect in the monitor?

13 MR WINSLOW Object to the form

14 A I did not look for a defect

15 MR DuBOSE Would you read my question
16 back?

17 (Question read)

18 A I understood the question My answer is the
19 same I did not look for a defect

20 Q And is it true then that you did not find a
21 defect in that monitor?

22 A Yes that is true

23 Q How long did you examine and test the CAS Am1
24 Plus monitor?

25 A I had it for almost a month, but I really

1 Q How long did you spend running the monitor on
2 the simulator?

3 A That was the two to four hours

4 Q And, Mr Painter, when you spent two to four
5 hours running tests on the Am1 Plus monitor did it
6 function properly on every occasion that you ran the
7 simulations on it?

8 A Yes

9 Q Have you at any time run simulations or other
10 tests on an Am1 or Am1 Plus monitor when the monitor
11 did not function properly?

12 A No

13 Q What other work have you done in this case
14 other than what we've talked about already?

15 A Nothing that I can think of

16 Q Have you at any time whether for this case
17 or for the other case, run tests specifically on the
18 software of the monitor either in the monitor or on a
19 computer disc?

20 A No

21 Q Have you at any time for either case ever
22 examined a printed version of the software?

23 A I was given I ve seen a printed version of
24 the software, and I spent a half an hour just thumbing
25 through it and looking at it but I did not study it

1 review?

2 MR WINSLOW Object to the form He s
3 asked and answered that many times

4 A That s correct I didn t really look for
5 problems when I was reviewing the code itself

6 Q So is it fair to say your opinion is that
7 there were no problems with the code, is that correct?

8 A That s correct

9 Q But you also testified that you have not
10 looked for problems in the code?

11 A That s correct

12 Q Thank you Tell me what problems you believe
13 exist in the code and how they got there

14 A There are a certain set of sequences set up
15 in the software in this monitor, and the monitor does
16 not perform as it was originally specified to perform

17 Q Where are they located in the code? Let me
18 rephrase that

19 Where are these sequences that you refer to
20 that exist in the code that preclude the monitor from
21 operating or being set up as intended to operate?

22 A Well, I think perhaps you misunderstood what
23 I said The sequences are external events They're
24 inputs to the code itself, and so when certain
25 sequences happen when the code is receiving certain

1 inputs there s some unknown sequence which sets up a
2 situation where the code malfunctions and it does not
3 perform the way it should

4 To answer your question - to answer your
5 question specifically, those -- it's my opinion that
6 the problem is in the alarm module somewhere, that is,
7 the alarm module in the software

8 Q Mr Painter, have you examined the software
9 in the alarm module of the Am1 or Am1 Plus monitor?

10 A No sir

11 Q Mr Painter have you tested the software in
12 the alarm module in the Am1 or Am1 Plus software?

13 A No I think that it would almost be
14 impossible to test it to create a test that would be a
15 valid test having the information that I have

16 Q The answer to the question then, Mr Painter
17 is you have not -- is it correct rather that you have
18 not tested the alarm module in the Am1 or Am1 Plus
19 monitor?

20 A That's correct I know it would be nearly
21 impossible for me to create a valid test to do so, so I
22 did not do it

23 Q What are the sequences or inputs that you
24 claim caused the Am1 or Am1 Plus monitor to
25 malfunction?

1 A It could have been a variety of things a
2 combination of many things, but it could be a loose
3 lead alarm. It could be a low battery alarm. It could
4 be a low heart rate alarm. All of these would
5 contribute to what's in the sequence, and the length of
6 the events create a certain situation in the software
7 code that allows it to malfunction. I do not know what
8 it is, but I do know that at certain times these
9 external inputs appear in a certain sequence and cause
10 the problem.

11 Q Do you consider an apnea alarm or a low
12 battery alarm an external input?

13 A Yes.

14 Q Explain that to me. I thought the alarm was
15 internal to the machine?

16 A Well, do you mean the vent rather than the
17 alarm? It's a whole series of things. It has to do
18 with the physiological parameters of the baby. It has
19 to do with the settings of the alarm itself. It has to
20 do with the length of the alarm. All of those things
21 are events of variable duration that provide input to
22 the software.

