

THE STATE OF SOUTH CAROLINA
In The Court of Appeals

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APPEAL FROM THE SOUTH CAROLINA
WORKERS' COMPENSATION COMMISSION

SC Court of Appeals

Melody L. James, Appellate Panel Chairman, Commissioner

App. Case No. 2014-002294
WCC File No. 1106833

TIMOTHY MCMAHAN, APPELLANT/RESPONDENT,

V.

SC DEPARTMENT OF EDUCATION – TRANSPORTATION,
EMPLOYER, AND STATE ACCIDENT FUND, CARRIER,
RESPONDENTS/APPELLANTS.

AMENDED RECORD ON APPEAL

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INDEX

I.	ORDERS	
	Order of the SCWCC Hearing Commissioner dated 3/24/14.....	002
	Order Notes of Full Commission dated 8/13/14.....	013
	Order of SCWCC Appellate Panel dated 9/30/14.....	015
II.	PLEADINGS	
	SCWCC Form No. 50 dated 7/19/11	029
	SCWCC Form No. 50 dated 5/16/13	030
	SCWCC Form No.51 dated 6/13/13	031
	Amended SCWCC Form No. 50 dated 7/31/13.....	032
	SCWCC Form No. 51 dated 8/7/13	033
	SCWCC Form No. 58 of the Carrier/Employer dated 8/5/13.....	034
	SCWCC Form No. 58 of the Claimant dated 7/30/13	035
	SCWCC Form No. 30 of the Carrier/Employer dated 3/27/14.....	036
	Brief of the Defendants/Appellants dated 6/4/14.....	038
	Claimant/Respondent's Brief dated 6/19/14.....	061
III.	TESTIMONY	
	Transcript of the SCWCC Single Commissioner Hearing dated 8/14/13.....	072
	Transcript of the SCWCC Full Commission Hearing dated 7/22/14	076
	Amended Notice of Deposition of Dr. Patrick Bolt dated 6/25/13.....	084
IV.	MEDICAL RECORDS/EXHIBITS	
	Medical records of Dr. Patrick Bolt dated 4/23/12-2/27/13	085
	Medical records of Dr. Raymond Turner dated 8/2/11-2/7/12	097
	Medical records of MUSC dated 6/16/11-12/6/11.....	105
	Letter from Employer to Claimant/Appellant dated 1/13/12.....	118
	Appointment of Personal Representative Dorothy McMahan from Chancery Clerk of Cocke County, Tennessee	119
	Death Certificate from the State of Tennessee	120
	AMA Guides to Permanent Impairment (6 th Ed.), pp. 26-27	121
	AMA Guides to Permanent Impairment (6 th Ed.), Chapters 13 & 17	123
V.	CERTIFICATE OF COUNSEL	193

BEFORE THE
SOUTH CAROLINA WORKERS' COMPENSATION COMMISSION
WCC FILE NO.: 1106833

TIM MCMAHAN, Employee,

Claimant,

vs.

SC DEPARTMENT OF EDUCATION,
Employer,

and

STATE ACCIDENT FUND, Carrier,

Defendants.

ORDER

HEARING:

Summerville, SC on August 15, 2013.

APPEARANCES:

Employee/Claimant represented by Hoffman Law
Firm, with Kevin B. Smith appearing.

The Defendants are represented by George T.
Miars, Jr. who appeared on behalf of his client.

PURPOSE OF THE HEARING:

To determine the issues as set forth on WCC Forms
50 and 51 and all other issues under the Regulations
of the SCWCC.

OPINION AND AWARD:

Honorable Aisha Taylor

FILED:

March 24, 2014

APA SUBMISSIONS

The following medical records and documents were submitted by the parties without objection under the Administrative Procedures Act and Regulations of the SCWCC.

APA #:	PROVIDER	TYPE OF REPORT	DATED	# OF PAGES	PAGES
1	Dr. Patrick Bolt	Form 14B	2/27/13	1	1
2	Dr. Patrick Bolt	Medical records	4/23/12-2/27/13	11	2-12
3	Dr. Raymond Turner	Medical records	8/2/11-2/7/12	13	13-25
4	MUSC	Medical records	6/16/11-10/10/11	8	26-33

EXHIBITS

APA #:	PROVIDER	TYPE OF REPORT	DATED	# OF PAGES	PAGES
5	Employer	Letter	1/13/12	1	34
6	Chancery Clerk of Cocke Co., TN	Appointment of PR	7/1/13	1	35
7	State of Tennessee	Death certificate	10/9/12	1	36

STIPULATIONS

FIRST: This claim was set before the undersigned Commissioner in accordance with notices timely and properly served upon all parties of interest.

SECOND: The Commission's file was made a part of the record with the exception of unstipulated medical records and self-serving declarations.

THIRD: The parties are subject to the SC Workers' Compensation Act.

FOURTH: The Claimant suffered a compensable injury-by-accident on June 15, 2011.

FIFTH: The Claimant had an average weekly wage of \$558.60, making the compensation rate \$372.42 applicable to the claim

SIXTH: The Claimant sustained a compensable injury to his back.

STATEMENT OF THE CASE

The Claimant filed a WCC Form No. 50 on May 23, 2013 alleging he sustained injuries by accident to his head, brain, back, internal organs, teeth, legs, mouth and ribs arising out of and occurring within the course and scope of his employment on June 15, 2011. The Defendants filed a WCC Form No. 51 on June 13, 2013 admitting the injury to his back, but denying all others. A Hearing was set for August 15, 2013.

Following his admitted injury, the Claimant underwent two surgeries to his back. He was declared at maximum medical improvement (MMI) by the authorized treating physician on April 23, 2012, and referred to pain management. The Claimant died of unrelated causes on October 6, 2012. The authorized treating physician filled out a WCC Form No. 14B after his death providing a 54% impairment to his back and noted that the injury also affected his lower extremity. The authorized treating physician explicitly stated the Claimant had reached MMI before he died. No medical opinions were submitted to the contrary.

Section §42-9-280 provides, "When an employee receives or is entitled to compensation under this Title for an injury covered by the second paragraph of §42-9-10 or 42-9-30 and dies from any other cause than the injury for which he was entitled to compensation, payment of the unpaid balance of compensation shall be made to his next of kin dependent upon him for support, in lieu of the compensation the employee would have been entitled to had he lived."

The Claimant contends the abatement statute above envisions two situations where the claim would not abate, "when an employee receives or is entitled to compensation under this Title..." This is an accepted claim and the Claimant was deemed to be at MMI before he died. The authorized treating physician has issued his impairment rating. Therefore, the Commission has the right to determine if he was entitled to compensation just as it does in nearly every other

claim. This has been the Commission's long-standing interpretation of the statute and many times results in an award identical to the impairment rating, sometimes higher. The Claimant states he was entitled to total disability compensation under §42-9-30(21) due to a 50% or greater loss of use to his back prior to his death which was based off his 54% impairment rating given by the authorized treating physician. Therefore, under §42-9-280 the claim would not abate and his widow would be entitled to the benefits for total disability.

The Defendants took four positions. First, even though they denied his legs were compensable body parts and no doctor ever diagnosed him as paraplegic, the Defendants contended the Claimant was paraplegic under §42-9-10(C), therefore his claim should abate. Second, that the Commission is not allowed to accept a WCC Form 14B completed after a Claimant has passed. Third, the Defendants asserted that claimant had not reached maximum medical improvement nor received an impairment rating before his death, and therefore was not entitled to or due any permanent disability benefits under the Act. Fourth, the Defendants asserted that the Act does not provide for a posthumous determination of permanent disability. The Defendants did not present evidence to rebut the presumption that the Claimant was totally disabled in the event the undersigned found his claim would not abate.

REVIEW OF THE EVIDENCE

The Claimant's widow and Personal Representative, Dorothy McMahan, testified at the Hearing. She was married to the Claimant for thirty-three (33) years. They had two (2) children. Dorothy testified that the Claimant had a high school education. He also served in the US Army as a mechanic. After discharge, the Claimant went to work as a mechanic. The last job he had was as a bus mechanic for the Employer. All of the work he has done required heavy lifting,

being on his feet, bending, stooping, and squatting. The Claimant never held a desk job. (HT, pp. 8-10).

Dorothy testified that the second surgery helped his pain, that she noticed an improvement. They moved to Tennessee because his mom and dad were ill and he wanted to spend time with them. The Claimant's back condition did not change once they got to Tennessee. Dorothy testified that by the time he got to see Dr. Bolt, the Claimant had gotten about as good as he was going to get. He was not making any major improvements, "He stayed the same." (HT, pp 10-12).

A review of the medical records indicates the Claimant saw Dr. Patrick Bolt, the authorized treating physician, in Tennessee on April 23, 2012. (APA 2) Dr. Bolt noted his prior surgery in Charleston and stated, "He walks with a markedly pitched forward gait...he is able to flex 80% of normal...His quadriceps are 3/10 on the left, hip flexors are 3/10 on the left, otherwise full strength in the lower extremities." Several tests were ordered and Dr. Bolt commented that the Claimant was at MMI. Dr. Bolt referred the Claimant to pain management.

The Claimant returned to see Dr. Bolt on May 11, 2012, with continued "extreme mid and low back pain and also left lower leg pain." The physical examination revealed "Quadriceps 3/5 left leg, hip flexion is 3/5 left leg, otherwise full strength in bilateral lower extremities. Pain-free full range of motion in bilateral hips, knees and ankles today." The MRI showed "a severe compression fracture," but no new neural pinches or pseudoarthroses.

On February 27, 2013, Dr. Bolt issued his opinions regarding MMI and impairments. Dr. Bolt stated, "I would say that he was at maximum medical improvement when I saw him on 4/23/2012." Dr. Bolt commented that the Claimant was "totally disabled" and assigned a 54% impairment for his work-related injury.

APA 3 is the medical records from MUSC. The Claimant had surgery (laminectomy and decompression) at T12 and L1. On September 29, 2011, the doctor noted "Patient is mobilizing well with a walker, given the initial spinal cord injury." A second surgery was discussed. Surgery was done on October 9, 2011 in the form of a T11, T12, L1 laminectomy and bilateral foraminotomy with placement of pedicle screws at T10 and removal of pedicle screws at T11. He was treated subsequently for urinary retention. On February 7, 2012, the Claimant was about to move to Tennessee and begin his treatment with Dr. Bolt. The physical examination revealed "left leg 4/5 strength, right 3/5, tight bilateral lumbar paraspinal muscles to palpation, kyphosis." He was given pain medication to hold him over.

APA 4 is the reports of operation following the initial injury.

APA 5 is a letter from the Employer stating the Claimant is terminated due to the restrictions by his doctor.

APA 6 is an official document from the State of Tennessee showing the Claimant's wife, Dorothy, was named his Personal Representative.

APA 7 is the Death Certificate showing his date of death to be October 6, 2012, due to his heart condition and COPD.

FINDINGS OF FACT

After due consideration of the claim, defenses and stipulations of the parties, the following findings of fact as required under §42-17-40, South Carolina Code of Laws, 1976 as amended, are hereinafter set forth:

FIRST: The Claimant was a covered Employee and the Employer was a covered Employer. The Employee and Employer relationship existed at all times in question.

SECOND: The Employer was subject to the South Carolina Workers' Compensation Act and the South Carolina Worker's Compensation Commission has jurisdiction over this claim.

THIRD: The Claimant had an average weekly wage of \$558.60 at the time of the accident, making the compensation rate of \$372.42 applicable to the claim.

FOURTH: The Claimant suffered a compensable injury-by-accident arising out of and occurring within the course and scope of his employment to his back which affected his left leg. The medical records repeatedly reflect the problems he was having his left leg by multiple physicians prior to his death.

FIFTH: The Claimant received necessary treatment related to his compensable accident from MUSC and Dr. Patrick Bolt. The Employer is responsible for payment of these medical bills and reimbursement to the Claimant for any out-of-pocket expenses.

SIXTH: The Claimant reached maximum medical improvement on April 23, 2012. This is supported by the opinion of the authorized treating physician stating he was at MMI and referring him to long-term pain management. No medical opinions were submitted to the contrary.

SEVENTH: The Claimant died of unrelated causes on October 6, 2012.

EIGHTH: The Claimant was at maximum medical improvement prior to his death. The authorized treating physician stated he was at MMI prior to his death. Nearly six (6) months before his death, the Claimant was referred to long-term pain management by the authorized treating physician.

NINTH: I find that the Claimant had a fifty (50) percent or greater loss of use to his back prior to his death. The Claimant was assigned a fifty-four (54) percent impairment and his authorized treating physician stated he was totally disabled. The Claimant had a high school

education and he always worked in heavy manual labor jobs. His very high impairment rating is supported by the authorized treating physician's explanation of the rating.

TENTH: The Defendants failed to rebut the presumption that the Claimant was not totally and permanently disabled due to a fifty (50) percent or greater disability to his back. No evidence was submitted to rebut the presumption.

ELEVENTH: The Defendants failed to prove that the Claimant was paraplegic under §42-9-10. The medical records established the Claimant was able to walk, although using a wheelchair at times. No physician at any time ever diagnosed the Claimant as being paraplegic. Furthermore, the Defendants took the position that the Claimant's legs were not affected and not compensable injuries.

TWELVTH: There is nothing within our laws stating the Commission cannot rely on posthumous impairment rating. What is important in this case is that the Claimant's authorized treating physician stated he was at maximum medical improvement before he died. This is supported by the referral to pain management and no medical opinions were submitted to the contrary. The date the doctor actually wrote down what his impairment rating is not dispositive.

CONCLUSIONS OF LAW

After due consideration of the claim, defenses, and stipulations of the parties, the following conclusions of law as required under §42-17-70, South Carolina Code of Laws, 1976 as amended, are hereinafter set forth:

FIRST: Under §42-1-130, the Claimant was a covered Employee at the time of his accident on January 7, 2012.

SECOND: Under §42-1-140 and §42-1-360, the Employer was a covered Employer under the Act.

THIRD: The Commission has jurisdiction of the parties and the subject matter of this claim and venue is proper.

FOURTH: Under §42-1-160, the Claimant sustained a compensable injury by accident arising out of and occurring within the course and scope of his employment on June 15, 2011, to his back and left leg.

FIFTH: Under §42-15-40, the Claimant properly filed the claim.

SIXTH: Under §42-15-20, proper notice was provided.

SEVENTH: Under §42-1-40, the average weekly wage is \$558.60, making the compensation rate of \$372.42 applicable to the claim.

EIGHTH: Under §42-15-60, the Employer is responsible for the payment for the medical treatment he received, including MUSC and Dr. Patrick Bolt.

NINTH: The Claimant reached maximum medical improvement on April 23, 2012, prior to his death.

TENTH: Under §42-9-30(21), the Claimant was permanently and totally disabled due to a fifty (50) percent or greater loss of use to his back that affected his left leg prior to his death.

ELEVENTH: Under §42-9-280, the claim does not abate. The statute provides, "When an employee receives or is entitled to compensation under this Title for an injury covered by the second paragraph of §42-9-10 or 42-9-30 and dies from any other cause than the injury for which he was entitled to compensation, payment of the unpaid balance of compensation shall be made to his next of kin dependent upon him for support, in lieu of the compensation the employee would have been entitled to had he lived." In construing a workers' compensation statute, "the words must be given their plain and ordinary meaning without resort to subtle or forced construction to limit or expand the statute's operation." Adkins v. Comcar Industries, Inc., 323

S.C. 409, 475 S.E.2d 762 (1996). Because the case is accepted and MMI and an impairment rating have been given by the authorized treating physician, the Commission has the right to determine if the Claimant is "entitled to compensation" just like it does in most every other case. The only difference is that the claim abates unless the award is based upon the second paragraph of §42-9-10 or §42-9-30. The clear words of the statute provide a person who is entitled to compensation AND a person who has already received compensation are both entitled to their awards so long as they are based upon the second paragraph of §42-9-10 or §42-9-30. The Claimant was entitled to compensation because he reached maximum medical improvement prior to his death of unrelated causes. This is consistent with the prior rulings of the Commission and its long standing interpretation of the statute.

ORDER AND AWARD

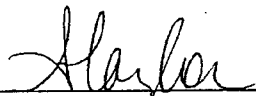
Based upon the above Findings of Fact and Conclusions of Law, it is hereby

ORDERED, ADJUDGED AND DECREED that the claimant sustained a compensable injury-by-accident arising out of and occurring within the course and scope of his employment on June 15, 2011 to his back and left leg, and it is further,

ORDERED, ADJUDGED AND DECREED that the Claimant is entitled to receive permanent and total disability benefits due to the fifty (50) percent or greater loss of use to his back under §42-9-30(21), and it is further,

ORDERED, ADJUDGED AND DECREED that dependency and lump sum are reserved for a later hearing. The undersigned Commissioner will rule on these issues upon receipt of a qualified dependency investigation.

IT IS SO ORDERED.



Commissioner Aisha Taylor

CERTIFICATE OF SERVICE

This is to certify that the undersigned has on this date served a copy of this order in the above entitled action upon all parties to this case by sending an electronic copy hereof by electronic mail addressed to the attorneys for said parties; or if there is an unrepresented party(ies), by depositing a copy hereof, postage paid, in the United States mail, first class, addressed to the unrepresented party(ies) and to the attorney(s) for the represented party(ies).
March 25, 2014

By: Renee Smith, Administrative Assistant to
Commissioner Taylor

Kevin Smith

From: Hollmon, Eugenia <EHollmon@wcc.sc.gov>
Sent: Wednesday, August 13, 2014 12:51 PM
To: gtmiares@wjlaw.net; Kevin Smith
Cc: Karen L. Strickland (klstrickland@wjlaw.net) (klstrickland@wjlaw.net); Janet DeBruhl
Subject: McMahan

Below is a request for a proposed decision and order

SOUTH CAROLINA WORKERS' COMPENSATION COMMISSION
REQUEST FOR A PROPOSED DECISION AND ORDER

This document is not a Decision and Order. It is a request for a proposed order. The Commissioners reserve the right to modify and/or delete any or all portions of the submitted Decision and Order.

Timothy McMahan v SC Department of Education
SCWCC: 1106833
Commission Panel: Wilkerson, Beck, James; Chair
Order Assigned to Commissioner: James
Court Reporter – Christine Tatum – ctatumcr@gmail.com

George T. Miars, Jr.
Kevin Smith

Defendants/Appellants
Claimant/Respondent

This matter was heard before the South Carolina Workers' Compensation Full Commission Appellate Panel during the last term of Review. The Commissioners considered the matter and **Fully Reverse** the decision and order of the Single Commissioner. "There was no clear opinion of MMI prior to or after death of the claimant. Dr. Bolt vacillates with regards to whether the claimant was at MMI or not. Benefits stop upon the death of the claimant."

Mr. Miars please prepare a proposed order and submit to the Judicial Department within thirty (30) days of this notice. The proposed order shall be submitted in Word format to appeals@wcc.sc.gov and shared with each Party. Please make sure the Appellate Panel Decision and Order recites the specific Finds of Fact and Rulings of Law of the Single Commissioner's Decision and Order and reflects any comments requested by a Commissioner.

The signature page shall include a signature line for each Commissioner and the first signature should be the name of the Commissioner assigned the case as indicated above.

If you have any questions, please do not hesitate to email me at ehollmon@wcc.sc.gov or call at 803.737.5737

Judicial

Transmitted via email this 13 August 2014

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APPELLATE PANEL
DECISION AND ORDER
OF THE
SOUTH CAROLINA WORKERS' COMPENSATION COMMISSION
WCC FILE NO. 1106833

Timothy McMahan,

RESPONDENT
CLAIMANT,

vs.

SC Department of Education--Transportation,

EMPLOYER,

AND

State Accident Fund,

CARRIER,
DEFENDANTS/APPELLANTS

Appellate Panel Review held in Columbia, South Carolina,
on July 22, 2014, per notices timely and properly served
upon all parties of interest.

Appellate Panel Decision and Order filed
September 30, 2014

APPEARANCES:

Respondent/Claimant, Timothy McMahan, represented by
Kevin Smith of the Hoffman Law Firm, North Charleston,
South Carolina.

Defendants/Appellants, SC Department of Education and
the State Accident Fund, represented by George T. Miars,
Jr., Esquire of Willson Jones Carter & Baxley, P.A. in
Mount Pleasant, South Carolina.

STATEMENT OF THE CASE

The parties were heard by Commissioner Aisha G. Taylor, on August 15, 2013, in Columbia, South Carolina. On March 25, 2014, she issued the following Order:

IT IS HEREBY ORDERED, ADJUDGED AND DECREED that the claimant sustained a compensable injury-by-accident arising out of and occurring within the course and scope of his employment on June 15, 2011 to his back and left leg, and it is further,

ORDERED, ADJUDGED AND DECREED that the Claimant is entitled to receive permanent and total disability benefits due to the fifty (50) percent or greater loss of use to his back under §42-9-30(21), and it is further,

ORDERED, ADJUDGED AND DECREED that dependency and lump sum are reserved for a later hearing. The undersigned Commissioner will rule on these issues upon receipt of a qualified dependency investigation.

IT IS SO ORDERED.

Within the statutory period, counsel for Defendants filed a Form 30, Application for Review, appealing the decision of the hearing Commissioner and setting forth alleged errors. Copies of this Form were served on all interested parties, prior to being presented before the Appellate Panel on July 22, 2014. All parties appeared for oral argument before the Appellate Panel of the Commission and presented their case on appeal.

All proffered testimony has been taken. Such, together with all documentary evidence, has been delivered by oral argument to the individual members of the Appellate Panel and has since been under study and consideration.

By appeal, Defendants respectfully submitted that the Hearing Commissioner erred in the following:

1. The Hearing Commissioner erred in finding that the Claimant's estate is entitled to an award of permanent and total disability because the Workers' Compensation Act does not provide for a posthumous determination of Claimant's disability; because Claimant's award for benefits would have abated under S.C. Code § 42-9-280, if Claimant's estate had the legal ability to

posthumously litigate disability; because Claimant failed to reach maximum medical improvement prior to his death; and finally, because the award of disability in the matter violates Defendants' due process rights.

- II. The Hearing Commissioner erred in finding that Claimant reached maximum medical improvement as of April 23, 2012, because the evidence shows that the Claimant did not reach maximum medical improvement prior to his death.
- III. The Hearing Commissioner erred in failing to find that Claimant suffered from paraplegia as a result of his work accident.

In an Appellate Review, the Appellate Panel shall, pursuant to S.C. Code Ann. Section 42-17-50, review the award, weigh the evidence as presented at the initial hearing, and if good grounds be shown therefore, make its own Findings of Fact and reach its own Conclusions of Law consistent or inconsistent with those of the Hearing Commissioner. (see also McGuffin v. Schlumberger-Sangamo, 307 S.C. 184, 414 S.E.2d 162 (1992)). "In workers' compensation cases, the Appellate Panel is the ultimate fact finder." Shealy v. Aiken County, 314 S.C. 448, 535 S.E.2d 438 (S.C. 2000) (citing Hunter v. Patrick Constr. Co., 289 S.C. 46, 344 S.E.2d 613 (1986)). "The final determination of witness credibility and the weight to be accorded evidence is reserved to the Full Commission." Id. (citing Ford v. Allied Chem. Co., 252 S.C. 561, 167 S.E.2d 564 (1969)). In this case, the preponderance of evidence in the record supports a reversal of the Hearing Commissioner's award.

Claimant filed a Form 50 requesting a hearing on May 23, 2013, alleging injuries by accident to his head, brain, back, internal organs, teeth, legs, mouth, and ribs, arising out of and in the course and scope of his employment with the employer on June 15, 2011. The Defendants filed a Form 51 answer on June 13, 2013, admitting injury to the back only, and denying that Claimant's estate was entitled to any disability benefits. Unfortunately, the Claimant died due to unrelated causes on October 6, 2012. Claimant's estate takes the position that they be allowed to have a posthumous determination of Claimant's disability and that Claimant should be considered

permanently and totally disabled only as a result of having a greater than 50% disability to the spine. Defendants take the position that Claimant's estate is not entitled to posthumously litigate Claimant's disability because the Claimant did not reach maximum medical improvement ("MMI") before his death, and because the Act does not allow for post mortem adjudication of disability. Further, Defendants assert that Claimant suffered from paraplegia as a result of his work related injury, and therefore, pursuant to South Carolina Code § 42-9-280, even if the Act allowed Claimant's estate to a post mortem disability award, such award would abate.

In an Order dated March 24, 2014, the single Commissioner found that the Claimant's estate was entitled to an award of permanent and total disability due to the Claimant having a greater than 50% disability to the spine. It is from this Order that Defendants appealed to the Full Commission Appellate Panel.