23 Q Have you been able to identify any external
24 inputs that cause the Am1 or Am1 Plus monitor to
25 malfunction?

1 combination of events

2 Q Is it a combination of events or could it be
3 more than one different combination of events?

4 A I don't know

5 Q Have you identified any combination of events
6 that can cause the Am1 or Am1 Plus monitor to
7 malfunction?

8 A No If I did we wouldn't be here

9 Q Have you made any effort whatsoever to
10 identify any combination of external events that will
11 cause an Am1 or Am1 Plus monitor to malfunction, the
12 alarm?

13 A No My life isn't long enough to be able to
14 do it It's a complicated process and I have so
15 little data to base my start on that I would have to
16 create a test sequence that would include all possible
17 combinations, and it's a lengthy job, too unreasonable
18 to even start

19 Q So do I understand correctly that you have
20 made no attempt whatsoever to determine what if any
21 combination of external events can cause an Am1 Plus
22 monitor to malfunction?

23 A That's correct

24 Q Are there any budgetary constraints put on
25 you by plaintiff or plaintiffs' counsel in the two

1 the downloads, isn't that correct?

2 A That's correct

3 Q Have you made any attempt to correlate that
4 information to determine whether or not there are
5 common factors that indicate external -- specific
6 external inputs that can cause the Am1 or Am1 Plus
7 monitor to malfunction so the alarm won't sound?

8 A Yes

9 Q What have you done in that regard?

10 A I've looked at the downloads I've looked at
11 the time of the event I've looked backwards in
12 history to determine when the monitor alarm was
13 sounding prior to that I've looked at the events from
14 the last known audible alarm to the time of the
15 incident and tried to determine what the pattern was,
16 and I have not been able to I have, you know a
17 general opinion, but it's not with any engineering
18 certainty I have tried to limit my opinions to those
19 of engineering certainty

20 Q So is it fair to say that to a reasonable
21 degree of engineering certainty you have not been able
22 to find a pattern of external input that can cause the
23 Am1 and Am1 Plus monitor to malfunction so the alarm
24 will not sound?

25 A Yes Due to a lack of data, that is correct

1 If I had more points on the curve or more points of
2 data I think it would be a reasonable thing We could
3 reasonably come to a conclusion and begin to form a set
4 of test questions that could test the Am1 monitor and
5 derive where the software problem is

6 Q But that is a hypothetical until you get the
7 information, isn't that correct, because you don't know
8 what that information will show?

9 A That's correct

10 MR DuBOSE Could we take a short
11 break?

12 (Recess taken)

13 (Record read)

14 Q What else do you think that CAS should have
15 done with regard to investigating complaints about the
16 Am1 alarm?

17- A Okay When there are complaints the
18 complaint will typically be filed with the dealer who
19 provided the medical equipment to the patient The
20 medical -- the dealer then reports the complaint to CAS
21 Medical CAS then reports the complaint to the FDA
22 If a medical device report has not already been filed
23 CAS at that point files a medical device report with
24 the FDA They take the information provided to them by
25 the dealer summarize it, put it in the report I

1 A Correct

2 Q That Aequitron originally designed the
3 product and then commercialization of the product was
4 taken over during the development phase by Mallinckrodt
5 and then sold to CAS after they had been selling the
6 product for a couple of years, correct?

7 A Yes It s my understanding that Aequitron
8 developed the product and submitted it to the FDA for
9 approval and received the approval and began marketing
10 the device before it was transferred to Mallinckrodt

11 Q In any event the product had been on the
12 market for two or three years before my client, CAS
13 Medical bought the product line, is that your
14 understanding?

15 A At least two or three years

16 Q And when my client bought the product, when
17 CAS bought the Ami Plus monitor line the product had
18 been approved by the FDA is that correct?

19 A Correct

20 Q And do you believe that that approval by the
21 FDA is something that CAS appropriately relied upon
22 when it made the determination to buy the product line?

23 A It's my opinion that the FDA approval is one
24 small piece of data that CAS should have looked at when
25 buying the product line but there are many many more

1 A Well, I teach about that, and I understand
2 that

3 Q And you understand as we somewhat talked
4 about a little while ago, that complaints of a certain
5 type made to the manufacturer are required by law to be
6 reported to the FDA on one point at least which we
7 discussed was a medical device report?

8 A Correct

9 Q And you would agree, would you not that the
10 filing of a medical device report by a manufacturer is
11 not an acknowledgement that the problem reported
12 actually exists is that correct?

13 A That's correct

14 Q Okay All the medical device report is is a
15 report of a complaint, correct?

16 A That's correct

17 Q Okay And likewise there is no determination
18 either by the manufacturer or by the FDA when that
19 report is filed or reviewed by the FDA that that
20 complaint is well founded is that correct?

21 A There is no guarantee of it I mean it
22 could be well founded, but without further research
23 there's no guarantee of it

24 Q When a manufacturer files a medical device
25 report, that is not an acknowledgment or admission by

1 the manufacturer that that complaint is well founded,
2 is that correct?

3 A Well, absolutely It s just simply passing
4 the data as required by law, along to the FDA

5 Q Right And after the FDA receives the
6 report the FDA I guess has a choice of reviewing them
7 or not?

8 A They report them

9 Q But do they investigate the MDR they being
10 the FDA?

11 A Not that I'm aware of

12 Q They may?

13 A The FDA does have reviewers who look at the
14 reports and read them, but the FDA doesn't typically go
15 out and investigate that information

16 Q Would you agree with me that the fact that a
17 report, an MDR report appears on the FDA MAUDE system
18 for the public to see by computer is not an indication
19 that that complaint has been found to be valid?

20 A Absolutely It's just simply providing as
21 much information as the original reporter provided to
22 the seller and manufacturer It's just simply passing
23 data along

24 Q In other words, when you look at an MDR or a
25 report of an MDR on the MAUDE website, you'll know a

1 Q And it said the alarm was heard by the
2 microphone?

3 A That seems to be what is indicated here

4 Q So either the download is wrong or the Graves
5 are wrong?

6 A They can't be both ways

7 Q Exactly Okay So the download -- in other
8 words, let me put it this way

9 The Graves' testimony contradicts what the
10 download says?

11 A That s correct

12 Q And by the same token the download
13 contradicts what the Graves say?

14 A I think we just -- I mean it s the same
15 thing Yeah that's true

16 Q Okay And you decided to side with the
17 Graves rather than the computer download?

18 A That's true

19 Q But until today you did not even know that
20 the monitor recorded an indication that the microphone
21 heard - an affirmative indication that the microphone
22 heard the alarm?

23 A Yes I'm still not convinced that that s
24 what we re looking at here on this page

25 Q But that's what the manual says opposed to --

1 A That's right

2 Q Okay And you didn't know that until today
3 until during this deposition?

4 A Yeah I'll say that I did have to look it
5 up

6 Q And is it your testimony that this new
7 information you have that the download reflects that
8 the alarm sounded and was heard by the monitor
9 microphone had no effect on your testimony at all?

10 A No

11 Q No, it has no effect?

12 A It has no effect on my testimony

13 Q Are you saying the fact that the download
14 indicates that the alarm went off and was heard by the
15 microphone raises a question in your mind as to what
16 happened that night?

17 A No I'm not convinced that what we're
18 looking at here is an actual audio recording of the
19 alarm

20 Q Does it matter whether it s an audio
21 recording or simply an electronic signal generated by a
22 microphone onto a log?

23 A Or it could have been something else

24 Q What could it have been? You re all over the
25 place I'm talking about more likely than not what

1 happened That's what we're here for today

2 A Right

3 Q And if you were given this without a name on
4 it without knowing anything about it and just looking
5 at it the indication on here is that the alarm
6 sounded -- and I'm referring to the download for India
7 Graves The alarm sounded it was heard by the
8 microphone and it was recorded as such on this page?

9 A That I'll agree with That's what that
10 indicates

11 Q Right But because the Graves say they
12 didn't hear the alarm, you believe that this indicator
13 on the download, Exhibit 7 to the Daugherty
14 deposition, is simply wrong, that's computer error?

15 A Yeah software error

16 Q Yeah

17 A Yes, exactly That's still my opinion I'm
18 not convinced that this is an actual audio recording

19 Q Getting back to your affidavit

20 A Okay

21 Q We're on the same page further down "The
22 death of India Graves was completely avoidable if the
23 Am1 monitor would have been properly designed "

24 A Where are we?

25 Q The fifth paragraph down It sounds to me

1 talk about it s disorganization

2 Q And so when you talk about the design of the
3 system being unreasonably dangerous and constitutes a
4 defect that s based on their testimony with regard to
5 the opinion they have that it s disorganized?

6 A No It s based on the pattern of failure
7 from the MAUDE reports

8 Q You re not basing the opinion on what you've
9 been told by Lively and Daugherity in person or by
10 their depositions?