DISCUSSION OF APPLICABLE LAW AND EVIDENCE OF THE CASE

The South Carolina Workers' Compensation Act requires a claimant to be at MMI in order to be entitled to an award of permanent disability. As indicated by the South Carolina Supreme Court in Owens v. Herndon, 252 S.C. 166, 167, 165 S.E.2d 696, 697 (1969), "[t]he rights and liability of employee and employer under the Workmen's Compensation Act are purely statutory and are to be judged by the terms of the Act. Policy consideration as to what benefits should be conferred or obligations imposed are strictly for the legislature." Id. Since workers' compensation statutes provide an exclusive compensatory system in derogation of common law rights, courts must strictly construe such statutes, leaving it to the legislature to amend and define any ambiguities. Cox v. BellSouth, 356 S.C. 468, 589 S.E.2d 766 (Ct.App. 2003).

South Carolina Code § 42-9-280 provides the sole basis under the Act for a claimant's estate's or beneficiaries' entitlement to a claimant's disability award after the claimant dies from a

non-work related reason. This Statute, titled "Payment of unpaid balance of compensation when employee dies" states:

When an employee receives or is entitled to compensation under this Title for an injury covered by the second paragraph of Section 42-9-10 or 42-9-30 and dies from any other cause than the injury for which he was entitled to compensation, payment of the unpaid balance of compensation shall be made to his next of kin dependent upon him for support, in lieu of the compensation the employee would have been entitled to had he lived.

S.C. Code Ann. § 42-9-280 (1976) (emphasis added).

It is well settled in South Carolina that the award of disability benefits is premature prior to the claimant reaching MMI. Curiel v. Environmental Management Services, 376 S.C. 23, 655 S.E.2d 482 (2007) (stating that "workers' compensation benefits accrue along a time continuum: temporary total disability benefits are available from the date of injury through the date of maximum medical improvement; **post-maximum medical improvement benefits may then be awarded either as a permanent total or partial disability, or as a percentage of impairment to a scheduled member.**" (emphasis added)). Likewise, in Smith v. S.C. Dep't of Mental Health, 335 S.C. 396, 517 S.E.2d 694 (1999) (citing Hines v. Hendricks Canning Co., 263 S.C. 399, 211 S.E.2d 220 (1975)), the court explained that the rationale for ceasing temporary benefits upon a finding of MMI is to permit entry of a permanent award, and noting that the degree of permanent disability cannot be determined prior to MMI.

It is also well settled that "maximum medical improvement" or "MMI" is the term used to demonstrate that a claimant has reached such a plateau in their treatment and recovery that, in the physician's opinion, there is no further medical care or treatment which will lessen the degree of impairment. Cranford v. Hutchinson Construction, 399 S.C. 65, 731 S.E.2d 303 (Ct. App. 2012) (citing O'Banner v. Westinghouse Elec. Corp., 319 S.C. 24, 28, 459 S.E.2d 324, 327 (Ct. App. 1995)). The court explained this concept in Scruggs v. Tuscarora Yarns, Inc., 294 S.C. 47, 50, 362 S.E.2d 319, 321 (Ct. App. 1987), concluding that a finding of MMI was proper by the single

Commissioner because the evidence supported that additional medication or treatment prescribed for the claimant was intended to help alleviate the claimant's remaining symptoms but *would not improve* the claimant's condition.

Further, the AMA Guides support that a finding of MMI is necessary before the determination of permanent disability, noting:

Permanency is the condition whereby impairment becomes static or well stabilized with or without medical treatment and is not likely to remit in the future despite medical treatment, within medical probability. This term is usually synonymous with MMI, usually occurring when all reasonable medical treatment expected to improve the condition has been offered or provided. Impairment ratings are to be performed when an individual is at a state of permanency.

Guides to the Evaluation of Permanent Impairment, AMA, 6th Ed., p. 26-27.

In this case, the evidence shows that Claimant was never at MMI prior to his death. Claimant underwent a T12 corpectomy and fusion on June 16, 2011, and he was seen again by his surgeon, Dr. Raymond Turner on October 10, 2011, who opined that Claimant was able to regain some mobilization of his lower extremities, but did have deformity correction which left him with severe back pain. (Claimant's APA p. 26; p. 32). Claimant underwent a second spine surgery on October 10, 2011, and was seen by Dr. Turner on December 6, 2011, with complaints of left leg pain and bilateral foot swelling since his surgery. (Claimant's APA p. 22; p. 32). His last medical report from MUSC is dated two months later, on February 7, 2012, and states that Claimant told his providers he would be moving by the end of the month to Tennessee to take care of his father, and requested transfer of care with enough pain medication to last through his transfer. (Claimant's APA p. 24). Further, these medical reports show that Claimant was directed to "set up with Rehab and Pain Management ASAP in Tennessee for a smooth transfer of care," and recommended that Claimant undergo physical therapy to focus on his lower lumbar paraspinals. (Claimant's APA p. 25). The reports from MUSC do not contain any statement indicating Claimant was being released from care, that he had reached a plateau in his medical condition, or that he was at MMI as a result

of his work related injuries, and it is clear from these reports that his medical treatment needed to continue to improve Claimant's condition. (see Claimant's APA p. 24-25).

After moving to Tennessee, Claimant was seen by Dr. Patrick Bolt for an independent medical evaluation on April 23, 2012. (Claimant's APA p. 2-5). In his report, Dr. Bolt stated Claimant was a relatively poor historian, and Dr. Bolt admitted he had not reviewed the Claimant's medical records from MUSC, or any other provider other than Dr. Brandli at Carolina Family Urology. (Claimant's APA p. 4). Dr. Bolt expressed concern that Claimant may have an indolent infection and recommended lab work. At that time, Dr. Bolt also recommended that Claimant undergo an MRI of both the thoracic and lumbar spine to further delineate the discs and neural structures, and a CT scan of the thoracic and lumbar spine to evaluate the bony fusion, screw placement, and cage position. (Claimant's APA p. 4). Dr. Bolt specifically noted that he was declining to take over the patient's pain management as he was only seeing the Claimant for a surgical opinion, and recommended that Claimant be placed in pain management in the Knoxville area. (Claimant's APA p. 4). Despite not reviewing the Claimant's medical records related to his spine injury, only seeing the claimant for an independent evaluation, and recommending the Claimant for a large amount of diagnostic testing and ongoing medical treatment, Dr. Bolt states in this note that "[a]pparently, the patient is already at maximum medical improvement, **but, again, I have no records to confirm this.**" (Claimant's APA p. 5) (emphasis added).

Claimant underwent the MRI study and CT scan recommended by Dr. Bolt on May 4, 2012, and was seen by Dr. Bolt on May 11, 2012, who ordered EMG testing to be scheduled to rule out any further radiculopathies. (Claimant's APA p. 7). Claimant was advised to return to see Dr. Bolt as soon as the EMG testing was done. (Claimant's APA p. 7). Unfortunately, Claimant passed away on October 6, 2012 due to unrelated causes. (Claimant's APA p. 36). No further reports were produced to show Claimant returned for any further visits with Dr. Bolt after April 23,

2012, or that the EMG studies were actually performed or reviewed as ordered.

It is clear from a reading of the Claimant's medical records that he was never at MMI before his death. He was not placed at MMI by any provider at MUSC before his visit with Dr. Bolt, and Dr. Bolt's statement assuming Claimant was at MMI was therefore incorrect. Dr. Bolt admits as much in his February 27, 2013 note, stating, "I had thought [the claimant] was previously at maximum medical improvement, apparently that was not the case." (Claimant's APA p. 11). Dr. Bolt then, without explanation, summarily states that "I would say that [the Claimant] was at maximum medical improvement when I saw him on April 23, 2012," despite the fact that the Claimant had not undergone the diagnostic studies and medical treatment both Dr. Bolt and MUSC recommended for him, including initiation of therapy, further diagnostic testing, and pain management. (Claimant's APA p. 11).

Based on Dr. Bolt's own statements, there is no medical opinion that Claimant was at maximum medical improvement prior to his death, and we find that his posthumous opinion of MMI by Dr. Bolt is based on surmise and unsupported by the medical evidence. The medical evidence clearly shows that Claimant had not reached maximum medical improvement, but was continuing to improve, and still had a large amount of medical treatment and diagnostic testing being recommended for him at the time of his death.

Defendants alternatively assert that Claimant's award of disability would abate if he was found to be at MMI before his death, as he was a paraplegic. Given that we find that the Claimant was not at MMI at the time of his death, neither he nor his estate are entitled to a disability award, and we do not need to reach this issue.

We find that Claimant's award of permanent and total disability should be reversed, as the Claimant was not at maximum medical improvement prior to his death.

FINDINGS OF FACT

Based upon the documentary evidence submitted by the respective parties, pursuant to the Administrative Procedures Act, and the Commission's file relative to this claim, WE, THE APPELLATE PANEL, FIND THE FOLLOWING AS FACT:

1. That the South Carolina Workers' Compensation Commission has exclusive jurisdiction over this matter.
2. That the Full Commission has reviewed the submitted evidence, including the medical records, the expert opinions of the medical doctors, and the other submitted documents and evidence.
3. That "maximum medical improvement" or "MMI" is the term used to demonstrate that a claimant has reached such a plateau in their treatment and recovery that, in the physician's opinion, there is no further medical care or treatment which will lessen the degree of impairment. Cranford v. Hutchinson Construction, 399 S.C. 65, 731 S.E.2d 303 (Ct. App. 2012) (citing O'Banner v. Westinghouse Elec. Corp., 319 S.C. 24, 28, 459 S.E.2d 324, 327 (Ct. App. 1995)). The court explained this concept in Scruggs v. Tuscarora Yarns, Inc., 294 S.C. 47, 50, 362 S.E.2d 319, 321 (Ct. App. 1987), concluding that a finding of MMI was proper by the single Commissioner because the evidence supported that additional medication or treatment prescribed for the claimant was intended to help alleviate the claimant's remaining symptoms but *would not improve* the claimant's condition.
4. That whether a claimant is at MMI is a factual determination to be made by the Full Commission, and the Full Commission must look at all of the evidence in the record in making this determination.
5. That the Claimant was never found to be at MMI by his treating physicians at MUSC.

The last medical report from MUSC, on February 7, 2012, notes that Claimant was recommended to "set up with Rehab and Pain Management ASAP in Tennessee for a smooth transfer of care." We find that this report supports that the Claimant was not at maximum medical improvement when he was last seen by MUSC, and that his treating physicians believed that Claimant's treatment needed to continue to improve his medical condition and work related injuries before he reached MMI.

6. That Claimant was next seen by Dr. Patrick Bolt for an independent medical evaluation on April 23, 2012, in Knoxville, Tennessee, and that, in his report from this office visit, Dr. Bolt recommended that the Claimant undergo additional diagnostic testing in the form of MRIs and CT scans to his lumbar and thoracic spine, and undergo additional pain management treatment in the Knoxville area.
7. That despite not reviewing the Claimant's medical records related to his spine injury, only seeing the Claimant for one evaluation, and recommending the Claimant for ongoing treatment to include additional diagnostic testing and pain management, Dr. Bolt states in his first report that "[a]pparently, the patient is already at maximum medical improvement, but, again, I have no records to confirm this." We find that it is clear from a reading of the Claimant's medical records that Claimant was never found at MMI before this visit with Dr. Bolt; therefore, we find that Dr. Bolt's statement of MMI was incorrect.
8. That the Claimant passed away from unrelated causes on October 6, 2012.
9. That, in a note dated February 27, 2013, well after Claimant's death, Dr. Bolt was asked by the Claimant's attorney to provide the Claimant with a posthumous impairment rating. In this report, Dr. Bolt admits that he thought the Claimant was previously at MMI, but then admits, "apparently that was not the case." Without

explanation, Dr. Bolt then summarily states "[the Claimant] was at maximum medical improvement when I saw him on April 23, 2014," despite the fact that the Claimant had not undergone the pain management treatment both Dr. Bolt and MUSC recommended for him, nor the diagnostic ENG/Nerve Conduction Studies recommended by Dr. Bolt. We find that this additional treatment and testing was to further diagnosis and improve the Claimant's medical condition, not to merely keep him at his current level of disability, and therefore, Claimant was not at MMI at the time of his death. Further, given that additional diagnostic testing was being recommended at the time of Claimant's death, we can only speculate as to the Claimant's level of disability or severity of his medical condition.

10. That the Claimant was recommended for additional diagnostic studies and ongoing medical treatment at the time of his death is strongly supportive of our finding that the Claimant was not at MMI, and damaging to the credibility of Dr. Bolt's post-mortem opinion of MMI. Dr. Bolt gives no explanation as to why he found the claimant at MMI, when he never obtained the testing he specifically ordered to determine the extent of the Claimant's neurological/spinal cord condition. Without this additional testing, we find that Dr. Bolt's post-mortem opinion was based on speculation and conjecture.
11. That Dr. Bolt vacillates with regards to whether the Claimant was at MMI or not. He initially states in his first report that the claimant was previously found at MMI, but admits that he had no records to confirm this. He then recommends additional diagnostic testing and treatment, which the Claimant did not undergo prior to his death. Subsequently, Dr. Bolt provides a post-mortem report to Claimant's attorney, stating that he was incorrect when he believed the claimant was found at MMI prior to his first evaluation of the Claimant, but then post-dates MMI back to the date of his first

evaluation. Dr. Bolt's opinions are convoluted at best, and we find they are not sufficient to support a finding that the Claimant was at MMI prior to his death when viewing the evidence in total.

12. That the Claimant did not receive an impairment rating before his death, which we find further evidences that he was not at MMI at the time of his death.
13. That there was no clear opinion of MMI prior to or after the death of the Claimant on October 6, 2012, and the medical evidence instead supports a finding that the Claimant was not at MMI at the time of his death. We find that the preponderance of evidence in the record shows that the Claimant was not at MMI at the time of his death, and therefore not entitled to an award of permanent disability.
14. That, as the Claimant was not at MMI at the time of his death, he was therefore not entitled to any disability award prior to his death, and therefore there is no award to survive the Claimant's death pursuant to S.C. Code § 42-9-280.

CONCLUSIONS OF LAW

In view of those Findings of Fact, and as provided in the South Carolina Code of Laws, WE, THE APPELLATE PANEL, CONCLUDE THE FOLLOWING AS MATTERS OF LAW:

1. We find, as discussed by the Supreme Court, in Stone v. Roadway Express, 367 S.C. 575, 627 S.E.2d 695 (2006), and per the provisions of S.C. Code § 42-9-280, that a compensation award, unlike a tort award, is a personal one based on the employee's need for compensation of lost wages and earning capacity, and in the absence of a special statutory provision, heirs have no claim to un-accrued weekly payments.
2. That "maximum medical improvement" or "MMI" is the term used to demonstrate that a claimant has reached such a plateau in their treatment and recovery that there is no further

medical care or treatment which will lessen the degree of impairment. Cranford v. Hutchinson Construction, 399 S.C. 65, 731 S.E.2d 303 (Ct. App. 2012) (citing O'Banner v. Westinghouse Elec. Corp., 319 S.C. 24, 28, 459 S.E.2d 324, 327 (Ct. App. 1995)). The court explained this concept in Scruggs v. Tuscarora Yarns, Inc., 294 S.C. 47, 50, 362 S.E.2d 319, 321 (Ct. App. 1987), concluding that a finding of MMI was proper by the single Commissioner because the evidence supported that additional medication or treatment prescribed for the claimant was intended to help alleviate the claimant's remaining symptoms but *would not improve* the claimant's condition.

3. Pursuant to Curiel v. Environmental Management Services, 655 S.E.2d 482, 376 S.C. 23 (2007) (explaining that "workers' compensation benefits accrue along a time continuum: temporary total disability benefits are available from the date of injury through the date of maximum medical improvement; post-maximum medical improvement benefits may then be awarded either as a permanent total or partial disability, or as a percentage of impairment to a scheduled member."), we find that an award of permanent disability benefits is premature prior to the Claimant reaching MMI.

ORDER

Based upon the foregoing Findings of Fact and Conclusions of Law,

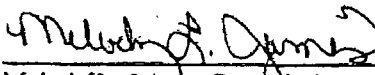
IT IS, THEREFORE, ORDERED that the Order of the Hearing Commissioner dated March 24, 2014, be fully reversed, as the preponderance of the evidence shows that the Claimant was not at MMI prior to or at the time of his death.

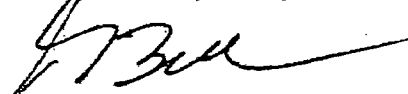
IT IS FURTHER ORDERED that no benefits are owed by Defendants after Claimant's death.

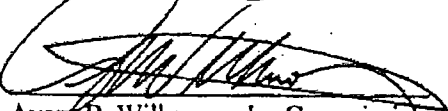
AND IT IS SO ORDERED.

SOUTH CAROLINA WORKERS'
COMPENSATION COMMISSION

WE CONCUR:


Melody L. James, Commissioner


T. Scott Beck, Commissioner


Avery B. Wilkerson, Jr., Commissioner

CERTIFICATE OF SERVICE

This is to certify that the undersigned has on this date served a copy of this order in the above entitled action upon all parties to this case by sending an electronic copy hereof by electronic mail addressed to the attorneys for said parties; or if there is an unrepresented party(ies), by depositing a copy hereof, postage paid in the United States mail, first class, addressed to the unrepresented party(ies) and to the attorney(s) for the represented party(ies).

By Kim Falls on September 30, 2014



WCC File #: Unknown
Carrier File #: _____
Carrier Code #: _____
Employer FEIN #: _____

Claimant's Name: Tim McMahan SSN: 413-90-3127 Employer's Name: South Carolina Department of Education
Address: 123 Arnold Dr. Address: 1429 Senate Street
City: Ladson State: SC Zip: 29456 City: Columbia State: SC Zip: 29201
Home Phone: (843) 330-2986 Work Phone: _____ Insurance Carrier: State Accident Fund
Preparer's Name: Kevin B. Smith Law Firm: The Steinberg Law Firm Preparer's Phone #: (843) 720-2800

Complete each information blank. To request a hearing, check Box 13b, indicate the kinds of benefits claimed by checking the box(es) at Lines 6, 7, 8, and 9, and file this form in duplicate.

A claim for workers' compensation benefits is made based on the following grounds:
☒ Injury ☐ Illness ☐ Repetitive Trauma

Date of Injury or Illness: June 15, 2011

- 1a. The claimant sustained an injury to head, brain, back, internal injuries, teeth, mouth, ribs (Part(s) of Body Injured) on June 15, 2011 (Month/Day/Year) in
1b. Dorchester County, State of South Carolina.
Body part(s) affected are: head, brain, back, internal injuries, teeth, mouth, ribs
Briefly describe how the accident occurred. bus fell on claimant
2. Both the claimant and the employer were subject to the South Carolina Workers' Compensation Act at the time of injury.
3. The relationship of employer and employee existed at the time of injury.
4. At the time of the injury the claimant was performing services arising out of and in the course of employment.
5. Notice of the accidental injury was given to the Employer on June 15, 2011 (Month/Day/Year) in the following manner:
Verbally to supervisor.
- ☒ 6. Due to injury, the claimant is in need of (check one):
☐ (a) medical examination and treatment for: _____
☒ (b) additional medical examination and treatment for: Injuries listed above.
- ☒ 7. Due to injury, the claimant requests temporary total disability benefits because of lost compensable time from work and wages for the period of:
To be determined.
- ☒ 8. Due to the injury, the Claimant has permanent disability of the following nature and extent (check one):
☒ (1) General Disability: ☒ Total ☒ (2) Specific Disability: ☒ Total
☐ (3) Wage Loss ☐ Partial ☐ Partial
- ☒ 9. Due to the injury, the Claimant has a serious bodily disfigurement consisting of:
None known at this time.
- 10a. At the time of the injury, the Claimant was paid weekly wages of \$Form 20 requested, and demands accounting of days worked and wages earned as provided by law.
- 10b. Give names and addresses of all employers for whom the Claimant has worked since the date of the accident:
The employer herein; and/or to be determined
- 11a. Further grounds or unusual aspects of claim:
To provide all benefits under the Act
- 11b. List names and addresses of all physicians or other medical specialists who have seen or treated the Claimant as a result of the accident:
MUSC; HealthSouth Rehabilitation
- 11c. To the best of your knowledge, did you have any prior permanent disability? No.
If yes, describe: _____
12. Appropriate benefits as provided in the Act for the above grounds and other relief as the Workers' Compensation Commission may direct as just and proper.
- ☒ 13a. I am filing a claim. I am not requesting a hearing at this time.
- ☐ 13b. I am requesting a hearing. A \$25 fee is required.
14. Estimated time needed for hearing: 45 minutes.

I verify the contents of this form are accurate and true to the best of my knowledge.

Preparer's Signature
Refer to R.67-204 through R.67-210 and R.67-601 through R.67-615. Questions about the use of this form may be directed to the Commission's Claims Department.

Attorney for Claimant
Title

ksmith@steinberglawfirm.com
Email

July 19, 2011
Date

WCC Form # 50
Revised 9/07

50

Employee's Notice of Claim and/or
Request for Hearing

South Carolina Workers' Compensation Commission
512 Marion Street • Post Office Box 1715
Columbia, South Carolina 29202-1715
(803) 737-5723



WCC File #: 1106833
Carrier File #: _____
Carrier Code #: _____
Employer FEIN #: _____

Claimant's Name: Tim McMahan (dec.) SSN: 413-90-3127 Employer's Name: SC Department of Education
Address: 1688 Hwy. W 2570 Address: 1429 Senate St.
City: Newport State: TN Zip: 37821 City: Columbia State: SC Zip: 29201
Home Phone: (865) 248-6250 Work Phone: _____ Insurance Carrier: State Accident Fund
Preparer's Name: Kevin Smith Law Firm: Hoffman Law Firm Preparer's Phone #: (843) 769-7077

Complete each information blank. To request a hearing, check Box 13b., indicate the kinds of benefits claimed by checking the box(es) at Lines 6, 7, 8, and 9, and file this form in duplicate.

A claim for workers' compensation benefits is made based on the following grounds:

Date of Injury or Illness: June 15, 2011

- 1a. The claimant sustained an accidental injury to head, brain, back, internal injuries, teeth, mouth, ribs on June 15, 2011 in Dorchester County, State of SC.
1b. Briefly describe how the accident occurred. bus fell on claimant
2. Both the claimant and the employer were subject to the South Carolina Workers' Compensation Act at the time of injury.
3. The relationship of employer and employee existed at the time of injury.
4. At the time of the injury the claimant was performing services arising out of and in the course of employment.
5. Notice of the accidental injury was given to the employer on June 15, 2011 in the following manner: Reported to supervisor.
- ☒ 6. Due to injury, the claimant is in need of (check one):
☒ (a) medical examination and treatment for: head, brain, back, internal injuries, teeth, mouth, ribs
☒ (b) additional medical examination and treatment for: head, brain, back, internal injuries, teeth, mouth, ribs
- ☒ 7. Due to injury, the claimant requests temporary total disability benefits because of lost compensable time from work and wages for the period of:
To be determined
- ☒ 8. Due to the injury, the claimant has permanent disability of the following nature and extent (check one):
☒ (1) General Disability: ☒ Total ☒ Partial ☒ (2) Specific Disability: ☒ Total ☒ Partial
Body part(s) affected are: head, brain, back, internal injuries, teeth, mouth, ribs
- ☒ 9. Due to the injury, the claimant has a serious bodily disfigurement consisting of: To be determined
- 10a. At the time of the injury, the claimant was paid weekly wages of \$TBD, and demands accounting of days worked and wages earned as provided by law.
- 10b. Give names and addresses of all employers for whom the claimant has worked since the date of the accident: The employer herein and/or to be determined.
- 11a. Further grounds of claim: To establish a claim prior to the expiration of the statute of limitations. To provide all benefits under the Act.
- 11b. List names and addresses of all physicians or other medical specialists who have seen or treated the claimant as a result of the accident:
MUSC; Dr. Raymond Turner; Keri Melancon, M.D., Primary Care Center of Newport, 434 4th St., Ste. 301, Newport, TN 37821; Patrick M. Bolt, M.D., Tennessee Orthopaedic Clinic, 308 North Peters Rd., Ste. 225, Knoxville, TN 37922; Russell R. Blakeley, M.D., East Tennessee Heart Consultants, PC, 900 East Oak Hill Ave., Central Annex, Ste. 600, Knoxville, TN 37917; Physicians Regional Medical Center, 900 E. Oak Hill Ave., Knoxville, TN 37917; Newport Medical Center, 435 2nd St., Newport, TN 37821; HealthSouth Rehabilitation Hospital, 9181 Medcom Street, Charleston, SC 29406; Amedisys Hospice, 1423 West Morris Blvd., Ste. C, Morristown, TN 37813
- 11c. To the best of your knowledge, did you have any prior permanent disability? no If yes, describe:
12. Appropriate benefits as provided in the Act for the above grounds and other relief as the Workers' Compensation Commission may direct as just and proper.
- ☐ 13a. I am filing a claim. I am not requesting a hearing at this time.
- ☒ 13b. I am requesting a hearing. A \$25 fee is required.
14. Estimated time needed for hearing: 30 minutes

I verify the contents of this form are accurate and true to the best of my knowledge.