11 A You're talking about the last sentence?

12 Q Yes

13 A No, that s my independent opinion

14 Q Have you charted the complaints about the Am1
15 monitor year by year or in any other periodic fashion
16 to determine whether they're steady complaints or
17 whether they ve tapered or increased for that matter?

18 A I thought I did Just a second please I
19 have them in chronological order I can give you a
20 verbal graph

21 Q Okay

22 A There were two in 98, seven in 99, 12 in
23 2000 I have eight in 2001 but my data only goes up
24 to August It appears from my analysis there is a full
25 year of data missing between August '01 and July of

1 '02

2 Q Could it be that there weren't any complaints
3 during that time?

4 A I don't think so, because the complaints are
5 pretty evenly spaced We have October -- I'm just
6 going back and looking at some points September
7 October, February, April, July, July, July, August I
8 find it hard to believe that 12-month period is
9 missing I think the data didn't make it into the
10 database

11 Then in 2002 -- actually, if I can -
12 actually in 2001 we have eight occurrences but it's
13 only for eight months worth of data so we could
14 translate that to 12 Then looking at 2002, I only
15 have six months worth of data, and there are five
16 occurrences That probably could be extrapolated to
17 ten, but we don't need to do that now Then in 2003 I
18 have six events 2004 eight events I don't have a
19 full year's worth of data In 2005 there are only two
20 events Looks like actually 2003 there's one more so
21 there are seven in 2003 So from the data I have it
22 does look like it tapers off in 2005 to just two
23 events, but I may not have all the data

24 Q All right Do you know whether the number of
25 Ami Plus or Ami monitors in the marketplace has tapered

1 off to explain the tapering of events?

2 A I do not have that information

3 Q Do you know how the percentage of complaints
4 made on the alarm failure for the Am1, Am1 Plus
5 monitors compares with the percentage of alarm
6 complaints made with regard to other brands of apnea or
7 heart rate monitors?

8 A No

9 Q Have you looked into that?

10 A No

11 Q Have you -- I think the answer to this is
12 obvious, but since you haven't found the alleged error
13 in the software is it fair to assume that neither you
14 nor Dr Daugherity or Lively have either corrected the
15 error or rewritten the software to avoid the alleged
16 error in the Am1 software?

17 A That s correct

18 Q And why haven't you done that?

19 A Because we didn't know exactly where the
20 error was because the code was so difficult to
21 diagnose It s my opinion that it would be easier to
22 redesign the circuit card put an up-to-date
23 microprocessor in it and rewrite the software from
24 scratch so that it functions as it should than it would
25 be to troubleshoot the old package

1 Q And as far as you know, nobody on behalf of
2 the plaintiffs has done any of that?

3 A As far as I know no one on behalf of the
4 plaintiffs has done any of that

5 Q You put in your report that your opinions are
6 based to a reasonable degree of engineering certainty
7 What does the term reasonable degree of engineering
8 certainty mean?

9 A That it s more likely than not that my
10 opinions are true, and they re based on engineering
11 principles

12 Q What is the rate of error in your opinions?

13 A I don't know

14 Q Have you made any attempt to calculate a rate
15 of error?

16 A No The nature of this activity, the nature
17 of my opinion does not incline itself to calculating an
18 error so I haven t done it

19 Q Why not?

20 A Why?

21 Q The nature of your opinion does not incline
22 itself to the calculation of a rate of error?

23 A Because these aren t -- there are not a lot
24 of -- there is not a lot of numerical activity in this
25 This is mostly just understanding based on my

1 particular background and my experience -

2 Q Okay

3 A -- as an engineer

4 Q And I think I asked you this early on but
5 there are no learned treatises that you point to that
6 support your testimony?

7 A No

8 Q And I think you said you're relying on your
9 background and your training?

10 A My experience yeah

11 Q And would you characterize the majority of
12 your opinions as subjective or objective?

13 A Objective

14 Q Is it objective or subjective that the
15 download incorrectly reflects that the alarm sounded
16 and the Graves correctly identified that it didn't?

17 A The information that is displayed in these
18 printouts is the result of defective software That's
19 my only explanation for it

20 Q That's giving me an opinion not an answer to
21 the question of whether or not your opinion is
22 objective or subjective with regard to the Graves
23 testimony

24 A Right

25 Q So my question again is -- and I'll try to do

1 A It's a summary of 52 I created it myself
2 for the last case Looking for example, at Number 8,
3 they found the patient cable connector was broken

4 Q Does that mean the problem was a software
5 problem or a hardware problem?

6 A In other words, they could say that this was
7 a hardware problem and oh, like we found a broken
8 patient cable connector but in my opinion a broken
9 patient cable connector has nothing to do with no loose
10 lead alarm This has something to do with no loose
11 lead alarm There is some situation here where there
12 was an alarm -- no audio - as matter of fact, I think
13 we ought to look at this more carefully to get the full
14 story I guess I might have been a little more cryptic
15 in some of my --

16 Q Is that Number 8?

17 A Yes Some of my summaries No loose lead
18 alarm Yean, that s entirely possible that that no
19 loose lead alarm was solved by the cable

20 Q And Number 8 is one of the 52 that we were
21 talking about?

22 A Yes

23 Q Could a defective circuit card cause a loose
24 lead alarm failure?

25 A It's possible It s also possible that it

1 could have been caused by software and they replaced
2 the circuit card with the very panacea that they just
3 did in order to make it look like they did something

4 Q Well, turn to Number 9 and 10 Could you say
5 more likely than not that it was a software problem or
6 a hardware problem in both of those? They say
7 "confirmed problem Replaced circuit cards and
8 tested," according to your outline

9 A It says circuit card There s no detailed
10 note here that gives me enough to verify it on a
11 component level which makes me believe that they really
12 didn t know

13 Q Well when you re getting down to the
14 component level in a device like that you're talking
15 about pretty small pieces of the circuitry are you
16 not?

17 A Right

18 Q And do you know on this particular -- are you
19 looking at 9 or 10?

20 A I'm looking at 9

21 Q Do you know whether or not more likely than
22 not this was a hardware or a software problem?

23 A I don't know I can't tell you whether it's
24 more likely than not It's a hardware and software
25 problem I can't tell It seems more likely than not

1 it's a hardware problem Number 9 I m not convinced
2 that it wasn't a software problem, but it s a tossup
3 with that

4 Q So you don't know what we have here is what
5 you're telling me?

6 A No I don't think there - yeah I don t
7 know We need to have more definition of the term
8 There's no way to tell

9 Q And the same would be true for Number 10?

10 A Would the same be true? No Number 10 I'd
11 say that -- well, they replaced the battery and circuit
12 card They did a bunch of things

13 Q, Can you tell me from looking at Number 10
14 more likely than not the problem was a hardware or a
15 software problem?

16 A No

17 Q Looking at Number 12 according to your
18 list -- which we're going to mark in a minute -- the
19 monitor was not picking up respiration, it was not
20 showing LEDs, it was not giving a lead alarm, and it
21 had a service LED on constantly Do you see that?

22 A Yes

23 Q That's different than what's reflected in the
24 Graves case, is it not?

25 A We have not -- we do not have a service LED

1 in the Graves case and admittedly everything was
2 working but the audible alarm

3 Q Correct in the Graves case?

4 A Yes

5 Q So this Number 12 is substantially different?

6 A It's substantially different than the Graves
7 case, but it may not be It may still be a software
8 issue

9 Q How was the machine operating when it got to
10 the company?

11 A Which one

12 Q Number 12

13 A The device was not returned to the
14 manufacturer

15 Q According to this they replaced the board
16 the main board on the computer?

17 A Yeah Well according to this it had a
18 watchdog error No lead alarm Service LED is not
19 picking up respiration It has a Heart Slow alarm
20 right after watchdog error

21 Q The service LED is for what purpose on the
22 Ami Plus monitor?

23 A I do not know exactly what specifically it
24 indicates

25 Q Well it -- do you understand that to alert

1 you

2 Q Okay Now the only thing we have to say
3 that it happened at the Graves house is the Graves
4 isn't that right?

5 MR WINSLOW Object to the form

6 Q Or the family which would include the sister
7 or the mother?

8 A Yes

9 Q And we've got evidence that says that it
10 didn't happen here, do we not?

11 A From a monitor that could very well have in
12 my opinion failed, so you know, the evidence in my
13 opinion is coming from a monitor that failed in a way
14 that we don't really understand

15 Q But the only reason you say it failed was
16 because the Graves said it failed isn't that right?

17 A Yeah

18 Q Okay I think we've covered this, but let me
19 make sure You're not testifying that CAS created this
20 problem in the software --