Preparer's Signature: [Signature] Attorney for Claimant: ksmith@hoffmanlaw.net Title: _____ Email: _____ Date: May 16, 2013

Refer to R.67-204 through R.67-210 and R.67-601 through R.67-615. Questions about the use of this form may be directed to the Commission's Claims Department.

WCC Form # 50
Revised 9/07

50

Employee's Notice of Claim and/or
Request for Hearing

**South Carolina Workers' Compensation
Commission**

1333 Main Street, Suite 500 • Post Office Box 1715
Columbia, South Carolina 29202-1715
(803) 737-5739
www.wcc.sc.gov



WCC File #: 1106833
Carrier File #: 2011-001842
Carrier Code #: _____
Employer FEIN #: _____

Claimant's Name: Timothy McMahan -deceased SSN: 413-90-3127 Employer's Name: SC Department of Education--Transportation
Address: _____ Address: 1429 Senate Street
City: _____ State: _____ Zip: _____ City: Columbia State: SC Zip: 29201
Home Phone: _____ Work Phone: _____ Insurance Carrier: State Accident Fund
Date of Injury: 6/15/2011
Preparer's Name: George T. Miars, Jr. Law Firm: Willson Jones Carter & Baxley, P.A. Preparer's Phone #: (843) 284-1091

Date of Injury or Illness: 6/15/2011

Complete each information blank. Specify clearly when contentions are admitted in part and denied in part. The employer/carrier in answer to the claim, respectfully shows:

1. It is **Admitted / Denied** the employee sustained an injury or illness on or about the date set forth in the Form 50. The reasons for denial are:
Defendants admit claimant sustained injury to his back, but deny that claimant's subsequent death was causally related to his work accident or resulting injury.
2. It is **Admitted / Denied** both the employer and employee were subject to the Workers' Compensation Act at the time in question. The reasons for denial are:

3. It is **Admitted / Denied** the relationship of employer and employee existed at the time in question. The reasons for denial are:

4. It is **Admitted / Denied** at the time in question the employee was performing services arising out of and in the course of employment. The reasons for denial are:

5. It is **Admitted / Denied** notice of injury was given the employer. The reasons for denial are:

6. It is **Admitted / Denied** the employee **Needs / Is Entitled to Additional** medical care as a result of injury or illness. The reasons for denial are:
See #1.
7. It is **Admitted / Denied** the employee is entitled to temporary total disability for the period(s) of :

8. It is **Admitted / Denied** the employee is permanently disabled. The reasons for denial are:
Claimant died due to non-work related reasons, prior to being found at maximum medical improvement.
9. It is **Admitted / Denied** the employee has serious disfigurement.
[TO BE PROVIDED]
10. It is contended that an average weekly wage of \$ 558.60 applies, according to attached Form 20 as provided by law.
11. Further contentions, grounds of defense, or unusual aspects are:
Defendants reserve the right to amend and to assert defenses as they become aware of them.
12. Estimated time needed for hearing: 1.5 hours

I certify that I have served this document pursuant to R.67-212 by delivering a copy to: Kevin Smith, 7087 Rivers Avenue
Name & Address
North Charleston, SC 29406 and Virginia Crocker, Judicial Director, SC WCC, P.O. Box 1715, Columbia, SC 29202 on the 13th day of June,
2013 by ☒ first class mail ☐ personal service ☐ certified mail.
I verify the contents of this form are accurate and true to the best of my knowledge.

George T. Miars, Jr.
Preparer's Signature

Attorney for the Employer/Insurer
Title

gtmiars@wjlaw.net
Email

06/13/2013
Date

Melody L. Reeves
Certifier, Melody L. Reeves

Refer to R.67-204 through R.67-210 and R.67-601 through R.67-615. Questions about the use of this form may be directed to the Commission's Judicial Department. Pursuant to R.67-606, a Form 20 must be filed with the Claims Department at least 30 days from the date of filing this form.

South Carolina Workers' Compensation Commission

1612 Marion Street • Post Office Box 1715

Columbia, South Carolina 29202-1715

(803) 737-5723

**AMENDED**WCC File #: **1106833**

Carrier File #: _____

Carrier Code #: _____

Employer FEIN #: _____

Claimant's Name: Dorothy McMahan as PR of SSN: 413-90-3127
the Estate of Timothy McMahanEmployer's Name: SC Department of EducationAddress: 1688 Hwy. W 2570Address: 1429 Senate St.City: Newport State: TN Zip: 37821City: Columbia State: SC Zip: 29201Home Phone: (865) 248-6250 Work Phone: _____Insurance Carrier: State Accident FundPreparer's Name: Kevin SmithLaw Firm: Hoffman Law FirmPreparer's Phone #: (843) 769-7077**A claim for workers' compensation benefits is made based on the following grounds:** Date of Injury or Illness: June 15, 2011☒ Injury ☐ Illness ☐ Repetitive Trauma ☐ Occupational Disease ☐ Physical Brain Injury ☐ Concurrent Jurisdiction1a. The claimant sustained an accidental injury to head, brain, back, internal injuries, teeth, mouth, ribs (Part(s) of Body Injured) on June 15, 2011
1b. (Month/Day/Year) in Dorchester County, State of SC.2. Body part(s) affected are: head, brain, back, internal injuries, teeth, mouth, ribsBriefly describe how the accident occurred. bus fell on claimant

3. Both the claimant and the employer were subject to the South Carolina Workers' Compensation Act at the time of injury.

4. The relationship of employer and employee existed at the time of injury.

5. At the time of the injury the claimant was performing services arising out of and in the course of employment.

6. Notice of the accidental injury was given to the employer on June 15, 2011 in the following manner: Reported to supervisor.☒ 7. Due to injury, the claimant is in need of (check one):☒ (a) medical examination and treatment for: head, brain, back, internal injuries, teeth, mouth, ribs☒ (b) additional medical examination and treatment for: head, brain, back, internal injuries, teeth, mouth, ribs☒ 8. Due to injury, the claimant requests temporary total disability benefits because of lost compensable time from work and wages for the period of:
To be determined☒ 9. Due to the injury, the claimant has permanent disability of the following nature and extent (check one):☒ (1) General Disability: ☒ Total ☒ Partial ☐ (2) Specific Disability: ☒ Total ☒ Partial ☒ (3) Wage Loss9a. ☐ A determination of permanent disability is premature at this time.☒ 10. Due to the injury, the claimant has a serious bodily disfigurement consisting of: To be determined10a. At the time of the injury, the claimant was paid weekly wages of \$TBD, and demands accounting of days worked and wages earned as provided by law.10b. Give names and addresses of all employers for whom the claimant has worked since the date of the accident: None.11. Further grounds or unusual aspects of claim: To provide all benefits under the Act.

11a. List names and addresses of all physicians or other medical specialists who have seen or treated the claimant as a result of the accident:

MUSC; Dr. Raymond Turner; Keri Melancon, M.D., Primary Care Center of Newport, 434 4th St., Ste. 301, Newport, TN 37821; Patrick M. Bolt, M.D., Tennessee Orthopaedic Clinic, 308 North Peters Rd., Ste. 225, Knoxville, TN 37922; Russell R. Blakeley, M.D., East Tennessee Heart Consultants, PC, 900 East Oak Hill Ave., Central Annex, Ste. 600, Knoxville, TN 37917; Physicians Regional Medical Center, 900 E. Oak Hill Ave., Knoxville, TN 37917; Newport Medical Center, 435 2nd St., Newport, TN 37821; HealthSouth Rehabilitation Hospital, 9181 Medcom Street, Charleston, SC 29406; Amedisys Hospice, 1423 West Morris Blvd., Ste. C, Morristown, TN 3781311b. To the best of your knowledge, did you have any prior permanent disability? no If yes, describe:

12. Appropriate benefits as provided in the Act for the above grounds and other relief as the Workers' Compensation Commission may direct as just and proper.

☐ 13a. I am filing a claim. I am not requesting a hearing at this time.14. Estimated time needed for hearing: 30 min.☒ 13b. I am requesting a hearing. A \$25 fee is required.☐ Mediation☐ a. Mediation is requested to be ordered pursuant to Reg. 67-1803.☐ b. Mediation is required pursuant to Reg. 67-1802.☐ c. Mediation is requested by consent of the Parties pursuant to Reg. 67-1803.☐ d. Mediation has been conducted by a duly qualified mediator and resulted in an impasse.Questions regarding mediation may be submitted to mediation@wcc.sc.gov.I certify I have served this document pursuant to Reg. 67-211 by delivering a copy to George T. Miars, Jr., Esquire address Willson, Jones, Carter and Baxley, 421 Wando Park Blvd. Suite 100, Mt. Pleasant SC 29464 on July , 2013, by ☒ first class postage ☐ certified mail ☐ personal service.

I verify the contents of this form are accurate and true to the best of my knowledge.

Preparer's Signature [Signature]

Attorney for Claimant

Title

Email ksmith@hoffmanlaw.netDate July 31, 2013

Questions about the use of this form may be directed to the Commission's Claims Department at 803.737.5723. Refer to Regulations 67-204 through 67-211 and Regulations 67-601 through 67-615 as well as Reg. 67-1801.

WCC Form # 50

Revised 7/13

50Employee's Notice of Claim and/or
Request for Hearing

South Carolina Workers' Compensation Commission
1333 Main Street, Suite 500
P.O. BOX 1715
Columbia, SC 29202-1715
(803) 737-5675 www.wcc.sc.gov



WCC File #: **1106833**
Carrier File #: **2011-001842**
Carrier Code #:
Employer FEIN #:

Claimant's Name: Timothy McMahan SSN: 413-90-3127 Employer's Name: SC Department of Education—Transportation
Address: _____ Address: 1429 Senate Street
City: _____ State: _____ Zip: _____ City: Columbia State: SC Zip: 29201
Home Phone: _____ Work Phone: _____ Insurance Carrier: State Accident Fund
Preparer's Name: George T. Miars, Jr. Law Firm: Willson Jones Carter & Baxley, P.A. Preparer's Phone #: (843) 284-1091

Date of Injury or Illness: 6/15/2011

Complete each information blank. Specify clearly when contentions are admitted in part and denied in part. The employer/carrier in answer to the claim, respectfully shows:

1. It is ☒ Admitted ☐ Denied the employee sustained an injury or illness on or about the date set forth in the Form 50. The reasons for denial are:
Defendants admit injury to the back only. All other alleged injuries are denied.
2. It is ☒ Admitted ☐ Denied both the employer and employee were subject to the Workers' Compensation Act at the time in question. The reasons for denial are:

3. It is ☒ Admitted ☐ Denied the relationship of employer and employee existed at the time in question. The reasons for denial are:

4. It is ☒ Admitted ☐ Denied at the time in question the employee was performing services arising out of and in the course of employment. The reasons for denial are:

5. It is ☒ Admitted ☐ Denied notice of injury was given the employer. The reasons for denial are:

6. It is ☐ Admitted ☒ Denied the employee ☐ Needs ☐ Is Entitled to Additional medical care as a result of injury or illness. The reasons for denial are:

7. It is ☐ Admitted ☒ Denied the employee is entitled to temporary total disability for the period(s) of : For any period.

8. It is ☐ Admitted ☒ Denied the employee is permanently disabled. The reasons for denial are:
Claimant died from unrelated causes before reaching MMI.
9. It is ☐ Admitted ☒ Denied the employee has serious disfigurement
[TO BE PROVIDED]
10. It is contended that an average weekly wage of \$ 558.60 applies, according to attached Form 20 as provided by law.
11. Further contentions, grounds of defense, or unusual aspects are:
Defendants reserve the right to amend and to assert defenses as they become aware of them.

☐ **Mediation**

- ☐ a. Mediation is requested to be ordered pursuant to Reg. 67-1801 B.
- ☐ b. Mediation is required pursuant to Reg. 67-1802.
- ☐ c. Mediation is requested by consent of the Parties pursuant to Reg. 67-1803.
- ☐ d. Mediation has been conducted by a duly qualified mediator and resulted in an impasse.

Questions regarding mediation may be submitted to mediation@wcc.sc.gov.

I certify that I have served this document pursuant to R.67-212 by delivering a copy to: Kevin Smith, 7087 Rivers Avenue
Name & Address

North Charleston, SC 29406 and Virginia Crocker, Judicial Director, SC WCC, P.O. Box 1715, Columbia, SC 29202 on the 7th day of August, 2013 by ☒ first class
mail ☐ personal service ☐ certified mail.

I verify the contents of this form are accurate and true to the best of my knowledge.

G.T. Miars, Jr. Attorney for the Employer/Insurer
Preparer's Signature Title

gtmiars@wjlaw.net
Email

08/07/2013
Date

Melody L. Reeves
Certifier, Melody L. Reeves

Refer to R.67-204 through R.67-210 and R.67-601 through R.67-615. Refer to R. 67-1801 for mediation. Questions about the use of this form may be directed to the Commission's Judicial Department at 803-737-5675 or jud@wcc.sc.gov or mediation@wcc.sc.gov. Pursuant to R.67-606, a Form 20 must be filed with the Claims Department at least 30 days from the date of filing this form.



Claimant's Name: Timothy McMahan Employer's Name: SC Department of Education--Transportation
Address: 760 Central Church Road Address: 1429 Senate Street
City: Morristown State: TN Zip: 37814 City: Columbia State: SC Zip: 29201
Home Phone: _____ Work Phone: _____ Carrier: State Accident Fund
Preparer's Name: George T. Miars, Jr. Preparer's Phone #: (843) 284-1091

A claim for workers' compensation benefits is made based on the following grounds:

☐ Injury ☐ Illness ☐ Repetitive Trauma

1. Compensation Rate: \$372.42 2. AWW: \$ 558.60 Date of Injury: 6/15/2011
3. Type of injury and body part(s): Back and alleged head, brain, internal injuries, teeth, mouth, and ribs.
4. Facts in controversy: Defendants deny that Claimant's Estate is entitled to any permanent disability benefits under the Act.
5. Legal issues involved: § 42-9-30; § 42-9-280; Curiel v. Environmental Management Services (MS), 655 S.E.2d 482, 376 S.C. 23 (S.C. 2007)
6. Unusual aspects: Defendants reserve the right to and may move to either postpone or adjourn the scheduled hearing to exercise due process rights afforded by law to cross examine, respond to, and otherwise oppose evidence presented by the Claimant.
7. Witnesses (designate if expert):* Employer Representative
8. Exhibits: Claimant's Employment/Personnel File; Payroll Records; Deposition of Claimant's personal representative.
9. Medical evidence (indicate report pursuant to R.67-612; deposition or appearance): SEE APA SUBMISSIONS. Defendants reserve the right to rely on any of Claimant's submissions under the APA.
10. Name, address, and specialty, if any, of the treating physician: Patrick M. Bolt, MD, Tennessee Orthopaedic Clinic, 1819 Clinch Avenue, Ste. 100, Knoxville, TN 37916
11. Impairment rating(s); body part(s); physician and date of opinion: 54%; whole person; Patrick M. Bolt, MD 2/27/13
12. I am amending my Form 50/51 in the following manner: N/A

☐ **Mediation**

- ☐ a. Mediation is requested to be ordered pursuant to Reg. 67-1801 B.
- ☐ b. Mediation is required pursuant to Reg. 67-1802.
- ☐ c. Mediation is requested by consent of the Parties pursuant to Reg. 67-1803.
- ☐ d. Mediation has been conducted by a duly qualified mediator and resulted in an impasse.

Questions regarding mediation may be submitted to mediation@wcc.sc.gov.

I verify the contents of this form are accurate and true to the best of my knowledge.

I certify that I have served this document pursuant to R.67-212 by delivering a copy to: Kevin Smith, 7087 Rivers Avenue

Name & Address

North Charleston, SC 29406 and Aisha G. Taylor, P.O. Box 1715 Columbia, SC 29202-1715 on the 5th day of August, 2013 by ☒ first class mail ☐ personal service

☐ certified mail.

Certifier, Melody L. Reeves

Signature: _____

George T. Miars, Jr., Willson Jones Carter & Baxley, P.A.

Email: gtmiars@wjlaw.net

Date of hearing: August 15, 2013

Time needed for hearing: 45 Minutes

Questions about the use of this form should be directed to the Jurisdictional Commissioner. Refer to Regulations 67-204 through 67-211 and Regulations 67-601 through 67-615; as well as Regulation 67-1801. File this form and proof of service on the opposing party according to R.67-611 and R.67-212. Do not send medical reports. * Commissioners reserve the right to admit expert witnesses at hearings.

South Carolina Workers' Compensation Commission
1612 Marion Street • Post Office Box 1715
Columbia, South Carolina 29202-1715
(803) 737-5723



WCC File #: **1106833**
Carrier File #: _____
Carrier Code #: _____
Employer FEIN #: _____

Claimant's Name: Dorothy McMahan as PR of the Estate of Tim McMahan SSN: 413-90-3127

Employer's Name: SC Department of Education

Address: 1688 Hwy. W 2570

Address: 1429 Senate St.

City: Newport State: TN Zip: 37821

City: Columbia State: SC Zip: 29201

Home Phone: (865) 248-6250 Work Phone: _____

Insurance Carrier: State Accident Fund

Preparer's Name: Kevin Smith Law Firm: Hoffman Law Firm Preparer's Phone #: (843) 769-7077

A claim for workers' compensation benefits is made on the following grounds:

☒ Injury ☐ Illness ☐ Repetitive Trauma

1. Compensation Rate: \$372.42 2. AWW: \$558.60 Date of Injury: June 15, 2011

3. Type of injury and body part(s): head, brain, back, internal injuries, teeth, mouth, ribs, legs

4. Facts in controversy: This is an accepted claim. The claimant has been placed at MMI and assigned a 54% impairment rating by the authorized treating physician who also states he is "totally disabled."

5. Legal issues involved: Permanent and Total Disability due to 50% greater disability - §42-9-30(19)

6. Unusual aspects: The Claimant died from a heart condition. The authorized treating physician states he had reached MMI prior to his death and he would have remained totally disabled.

7. Witnesses (designate if expert):* Dorothy McMahan and any and all witnesses listed by the Defendant

8. Exhibits: Personnel records, death certificate, appointment of PR, letter of termination by employer.

9. Medical evidence (indicate report pursuant to R.67-612; deposition or appearance):
See attached Notice of Witnesses and Written Medical Reports to be Introduced as Direct Evidence on Behalf of the Claimant.

10. Name, address, and specialty, if any, of the treating physician: Dr. Patrick Bolt

11. Impairment rating(s); body part(s); physician and date of opinion: 54% to the back, Dr. Bolt, 2/27/13

12. I am amending my Form 50/51 in the following manner: Adding legs as affected body parts, changing caption to reflect Dorothy McMahan as PR of the Estate of Timothy McMahan.

☐ **Mediation**

- ☐ a. Mediation is requested to be ordered pursuant to Reg. 67-1803.
☐ b. Mediation is required pursuant to Reg. 67-1802.
☐ c. Mediation is requested by consent of the Parties pursuant to Reg. 67-1803.
☐ d. Mediation has been conducted by a duly qualified mediator and resulted in an impasse.

Questions regarding mediation may be submitted to mediation@wcc.sc.gov.

I verify the contents of this form are accurate and true to the best of my knowledge.

I certify I have served this document pursuant to Reg. 67-211 by delivering a copy to George T. Miers, Jr., Esquire address Willson, Jones, Carter and Baxley, 421 Wando Park Blvd. Suite 100, Mt. Pleasant SC 29464 on July 30, 2013, by ☒ first class postage ☐ certified mail ☐ personal service 30

SIGNATURE [Signature]

Email: ksmith@hoffmanlaw.net

DATE OF HEARING 8/15/13

Time needed for hearing: 45 mins.

On behalf of ☒ Claimant ☐ Employer

Questions about the use of this form should be directed to the Jurisdictional Commissioner. Refer to Regulations 67-204 through 67-211 and Regulations 67-601 through 67-615; as well as Regulation 67-1801. File this form and proof of service on the opposing party according to R.67-611 and R.67-212. Do not send medical reports. *Commissioners reserve the right to admit expert witnesses at hearings.

WCC Form #58
Rev. 7/13

58

PRE-HEARING BRIEF

South Carolina Workers' Compensation Commission
1333 Main Street, Suite 500
P.O. BOX 1715
Columbia, SC 29202-1715
803-737-5675 www.wcc.sc.gov



WCC File #:	1106833
Carrier File #:	2011-001842
Carrier Code #:	
Employer FEIN #:	

Claimant's Name: Timothy McMahan SSN: 413-90-3127 Employer's Name: SC Department of Education--Transportation
Address: _____ Address: 1429 Senate Street
City: _____ State: _____ Zip: _____ City: Columbia State: SC Zip: 29201
Home Phone: _____ Work Phone: _____ Insurance Carrier: State Accident Fund
Preparer's Name: George T. Miars, Jr. Law Firm: Willson Jones Carter & Baxley, P.A. Preparer's Phone #: (843) 284-1091

REQUEST FOR COMMISSION REVIEW

Request for Commission Review by ☐ Claimant ☒ Employer (check one) Date of Injury or Illness: 6/15/2011

The undersigned makes application for review of the findings of the Commissioner in the above-captioned case. The request for review is based on the following grounds: (State the grounds of your appeal in the form of questions presented. Each question presented must contain a concise statement of one proposition of law or fact. Refer to evidence by title and exhibit number. Use additional pages if necessary).

See Attached.

(Check one) Oral argument ☒ is ☐ is not requested. Appellant's request for oral argument is waived if not indicated on this form.

☐ **Mediation**

☐ Mediation is requested by consent of the Parties pursuant to Reg. 67-1803.

Questions regarding mediation may be submitted to mediation@wcc.sc.gov.

I certify that I have served this document pursuant to R.67-212 by delivering a copy to: Kevin Smith, 7087 Rivers Avenue

Name & Address

North Charleston, SC 29406 and Virginia Crocker, Judicial Director, SC WCC, P.O. Box 1715, Columbia, SC 29202 on the 27th day of March, 2014 by ☒ first class mail
☐ personal service ☐ certified mail

George T. Miars, Jr.
Preparer's Signature

Attorney for Defendants
Title

gtmiars@wjlaw.net
Email

03/27/2014
Date

Check this box if you are not represented by an attorney ☐

1. Did the single Commissioner err in finding (Findings of Fact # 6, 8, & 12) that the claimant/decedent reached maximum medical improvement on April 23, 2012, the error being that this finding is not supported by the evidence? This is also an error of law (Conclusions of Law # 9, 10, & 11).
2. Did the single Commissioner err in finding (Findings of Fact # 6 & 8) that the claimant/decedent was at maximum medical improvement at the time of his death, the error being that this finding is not supported by the evidence? This is also an error of law (Conclusions of Law # 9 & 11).
3. Did the single Commissioner err in failing to find that the claimant/decedent is not entitled to compensation for permanent disability under the SC Workers' Compensation Act? This is also an error of law.
4. Did the single Commissioner err in finding (Findings of Fact # 11) that the claimant/decedent was not a paraplegic as a result of his work related accident, the error being that this finding is not supported by the evidence? This is also an error of law (Conclusions of Law # 11).
5. Did the single Commissioner err in failing to find that the claimant/decedent's entitlement to permanent disability benefits abated upon his death, the error being that the claimant/decedent was a paraplegic as a result of his work accident, and if his estate is able to posthumously litigate permanent disability, any benefits would be due under S.C. Code § 42-9-10(C), which abate under S.C. Code § 42-9-280? This is also an error of law (Conclusions of Law # 11).
6. Did the single Commissioner err in finding (Findings of Fact # 11 & 12) that claimant/decedent's estate is able to posthumously litigate the extent of a claimant/decedent's permanent disability, the error being that this is not supported under the SC Workers' Compensation Act? This is also an error of law (Conclusions of Law # 10 & 11).
7. Did the single Commissioner err in finding (Findings of Fact # 12) that the Commission can rely on a posthumous impairment rating in determining claimant/decedent's permanent disability award, the error being that this is not supported under the SC Workers' Compensation Act? This is also an error of law (Conclusions of Law # 10 & 11).

Questions about the use of this form should be directed to the Judicial Department at 803.737.5675 or appeals@wcc.sc.gov.

If the claimant appeals and is not represented by counsel, the Judicial Department will properly serve this form pursuant to Reg. 67-607 C. Pursuant to Reg. 67-205 and Reg. 701, the appeal must be postmarked no later than 14 days from the date of service of the Decision and Order of the Hearing Commissioner along with the filing fee. Attach a Form 32, if you are unable to pay the filing fee. Refer to Reg. 67-211 and Reg. 67-701 through 711.

BEFORE THE SOUTH CAROLINA
WORKERS' COMPENSATION COMMISSION

WCC FILE NO. 1106833

Timothy McMahan,	)	
Employee,	)	
Claimant/Respondent,	)	
	)	
vs.	)	
	)	
SC Department of Education,	)	BRIEF OF DEFENDANTS/APPELLANTS
	)	
Employer,	)	
and	)	
	)	
State Accident Fund,	)	
	)	
Carrier,	)	
Defendants/Appellants.	)	

STATEMENT OF THE CASE

Claimant filed a Form 50 requesting a hearing on May 23, 2013, alleging injuries by accident to his head, brain, back, internal organs, teeth, legs, mouth, and ribs, arising out of and in the course and scope of his employment with the employer on June 15, 2011. The Defendants filed a Form 51 answer on June 13, 2013, admitting injury to the back only.

Claimant died due to unrelated causes on October 6, 2012. Claimant's estate takes the position that they be allowed to have a posthumous determination of Claimant's disability and that Claimant should be considered permanently and totally disabled only as a result of having a greater than 50% disability to the spine. Defendants take the position that Claimant's estate is not entitled posthumously litigate Claimant's disability. Further, Defendants assert that Claimant suffered from paraplegia as a result of his work related injury, and therefore, pursuant to South Carolina Code § 42-9-280, even if Claimant's estate was entitled to a post mortem disability award, such award would abate.

In an Order dated March 24, 2014, the single Commissioner found that the Claimant's

estate was entitled to an award of permanent and total disability due to the Claimant having a greater than 50% disability to the spine.¹ It is from this Order that Defendants appeal.

STATEMENT OF THE FACTS/EVIDENCE

Claimant was a mechanic for Defendant/Employer, and was injured by accident on June 15, 2011. At the time, he jacked a school bus up by the bumper, and was underneath the axel repairing the vehicle when the bumper broke, causing the school bus to fall on him, with the axel crushing his spine.

The first medical report from MUSC in evidence is dated June 16, 2011. This was a report from the transfer of the Claimant from the ICU floor. Claimant was admitted for "status post crush injury with T-12 compression fracture and paraplegia." (Claimant's APA p. 26) (emphasis added). Claimant's injury complex was noted to be T-12 compression fracture with retropulsion and paraplegia (Id.). Claimant was noted to have previously undergone a T-12 corpectomy and fusion by Dr. Turner on June 15, 2011.

Medical evidence clearly shows that the Claimant suffered from paraplegia as a result of this accident. He treated with Dr. Raymond Turner, a neurosurgeon at MUSC. Dr. Turner diagnosed the Claimant with a T-12 compression fracture on October 10, 2011, Dr. Turner performed a surgical T-11, T-12, and L-1 laminectomy and bilateral foraminotomies, with placement of pedestal screws at T-10 and L-2, and T-12 vertebral corpectomy, and fusion from T-10 to L-2. (Claimant's APA p. 32).

Claimant returned to MUSC for a urological evaluation on October 13, 2011. (Claimant's APA p. 20-21). This report notes that the Claimant was experiencing numbness in his bilateral lower extremities, urinary retention, and penile paresthesia. (Id. at 20). Claimant

¹ The Commissioner, pursuant to stipulations of the parties, held that such award would be held in trust until a good faith dependency investigation was performed to determine beneficiaries of this award.

was given a voiding trial, which he failed, and Claimant noted that his lower extremities felt “numb.” (Claimant’s APA p. 20-21). Claimant’s neurological evaluation showed generalized weakness, and that the Claimant was in a wheelchair, and sensory evaluation showed numbness and tingling in his feet. (Id.). Claimant was last seen at MUSC on February 7, 2012. (Claimant’s APA p. 24-25). It was again noted that he was in a wheelchair. He was noted to be moving to Tennessee, and it was recommended that he follow up with a physiatrist there as soon as possible. Claimant was never found by MUSC to be at maximum medical improvement. (Claimant’s APA p. 24-25).

After moving to Tennessee, the Claimant was seen for an initial evaluation with Dr. Patrick Bolt on April 23, 2012. (Claimant’s APA p. 2-5). Dr. Bolt noted that the Claimant had undergone two spine surgeries following a school bus falling off of a jack onto him. He noted the Claimant’s left lower extremity was “numb, and had been since his second surgery. (Id. at 2). Dr. Bolt further noted that the Claimant had been self catheterizing since October. (Id.). Physical exam noted a “markedly pitched forward gait, unable to heel and toe walk or reciprocating heel and toe walk secondary to ataxia.” (Id. at 3). Dr. Bolt admitted that he has not reviewed the Claimant’s medical records from MUSC or his neurosurgeon. In his discussion and plan, he noted that the Claimant had a complication of urinary retention and significant left lower extremity pain following his last surgery. He noted that it was “unclear if the partial spinal cord injury which he sustained was before or after the surgery. The patient reports that it was after the surgery, however it is unclear if this is the case, as certainly he was quite severely affected before the surgery was performed.” (Id. at 4). Dr. Bolt stated that he did not plan to take over the Claimant’s treatment, and that “apparently, the patient is already at maximum medical improvement, but again, I have no records to confirm this.” (Id. at 5).

Claimant’s attorney submitted a note from Dr. Bolt dated February 27, 2013, after

Claimant's death, stating that Dr. Bolt had "been asked by Kevin B. Smith of the Hoffman Law Firm, in Charleston, South Carolina to provide Mr. McMahan posthumously with an impairment rating." (Claimant's APA, p. 11). He stated, "I had thought he was previously at maximum medical improvement, apparently that was not the case. I would say that he was at maximum medical improvement when I saw him on 04/23/2012." (Id.). He notes that "the patient was totally disabled, and every time that I saw him he was confined to a wheelchair." (Id.). He stated that the Claimant has sustained a "partial spinal cord injury/myelopathy," with station and gait disorders, neurogenic bladder, neurogenic bowel, and dysesthetic pain. (Id.). Dr. Bolt assigned a 54% impairment to the whole person as a result of these conditions, noting that Claimant's spinal cord injury alone constituted a 44% whole person impairment. (Id.).

Last, Claimant's attorney submitted a Form 14B prepared by Dr. Bolt, dated February 27, 2013. Dr. Bolt noted the that the Claimant's "nature of injury" was a "T12 burst fracture w[ith] spinal cord injury." (Claimant's APA p. 1).

ISSUES PRESENTED

- I. Did the Hearing Commissioner err in finding that the Claimant's estate is entitled to an award of permanent and total disability?
- II. Did the Hearing Commissioner err in finding that the Claimant reached maximum medical improvement on April 23, 2012?
- III. Did the Hearing Commissioner err in failing to find that the Claimant suffered from paraplegia as a result of his work accident

ARGUMENTS/DISCUSSION

- I. The Hearing Commissioner erred in finding that the Claimant's estate is entitled to an award of permanent and total disability.

The evidence and law does not support the single Commissioner's award of permanent and total disability in this claim.

a. The Workers' Compensation Act does not provide for a posthumous determination of Claimant's disability.

The South Carolina Workers' Compensation Act does not provide for a posthumous determination of disability. As indicated by the South Carolina Supreme Court in Owens v. Herndon, "[t]he rights and liability of employee and employer under the Workmen's Compensation Act are purely statutory and are to be judged by the terms of the Act. Policy consideration as to what benefits should be conferred or obligations imposed are strictly for the legislature." 252 S.C. 166, 167, 165 S.E.2d 696, 697 (1969). Since workers' compensation statutes provide an exclusive compensatory system in derogation of common law rights, courts must strictly construe such statutes, leaving it to the legislature to amend and define any ambiguities. Cox v. BellSouth, 356 S.C. 468, 589 S.E.2d 766 (Ct.App. 2003).

South Carolina Code § 42-9-280 provides the sole basis under the Act for a claimant's estate's or beneficiaries' entitlement to a claimant's disability award after the claimant dies from a non-work related reason. As written by the Legislature, § 42-9-280 only provides recovery of benefits when there has been a prior award of disability. This Statute, titled "Payment of unpaid balance of compensation when employee dies" states:

When an employee receives or is entitled to compensation under this Title for an injury covered by the second paragraph of Section 42-9-10 or 42-9-30 and dies from any other cause than the injury for which he was entitled to compensation, payment of the unpaid balance of compensation shall be made to his next of kin dependent upon him for support, in lieu of the compensation the employee would have been entitled to had he lived.

S.C. Code Ann. § 42-9-280 (1976) (emphasis added).

The justification for this is clear. South Carolina Code § 42-9-280 was originally created

in 1936 (§1231), and codified as written in 1976, at which time the previous lump sum Statute, S.C. Code § 42-9-300 (1976) was in affect, and provided:

Whenever any weekly payment has been continued for not less than six weeks, the liability therefor may, in unusual cases, ... be redeemed, in whole or in part, by the payment by the employer of a lump sum which shall be fixed by the Commission....

S.C. Code § 42-9-300 (1976) (emphasis added).

Thus, at the time § 42-9-280 was written into law, the usual disability award was paid on a weekly basis, and lump sum payments were only in "unusual cases." Thus, with § 42-9-280, the Legislature addressed what to do with the remaining benefits if a claimant died while still receiving a weekly disability award. It is clear from the § 42-9-280's title and language that it only applies to claimant's who have been awarded disability by the Commission or thorough settlement, and have an "unpaid balance" of weekly benefits. **There is nothing in § 42-9-280 or the Act that provides for a claimant's estate to posthumously litigate the extent of disability the deceased claimant had before he died, and without that express provision by the Act, there is no legal basis for such an award.**

The Supreme Court, in Stone v. Roadway Express, 367 S.C. 575, 627 S.E.2d 695 (2006), discussed the provisions of S.C. Code § 42-9-280, stating:

Professor Larson notes that since a compensation award, unlike a tort award, is a personal one based on the employee's need for a substitute for lost wages and earning capacity, in the absence of a special statutory provision, heirs have no claim to unaccrued weekly payments. Larson's Workers' Compensation Law, (2000) §§ 89.01; 89.03. In construing a workers' compensation statute, the words must be given their plain and ordinary meaning without resort to subtle or forced construction to limit or expand the statute's operation. Adkins v. Comcar Industries, Inc., 323 S.C. 409, 475 S.E.2d 762 (1996) (internal citation omitted), Section 42-9-280 specifically provides for the inheritability of two types of awards only.

Stone at 585, 627 S.E.2d at 700.

There is no provision in the Act allowing a claimant's estate to posthumously litigate a

claimant's disability, and the reasoning for this is clear. Litigation of a claimant's disability involves determining a claimant's work history, education level, ability to return to work, pain complaints, etc. Defendants due process rights allow full discovery and the right to present and cross examine evidence on all of these issues, including obtaining medical evaluations of the claimant pursuant to S.C. Code § 42-15-80, deposing the claimant to discovery his work history, functional abilities, and education levels, and most importantly obtaining a vocational evaluation of the claimant to determine his or her ability to return to work. Likewise, to judge the extent of disability, a Commissioner must be allowed to see and speak to the claimant, and judge his or her credibility prior to making an award. Litigating disability after a claimant's death destroys Defendants due process rights to defend the claim.

Here, Claimant's estate argues that the claimant has sustained a greater than 50% disability to the back, and asserts that there is a rebuttable presumption Claimant was permanently and totally disabled. The Defendants therefore should have the legal due process rights to attempt to rebut this presumption. However, the Claimant is deceased, and Defendants cannot obtain vocational testing of him, depose him to discovery his work history, education level, or in anyway refute this presumption, or judge his credibility. This is an outcome not contemplated or allowed for under the Act, and the award of disability should be reversed.

b. Claimant's award for benefits would have abated under S.C. Code § 42-9-280, if claimant's estate had the legal ability to posthumously litigate disability.

In the alternative, even if the Act allows for posthumous litigation of a claimant's disability, Claimant's award would abate as he was a paraplegic as a result of his accident.

South Carolina Code § 42-9-280 only allows for awards to go to beneficiaries when they arise from the second paragraph of § 42-9-10 (loss of both hands, arms, shoulders, feet, legs, hips or vision, or any two thereof), or § 42-9-30 (scheduled member statute). Therefore, any award

for permanent and total disability from paraplegia (third paragraph of § 42-9-10) would abate under the Act.

As the Claimant did not provide any testimony in this claim, the Commission must look to the medical evidence to determine the extent of his disability, and it is clear from this medical evidence that Claimant sustained paraplegia as a result of his accident. Claimant was specifically diagnosed at MUSC on June 16, 2011 with "T12 compression fracture with retroplution" and "paraplegia." (Claimant's APA p. 26). **There is a clear diagnosis by his treating physician of paraplegia, and no physician ever refutes this diagnosis.** Further, the medical evidence consistently shows that the Claimant remained wheel-chair bound throughout his treatment, with significant neurological problems consistent with paraplegia, including significant gait and walking problems, dysesthetic pain, and neurogenic bladder. (See Dr. Bolt, 2/27/13, stating "every time that I saw [the Claimant] he was confined to a wheelchair." Claimant's APA p. 11).

In Dr. Bolt's February 27, 2013 note, after the claimant's death, he diagnosed the Claimant with a "partial spinal cord injury/myelopathy" as a result of a "thoracic burst fracture with bony repulsion into the canal." (Claimant's APA p. 11). Dr. Bolt specifically diagnoses the Claimant with neurogenic bladder, dysesthetic pain, and a significant gait disorder. (Id.). Dr. Bolt further notes in his Form 14B Claimant's "nature of injury" to be "T12 burst fracture w[ith] spinal cord injury." (Claimant's APA p. 1).

The strongest evidence for the finding of paraplegia, in addition to the diagnosis at MUSC, is the impairment rating relied upon by Claimant's estate. In a normal back injury claim, without paraplegia, impairment is calculated under Chapter 17, "The Spine and Pelvis." (*Guides to the Evaluation of Permanent Impairment*, 6th ed.). Spinal cord injury impairments involving paraplegia or incomplete paraplegia are calculated under Chapter 13, "The Central and

Peripheral Nervous System.” (*Id.*) (see Exhibit A, Chapter 13.4, *Guides to the Evaluation of Permanent Impairment*, 6th ed.). Dr. Bolt indicates in his February 27, 2013, note that Claimant’s spinal cord injury results in a 44% whole person impairment alone, pursuant to Chapter 13 of the AMA Guides. (Claimant’s APA p. 11).

Claimant’s estate will no doubt argue that Dr. Bolt’s diagnosis of “partial spinal cord injury” does not support an award of paraplegia. However, this case is directly on point with the Court of Appeals decision in Reed-Richards v. Clemson University, 371 S.C. 304, 638 S.E.2d 77 (Ct.App. 2006). In upholding a lifetime benefits award where the claimant was found to have partial paraplegia, the Reed-Richards Court held that **“the Commission and circuit court correctly interpreted the term ‘paraplegic’ to include a diagnosis of incomplete paraplegia.”** *Id.* at 309, 638 S.E.2d at 80 (emphasis added). Further, the claimant’s condition in Reed-Richards is on point with this Claimant’s. The Court noted:

As a result of the accident, Reed-Richards has to use a walker, something she never needed before. She has also lost the ability to control her bowels; they empty at random times, forcing her to wear adult diapers and restricting her from going out in public because of odor problems. Her bladder condition originating from her 1973 accident has worsened, requiring her to catheterize herself more often than she had to in the past. Because of these problems, she is able to perform only menial tasks and cannot pursue additional vocational training.

Reed-Richards at 306, 638 S.E.2d at 78.

In Reed-Richards, the claimant was able to walk with the assistance of a walker, where as here, Claimant was wheelchair bound. Both claimants had neurogenic bladders, with need for cathertizations due to neurogenic bladders. Further, he Court noted the opinion of the treating physician, who stated that “[p]araplegia”, according to the International Standards of Neurologic Classification of Spinal Cord Injury, Revised Sixth Edition, dated 2000, is ‘impairment or loss of motor and/or sensory function in the thoracic, lumbar, or sacral segments of the spinal cord secondary to damage of neural elements within the spinal canal.’” This classification, relied upon

in Reed-Richards to support a diagnosis of paraplegia, is completely consistent with Claimant's condition, and supports the diagnosis of paraplegia by MUSC, and partial paraplegia by Dr. Patrick Bolt.

Had the issue of Claimant's disability been litigated prior to his death, it is clear that he would have been found to be a paraplegic, and there is no medical evidence refuting this diagnosis. Given that Claimant's estate asserts that Claimant was permanently and totally disabled at the time of his death, and that the Commissioner found the Claimant permanently and totally disabled, then the Claimant would have been awarded lifetime benefits pursuant to the third paragraph of S.C. Code § 42-9-10, and this award would have abated at his death pursuant to S.C. Code § 42-9-280.

c. The Claimant failed to reach maximum medical improvement prior to his death.

Claimant's award of permanent and total disability should be reversed because Claimant failed to reach maximum medical improvement prior to his death.

The award of disability benefits is premature prior to the claimant reaching maximum medical improvement. Curiel v. Environmental Management Services, 655 S.E.2d 482, 376 S.C. 23 (2007) (stating that "workers' compensation benefits accrue along a time continuum: temporary total disability benefits are available from the date of injury through the date of maximum medical improvement; **post-maximum medical improvement benefits may then be awarded either as a permanent total or partial disability**, or as a percentage of impairment to a scheduled member." (emphasis added)).

Claimant was never found to be at maximum medical improvement prior to his death. He was actively treating at MUSC, prior to moving to Tennessee. His last medical report from MUSC, on February 7, 2012, notes that Claimant was recommended to "set up with Rehab and

Pain Management ASAP in Tennessee for a smooth transfer of care.” (Claimant’s APA p. 25). He was not released from treatment, and it was clear from his report that his treatment needed to continue to improve his condition. Claimant was next seen by Dr. Patrick Bolt for an independent medical evaluation on April 23, 2012. (Claimant’s APA p. 2-5). In his report, Dr. Bolt admitted that he has not reviewed the Claimant’s medical records from MUSC, or any other provider other than Dr. Brandli at Carolina Family Urology. (Id. at 4). Dr. Bolt further noted that “I have declined to take over the patient’s pain management as this was a stipulation to my seeing the patient,” and that “I have recommended that the patient be placed in pain management in the Knoxville area.” (Id.). Despite not reviewing the Claimant’s medical records related to his spine injury, only seeing the claimant for an evaluation, and recommending the Claimant for ongoing treatment, Dr. Bolt states that “[a]pparently, the patient is already at maximum medical improvement, but, again, I have no records to confirm this.” (Claimant’s APA p. 5). It is clear from a reading of the Claimant’s medical records that he was never found at maximum medical improvement before this visit with Dr. Bolt, and that Dr. Bolt’s statement was incorrect. Dr. Bolt admits as much in his February 27, 2013 note, stating, “I had thought he was previously at maximum medical improvement, apparently that was not the case.” (Claimant’s APA 11). He then, without justification, summarily states that “I would say that [the Claimant] was at maximum medical improvement when I saw him on April 23, 2014,” despite the fact that the Claimant had not begun to undergo the treatment both Dr. Bolt and MUSC recommended for him. (Id.).

Based on Dr. Bolt’s own statements, the Claimant was never found to be at maximum medical improvement prior to his death. Further, Defendants assert that the posthumous finding of maximum medical improvement is based on surmise, and unsupported by the medical evidence. Defendants therefore assert that a finding of disability was premature, and respectfully

request that the single Commissioner's award be reversed.

d. The award of disability in the matter violates Defendants' due process rights.

The posthumous litigation of Claimant's permanent disability violates Defendants' due process rights under the Constitutions of the United States and South Carolina.

The South Carolina Constitution provides that in procedures before administrative agencies, "[n]o person shall be finally bound by a judicial or quasi-judicial decision of an administrative agency affecting private rights except on due notice and an opportunity to be heard...." Art. I, § 22 (2009 & Supp.2011). The South Carolina Supreme Court has explained:

"Procedural due process requirements are not technical; no particular form of procedure is necessary. The United States Supreme Court has held, however, that at a minimum certain elements must be present. These include (1) adequate notice; (2) adequate opportunity for a hearing; (3) **the right to introduce evidence**; and (4) **the right to confront and cross-examine witnesses**."

In re Dickey, 395 S.C. 336, 360, 718 S.E.2d 739, 751 (2011) (quoting In re Vora, 354 S.C. 590, 595, 582 S.E.2d 413, 416 (2003)) (emphasis added).

Administrative agencies are required to meet minimum standards of due process. S.C. Const. art. 1, § 3; Stono River Environmental Protection Ass'n v. South Carolina Dept. of Health & Environmental Control, 305 S.C. 90, 406 S.E.2d 340 (1991). In cases where important decisions turn on questions of fact, due process **at least** requires an opportunity to present favorable witnesses and evidence. See, e.g., Brown v. South Carolina State Bd. of Educ., 301 S.C. 326, 391 S.E.2d 866 (1990); Tall Tower, Inc. v. South Carolina Procurement Review Panel, 294 S.C. 225, 363 S.E.2d 683 (1987).

Here, the single Commissioner held that the Claimant was permanently and totally disabled as a result of having a greater than 50% disability to the spine. However, under S.C. Code § 42-9-30, this is a rebuttable presumption, and the Defendants therefore have the right to

discover and present evidence to rebut this presumption. The most relevant witness to this issue is the Claimant himself, who could not testify or be evaluated. The Defendants were at a hearing against a ghost party, the deceased Claimant, who they were not able to have evaluated by a physician or vocational expert, who could not be cross-examined, and whose credibility could not be discovered. Defendants therefore assert that the award of permanent and total disability benefits violates their due process rights, and respectfully request that it be reversed.

II. The Hearing Commissioner erred in finding that the claimant reached maximum medical improvement as of April 23, 2012, because the evidence shows that the claimant did not reach maximum medical improvement prior to his death.

As discussed herein and above, Defendants assert that the single Commissioner erred in finding the Claimant at maximum medical improvement as of April 23, 2013. Defendants assert that Claimant did not reach maximum medical improvement prior to his death, and therefore respectfully request the award of permanent and total disability be reversed.

III. The Hearing Commissioner erred in failing to find that the Claimant suffered from paraplegia as a result of his work accident.

As discussed herein and above, Defendants assert that the single Commissioner erred in failing to find that the Claimant suffered from paraplegia as a result of his work accident. The unrefuted medical evidence supports a diagnosis and finding of paraplegia, and Defendants respectfully request this finding be made by the Full Commission.

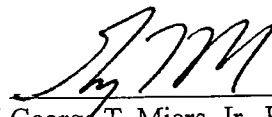
CONCLUSION

Claimant's estate is trying to create the legal fiction that they are allowed, after the Claimant's death, to go back, as if Claimant were alive, and have the Commission determine what disability he would have had if he had not died. There is no basis under the Act for this, and this award violates Defendants due process rights. Further, even if the Act allowed for

Claimant's estate to posthumously litigate disability in this matter, any benefits would have abated given Claimant's status as a paraplegic. For the foregoing reasons and as indicated above, Defendants respectfully request that the single Commissioner's award of permanent and total disability be reversed.

Respectfully submitted,

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EXHIBIT A

Brief of Defendants/Appellants
Timothy McMahan vs. SC Department of Education

impairments (eg, stroke or head injury) are assessed using the criteria in this chapter. Psychiatric features may also exist with primary neurologic disorders. Psychiatric features can range from irritability to outbursts of rage or panic and from aggression to withdrawal. Neurologic impairments producing psychiatric conditions are assessed using the neurologic examination, with an expanded neuropsychiatric history and the necessary ancillary tests. Psychiatric impairments may include depression, manic states, emotional fluctuations, socially unacceptable behavior, involuntary laughing or crying, impulsivity, general disinhibition with obsessive and scatological behaviors, and other kinds of CNS responses. Just as in the chapter on impairment due to mental and behavioral disorders (Chapter 14), the rater should carefully assess 4 main parameters, including in patients with organic emotional and behavioral disorders: (1) ability to perform ADLs; (2) social functioning; (3) concentration; and (4) decompensation in formal settings. The reader should refer to Chapter 14, Mental and Behavioral Disorders, for additional background information.