21 A No

22 Q - if it exists?

23 A No I'm saying the problem existed from the
24 beginning

25 Q That's right You did tell me that I

April Simmons August 8, 2007

Page 1

STATE OF SOUTH CAROLINA

COURT OF COMMON PLEAS

COUNTY OF RICHLAND

KAREEM J GRAVES and TARA GRAVES individually and
as duly appointed personal representatives of the
ESTATE OF INDIA IYANNA GRAVES

Plaintiffs

vs

CASE NO 06 CP-38-421

CAS MEDICAL SYSTEMS INC AMERICAN HEALTHCARE
RESOURCES INC d/b/a ASHBY MEDICAL and STEVE M
ELLIOTT or any business entity d/b/a ASHBY MEDICAL
PALMETTO HEALTH RICHLAND MEMORIAL HOSPITAL and
PALMETTO HEALTH ALLIANCE

Defendants

DEPOSITION OF APRIL SIMMONS

DATE August 8 2007

TIME 11 35 a m

LOCATION Law Offices of
Haynsworth Sinkler Boyd PA
1201 Main Street 22nd Floor
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TAKEN BY Counsel for the Defendant

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000991

1 Q Was it carpeted, the floors?

2 A Some of it was carpeted Some of it is
3 linoleum, I guess you would call it

4 Q Like in the kitchen was linoleum, and
5 maybe the bathrooms?

6 A When you walk in, that floor right
7 there is not carpeted, and the kitchen and where
8 the table is

9 Q But the rest of it is carpeted?

10 A Except for the bathrooms

11 Q Carpeted up and down?

12 A Yes

13 Q And you, again, slept downstairs?

14 A Yes

15 Q At the time we're talking about, was
16 Kareem still living at the home then?

17 A Yes

18 Q And they were both up in the bedroom we
19 talked about?

20 A All the girls was upstairs that night
21 When I got there all of them was already asleep so
22 I didn't have any of them downstairs with me

23 Q Was there one other child in the house
24 or two other children in the house that night?

25 A My other niece, Lela

1 Because at one point there was a door and they took
2 it down, but I don't remember if it was or if it
3 wasn't at that time

4 Q You don't remember whether there was a
5 door there or not?

6 A Not at that -- I know it wasn't closed

7 Q Why do you know it wasn't closed?

8 A Because I remember when I got up I
9 didn't open a door to go upstairs

10 Q When did you get up?

11 A When I heard my sister screaming

12 Q Do you know what time that was?

13 A I don't remember the exact time No, I
14 don't I don't even remember

15 Q Tell me why none of the triplets were
16 in the room with you that night

17 A Because they were already asleep when I
18 got there

19 Q You were there, though, to help out
20 with them during the night, is that correct?

21 A I would go there -- that night I was
22 there to help out that morning to get them ready
23 for church That was my main reason for being
24 there that Saturday night

25 Q Is that the first time one of the

1 hear the alarms down in that bedroom where you were
2 if they went off?

3 A I sure did I could hear upstairs and
4 Tara could hear downstairs and we would get up If
5 I would hear it I would say, Tara -- I'd go to the
6 steps and call or either I would go up there, and
7 if she would hear it downstairs she would call me
8 from the steps or either come down But you could
9 hear it

10 Q Did you hear any of the alarms going
11 off that night?

12 A No, I didn't

13 Q Have you ever slept through any of the
14 alarms?

15 A No

16 Q Of course, I guess you wouldn't know if
17 you slept through them because -- you wouldn't know
18 whether you had or not, would you?

19 A You couldn't sleep through them if they
20 was going off It was just that loud

21 Q I've heard them I know how loud they
22 are

23 A Especially if they was disconnected
24 There was no way of sleeping through that Maybe
25 if you're a -- I'm a light sleeper Maybe if you

Page 33

1 were a hard sleeper -- I don't know -- but I'm a
2 light sleeper and I hear Like I said, it would be
3 that close and you could definitely hear the beep

4 Q Tell me what happened when you woke up

5 A I woke up and I went upstairs, and when
6 I went upstairs Tara had India on the bed and she
7 was giving her CPR I asked her what was going on
8 She said she wasn't responding, she wasn't
9 breathing My brother-in-law was calling 911
10 Shortly after that, as soon as he hung up, he got
11 sick, so he was in the bathroom Tara was doing
12 CPR, giving CPR to India

13 Q How long did it take for the ambulance
14 to get there?

15 A For them to be -- from where my sister
16 lives, for them to be in the areas where they said
17 they are stationed, it was a long time I'm not
18 saying it was an hour or -- it was a pretty long
19 time Because I'm understanding they were supposed
20 to have been right there on Ellis, and she was
21 doing CPR a while

22 Q Would it have been more than ten
23 minutes?

24 A It was more than ten minutes

25 Q Would it have been more than 20?

1 giving India CPR on the bed?