Psychiatric manifestations and impairments that do not have documented neurologic impairments are evaluated using the criteria in Chapter 14.

Examples of neurologic conditions that are associated with changes in emotion and affect include the following: (1) right hemisphere infarct and inappropriate jocularity; (2) left hemisphere infarct and deep dejection and dysphasia; (3) left-sided temporolimbic seizure foci and ideational disorders; and (4) right-sided temporolimbic seizure foci and mood disturbances. Use Table 13-10 to determine impairments of emotional or behavioral disturbances due to neurologic disorders.

EXAMPLE 13-11: 10% IMPAIRMENT DUE TO EMOTIONAL OR BEHAVIORAL IMPAIRMENTS

A 60-year-old right-handed former boxer has been frequently knocked out for brief periods. He has episodes of mild confusion and occasional unsteadiness of gait, with difficulty in speech and articulation. He has mild head tremor. Physical exam reveals no paresis or sensory defect, but he has difficulty with higher cortical functions on mental status exam testing. He has difficulty with inappropriate jocularity and interpersonal relationships, *which are distinctly different than his personality and behavior when he was younger*. He has moderate symptoms in social and occupational settings. He would score a 51 to 60 on

the Global Assessment of Functioning (see Table 13-10).

EXAMPLE 13-12: 50% IMPAIRMENT DUE TO EMOTIONAL OR BEHAVIORAL IMPAIRMENTS

A 25-year-old right-handed man suffered severe frontal lobe damage due to a traumatic brain injury. He recovered to a point at which he has signs of frontal lobe release and upgoing plantar responses bilaterally, but no clinically notable paresis or sensory disorders. He has marked dementia and severely violent behavior, in which he is a constant physical threat to himself and others despite optimal psychopharmacological management. He requires institutionalization due to his constant violent behavior. He scores a 1 to 10 on the Global Assessment of Functioning.

13.4 Criteria for Rating Impairment due to Spinal Cord Dysfunction and Movement Disorders

13.4a Spinal Cord Disorders

The spinal cord conveys nerve impulses for motor, sensory, and visceral functions. Disorders of impulse transmission can result in permanent impairment. The magnitude of the impairment is estimated according to the effects on the ability to perform ADLs and the results of neurologic examination and testing.

Impairments resulting from spinal cord injuries and other adverse conditions include those relating to station and gait, use of the upper extremities, respiration, urinary bladder function, anorectal function, sexual function, and pain.

Sensory disturbances, including the loss of sense of touch, sense of pain, temperature perception, and sense of vibration and joint position, as well as paresthesias, dysesthesias, and phantom limb sensations, may indicate spinal cord dysfunction. Autonomic system disorders, including disturbances in sweating patterns, regulation of circulation, and regulation of temperature, may occur. Impairment is determined according to the amount of functional impairment and the level of involvement.

When an individual with a spinal cord injury has impairments of several functions or systems (eg, upper extremities, lower extremities, and of bladder,

TABLE 13-10

Global Assessment of Functioning (GAF) Impairment Score

GAF	Description	GAF Impairment Score
91-100	Superior functioning in a wide range of activities; life's problems never seem to get out of hand; is sought out by others because of his or her many positive qualities. No symptoms.	0%
81-90	Absent or minimal symptoms (eg, mild anxiety before an exam), good functioning in all areas, interested and involved in a wide range of activities, socially effective, generally satisfied with life, no more than everyday problems or concerns (eg, an occasional argument with family members)	0%
71-80	If symptoms are present, they are transient and expectable reactions to psychosocial stressors (eg, difficulty concentrating after family argument); no more than slight impairment in social, occupational, or school functioning (eg, temporarily falling behind in school work)	0%
61-70	Some mild symptoms (eg, depressed mood and mild insomnia) or some difficulty in social, occupational, or school functioning (eg, occasional truancy, or theft within the household) but generally functioning pretty well, has some meaningful interpersonal relationships	5%
51-60	Moderate symptoms (eg, flat affect and circumstantial speech, occasional panic attacks) or moderate difficulty in social, occupational, or school functioning (eg, few friends, conflicts with coworkers)	10%
41-50	Serious symptoms (eg, suicidal ideation, severe obsessional rituals, frequent shoplifting) or any serious impairment in social, occupational, or school functioning (eg, no friends, unable to keep a job)	15%
31-40	Some impairment in reality testing or communication (eg, speech is at times illogical, obscure, or irrelevant) or major impairment in several areas, such as work or school, family relations, judgment, thinking, or mood (eg, depressed man avoids friends, neglects family, and is unable to work; child frequently beats up younger children, is defiant at home and is failing at school)	20%
21-30	Behavior is considerably influenced by delusions or hallucinations or serious impairment in communication or judgment (eg, sometimes incoherent, acts grossly inappropriately, suicidal preoccupation) or inability to function in almost all areas (eg, stays in bed all day; no job, home, or friends)	30%
11-20	Some danger of hurting self or others (eg, suicide attempts without clear expectation of death, frequently violent, manic excitement) or occasionally fails to maintain minimal personal hygiene (eg, smears feces) or gross impairment in communication (eg, largely incoherent or mute)	40%
1-10	Persistent danger of severely hurting self or others (eg, recurrent violence) or persistent inability to maintain minimal personal hygiene or serious suicidal act with clear expectation of death	50%

bowel, sexual functioning, or respiratory system neurologic impairments), the Combined Values Chart in the Appendix should be used to combine the whole person impairment estimates for the several functions. The clinician should use Tables 13-11 through 13-16. In this edition of the *Guides*, dyesthetic pain due to spinal cord impairment can be rated using Table 13-17.

Accompanying disorders, such as trophic lesions, urinary calculi, osteoporosis, nutritional disturbances, infections, and reactive psychological states, may occur. The degree to which any of these conditions augments spinal cord impairment should be based on the criteria given in the *Guides* chapters dealing with those disorders.

13.4b Movement Disorders

Movement disturbances resulting from cerebral dysfunction are impairments that may affect ADLs. Mild tics may have no impact on ADLs, while other involuntary movements, such as tremors (resting, postural, and intention), chorea, athetosis, hemiballismus, and dystonia tone may prevent meaningful use of the extremity. Besides abnormal movements, difficulty with coordination for either dexterous or precise movements may interfere with activity; these difficulties can develop from lesions in the basal ganglia or cerebellum. Coordinated movements include gait that may manifest as ataxia requiring use of an ancillary device. Movement disorders, therefore, are assessed for their interference with ADLs as described in Tables 13-11 and 13-12 for the upper and lower extremities.

13.5 Criteria for Rating Impairments of Upper Extremities due to CNS Dysfunction

The basic tasks of everyday living depend on dexterous use of the dominant upper extremity. Loss of use of that extremity results, in most instances, in greater impairment than would be the case with impairment of the limb on the nondominant side. Table 13-11 is used to rate upper extremity dysfunction from any lesion in the brain or spinal cord. Use this table for rating upper extremity dysfunction (manifested by weakness, tremor, or pain) that affects ADLs. The upper extremity impairment may result from, but is not limited to, traumatic brain injury, stroke, neurodegenerative diseases (eg, Parkinson's disease, progressive supranuclear palsy), multiple sclerosis, spinal cord injury, and sequelae of CNS infection.

When the spinal cord disorder affects both upper extremities, combine the ratings for the dominant and nondominant upper extremity.

The impairment ratings given in Table 13-11 are determined from neurologic examination of motor strength, coordination, and dexterity. Functional activities such as buttoning a shirt, lacing shoes, writing, and performing a pegboard task can assess abilities needed for daily activities. Ratings are listed for the nondominant and dominant limb.

TABLE 13-11 Criteria for Rating Impairments of the Upper Extremities due to CNS Dysfunction

Upper Extremity CNS Dysfunction					
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
WHOLE PERSON IMPAIRMENT RATING (%)	0%	1%–5% Nondominant 1%–10% Dominant	6%–15% Nondominant 11%–20% Dominant	16%–30% Nondominant 21%–40% Dominant	31%–50% Nondominant 41%–60% Dominant
DESCRIPTION	Patient has no impairment of upper extremity function	Individual can use the involved extremity for ADLs and holding but has difficulty with digital dexterity	Individual can use the involved extremity for ADLs, can grasp and hold objects with difficulty, but has no digital dexterity	Individual can use the involved extremity only as a gross assist in ADLs	Individual cannot use the involved extremity for ADLs

TABLE 13-12 Criteria for Rating Impairments due to Station and Gait Disorders

 Station and Gait Disorders					
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
WHOLE PERSON IMPAIRMENT RATING (%)	0%	1%–10%	11%–20%	21%–35%	36%–50%
DESCRIPTION	No disorder of gait or station	Rises to standing position; walks but has difficulty with elevations, grades, stairs, deep chairs, and/or long distances	Rises to standing position; walks some distance with difficulty and without assistance, but is limited to level surfaces	Rises and maintains standing position with difficulty; cannot walk without assistance	Cannot stand without help, mechanical support, and/or an assistive device

13.6 Criteria for Rating Impairments of Station, Gait, and Movement Disorders

Problems maintaining balance and a stable gait can develop from a CNS or peripheral neurologic impairment. On physical examination, the physician may observe loss of equal arm or leg movement, falling or staggering to one or the other side, inability to control starting or stopping, and arrhythmic body or extremity movements. Increased tone in the lower extremities from a CNS lesion such as traumatic brain injury, stroke, spinal cord injury, or multiple sclerosis may result in a spastic paraparesis or spasticity in 1 limb. Loss of station or Romberg sign (falling with eyes closed) may indicate dysfunction in the peripheral nerves or their ascending pathways to the brain. Peripheral neuropathy, identified by physical examination and electrodiagnostic tests, is frequently associated with complaints of imbalance or stumbling, since information from sensory receptors is altered.

Impairment ratings for station and gait disorders are determined according to the effect on ambulation (see Table 13-12). Other anatomic or functional changes from other body systems, such as the musculoskeletal system, are combined with the neurologic assessment for station and gait.

13.7 Criteria for Rating Neurogenic Bowel, Bladder, and Sexual Dysfunction

13.7a Neurogenic Bowel

The ability to control emptying provides the criterion for evaluating permanent impairment of the anus and rectum due to spinal cord or other neurologic dysfunction (Table 13-13).

13.7b Neurogenic Bladder

The ability to control bladder emptying provides the criterion for evaluating permanent bladder impairment resulting from spinal cord and CNS disorders (Table 13-14). Documentation by cystometric or other tests may be necessary. When evaluating impairments of the bladder, the physician also must consider the status of the upper urinary tract. Refer to Chapter 7, the Urinary and Reproductive Systems, and apply the Combined Values Chart in the Appendix if impairments of several organ systems are present.

13.7c Neurogenic Sexual Dysfunction

Awareness and capability of having an orgasm are the criteria for evaluating permanent impairment of sexual functioning that may result from spinal cord or other neurologic system disorders (Table 13-15). The individual's previous sexual functioning should be considered by the physician; age is only 1 criterion for evaluating previous sexual functioning. Adjust for age according to the criteria outlined in Chapter 7, The Urinary and Reproductive Systems.

TABLE 13-13 Criteria for Rating the Neurogenic Bowel

 Neurogenic Bowel					
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
WHOLE PERSON IMPAIRMENT RATING (%)	0%	1%–5%	6%–10%	11%–20%	21%–50%
DESCRIPTION	Fully continent without special program	Continent with bowel program	Incontinent about once a week despite optimal bowel program	Incontinent about once a day despite optimal bowel program	Totally incontinent

13.8 Criteria for Rating Neurogenic Respiratory Dysfunction

Neurologic impairment of one's ability to breathe is considered in Table 13-16 only in terms of neurologic limitations. Other aspects of respiratory function are covered in Chapter 5, The Respiratory System.

CLASS 5

97% Impairment of the Whole Person

EXAMPLE 13-13: IMPAIRMENT SECONDARY TO COMPLETE C4 TETRAPLEGIA

A 23-year-old left-handed man suffered a C4 fracture dislocation resulting in C4 complete tetraplegia. He underwent acute surgical stabilization with

anterior and posterior fixation of the fracture. He has no sensation below the C4 dermatome, has no movement in his upper and lower extremities, and has been weaned from a ventilator. He still has a tracheostomy in place for intermittent suctioning. He does not suffer from dysesthetic pain.

Step 1. He has complete paralysis of both upper extremities. If one uses Table 13-11 to rate impairment, he would have a 50% impairment due to non-dominant limb function, and 60% impairment due to dominant limb function.

Step 2. He has complete paralysis of both lower extremities. Using Table 13-12, one finds that he has a 50% impairment due to complete loss of gait function.

Step 3. He is occasionally incontinent with his bowel management program. With use of Table 13-13, he has a 10% impairment due to occasional incontinence.

TABLE 13-14 Criteria for Rating the Neurogenic Bladder

 Neurogenic Bladder					
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
WHOLE PERSON IMPAIRMENT RATING (%)	0%	1%–5%	6%–15%	16%–20%	21%–30%
DESCRIPTION	Fully continent without catheter or external device	Less than normal voluntary control but no incontinence with bladder management program	Requires indwelling or external catheter to maintain continence	Incontinent about once a day despite optimal bladder management	Total incontinence

TABLE 13-15 Criteria for Rating Neurogenic Sexual Dysfunction

 Neurogenic Sexual Dysfunction				
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3
WHOLE PERSON IMPAIRMENT RATING (%)	0%	1%–5%	6%–10%	11%–15%
DESCRIPTION	No impairment of sexual function	Individual has some sexual function but with difficulty of erection or ejaculation in men or lack of awareness, excitement, or lubrication in either sex	Reflex sexual functioning is possible, but there is no awareness	No sexual function

Step 4. He is managed on an intermittent catheterization program 4 times per day, with frequent leakage requiring an external catheter in between. With use of Table 13-14, he has a 15% impairment due to neurogenic bladder.

Step 5. Reflex sexual functioning is possible, but he has no awareness. With the use of Table 13-15, there is a 10% impairment due to neurogenic sexual dysfunction.

Step 6. He requires a tracheostomy for frequent suctioning. Use of Table 13-16 results in a 50% impairment.

Step 7. Combine the impairments (50%, 60%, 50%, 10%, 15%, 10%, and 50%) using the Combined Values Chart in the Appendix. The resulting impair-

ment is 97% impairment of the whole person for C4 complete quadriplegia.

CLASS 4

57% Impairment of the Whole Person

EXAMPLE 13-14: IMPAIRMENT SECONDARY TO T10 COMPLETE PARAPLEGIA

A 55-year-old right-handed man suffered T10 complete paraplegia after an abdominal aneurysm repair. He has no sensation below the T10 dermatome and has no movement in the lower extremities, which are spastic.

TABLE 13-16 Criteria for Rating Neurogenic Respiratory Dysfunction

 Neurogenic Respiratory Dysfunction						
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4	CLASS 5
WHOLE PERSON IMPAIRMENT RATING (%)	0%	1%–5%	6%–20%	21%–35%	36%–50%	51%–65%
DESCRIPTION	No neurologic impairment of respiration	Individual can breath spontaneously but has difficulty performing ADLs that require intensive effort such as running	Individual is capable of spontaneous respiration but is restricted to any exertional activity such as hill climbing or prolonged exertion	Individual is capable of only sedentary activities	Tracheostomy	Individual has no capacity for spontaneous respiration, is ventilator dependent

Step 1. He has normal function in the upper extremities. If one uses Table 13-11, he would have a 0% impairment.

Step 2. He has complete paralysis of both lower extremities. Using Table 13-12, one finds that he has a 50% impairment due to complete loss of gait function.

Step 3. He is continent with his bowel management program. With use of Table 13-13, he has a 5% impairment due to occasional incontinence.

Step 4. He is managed on an intermittent catheterization program 4 times per day without leakage in between. When one uses Table 13-14, he has a 5% impairment due to neurogenic bladder.

Step 5. He has some sexual functioning, but difficulties with both erection and ejaculation. Erection is improved with medication. With the use of Table 13-15, there is a 5% impairment due to neurogenic sexual dysfunction.

Step 6. He has no impairment of neurogenic respiratory function. Use of Table 13-16 results in a 0% impairment.

Step 7. Combine the impairments (0%, 50%, 5%, 5%, 5%, and 0%) using the Combined Values Chart in the Appendix. The resulting impairment is 57% impairment of the whole person for T10 complete quadriplegia.

Step 8. If the patient suffers from dysesthetic pain, use Table 13-17 as described below, and combine with the Combined Values Chart.

13.9 Criteria for Rating Peripheral Neuropathy, Neuromuscular Junction Disorders, and Myopathies

Evaluating the peripheral nervous system requires documentation of the extent of loss of function due to sensory deficit, pain, or discomfort; loss of muscular strength and control of specific muscles or groups of muscles; and alteration of autonomic nervous system (ANS) control. Documentation of these deficiencies should include, if possible, descriptions of the abnormal finding on examinations of the spinal root or roots, portion of the plexus, and/or peripheral nerve or nerves that are involved. The mechanism or cause of the abnormality assists in determining the impairment duration and probable prognosis. Ancillary testing by neuroimaging (CT, MRI, and radiography) and physiologic tests (EMG, nerve conduction studies, and evoked responses) may assist in reaching final conclusions.

Neurologic evaluation of pain is based first on the individual's description of the character, location, intensity, duration, and persistence of the discomfort and on verification of the anatomic distribution of the neurologic defect. A description of the ways and the degrees to which the pain interferes with the individual's performance of ADLs and the factors that augment the discomfort should be included. Anatomic descriptions should be made according to the usual distributions of the roots, plexuses, and nerves of the nervous system when the distal digital nerves are being evaluated, especially in the hand, as indicated in the upper and lower extremities chapters (Chapters 15 and 16).

TABLE 13-17 Dysesthetic Pain Secondary to Peripheral Neuropathy or Spinal Cord Injury

 Dysesthetic Pain				
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3
Document that individual has a peripheral neuropathy or spinal cord injury consistent with dysesthetic pain				
WHOLE PERSON IMPAIRMENT RATING (%)	0%	1%–3%	4%–7%	8%–10%
DESCRIPTION	No dysesthetic pain	Mild dysesthetic pain	Moderate dysesthetic pain	Severe dysesthetic pain

BEFORE THE SOUTH CAROLINA
WORKERS' COMPENSATION COMMISSION

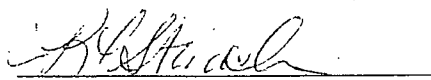
WCC FILE NO. 1106833

Timothy McMahan,	)	
Employee,	)	
Claimant,	)	
	)	
vs.	)	
	)	
SC Department of Education,	)	CERTIFICATE OF SERVICE
	)	
Employer,	)	
and	)	
	)	
State Accident Fund ,	)	
	)	
Carrier,	)	
Defendants.	)	

I, Karyn L. Strickland, do hereby certify that I am the Paralegal for George T. Miars, Jr., Esquire, attorney for the defendants with **WILLSON JONES CARTER & BAXLEY, P.A.** in Mount Pleasant, South Carolina, and that on the 4th day of June, 2014, I mailed the foregoing BRIEF OF DEFENDANTS/APPELLANTS to the following by placing a copy thereof in the United States mail, first class, proper postage affixed thereto:

Kevin Smith, Esquire
Hoffman Law Firm
7087 Rivers Avenue
North Charleston, SC 29406

Grant Duffield
Judicial Department
South Carolina Workers' Compensation Commission
P.O. Box 1715
Columbia, SC 29202-1715



Karyn L. Strickland
Paralegal to George T. Miars, Jr., Esquire
WILLSON JONES CARTER & BAXLEY, P.A.
421 Wando Park Boulevard, Suite 100
Mount Pleasant, SC 29464

BEFORE THE
SOUTH CAROLINA WORKERS' COMPENSATION COMMISSION
WCC FILE NO.: 1106833

DOROTHY MCMAHAN AS PR OF THE
ESTATE OF TIMOTHY MCMAHAN,
Employee,

Claimant,

vs.

SC DEPARTMENT OF EDUCATION,
Employer,

and

STATE ACCIDENT FUND, Carrier,

Defendants.

CLAIMANT/RESPONDENT'S BRIEF

STATEMENT OF FACTS:

The Claimant suffered an admitted injury on June 15, 2011. As a result, he underwent two surgeries to his back. He was declared at maximum medical improvement (MMI) by the authorized treating physician on April 23, 2012, and referred to long-term pain management. The Claimant died of unrelated causes on October 6, 2012. The authorized treating physician is in Tennessee and not familiar with South Carolina WC forms. He filled out a WCC Form No. 14B after the Claimant's death providing a 54% impairment to his back and noted that the injury also affected his lower extremity. The authorized treating physician explicitly stated the Claimant had reached MMI before he died. No medical opinions were submitted to the contrary.

QUESTION PRESENTED:

When a person dies of unrelated causes, can his family be compensated for his impairment rating if he reached maximum medical improvement before his death?

STATUTE:

Section §42-9-280 provides, "When an employee receives or is entitled to compensation under this Title for an injury covered by the second paragraph of §42-9-10 or 42-9-30 and dies from any other cause than the injury for which he was entitled to compensation, payment of the unpaid balance of compensation shall be made to his next of kin dependent upon him for support, in lieu of the compensation the employee would have been entitled to had he lived."

DISCUSSION:

I. THE COMMISSION HAS ALWAYS HELD THAT WHEN A PERSON DIES OF UNRELATED CAUSES, HIS FAMILY CAN BE COMPENSATED FOR HIS IMPAIRMENT/DISABILITY.

The statute above envisions two situations where the claim would not abate following a death from unrelated causes. The first is when an award has already been given ("when an employee receives...compensation) and the second is when the employee "is entitled to compensation..." This is an accepted claim and the Claimant was deemed to be at MMI before he died. The authorized treating physician has issued his impairment rating. Therefore, the Commission has the right to determine if he was entitled to compensation just as it does in nearly every other claim. This has been the Commission's long-standing interpretation of the statute and usually results in an award identical to the impairment rating, sometimes higher.

"The Court generally gives deference to an administrative agency's interpretation of an applicable statute or its own regulation." Brown v. South Carolina Dep't of Health and Env'tl. Control, 348 S.C. 507, 560 S.E.2d 410 (2002). Below is a list of claims decided in accordance with the statute.

Wright v. All My Sons, WCC 0524754 (2008). This was an admitted leg claim. The Claimant died of unrelated causes. No award had been given at the time of death. The authorized

treating physician assigned his impairment treating after he died. The full commission's unanimous award was identical to the impairment rating.

Bourne v. USC, WCC 0414625 (2011). This was an accepted back claim. The Claimant died of unrelated causes. No award had been given at the time of death. The full commission's unanimous award was identical to the impairment rating.

Cumbee v. C of C, WCC 9523133 (2002). This was an accepted back and psychological claim. The authorized treating physician assigned a 20% impairment rating for the back injury before his death. The Claimant died of unrelated causes. No award had been given at the time of his death. He was declared at MMI for the psychological injury after his death. The Claimant's widow testified regarding his age, education, work history and transferable skills. The award was permanent and total disability for a 50% or greater disability to his back.

Faulkenberry v. Springs Industries, WCC 0118462 (2002). This was an admitted back and leg claim. The Claimant died of unrelated causes. No award had been given at the time of death. The Claimant's widow testified regarding his pain, limitations and ability to work. The award was permanent and total disability for a 50% or greater disability to his back.

- Heimerl v. Pelham Fire Dept, WCC 0414792 (2012). This was an admitted right hip and psychological claim. The Claimant died of unrelated causes. No award had been given at the time of death. The authorized treating physician assigned at 40% impairment for the hip injury. The Claimant was still treating at time of death for the psychological injury. The Claimant was found not to be at MMI for the psychological injury at the time of death. The full commission's unanimous award was identical to the impairment rating for the hip.

Henry v. Gold Mechanical, WCC 0417344 (2007). This was an admitted carpal tunnel claim. The Claimant died of unrelated causes. No award had been given at the time of death. The full commission's unanimous award was identical to the impairment rating.

Johnson v. Efco Corp., WCC 9917051 (2002). This was an admitted claim. The Claimant died of unrelated causes. No award had been given at the time of death. The Claimant's widow testified regarding his pain, limitations and ability to work. The award was permanent and total disability.

The Commission's long-standing interpretation is supported by the law. In construing a workers' compensation statute, "the words must be given their plain and ordinary meaning without resort to subtle or forced construction to limit or expand the statute's operation." Adkins v. Comcar Industries, Inc., 323 S.C. 409, 475 S.E.2d 762 (1996). The clear words of the statute provide a person who has already received an award of compensation AND a person who is entitled to compensation are both entitled to their awards so long as they are based upon the second paragraph of 42-9-10 or 42-9-30.

The Defendants first contend only people who have already been before the Commission and given award can be compensated after they die from unrelated causes. (See Def. Brief, p. 6-7 stating, "*There is no provision in the Act allowing a claimant's estate to posthumously litigate a claimant's disability.*") Of course this completely ignores the second class of people specifically mentioned in the statute. Please notice the statute only states "When an employee...is entitled to compensation under this Title...and dies from any other cause than the injury for which he was entitled to compensation, payment...shall be made to his next of kin..." If the legislature intended to only compensate the deceased Claimant's family when an award has already been given as the Defendants suggest, they would have left out the second class for those who are

“entitled to compensation,” and inserted the term the term, “and dies after an award has been issued.” The language of the statute explicitly states those who have already received an award of compensation AND those who are entitled to compensation are both entitled to their awards so long as they are based upon the second paragraph of 42-9-10 or 42-9-30.

Next, the Defendants contend it is illegal for the Commission to consider an impairment rating given after the Claimant’s death. There is nothing within any of our laws anywhere that state the Commission cannot accept a posthumous impairment rating. In this case, the authorized treating physician stated he was at MMI in his treatment notes, and this occurred before his death. Then, the authorized treating physician also completed a WCC Form 14B again stating MMI was achieved six (6) months before death and assigning a fifty-four (54%) percent impairment rating. We have all seen cases in which the doctor states a Claimant is at MMI in the notes, but completes a WCC Form 14B many months later. Any number of things can affect when the doctor completes this form. The 14B is not a treatment note and forms for attorneys or carriers can sit on a doctor’s desk for months. Sometimes the doctor is waiting for pre-payment for the completion of the form. Sometimes the doctor is out of town. Sometimes the doctor can just ignore the 14B for no reason at all. The point is that the family’s recovery shouldn’t rest entirely on the timing of the doctor completing some worker’s compensation form. If the Claimant is at MMI and it’s an accepted case, the Commission has the right to determine if he is entitled to compensation. The Form 14B and impairment rating are simply evidence of the amount of compensation due. Any arguments about the timing of the rating go to the weight, not its admissibility.

Here, the authorized treating physician laid out an extremely detailed rationale for the impairment rating, all with references to the *AMA Guides*. The Defendants had his deposition

scheduled before the hearing, but decided not to go forward, so they cancelled it. The Defendants claim their due process rights were violated by Commissioner Taylor because they didn't have the opportunity to cross examine the witnesses. They state any award under this scenario is unfair to them. They even go so far as to call the deceased Claimant a "ghost party." First of all, it is the Claimant who is dead. It's unfair to HIM that he wasn't alive and able to prosecute his own case, testify on his own behalf, and be there to take care of his family. It is unfair to his widow to have to live without him and carry some of the burden of proving his case. It was the Defendants themselves who CHOSE not to cross examine the authorized treating physician about MMI, the impairment rating, paraplegia, or the Claimant's condition. After the Claimant's widow testified regarding his age, education, work history and transferable skills, it was the Defendants themselves who CHOSE not to ask her a single question or cross examine her in any way. This argument, while insensitive to say the least, is totally contrary to the law and should have absolutely no merit. Commissioner Taylor was simply following the law. If the Defendants think this provision in the statute is so unfair, they should bring that to the Legislature, not the Commission.

II. COMMISSIONER TAYLOR WAS CORRECT IN CONCLUDING THE CLAIMANT HAD REACHED MAXIMUM MEDICAL IMPROVEMENT.

The authorized treating physician placed the Claimant at MMI six (6) months prior to his death and referred him to long-term pain management. (See WCC Form 14B, APA 1). The authorized treating physician actually stated he was at MMI before his death three (3) times. The third time he explained, "I would say he was at maximum medical improvement when I saw him on 4/23/12)." No doctor has ever said the Claimant was not at MMI and the Defendants chose not to cross examine him to explore this issue in any way. No medical opinions were submitted to the contrary.

III.COMMISSIONER TAYLOR WAS CORRECT IN CONCLUDING THE DEFENDANTS DID NOT PROVE THE CLAIMANT WAS PARAPLEGIC.

Paraplegic cases are among the most difficult to prove. I could never have proven the Claimant was paraplegic under the facts of this case. Although the day after his injury, the emergency room doctor used the term paraplegic, over two (2) years passed and the Claimant underwent two (2) surgeries that helped him recover and it was never mentioned again. The Defendants conveniently leave out the entire sentence where the term is found, which reads, "He was found to be paraplegic." This is not a diagnosis but a description of how they found the Claimant at the scene. He couldn't move his legs. This description was never made again by any other doctor because the Claimant was getting better and again, that was just a description of how they found him. In fact, the section titled "Diagnosis" for the emergency room reads "Acute urinary retention, T12 vertebral body fracture, scalp laceration x 2." The "Secondary Diagnosis" was "Chronic obstructive pulmonary disease." (APA 4). This is hardly the type of evidence it would take to prove permanent paraplegia. And then, the paraplegia claim gets even more difficult given his improvements over time with treatment.

On September 29, 2011 (3 months after the paraplegic reference) the doctor noted "Patient is mobilizing well with a walker, given the initial spinal cord injury." (APA 3). This is an improvement from his condition at the scene and emergency room.

On February 7, 2012, the physical examination revealed "left leg 4/5 strength, right 3/5, tight bilateral lumbar paraspinal muscles to palpation, kyphosis." This is a greater improvement from his condition at the scene and emergency room.

On April 23, 2012, Dr. Bolt noted his prior surgery in Charleston and stated, "He walks with a markedly pitched forward gait...he is able to flex 80% of normal...His quadriceps are 3/10 on the left, hip flexors are 3/10 on the left, otherwise full strength in the lower extremities."

(APA 2). This is yet another improvement from his condition at the scene and emergency room.

On May 11, 2012, (the last time he saw the authorized treating physician before his death) the physical examination revealed "Quadriceps 3/5 left leg, hip flexion is 3/5 left leg, otherwise full strength in bilateral lower extremities. Pain-free full range of motion in bilateral hips, knees and ankles today." The MRI showed "a severe compression fracture," but no new neural pinches or pseudoarthroses." (APA 2).

The reality is that no doctor ever gave the diagnosis of paraplegia. Physical examinations of the Claimant demonstrated his ability walk and full strength in both of his legs. The Defendants would deny a paraplegic claim under these facts and win. The only reason it is being asserted is because they are trying to avoid their responsibility to this sixty (60) year old veteran who was severely injured while working for them. No doctor has ever stated paraplegia to a reasonable degree of medical certainty. No doctor has even made the diagnosis. If the case is so strong based on the records alone as they suggest, they could have easily sent those same records to another doctor to review and weigh in on their assertion in an effort to meet their burden of proof. Finding paraplegia in this case would open the door to more of those claims and set a much lower threshold than what we all understand it to be.

IV. COMMISSIONER TAYLOR WAS CORRECT IN CONCLUDING THE DEFENDANTS FAILED TO REBUT THE PRESUMPTION THAT THE CLAIMANT WAS TOALLY DISABLED BY WAY OF A 50% OR GREATER DISABILITY TO HIS BACK.

The Claimant was found to be totally and permanently disabled by way of a 50% or greater disability to his back. This was based upon the 54% impairment rating assigned by the authorized treating physician. The Claimant was 60 years old and had worked in heavy manual labor his entire life. There was no cross examination and no evidence submitted to rebut the presumption.

V. THE APPELLANTS' EXHIBIT TO ITS BRIEF WAS NOT NOTICED IN ITS PRE-HEARING BRIEF NOR WAS IT SUBMITTED INTO EVIDENCE AT THE HEARING, THEREFORE THIS EXHIBIT SHOULD BE REMOVED FROM THE COMMISSION'S FILE AND NOT CONSIDERED FOR THE APPEAL IN THIS MATTER.

This appeal is limited to the hearing commissioner's record. The Defendants did not notice the Exhibit either as an APA or an Exhibit, nor was it offered at the hearing. Obviously, the Exhibit was not accepted into evidence, nor was it proffered. The Commission is bound to remove this Exhibit and ensure it does not weigh into the decision on appeal.

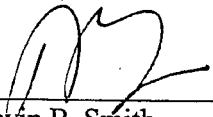
CONCLUSION

The Defendants are asking the Commission to change the law. Even though litigating a person's disability after death is specifically authorized and required by the statute, the Defendants are asking for a ruling stating this long standing practice is illegal. (See Def. Brief, p. 6-7).

The Defendants are also asking that the standard for proving paraplegia be expanded to include cases where that diagnosis was never actually made, and certainly never to a reasonable degree of medical certainty. Paraplegia cases are among the most complex, therefore our rules require more than simply a description of how someone was found at the scene. Our rules require a specific diagnosis from a treating doctor, much more than a single mention of the term the day after an accident, especially when the employee gets treatment over the two (2) years following. To prove paraplegia, our understanding is that a doctor needs to specifically diagnosis that condition at the close of treatment, and after all efforts to cure the person have been exhausted and he or she has been declared at MMI. The Defendants' Brief goes through all the reasons they claim the authorized treating physician should have diagnosed the Claimant as paraplegic, but he never even mentioned the term one time. They had the opportunity to depose the doctor on these issues, but they chose not to. If they claim there is enough in his records for

the Commission make the diagnosis, couldn't they have also sent those same records to any other doctor of their choosing? The reality is that Commissioner Taylor applied the burden of proof even handedly, just as she would had the Claimant asserted paraplegia, and found the evidence insufficient to prevail.

For the reasons foregoing, the Claimant requests the Commission affirm the decision of Commissioner Taylor in its entirety.



Kevin B. Smith
Hoffman Law Firm
7087 Rivers Ave.
N. Charleston, SC 29406
Attorney for the Claimant

North Charleston, South Carolina
June 18, 2014

BEFORE THE
SOUTH CAROLINA WORKERS' COMPENSATION COMMISSION
WCC FILE NO.: 1106833

DOROTHY MCMAHAN AS PR OF THE
ESTATE OF TIM MCMAHAN, Employee,

Claimant,

vs.

SC DEPARTMENT OF EDUCATION,
Employer,

and

STATE ACCIDENT FUND, Carrier,

Defendants.

CERTIFICATE OF SERVICE

I hereby certify that I served the Defendant in the foregoing matter with a copy of the attached **CLAIMANT/RESPONDENT'S BRIEF** by mailing a copy of same via first class mail, postage pre-paid and addressed as follows:

George T. Miars, Jr.
Willson, Jones, Carter and Baxley
421 Wando Park Blvd. Suite 100
Mt. Pleasant, SC 29464


Janet DeBruhl

North Charleston, South Carolina

June 19, 2014

YES, YOUR HONOR.

BY THE COMMISSIONER:

OKAY; THANK YOU. ARE THERE ANY OBJECTIONS TO THE APAs, JURISDICTION, VENUE, OR ANY OTHER ITEMS?

BY MR. SMITH:

NO, MA'AM.

BY MR. MIARS:

NO, YOUR HONOR.

BY THE COMMISSIONER:

ALL RIGHT. WITHOUT OBJECTION THE COMMISSION FILE BECOMES A PART OF THE RECORD WITH THE EXCEPTION OF SELF-SERVING DECLARATIONS AND UNSTIPULATED MEDICAL REPORTS. MR. SMITH? WELL, I'M SORRY. BEFORE WE GO ON THE RECORD WITH THE CLAIMANT'S SPOUSE, I WILL ALLOW THE PARTIES TO PUT BRIEF POSITION STATEMENTS ON THE RECORD. MR. SMITH?

BY MR. SMITH:

THANK YOU, YOUR HONOR. I REPRESENT TIMOTHY McMAHAN. THIS IS AN ACCEPTED CLAIM. THE AUTHORIZED TREATING PHYSICIAN HAS PLACED MR. McMAHAN AT MAXIMUM MEDICAL IMPROVEMENT ON APRIL 23RD, 2012, AND ISSUED A 54 PERCENT IMPAIRMENT RATING. WE ARE SEEKING TOTAL DISABILITY BENEFITS UNDER THE STATUTE 42-9-30, 19, FOR A 50 PERCENT OR GREATER DISABILITY.

BY THE COMMISSIONER:

THANK YOU. MR. MIARS?

BY MR. MIARS:

YES, YOUR HONOR. GEORGE MIARS. I'M HERE ON BEHALF OF THE SOUTH CAROLINA DEPARTMENT OF EDUCATION AND THE STATE ACCIDENT FUND. OUR POSITION IS THAT THIS CLAIM ABATES PURSUANT TO 42-9-280, AND SPECIFICALLY THE STATUTE DOES NOT PROVIDE FOR ADJUDICATION FOR A DECEDENT'S DISABILITY AFTER HIS DEATH. WE BELIEVE THE STATUTE DOESN'T PROVIDE FOR THAT. WE FURTHER ASSERT THAT ANY AWARD AT THIS POINT WOULD BE BASED ON CONJECTURE, SPECULATION, AND SURMISE. FURTHER, IT WAS NOT UNTIL AFTER THE CLAIMANT'S DEATH THAT HE WAS FORMALLY FOUND AT MAXIMUM MEDICAL IMPROVEMENT. OUR ARGUMENT IS THAT -- IN THE ALTERNATIVE IS THAT IF YOU DO FIND THAT THE CLAIM IS ABLE TO GO FORWARD FOR ADJUDICATION AND HAD THE CLAIMANT ACTUALLY -- HIS PERMANENT DISABILITY BEEN ADJUDICATED BEFORE HIS DEATH, CLEARLY THE MEDICALS SHOW THAT HE HAD A SPINAL CORD INJURY WITH PARAPLEGIA, AND IF THAT'S THE CASE HE WOULD BE ENTITLED TO BENEFITS UNDER 42-9-10, C, WHICH IS THE THIRD PARAGRAPH, AND UNDER 42-9-280 THAT AWARD WOULD ABATE AS WELL.

BY THE COMMISSIONER:

THANK YOU. MR. SMITH, YOU MAY CALL YOUR FIRST

WITNESS.

BY MR. SMITH:

COMMISSIONER, BEFORE WE DO THAT, WE HAD TALKED IN THE PREHEARING CONFERENCE THAT ANY DEPENDENCY INVESTIGATION WOULD FOLLOW THIS HEARING, SO I'M NOT GOING TO OFFER TESTIMONY THAT WOULD BE RELEVANT TO A DEPENDENCY INVESTIGATION. AND WE ALSO TALKED ABOUT THAT A LUMP SUM DETERMINATION WOULD ALSO BE MADE AT A DEPENDENCY INVESTIGATION AS WELL.

BY THE COMMISSIONER:

THAT'S CORRECT. WE'LL RESERVE THOSE TWO MATTERS FOR A FUTURE HEARING.

BY MR. SMITH:

YES, MA'AM.

BY THE COMMISSIONER:

OKAY. YOU MAY CALL YOUR FIRST WITNESS.

BY MR. SMITH:

YES, MA'AM. I CALL DOROTHY McMAHAN.

BY THE COURT REPORTER:

MA'AM, IF YOU WOULD RAISE YOUR RIGHT HAND, PLEASE.

THE WITNESS WAS DULY SWORN TO TELL THE TRUTH, THE WHOLE TRUTH, AND NOTHING BUT THE TRUTH CONCERNING THE MATTER HEREIN:

DOROTHY McMAHAN,

BEING FIRST DULY SWORN, TESTIFIED ON HER OATH AS FOLLOWS:

DIRECT EXAMINATION BY MR. SMITH:

Q. DOROTHY, SPEAK UP FOR US, OKAY?

A. OKAY.

Q. ALL RIGHT. PLEASE STATE YOUR FULL NAME.

A. DOROTHY MARIE McMAHAN.

Q. MS. McMAHAN, WHERE DO YOU LIVE?

A. MORRISTOWN, TENNESSEE.

Q. WERE YOU MARRIED TO TIM McMAHAN?

A. YES.

Q. HOW LONG WERE YOU ALL MARRIED?

A. THIRTY-THREE YEARS.

Q. ALL RIGHT. DO YOU ALL HAVE KIDS?

A. YES.

Q. HOW MANY KIDS DO YOU HAVE?

A. TWO.

Q. WHAT ARE THEIR AGES?

A. THIRTY-THREE AND TWENTY-SIX.

Q. ALL RIGHT. WHO'S HERE WITH US TODAY?

A. MY SON, OUR SON.

Q. ALL RIGHT. HIS NAME IS TIM?

A. TIM, JR.

Q. ALL RIGHT. TELL ME, WHAT KIND OF EDUCATION DID YOUR

1 HUSBAND, TIM, HAVE?
 2 A. HE'D BEEN TO HIGH SCHOOL, HE HAD SOME TRAINING IN
 3 THE ARMY, VOLKSWAGEN MECHANIC.
 4 Q. ALL RIGHT. SO HE SERVED IN THE ARMY?
 5 A. YES.
 6 Q. AND HAD A HIGH SCHOOL EDUCATION?
 7 A. YES.
 8 Q. DID TIM GO TO COLLEGE?
 9 A. NO.
 10 Q. AND YOU SAID HE WAS IN THE ARMY?
 11 A. YES.
 12 Q. HOW LONG DID HE SERVE IN THE ARMY?
 13 A. FOUR YEARS.
 14 Q. DID HE DO RESERVES AFTER THAT?
 15 A. YES.
 16 Q. WHAT WAS HIS JOB IN THE ARMY?
 17 A. HE -- MECHANIC AND RADIO OPERATOR.
 18 Q. OKAY. AND AFTER TIM GOT OUT OF THE ARMY, WHAT KIND
 19 OF WORK DID HE DO?
 20 A. MECHANIC.
 21 Q. ALL RIGHT. AND WHAT KIND OF MECHANIC JOBS DID HE
 22 HAVE OVER THE YEARS?
 23 A. CAR. HE STARTED OUT IN CAR DEALERSHIPS, NEW CAR,
 24 AND HE WENT ON TO HEAVY EQUIPMENT, AND THEN BUSES.
 25 Q. AND THE BUS MECHANIC JOB, THAT WAS THE JOB HE HAD

1 WITH THE DEPARTMENT OF EDUCATION?
 2 A. YES.
 3 Q. THAT WAS THE LAST JOB HE HAD?
 4 A. YES.
 5 Q. AS FAR AS THE MECHANIC WORK, DID ALL THAT WORK
 6 REQUIRE HEAVY LIFTING?
 7 A. YES.
 8 Q. DID THAT WORK REQUIRE HIM TO BE ON HIS FEET?
 9 A. YES.
 10 Q. DID THAT WORK REQUIRE BENDING, STOOPING, SQUATTING,
 11 AND THINGS OF THAT NATURE?
 12 A. YES.
 13 Q. HAS TIM EVER HELD A JOB WHERE HE SAT AT A DESK?
 14 A. NO.
 15 Q. HAS TIM EVER HELD A JOB WHERE IT DID NOT INVOLVE
 16 HEAVY MANUAL LABOR?
 17 A. NO.
 18 Q. HOW OLD WAS TIM WHEN HE DIED?
 19 A. SIXTY.
 20 Q. WHAT DO YOU KNOW ABOUT HIS ACCIDENT?
 21 A. I KNOW A BUS FELL ON HIM DUE TO THE BUMPER COMING
 22 OFF.
 23 Q. AND HE HAD A SURGERY EARLY ON?
 24 A. YES.
 25 Q. AND THEN I THINK HE HAD ANOTHER SURGERY AFTER THAT?

1 A. YES.
 2 Q. WHY WAS THE SECOND SURGERY DONE?
 3 A. THE HARDWARE FAILURE.
 4 Q. DID THAT SECOND SURGERY HELP TIM?
 5 A. YES.
 6 Q. DID IT HELP HIS PAIN?
 7 A. YES.
 8 Q. DID YOU NOTICE AN IMPROVEMENT?
 9 A. YES.
 10 Q. WHY DID YOU ALL MOVE TO TENNESSEE?
 11 A. HIS MOM AND DAD WERE OLD, AND THEY WERE BOTH ILL,
 12 AND HE WANTED TO SPEND TIME WITH THEM.
 13 Q. ALL RIGHT. DID TIM'S BACK CONDITION CHANGE ONCE YOU
 14 ALL GOT TO TENNESSEE?
 15 A. NO.
 16 Q. AND DO YOU FEEL LIKE BY THE TIME YOU ALL GOT TO
 17 TENNESSEE, OR AT LEAST BY THE TIME YOU ALL SAW DR.
 18 BOLT, THAT TIM HAD REACHED A HEALING PLATEAU?
 19 BY MR. MIARS:
 20 OBJECTION AS FAR AS A MEDICAL CONCLUSION.
 21 BY MR. SMITH:
 22 I'M NOT ASKING FOR A MEDICAL CONCLUSION.
 23 BY THE COMMISSIONER:
 24 I'M GOING TO SUSTAIN THE OBJECTION. HEALING
 25 PLATEAU, CAN WE ---

1 BY MR. SMITH:
 2 OKAY.
 3 BY THE COMMISSIONER:
 4 REPHRASE THE QUESTION, PLEASE.
 5 BY MR. SMITH:
 6 ALL RIGHT.
 7 DIRECT EXAMINATION RESUMED BY MR. SMITH:
 8 Q. AT THE TIME THAT TIM WAS FIRST SET UP WITH DR. BOLT,
 9 DO YOU THINK HE HAD GOTTEN ABOUT AS GOOD AS HE WAS
 10 GOING TO GET?
 11 A. YES.
 12 Q. OKAY. WAS TIM MAKING ANY MAJOR IMPROVEMENTS?
 13 A. NO.
 14 Q. WAS TIM MAKING ANY MAJOR TURNS FOR THE WORSE WITH
 15 REGARDS TO HIS BACK AND HIS WORK INJURY?
 16 A. HE STAYED THE SAME.
 17 Q. AND I THINK DR. BOLT WHEN HE HAD SEEN HIM HAD
 18 REFERRED TIM TO PAIN MANAGEMENT?
 19 A. YES.
 20 BY MR. SMITH:
 21 OKAY. I THINK THAT'S ALL I HAVE.
 22 BY THE COMMISSIONER:
 23 ALL RIGHT. THANK YOU. MR. MIARS?
 24 BY MR. MIARS:
 25 NO QUESTIONS, COMMISSIONER.

1 BY THE COMMISSIONER:

2 OKAY. MR. MIARS DOESN'T HAVE ANY QUESTIONS.

3 ALL RIGHT. MA'AM, YOU ARE EXCUSED AS A WITNESS.

4 DOES THE CLAIMANT HAVE ANY OTHER WITNESSES TO CALL?

5 BY MR. SMITH:

6 NO, MA'AM.

7 BY THE COMMISSIONER:

8 ALL RIGHT. DO THE DEFENDANTS HAVE ANY

9 WITNESSES TO CALL?

10 BY MR. MIARS:

11 NO, YOUR HONOR.

12 BY THE COMMISSIONER:

13 THAT CONCLUDES THIS MATTER. THANK YOU VERY

14 MUCH.

15 (THERE BEING NO FURTHER QUESTIONS, THIS HEARING WAS
16 CONCLUDED AT THE HOUR OF 11:02 A.M.)

CERTIFICATE OF NOTARY PUBLIC
SOUTH CAROLINA WORKERS' COMPENSATION COMMISSION
COLUMBIA, SOUTH CAROLINA
WCC FILE NO. 1106833

EMPLOYEE/CLAIMANT: TIMOTHY McMAHAN

EMPLOYER: DEPARTMENT OF EDUCATION

CARRIER: STATE ACCIDENT FUND

I, TIMMI A. PARRISH, A NOTARY PUBLIC FOR THE STATE OF SOUTH CAROLINA, DULY COMMISSIONED AND QUALIFIED AS SUCH, DO HEREBY CERTIFY THAT THE FOREGOING 13 PAGES REPRESENTS A TRUE AND ACCURATE TRANSCRIPT OF THE FOREGOING HEARING OF TIMOTHY McMAHAN, TAKEN ON THE 15TH DAY OF AUGUST, 2013.

THAT THE WITNESS WAS DULY PLACED UNDER OATH AND ADMONISHED TO SPEAK THE WHOLE TRUTH. THAT THE ORAL HEARING WAS DULY TAKEN AND TRANSCRIBED AS TO THE QUESTIONS PROPOUNDED AND THE ANSWERS GIVEN.