2 A Coming from the chest or coming from
3 the

4 Q Coming out from under the clothes Do
5 you know whether that wire was hooked up to the
6 monitor while your sister was giving the child CPR
7 on the bed?

8 A I didn't see wires and I didn't see the
9 box, and I really wasn't looking You're saying
10 coming out of clothes -- the hanging part that goes
11 to the box part?

12 Q Yes, ma'am

13 A Oh, yeah From this -- not coming from
14 the top, but I saw them hanging from whatever is at
15 the bottom I didn't see the box because she
16 always puts them under the bassinet

17 Q All right

18 A So I'm assuming when she picked her up
19 she disconnected that part and did whatever But I
20 didn't see the actual carrying part

21 Q Let's take it step by step just to make
22 sure that we've got it down clearly When you got
23 upstairs Tara had India on the bed, already giving
24 her CPR?

25 A Yes, sir

1 make it more clear I'm sorry You went upstairs
2 after you heard your sister screaming

3 A Yes

4 Q You found her When you got there, she
5 had India on the bed and she was giving her CPR?

6 A Yes

7 Q At that time, do you know whether or
8 not the child's wires were hooked up to the
9 monitor?

10 A When I went upstairs they were not
11 hooked up to the monitor

12 Q Okay Do you know whether the monitor
13 was off or on?

14 A At that time, when I went upstairs?

15 Q Yes

16 A I don't know, because it was under the
17 bassinet I don't know

18 Q You couldn't see it from where you
19 were?

20 A I could not see it

21 Q And I'm sure that wasn't the primary
22 focus?

23 A It sure wasn't

24 Q And I understand that Did you go back
25 up later and notice whether the monitor was off or

1 on?

2 A I didn't At some point in time I
3 asked what happened to the monitor, but I never
4 even -- I never even looked at it I never went to
5 see was it on then or was it hooked up I just
6 asked what happened to the monitor and she said it
7 didn't go off, but I never even looked at the
8 monitor

9 Q So if I ask you what lights were on on
10 the monitor, you couldn't tell me?

11 A I could not tell you

12 Q But you are comfortable in saying that
13 the child was not hooked up to the monitor -- or
14 the wires were not hooked up to the monitor when
15 you got up there?

16 A Yes

17 Q No doubt about that?

18 A No doubt

19 Q When you went up earlier and found all
20 three of the babies asleep -- I think you've
21 already told me India was in her bassinet?

22 A Yes

23 Q Was her monitor on then, do you know?

24 A Yes

25 Q And I asked you a really bad question

1 A I don't think he got off until like six
2 o'clock, so yeah, later I mean, not late-late at
3 night

4 Q Did he have any church duties that
5 night, that you know of?

6 A I don't know

7 Q Had they had any company at the house
8 that night, do you know?

9 A Not while I was there

10 Q Do you know whether they had had
11 company earlier?

12 A I don't

13 Q Were there any other adults at the
14 house that night?

15 A Beside Kareem and Tara?

16 Q Right, and you

17 A No

18 Q Had you spent Friday night at the
19 house?

20 A No We had just came back from the
21 beach

22 Q What day did you come back from the
23 beach?

24 A Friday

25 Q Do you know whether your mother spent

1 Q Tell me everything you remember seeing

2 A Her blowing I mean, she was talking,
3 trying to talk during the same time and give her
4 CPR She was just, you know, giving her CPR
5 Constantly giving her CPR She would stop, take a
6 break, give her CPR

7 Q Was this before or after 911 was
8 called?

9 A When I got there she was already doing
10 it, so it was before And my brother-in-law was on
11 the phone, so it was before As soon as she picked
12 her up, I assume I wasn't up there when she got
13 her out, but

14 Q Were there times prior to India's death
15 that you had to turn off the monitors for any of
16 the three children because the alarms were
17 sounding?

18 A Yeah, like when the wires come loose
19 The wires constantly did it, so we would turn them
20 off until we could get them back on

21 Q Okay In one of those occasions in the
22 past, before the death, when the alarm was going
23 off because a wire was loose, would you turn the
24 monitor off or reset it, or what would you do?

25 A I would turn it off Because I had to