THAT ALL THE OFFERED EXHIBITS, STIPULATIONS AND OBJECTIONS, IF ANY, INVOLVED IN THIS CASE ARE DULY ATTACHED OR INCLUDED HEREIN.

IN WITNESS WHEREOF, I HAVE SET MY HAND AND OFFICIAL SEAL THIS 27TH DAY OF AUGUST, 2013.

TIMMI A. PARRISH
NOTARY PUBLIC FOR SOUTH CAROLINA
MY COMMISSION EXPIRES: 11-20-2018

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SOUTH CAROLINA WORKERS' COMPENSATION HEARING
FULL COMMISSION APPELLATE HEARING

TIMOTHY McMAHAN,
Employee

WCC FILE NO.
1106833

-VS-

SC DEPARTMENT OF EDUCATION,
Employer

and

STATE ACCIDENT FUND,
Carrier

Pursuant to Notice of the Appellate Hearing taken on the 22nd day of July 2014, heard before the South Carolina Workers' Compensation Commission Full Commission Appellate Panel including, Honorable Avery Wilkerson, Scott Beck, Melody James; Chair, and commencing at the hour of 9:16 a.m. in Columbia, South Carolina.

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Page 3

INDEX

PROCEEDINGS	4
APPELLANT ARGUMENT BY MR. MIARS	4
RESPONDENT ARGUMENT BY MR. SMITH	15
APPELLANT REPLY BY MR. MIARS	27
REPORTER CERTIFICATE	30

OBJECTIONS:

(None)

EXHIBITS

<u>NUMBER</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
	(None Offered)	

LEGEND OF THE TRANSCRIPT

dashes [--] intentional or purposeful interruption
[ph] denotes phonetically written
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Page 2

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Page 4

PROCEEDINGS

COURT REPORTER: Today is July 22, 2014. This is South Carolina Worker's Compensation Case Number 1106833. This is the case of Timothy McMahan, Claimant, versus South Carolina Department of Education, Employer, and State Accident Fund, Carrier.

The Appellant is the Defendant, represented by George Miars, Junior. The Respondent is represented by Kevin Smith.

Each side is allowed ten minutes for oral argument and the Appellant three minutes in reply. You are requested to argue the grounds of exception and stay within the record.

MR. MIARS: Thank you. May it please the Court.

COMMISSIONER JAMES: Certainly.

APPELLANT ARGUMENT

MR. MIARS: We are here today, it's an admitted back claim with paraplegia, at least that's our position. I want to go through the issues with y'all.

First of all, Claimant died before he was found at maximum medical improvement and before any

litigation on his permanent disability, he was still receiving treatment. So the first issue is whether we can legally posthumously litigate his permanent disability.

The second is, if we're able to do that our position is he was a paraplegic and this claim would abate pursuant to the Survival Statute.

And then, also, we believe that there's a due process argument, as well.

Claimant was a mechanic for Department of Education and he was working on a school bus. He jacked the school bus up by the rear bumper and was underneath it, instead of jacking it up by the frame. And tragically, the bumper sheared off while he was under the axle and it crashed down on top of him resulting in a T12 burst fracture with retropulsion.

When he goes to MUSC -- and this is Claimant's APA page 26 -- he's diagnosed with paraplegia. He undergoes surgery and treats with MUSC Department of Neurosurgery and Urology, because not only does he have symptoms of partial paraplegia with station and gait disorder, but he also has neurogenic bladder, which requires him to self-catheterize.

He's never released by MUSC, but while he's

receiving treatment there he decides to move to Tennessee to be closer to his family. MUSC recommends that he undergo continued pain management treatment for his condition. He set up with a doctor, Dr. Patrick Bolt, up in Tennessee.

Dr. Bolt, when he originally sees the Claimant he says in his initial report (As Read): I haven't reviewed the Claimant's medical records from MUSC other than the Department of Urology records. I believe he's been found at maximum medical improvement, but I don't have any documentation to show that.

But he continues to provide treatment for the Claimant, never specifically finds the Claimant at maximum medical improvement while he's treating him, and then the Claimant dies of unrelated causes.

Claimant's attorney then gets Dr. Bolt to provide a posthumous rating. And I'll refer you to Claimant's APA page one, this is the Form 14B. Dr. Bolt specifically states (As Read): Diagnosis and nature of injury or illness, T12 burst fracture with spinal chord injury.

He then goes back and says that, in looking at it I would say that he was at maximum medical

improvement the first time I saw him. So he postdates MMI back to April 23, 2012 and assigns a 54 percent impairment rating.

And I do want to go through his rating with you, because I believe it really shows the extent of paraplegia that we have here. And when I refer to paraplegia, we're not arguing this is complete paraplegia. He has some movement of his legs. It's not that his spinal chord was cut off.

COMMISSIONER BECK: Well, he has more than some movement in his legs, he actually walks.

MR. MIARS: Well, what Dr. Bolt says, that every time he saw him he was confined to a wheelchair. But he can get up with assistance and do some minor walking.

But I think this case is directly on point with the Reid Richardson verse Clemson case, which had the exact same diagnosis, partial paraplegia where the Claimant was able to get up and walk some, had neurogenic bladder, had to self-catheterize, had some significant problems. But the Court there said for purposes of the Workers' Compensation Act, partial paraplegia is considered full paraplegia when you're dealing with Section 42-9-10. So when I refer to paraplegia, I believe

the Claimant has partial paraplegia, but for purposes of the Act it's paraplegia.

COMMISSIONER BECK: Remind me, did the Claimant assert paraplegia at the hearing?

MR. MIARS: No, your Honor, but we have and we've accepted the paraplegia. There was no litigation before the Claimant's death.

COMMISSIONER BECK: When did you accept it?

MR. MIARS: After he died, but there was no litigation to even --

COMMISSIONER BECK: Certainly a very good tactical move.

MR. MIARS: Well, I guess the issue never came up, quite honestly, Commissioner, because he was never at maximum medical improvement. They had accepted the medical treatment, they were providing all of the treatment related to the spinal chord injury.

COMMISSIONER BECK: But even the Claimant never asserted incomplete paraplegia.

MR. MIARS: No, your Honor.

COMMISSIONER BECK: And it wasn't until after his death when this issue was being litigated that y'all asserted it?

MR. MIARS: Yes.

COMMISSIONER BECK: Okay.

MR. MIARS: So what Dr. Bolt says is (As Read): That with regard to restriction I would say the patient is totally disabled. Every time that I saw him he was confined to a wheelchair. With regard to impairment based on the Sixth Edition of the AMA Guides he would be a Class IV impairment with thoracic bust fracture.

For the spine injury he assigns a 20 percent impairment rating. So I would argue that, okay, for the back he has a 20 percent rating. If Claimant's not asserting a spinal chord injury then the rest of the rating, which Dr. Bolt specifically says is for the spinal chord injury, I wouldn't believe would apply if he's not arguing that he doesn't have a spinal chord injury.

Under the Sixth Edition of the AMA Guides there's two different ways to determine impairment with spinal chord injury. First is injury to the spine itself, that's chapter seventeen. The second is chapter thirteen, which is injury to the spinal chord for partial paraplegia.

And he assigns for the partial paraplegia, itself, under chapter 13, he says that for station and gait disorder he has a Class III impairment.

That alone carries a 30 percent whole person impairment. He has a Class II impairment for neurogenic bladder requiring self-catheterization. And he has a Class III impairment for dysesthetic pain related to a spinal chord injury. So he has a total 54 percent impairment rating, but only 20 percent of that is for the back, the rest of that is for the spinal chord injury.

So we believe Claimant's attorney is trying to have it both ways here. He's arguing that the Claimant has a greater than 50 percent disability to the spine based, in large part, on the spinal chord injury. Yet, for purposes of disability he's saying, Oh, but wait, the Claimant doesn't have a spinal chord injury. So I believe he's trying to have it both ways, and I don't believe that in this case that would be warranted.

COMMISSIONER BECK: Discuss that a little further with me. Can't a spinal chord injury -- it's still the back.

MR. MIARS: I would argue that if you're talking about a spinal chord injury, you're talking about partial paraplegia. And so if he's -- what I'm saying is that --

COMMISSIONER BECK: Under what premise do you

connect those dots?

MR. MIARS: Because Claimant's attorney's not arguing that he has a spinal chord injury.

COMMISSIONER BECK: Any medical evidence that he has incomplete paraplegia, any doctor say he did?

MR. MIARS: The doctor specifically says he has paraplegia, that's the MUSC doctor.

COMMISSIONER BECK: All right.

MR. MIARS: There's a diagnosis of paraplegia. There's no doctor saying he doesn't have paraplegia.

COMMISSIONER BECK: All right.

COMMISSIONER JAMES: At what date is that diagnosis?

MR. MIARS: That doctor says it on June 16, 2011. And yes, it's early on in this claim, but the medical evidence is there to say paraplegia. We've got that medical evidence.

COMMISSIONER BECK: What's he say at the end of the claim -- towards the end of the claim?

MR. MIARS: The last doctor who gave an opinion, Dr. Bolt, says spinal chord injury. He doesn't use the term paraplegia, but no doctor says the Claimant doesn't have paraplegia.

COMMISSIONER JAMES: You know there's a -- in the beginning I agree with you, part of the diagnosis is -- that that's how he presented to -- that's how he presented to the hospital. But, you know, how are we supposed to assume that that's a permanent condition? We're supposed to take the word spinal chord injury and then decide that that means that that's partial or incomplete paraplegia?

MR. MIARS: I believe it's completely consistent with the diagnosis of paraplegia.

COMMISSIONER JAMES: Well, but, you know, an injury's one thing. Just like the brain damage cases, an injury's one thing. What we have to look at in the end is permanency. Because somebody may be -- just like with a burn case, somebody could be horrifically burnt and then they are very, very well healed, so we have to look at the end.

And then for us to take that phrase and to decide what it means would be us being a medical doctor. You know, there's a case out there where a commissioner read or interpreted an MRI. I can't remember the name of it, it might be Burnett. But, you know, the Court said, No, you can't do that, we're not doctors.

So I don't know how I would take that phrase,

1 if I follow your argument, how I could then decide
2 what that means. And my understanding is that the
3 doctor was not deposed in this case, that it was
4 set up and then canceled.

5 MR. MIARS: Right, and we never deposed the
6 doctor. But, again, I believe that the -- if you
7 look at the evidence as a whole, the fact that he's
8 still confined to a wheelchair, the fact that he
9 was initially diagnosed with paraplegia, the fact
10 that the doctor who last saw the Claimant bases 34
11 percent of his 54 percent rating on a spinal chord
12 injury, I believe it's consistent with looking at a
13 whole. You can make the finding of fact that the
14 Claimant is a paraplegic.

15 COMMISSIONER BECK: Mr. Miars, before you get
16 too short on your time I do want to hear the
17 argument with regard to the MMI posthumously, as
18 opposed to --

19 MR. MIARS: Thank you, Commissioner.

20 COMMISSIONER BECK: -- operating prior to.

21 MR. MIARS: Right. And so I would argue that
22 first of all, the Statute that the Claimant's
23 relying on, Section 42-9-280, doesn't allow for
24 these types of awards. That Statute was created
25 back when the Workers' Compensation Statute

1 way, I believe that it is inherently unfair, from a
2 legal standpoint, to put us in that position to
3 create the legal fiction that the Claimant is still
4 alive today and we can determine what his
5 disability is when we don't have the right -- we
6 don't have the ability to cross-examine him, we
7 don't have the ability to get a vocational
8 evaluation and prepare that defense. So I think
9 that would go hand in hand with our argument
10 regarding legislative intent for 42-9-280 and not
11 allowing this type of situation to occur.

12 And it's more difficult -- time?

13 COMMISSIONER JAMES: Yes.

14 MR. MIARS: Thank you very much.

15 COMMISSIONER JAMES: Thank you.

16 ****

17 RESPONDENT ARGUMENT

18 MR. SMITH: Good morning, nice to see y'all
19 again.

20 We've got some pretty straight forward issues.
21 And I thought about --

22 COMMISSIONER BECK: I don't know if I agree
23 with that statement necessarily.

24 MR. SMITH: What's that?

25 COMMISSIONER BECK: I don't know if I agree

1 initially came into being where the usual award was
2 a weekly award, not a lump sum award. And so then
3 you'd have a claimant having a 200 week award and
4 if he dies halfway through that what do you do with
5 the remainder.

6 If you look at the Statute on it's face, what
7 it's title is, Payment of Unpaid Balance of
8 Compensation When Employee Dies. That means that
9 there's an award out there and there's an unpaid
10 balance on that. Now, when the Lump Sum Statute
11 was changed in the 1980 lump sums became the norm
12 and weekly awards were unusual, but still, you're
13 going to have those issues of weekly awards, and
14 that's why this statute was left in there. Nothing
15 in the statute allows for posthumous litigation.

16 And if you believe Claimant's attorney, that
17 it did, I'd still argue that you need a finding of
18 MMI before the Claimant dies before you can even
19 make that determination.

20 And it goes to my due process argument, as
21 well. There was no litigation pending before the
22 Claimant died. We didn't depose him. This issue
23 was never in front of us. We didn't get a
24 vocational evaluation strictly because that issue
25 wasn't right for determination. And in the same

1 with that statement necessarily. But --

2 MR. SMITH: Well, let me discuss --

3 COMMISSIONER BECK: This issue of MMI --

4 MR. SMITH: Yes, sir.

5 COMMISSIONER BECK: -- posthumously versus an
6 MMI finding before an unrelated death is one that
7 we've had a great amount of discussion.

8 MR. SMITH: Right.

9 COMMISSIONER BECK: Even among us --

10 MR. SMITH: This panel in particular.

11 COMMISSIONER BECK: -- on how that gets
12 applied with regard to 42-9-280 --

13 MR. SMITH: Right.

14 COMMISSIONER BECK: -- Statute on unrelated
15 death. If you don't mind, and I hate to throw you
16 off --

17 MR. SMITH: Not a problem.

18 COMMISSIONER BECK: -- kilter, but I'd really
19 like for you to start with that issue.

20 MR. SMITH: Sure.

21 COMMISSIONER BECK: Because to me, that legal
22 issue is one of the most important, if not the most
23 important, issue in this matter.

24 MR. SMITH: Okay. Well, I think the first
25 thing to say is this is authorized and required by

1 the Statute, by 280. The Statute evisions two
2 situations where you go litigate disability after a
3 person dies. The one, where they've already
4 received their award, right? And two, where
5 they're entitled to compensation. All right. The
6 award's easy, that was left over from the old
7 statute.

8 COMMISSIONER JAMES: Let's talk about the
9 entitlement to the compensation. There is other
10 theories in other states in Larson. When it comes
11 to the loss of income, that that expires with the
12 person, as opposed to what their medical impairment
13 was at the date of their death. Because I think
14 records -- you know, a doctor may not have a record
15 done, there are certain records that can be
16 produced after a person dies to document what --
17 but I'd like you to comment on that too.

18 How do they survive? And how, in this
19 particular case, if you were going under two body,
20 parts, as opposed to fifty percent or more to the
21 back you would have to have a vocational analysis,
22 and how do you effectively do that and how are the
23 Defendants able to effectively -- and in this
24 situation they would have had to rebut it -- how do
25 you do a vocational analysis after a person is

1 dead? And it's supposed to replace lost income so
2 they wouldn't have --

3 MR. SMITH: Well, I think the lost income goes
4 to the 42-9-10, total disability under a wage loss
5 theory, total wage loss or partial wage loss
6 theory. My understanding is loss of income goes on
7 that.

8 The 42-9-30 is the presumed disability
9 statute, and that's why the numbers and the amounts
10 are calculated. Fifty percent or greater is based
11 on that, as well, so it's just simply presumed
12 disability.

13 42-9-10, wage loss, that's the loss of income.

14 COMMISSIONER JAMES: Yeah, I'm very familiar
15 with that. I've been doing this a long time. I
16 know the difference between the medical and the
17 economic model. And that's what I'm saying, does
18 the facts that -- and I understand if the award had
19 already been there --

20 MR. SMITH: Right.

21 COMMISSIONER JAMES: -- in place that the
22 dependents would end up with the money. But how
23 does this go beyond -- how do you do the vocational
24 analysis or how would the Defendants even respond
25 to be able to rebut that when you have a person

1 who's deceased, and how does that survive? How
2 does that survive a person's death, the loss of
3 income?

4 MR. SMITH: I think these are all great
5 questions for the legislature, but they're not
6 questions for the Commission, because this is
7 directly authorized, it's required by the Statute.
8 If you're someone who is entitled to compensation
9 and you are found to be, under 42-9-30 or the
10 second paragraph of 42-9-10, you are, according to
11 the laws of our State, entitled to the compensation
12 you would have received had you survived. I mean,
13 it's just that simple.

14 COMMISSIONER BECK: Are you asserting that
15 under 10 or 30?

16 MR. SMITH: I'm sorry?

17 COMMISSIONER BECK: Are you asserting it under
18 10 or 30?

19 MR. SMITH: Thirty. Anything under 30 goes,
20 only the second paragraph under 10.

21 COMMISSIONER JAMES: And that's what I said
22 earlier, if you were going under 10 it'd be
23 vocational analysis. In this case it was over the
24 50. So I just want to know how --

25 MR. SMITH: Well, you couldn't do it under 10,

1 because you're not allowed, it abates.

2 COMMISSIONER BECK: That's right.

3 COMMISSIONER JAMES: Okay.

4 MR. SMITH: And for all those reasons --

5 COMMISSIONER JAMES: And that's my point.
6 That was the point I was making, is it abates. But
7 if you have to do that too you would have to be
8 looking at vocational analysis.

9 MR. SMITH: Right.

10 COMMISSIONER JAMES: I'm talking about the
11 evidence right now, not the law. How are you --
12 how can either one of you effectively get a
13 vocational analysis with somebody that's deceased?
14 So in this case the Defendants would have to rebut
15 it with the vocational analysis.

16 COMMISSIONER BECK: Let me ask it this way.
17 If the Claimant is entitled to anything why aren't
18 they entitled to only the 54 percent?

19 MR. SMITH: Well, because you're presumed to
20 be totally disabled --

21 COMMISSIONER JAMES: That's my question.

22 MR. SMITH: -- unless you rebut the
23 presumption.

24 COMMISSIONER BECK: Which they never had an
25 opportunity to do.

1 MR. SMITH: None of this has anything to do
2 with the reason they couldn't rebut the
3 presumption. The reason they couldn't rebut the
4 presumption was because they were claiming on the
5 one hand the guy was paraplegic. It's really hard
6 to claim on the one hand and put your whole case
7 into this one bag saying paraplegic --

8 COMMISSIONER BECK: Well, quite frankly,
9 Mr. Smith --

10 MR. SMITH: -- and the other hand go --

11 COMMISSIONER BECK: -- I question the tactic
12 of that position --

13 MR. SMITH: Okay.

14 COMMISSIONER BECK: -- posthumously.

15 MR. SMITH: And the denial on the --

16 COMMISSIONER BECK: But I understand --

17 MR. SMITH: -- on the Form 51 that the legs
18 were even affected.

19 COMMISSIONER BECK: -- the legal ramifications
20 of taking that position.

21 MR. SMITH: Right.

22 COMMISSIONER BECK: My question is, assuming
23 that this panel agrees that a posthumous MMI with a
24 rating is legitimate to get you an award --

25 MR. SMITH: Right.

1 evaluation. And when we get to a hearing we tell
2 your Honors that the reason there's a vocational
3 report in evidence is because we're claiming both
4 42-9-10 disability and 42-9-30 disability. That's
5 why the vocational report's in evidence. But
6 that --

7 COMMISSIONER JAMES: I understand the law.
8 I'm just saying --

9 MR. SMITH: Okay.

10 COMMISSIONER JAMES: -- how do you do a -- how
11 would they even have the opportunity to rebut it?
12 How do you do a vocational assessment where there
13 may be necessary testing and whatnot? I understand
14 you have his background, but how -- you know, are
15 they supposed to do that posthumously too?

16 MR. SMITH: Yeah, well, you cross-examine
17 somebody. I mean, you know, you take some effort
18 to do something.

19 COMMISSIONER BECK: But not the Claimant.

20 MR. SMITH: What's that?

21 COMMISSIONER BECK: But not the Claimant,
22 which is typically the prime witness.

23 MR. SMITH: The guy died almost a year after
24 the doctor -- the treating doctor put him at MMI.
25 I mean, why not take his deposition during that

1 COMMISSIONER BECK: -- and you have a 54
2 percent back rating, why does the Claimant, if he's
3 entitled to anything, get a penny more than 54
4 percent?

5 MR. SMITH: Because the law says he's presumed
6 to be totally disabled unless --

7 COMMISSIONER BECK: But the Defendants have
8 not --

9 MR. SMITH: -- they rebut the presumption.

10 COMMISSIONER BECK: -- had a right to rebut
11 that.

12 MR. SMITH: Well, he --

13 COMMISSIONER BECK: They've never been given
14 that opportunity, because there was never an MMI
15 assertion prior to his death.

16 COMMISSIONER JAMES: Yeah, how would they do
17 that?

18 MR. SMITH: Well, they would, for one, they
19 would cross-examine somebody, anybody; the wife,
20 the doctor, anybody. You know, we learn this with
21 the medical versus economic model. And we learned
22 how vocational reports are not relevant to a 50
23 percent or greater situation, they're relevant to
24 the wage loss situation. We've heard that many
25 times before, we talk about our vocational

1 time?

2 COMMISSIONER BECK: Is there an MMI note prior
3 to his death?

4 MR. SMITH: The MMI -- it's how George
5 describes it, he was apparently at MMI already.
6 But the doctor --

7 COMMISSIONER BECK: But no doctor said that so
8 how would Mr. Miars client even be put on notice
9 that they're in that position, that's my point.

10 MR. SMITH: Well, there's a nurse case manager
11 and the treating doctor says apparently he's
12 already at MMI and he refers him out to long term
13 pain management. I mean, it's all consistent with
14 that.

15 COMMISSIONER BECK: What doctor says he's at
16 MMI prior --

17 MR. SMITH: The authorized treating physician.

18 COMMISSIONER BECK: At what page in the APAs?

19 MR. SMITH: Well, he says it three times. He
20 says it the last time he saw him, he says it on the
21 14B, and he says it on the note where he explains
22 the --

23 COMMISSIONER BECK: Well, the 14B was after
24 his death.

25 MR. SMITH: Right.

1 COMMISSIONER BECK: I'm looking for prior to
2 his death.

3 MR. SMITH: It would only be one time and it
4 would be the note that George described, Apparently
5 he's already at MMI.

6 COMMISSIONER BECK: What page?

7 MR. SMITH: George, do you know?

8 COMMISSIONER BECK: What doctor?

9 MR. MIARS: It's Dr. Bolt, Commissioner. And
10 it was...

11 MR. SMITH: It's page two. And, Commissioner,
12 while you're looking for that I will just point out
13 that this is the exact same fact scenario as a case
14 this exact panel decided in 2012, that was the
15 Hemrel case that I discussed in my brief. In that
16 case the Claimant was at MMI for one of his
17 injuries, but he was not at MMI for all of his
18 injuries.

19 MR. MIARS: It's actually page five,
20 Commissioner, by the way.

21 MR. SMITH: What the award was -- the
22 unanimous award of this panel was that even though
23 he wasn't at MMI for all of his injuries he was
24 awarded the impairment rating that he was at MMI
25 for.

1 Commissioner.

2 COMMISSIONER BECK: Well, just somebody point
3 me to it.

4 MR. MIARS: It's page five. Claimant's APA
5 page five (As Read): Apparently the patient is
6 already at maximum medical improvement --

7 COMMISSIONER BECK: You're not answering my
8 question, Mr. Miars. I'm trying to find the page.
9 We've got all these documents on-line, we're not
10 looking at them in paper format.

11 MR. SMITH: You want to see it on paper?

12 COMMISSIONER BECK: I'm just trying to connect
13 it up here.

14 Date of death is when?

15 MR. SMITH: I think it's October.

16 MR. MIARS: October 2012.

17 COMMISSIONER BECK: All right. Thank you.

18 MR. SMITH: Is there anything else y'all
19 wanted me to address?

20 COMMISSIONER JAMES: No.

21 Mr. Miars.

22 ****

23 APPELLANT REPLY

24 MR. MIARS: Yes. And, Commissioner, going to
25 that. What Dr. McMahan says when he first -- sorry

1 COMMISSIONER BECK: But that's not the same as
2 this scenario.

3 MR. SMITH: Well, it's the same in the
4 first --

5 COMMISSIONER BECK: That's completely
6 different, Mr. Smith. If he's rated at MMI for one
7 body part and that's the award he was given, for
8 that body part, that's consistent with Mr. Miars
9 argument. If we didn't give him anything for the
10 un-rated body parts, is my understanding of that.

11 MR. SMITH: Well, I mean, maximum --

12 COMMISSIONER BECK: Is that true?

13 MR. SMITH: It's either maximum medical
14 improvement or it's not. I mean, if you're at
15 maximum medical improvement for one injury and
16 you're not for another, you're not at maximum
17 medical improvement. If you file a Form 21 --

18 COMMISSIONER BECK: I understand your
19 position.

20 MR. SMITH: -- and you get partial maximum
21 medical improvement and one's still treating you
22 get kicked out of the Form 21 Hearing immediately.

23 COMMISSIONER BECK: Point me on that note
24 where that MMI reference is. If I'm looking at --

25 MR. MIARS: I can do it on rebuttal,

1 -- Dr. Bolt says when he first sees the Claimant,
2 quote, Apparently the patient is already at
3 improvement --

4 COMMISSIONER BECK: What's he base that on?

5 MR. MIARS: -- but, again, I have no records
6 to confirm that. That's what the sentence says the
7 doctor says. And so then you go back to his letter
8 to Kevin Smith posthumously -- and this would be
9 Claimant's APA page eleven, note in the chart dated
10 February 27, 2013, so four months after the
11 Claimant's death -- Dr. Bolt says (As Read): I had
12 thought he was previous at maximum medical
13 improvement, apparently that was not the case.

14 So he even admits after the Claimant dies, I
15 was wrong about saying I thought he was at maximum
16 medical improvement. So, again, we'd argue there
17 was no finding of maximum medical improvement
18 before the Claimant died.

19 I mean, as far as MMI, cited the Cruel
20 decision, benefits accrue on a time continuum.
21 You're not entitled to permanent disability
22 benefits until after you're found at maximum
23 medical improvement. And, again, he wasn't found
24 at maximum medical improvement before his death, so
25 we'd argue that that's another reason why the claim

would abate.

I'm happy to answer any other questions that
y'all have.

COMMISSIONER BECK: I think we got it.

MR. MIARS: Thank you very much.

COMMISSIONER JAMES: That concludes this
hearing.

(Whereupon, the hearing concluded at 9:42 a.m.)

STATE OF SOUTH CAROLINA

CERTIFICATE

Be it known that I, Christine Tatum,
Certified Court Reporter and Notary Public, did hear the
appellate matter of *Timothy McMahan v. SC Department of
Education*, Workers' Compensation File No. 1106833 on
Tuesday, July 22, 2014, in Columbia, South Carolina,
before the South Carolina Workers' Compensation
Commission Full Commission Appellate Panel including,
Honorable Avery Wilkerson, Scott Beck, and Melody James;
Chair;

That the foregoing pages constitute a true
and accurate transcription of the testimony given at
that time and place aforesaid to the best of my skill
and ability;

I further certify that I am not counsel or
kin to any of the parties to this cause of action, nor
am I interested in any matter of its outcome.

In Witness whereof, I have hereunto set my
hand this 20th Day of August 2014.

/s/ Christine Tatum

Christine Tatum, CCR
Notary Public For South Carolina
My Commission Expires December 29, 2021

BEFORE THE SOUTH CAROLINA
WORKERS' COMPENSATION COMMISSION

WCC FILE NO. 1106833

Timothy McMahan,)
Employee,)
Claimant,)
vs.)
SC Department of Education--Transportation,)
Employer,)
and)
State Accident Fund,)
Carrier,)
Defendants.)

AMENDED
NOTICE OF DEPOSITION

TO: KEVIN SMITH, ESQUIRE, ATTORNEY FOR CLAIMANT

YOU WILL PLEASE TAKE NOTICE that the deposition of Patrick M. Bolt, MD will be taken upon oral examination before a Notary Public or some other official authorized by law to take depositions. The deposition will be held on August 21, 2013, at 9:30 A.M., at the offices of Tennessee Orthopaedic Clinic, The Center For Advanced Medicine Building, 1819 Clinch Avenue, Ste. 100, Knoxville, Tennessee. The oral examination will continue from day to day until completed. You are invited to attend and take such part as is fit and proper.

**WILLSON JONES CARTER &
BAXLEY, P.A.**



George T. Miars, Jr., Esquire
421 Wando Park Boulevard, Suite 100
Mount Pleasant, SC 29464
Attorneys for Defendants

Date: June 25, 2013

South Carolina Workers' Compensation Commission
1333 Main Street, Suite 500 • Post Office Box 1715
Columbia, South Carolina 29202-1715
(803) 737-5723
www.wcc.sc.gov



Physician's Statement

Claimant's Name: Timothy McMahan

Employer's Name: SC Department of Education

Physician's Name: Patrick M. Bolt, M.D.

Insurance Carrier: State Accident Fund

Practice/Clinic: Tennessee Orthopaedic Clinic

SCWCC File No.: 1106833

Preparer's Name: Patrick M. Bolt, M.D.

Phone: (865) 694-7725

The undersigned physician has been authorized by the Employer/Carrier to treat this Claimant for his or her injury by accident pursuant to §§42-15-60, 42-1-172 or 42-11-10.

Date of Injury or Illness: June 15, 2011

Date of first office visit: 04/23/12

Date of last visit: 5/11/12

Diagnosis or nature of injury or illness: T12 burst fracture w/ spinal cord injury

Body part(s) injured: T12 vertebrae

Body part(s) affected: thoracolumbar spine with lower extremity weakness

Date of Maximum Medical Improvement: 04/23/12

Based on the AMA Guidelines, the claimant has sustained a 54 % medical impairment to whole person

Injured body part(s) and a % medical impairment to

other affected body part(s).

☐ The claimant is able to return to work without restriction.

☒ The claimant is able to return to work with the following restrictions:

Totally disabled

☒ The claimant is unable to return to work at his or her current employment.

As of the date I last saw this patient, it is my professional medical opinion the claimant:

☐ will not need future medical care related to his or her work related injury or illness based on a reasonable degree of medical certainty (more likely than not).

☐ will need future medical care and treatment related to his or her work related injury or illness based on a reasonable degree of medical certainty (more likely than not) and that medical care and treatment including medication is as follows:

N/A - Claimant deceased

Treating Physician

PBolt

PATRICK BOLT, MD

Date

2/27/13



TENNESSEE ORTHOPAEDIC CLINIC

INITIAL EVALUATION

Patient Name: MCMAHAN, TIM D.
Date of Birth: 08/31/1951
Patient ID: 532198
Date of Service: 04/23/2012
Provider Name: Patrick M. Bolt, M.D.

Mr. McMahan is a 60-year-old gentleman seen today in initial evaluation.

CHIEF COMPLAINT: Low back pain and left lower extremity pain.

HISTORY OF PRESENT ILLNESS: This is a 60-year-old male who had a significant injury in June of 2011 when he had a school bus fall off a jack onto him. He has had two major surgeries in late 2011 by Dr. Turner, a neurosurgeon in Charleston. He had apparently what sounds like a failure of instrumentation after the first surgery, had a second surgery and woke up with severe left lower extremity pain and weakness. This was complicated by a DVT in January of 2012. His left lower extremity is "numb" and has been since "my second surgery".

CURRENT CONDITION: The pain is worse with standing and is relieved by lying down. He rates the pain as 50% back pain and 50% left leg pain. These are both a 7/10 burning, aching pain radiating into the lumbar spine, down the left leg in a multidermatomal distribution, focused in the L5 distribution. The patient has been self-cathing since October, primary urinary retention, no fecal incontinence. Denies fevers, chills or night sweats.

CURRENT MEDICATIONS: Neurontin, Baclofen, Coumadin.

ALLERGIES: No known drug allergies.

PAST MEDICAL HISTORY: The patient denies.

PAST SURGICAL HISTORY: As above

FAMILY HISTORY: The patient denies any contributory family history. —

SOCIAL HISTORY: The patient smokes a pack of cigarettes per day but does not drink alcohol. He is married with children.

(Continued)

Patient Name: MCMAHAN, TIMD.
Date of Birth: 08/31/1951
Patient ID: 532198
Date of Service: 04/23/2012
Provider Name: Patrick M. Bolt, M.D.

WORK HISTORY: The patient is now disabled.

REVIEW OF SYSTEMS:

SKIN/BREASTS: Negative for rashes, psoriasis, bruising, abnormal lumps, painful breasts.

EYES: Negative for visual loss and double vision.

EARS: Negative for decreased hearing and ringing in ears.

NOSE: Negative for sinus problems and breathing problems.

THROAT: Negative for sore throat, hoarseness and snoring.

CARDIOVASCULAR: Negative for palpitations, irregular heartbeat, heart murmur, rheumatic fever and chest pain.

RESPIRATORY: Negative for shortness of breath, wheezing, cough/sputum production.

GASTROINTESTINAL: Negative for weight loss, abdominal pain, nausea/vomiting, diarrhea, constipation, blood in stool, and loss of bowel control.

MUSCULOSKELETAL: Negative for fractures/sprains, osteoporosis and joint swelling.

GENITOURINARY: Negative for blood in urine, increased frequency of urination, painful urination, loss of bladder control and kidney stones.

ENDOCRINE: Negative for enlarged thyroid/goiter, excessive thirst/appetite and diabetes.

NEUROLOGIC: Negative for headaches/migraines, vertigo/dizziness, convulsions/seizures and loss of consciousness.

All additional systems are negative.

PHYSICAL EXAM: The patient is a well-developed, well-nourished, 60-year-old male in no acute distress. The patient stands 5'11" tall, does not know his weight. He is afebrile. Normocephalic and atraumatic. Appropriate mood and affect. Alert and oriented to person, place and time. He walks with a markedly pitched forward gait, unable to heel and toe walk or reciprocating heel and toe walk secondary to ataxia. He is only able to straighten to neutral, he is able to flex to 80% of normal. The skin of the thoracolumbar spine is intact. There is no erythema, ecchymosis, or rash. There is no palpable mass or step-off. Muscle tone and bulk is normal and symmetric. He is tender to palpation along the long scar from the mid thorax into the mid lumbar spine. This incision is well-healed. The rods are prominent bilaterally. He is only able to stand for short periods of time. Sacroiliac joint provocative testing is negative, bilateral FABER and shear. There is full, pain-free range of motion of bilateral hips, knees and ankles. The calves are soft and nontender. There is no lymphedema. Motor examination reveals 4+/5 weakness in the gastrocnemius bilaterally, the tibialis anterior on the left, the toe extensors on the left. His quadriceps are 3/10 on the left, hip flexors are 3/10 on the left, otherwise full strength in the lower extremities. Sensory examination reveals reduced sensation to light touch in a left L4 and L5 distribution.

(Continued)

TOC

3

Patient Name: MCMAHAN, TIM D.
 Date of Birth: 08/31/1951
 Patient ID: 532198
 Date of Service: 04/23/2012
 Provider Name: Patrick M. Bolt, M.D.

otherwise intact to light touch and symmetric L2-S1. He has +3 deep tendon reflexes bilateral knee jerk and ankle jerk, +2 in the upper extremities. Three beats of clonus bilaterally. Upgoing toes bilaterally. Babinski's are downgoing bilaterally. Positive straight leg raise on the left, negative on the right. Femoral stretch test is negative bilaterally. The patient has full strength and sensation in his upper extremities. Pain-free range of motion of the cervical spine. Negative Spurling's maneuver. He has +2 radial pulses bilaterally.

REVIEW OF IMAGING STUDIES: AP and lateral flexion/extension radiographs of the lumbar spine reveal a T10-L2 posterior fusion, unclear arthrodesis. There is a T12 cage. This cage appears to have been put in through an extracavitary technique at T12. There remains significant collapse at T12 with subsidence of the cage into T11 and L1. Unclear posterolateral fusion. Unclear interbody fusion.

DIAGNOSIS: Status post T12 burst fracture status post anterior/posterior fusion with multiple surgeries T10-L2, unclear arthrodesis, unclear infectious status, complicated by left lower extremity DVT and postoperative pain and weakness in the left lower extremity as well as severe thoracic and lumbar pain.

DISCUSSION/PLAN: The above diagnoses are discussed at length with the patient including prognosis, natural history, and treatment options.

The patient has an incredibly complex history, is a relatively poor historian, and I have been provided with no records other than a urology report from Dr. Brandli, Carolina Family Urology.

The patient has had a complication of urinary retention as well as significant left lower extremity pain following the last surgery. It is unclear if the partial spinal cord injury which he sustained was before or after the surgery. The patient reports that it was after the surgery, however, it is unclear if this is the case, as certainly he was quite severely affected before any of the surgery was performed.

I am also concerned that the patient may have an indolent infection. I would like the following: c. reactive protein, sedimentation rate and CBC with differential, MRI of the thoracic and lumbar spine to further delineate the discs and neural structures, CT scan of the thoracic and lumbar spine to evaluate the bony fusion, if any, as well as screw placement and cage position.

I have declined to take over the patient's pain management as this was a stipulation to my seeing the patient, was only for a surgical opinion. I have recommended that the patient be placed in pain management in the Knoxville area. The patient will also require someone to follow his Coumadin.

(Continued)

Patient Name: MCMAHAN, TIM D.
Date of Birth: 08/31/1951
Patient ID: 532198
Date of Service: 04/23/2012
Provider Name: Patrick M. Bolt, M.D.

Apparently this is being set up by his case manager for a primary care provider. I will see the patient back after the imaging studies are obtained. We will see if there is anything that may be recommended further from a surgical standpoint. Apparently, the patient is already at maximum medical improvement but, again, I have no records to confirm this. There is no change in restrictions at this time.

I authorize my name to be automatically affixed to this report, signifying I have dictated this report and reviewed it accordingly.
Patrick M. Bolt, M.D.

PMB/asr

CC: Jane Colvin (579-5223)
Patry Vance (615-889-6720)

LOC: Regional
VF: 0776
DD: 04/26/2012
DT: 04/27/2012



TENNESSEE ORTHOPAEDIC CLINIC

CLINIC NOTE

Patient Name: MCMAHAN, TIM D.
Date of Birth: 08/31/1951
Patient ID: 532198
Date of Service: 05/11/2012
Provider Name: G. Taylor Fielden, PA-C

HISTORY OF PRESENT ILLNESS: Mr. McMahon is a 60-year-old male who is here for MRI results. His symptoms are exactly the same as at last visit. He has 90% back pain and 90% leg pain today. He has 7/10 constant low back pain. His leg pain is 7 to 8/10. He mostly has the pain in his left lower extremity.

PHYSICAL EXAMINATION: Reduced sensation to light touch left-sided L4 and L5 distribution. Quadriceps 3/5 left leg, hip flexion is 3/5 left leg, otherwise full strength in bilateral lower extremities. Pain-free full range of motion in bilateral hips, knees and ankles today. Positive straight leg test on the left and negative on the right. Full strength and sensation in bilateral upper extremities. Negative Spurling's maneuver.

REVIEW OF IMAGING STUDIES: MRI of the lumbar spine shows a severe compression fracture at T12 but no significant stenosis is noted in this area; however there is quite a bit of metallic artifact which limits the MRI effectiveness for evaluating for any pinch at the fracture site. These were done at Outpatient Diagnostic Center dated 05/01/2012.

MRI thoracic spine also at Outpatient Diagnostic Center showed a fusion present, minimal degenerative endplate changes at T5 but no fracture or thoracic compression present either centrally or foraminally.

A CT of the thoracic spine shows no significant stenosis noted T12 to L1 without any surgical complications seen here. There is evidence of pericardial effusion which Mr. McMahon has already been made aware of. There are spondylotic changes throughout the thoracic spine.

A CT of the spine also at Outpatient Diagnostic Center dated 05/04/2012 shows laminectomy changes but no acute impingements noted.

DIAGNOSIS:

1. Status post T12 burst fracture status post anterior/posterior fusion with multiple surgeries T10-L2 without any pseudarthrosis noted on most recent CT scan.
2. History of left lower extremity DVT without significant DVT noted on most recent scan.
3. Pericardial effusion noted on thoracic CT.
4. Extreme mid and low back pain.

(continued)

Patrick M. Bolt, M.D. Signed on 05/24/2012 4:43:24 PM

Patient Name: MCMAHAN, TIM D.
Date of Birth: 08/31/1951
Patient ID: 532198
Date of Service: 05/11/2012
Provider Name: G. Taylor Fielden, PA-C

DISCUSSION/PLAN: Mr. McMahon continues to have extreme mid low back pain and also left lower extremity pain. It is very debilitating for him. I did not see any new neural pinches on his MRI today. There are no pseudarthroses noted either. I will go ahead and set him up for EMG testing in bilateral lower extremities to rule out any radiculopathies. In addition we are sending him to his primary care doctor to have his pericardial effusion worked up. We will see him back following the EMG testing.

I have talked to Dr. Bolt on the phone today explaining the results of the test with him today and he agreed with my above treatment plan. We will see Mr. McMahon back as soon as the EMG testing is done. He will see Dr. Bolt next visit.

Dr. Reynolds was in the office today for supervision.

I authorize my name to be automatically affixed to this report, signifying I have dictated this report and reviewed it accordingly.

G. Taylor Fielden, PA-C with Patrick M. Bolt, M.D.

GTF/mfj

LOC: Regional
VF: 9240
DD: 05/16/2012
DT: 05/18/2012

**Outpatient Diagnostic Center of Knoxville**601 Hall of Fame Drive
KNOXVILLE, TN 37915

Phone: 865-525-7100

Fax: 865-971-4719

To: PATRICK M BOLT, MD
1819 CLINCH AVE #100
CENTER FOR ADVANCED MED
KNOXVILLE, TN 37916
Fax: 865-524-9703

Name: TIMOTHY MCMAHAN
MRN #: 18-00010477
Phone: 843-751-3126
DOB: 08/31/1951 **Gender: Male**
Exam Start: 5/4/12 11:26 am
Referring Phys.: PATRICK M BOLT, MD
Referring Phys Ph.: 865-524-5365

Exam: MAGNETIC RESONANCE (EG, PROTON) IMAGING, SPINAL CANAL AND CONTENTS,
WITHOUT CONTRAST MATERIAL, FOLLOWED BY CONTRAST MATERIAL(S) AND FURTHER
SEQUENCES; THORACIC (72157)

EXAM DESCRIPTION: MRI THORACIC SPINE W/WO CONTRAST**Report: EXAMINATION: MRI Thoracic Spine with and without Contrast****INDICATION: Back pain.****TECHNIQUE: Multiplanar and multisequence MR imaging of the thoracic spine performed with and without use of intravenous contrast.****FINDINGS:**

There is no evidence of acute malalignment. Susceptibility is seen from hardware spanning from the T10 through at least the L2 level. There is distortion of the field with distortion of the central canal but no definitive focal canal stenosis or compression of the cord identified. The patient has had laminectomies at T10, T11, T12 and L1. Additional laminectomies inferiorly not excluded. The thoracic cord is normal in size, shape and signal intensity. There is no focal cord compression, central canal or foraminal narrowing. T12 has undergone fracture with susceptibility from corpectomy cage device placement.

Following infusion of intravenous contrast media, no pathologic enhancement is observed.

IMPRESSION:

1. There is fusion present. No definite acute abnormality in the fused level is identified. There is some minimal degenerative endplate changes noted, most notably at T5 but no fracture or malalignment is identified. No thoracic cord signal abnormality or cord compression is identified.

Interpreting Radiologist

Printed: 5/8/2012 8:36 am

MCMAHAN, TIMOTHY (Exam 1853286)

Page 1 of 2

**Outpatient Diagnostic Center of Knoxville**601 Hall of Fame Drive
KNOXVILLE, TN 37915

Phone: 865-525-7100

Fax: 865-971-4719

To: PATRICK M BOLT, MD
1819 CLINCH AVE #100
CENTER FOR ADVANCED MED
KNOXVILLE, TN 37916
Fax: 865-524-9703

Name: TIMOTHY MCMAHAN
MRN #: 18-00010477
Phone: 843-751-3126
DOB: 08/31/1951 **Gender: Male**
Exam Start: 5/4/12 11:02 am
Referring Phys.: PATRICK M BOLT, MD
Referring Phys Ph.: 865-524-5365

Exam: COMPUTED TOMOGRAPHY, LUMBAR SPINE; WITH CONTRAST MATERIAL (72132)

EXAM DESCRIPTION: CT LUMBAR SPINE W/DYE

Report: EXAMINATION: CT Scan of the Lumbar Spine with Contrast

HISTORY: Burst fractured T12 with fusion.

TECHNIQUE: CT scan was performed axially following infusion of intravenous contrast media.

COMPARISON: Study is compared to recent MRI examination from May 1, 2012.

FINDINGS:

There is evidence of burst fracture of T12 with corpectomy and cage spacing device present at the T12 level. A fusion construct is partially imaged but spans at least from the T10 level through the L2 level. Pedicle screws engage the posterior elements of L1 and L2 and appear to be in good position without evidence for hardware loosening or hardware fracture. Laminectomy has been performed at T11, T12 and L1. There is no evidence for central canal narrowing at these levels. No definite bony central canal narrowing is seen at L2-L3, L3-L4, L4-L5 or L5-S1. No definite bony foraminal narrowing is identified at the L2-L3 or L3-L4 levels and only some mild foraminal narrowing is present on the right at L4-L5 and L5-S1 due to bulging disc material.

IMPRESSION:

1. Partially imaged thoracolumbar fusion with laminectomy performed at several levels as above. No definite acute impingement is appreciated.

Interpreting Radiologist

**Outpatient Diagnostic Center of Knoxville**601 Hall of Fame Drive
KNOXVILLE, TN 37915

Phone: 865-525-7100

Fax: 865-971-4719

To: PATRICK M BOLT, MD
1819 CLINCH AVE #100
CENTER FOR ADVANCED MED
KNOXVILLE, TN 37916
Fax: 865-524-9703

Name: TIMOTHY MCMAHAN
MRN #: 18-00010477
Phone: 843-751-3126
DOB: 08/31/1951 **Gender: Male**
Exam Start: 5/4/12 10:59 am
Referring Phys.: PATRICK M BOLT, MD
Referring Phys Ph.: 865-524-5365

Exam: DUPLEX SCAN OF EXTREMITY VEINS INCLUDING RESPONSES TO COMPRESSION AND
OTHER MANEUVERS; UNILATERAL OR LIMITED STUDY (93971)
LEFT LOWER EXTREMITY VENOUS ULTRASOUND, 5/4/2012

CLINICAL HISTORY: Left lower extremity pain.

TECHNIQUE: Ultrasound evaluation of the deep venous system of the left lower extremity was performed.

FINDINGS: There is no evidence of deep venous thrombosis. The veins of the left lower extremity are compressible and spontaneous flow is demonstrated with doppler technique.

IMPRESSION: Negative left lower extremity venous ultrasound. No evidence of DVT.

Interpreting Radiologist

Glenn Edward Jung MD

Electronically Signed: 5/4/12 1:04 pm

CC:

ONE CALL

Thank you for referring TIMOTHY MCMAHAN to Outpatient Diagnostic Center of Knoxville.

Printed: 5/8/2012 8:37 am

MCMAHAN, TIMOTHY (Exam 1853287)

Page 1 of 1



NOTE TO CHART

Patient Name: MCMAHAN, TIM D.
Date of Birth: 08/31/1951
Patient ID: 532198
Date of Service: 02/27/2013
Provider Name: Patrick M. Bolt, M.D.

NOTE: I have been asked by Kevin B. Smith of the Hoffman Law Firm in Charleston, South Carolina to provide Mr. McMahan posthumously with an impairment rating. Apparently, Mr. McMahan expired of a heart condition in October of 2012.

Mr. McMahan was under my care from 04/23/2012 until 06/14/2012, in which he had moved to Tennessee for followup of a T12 burst fracture he sustained in South Carolina. My workup included MRI and CT imaging of the thoracic and lumbar spine as well as EMG. I had thought he was previously at maximum medical improvement, apparently that was not the case. I would say that he was at maximum medical improvement when I saw him on 04/23/2012.

With regard to restrictions, I would say that the patient was totally disabled and every time that I saw him he was confined to a wheelchair. He was only able to ambulate with assistance short distances.

With regards to impairment, based on the AMA 6th Edition Guidelines, table 17-3, he would be a class four thoracic burst fracture with bony repulsion into the canal, treated with multiple surgeries, and with documented signs of bilateral/multilevel radiculopathy at the clinically appropriate levels at the time of the present examination. The patient also has partial spinal cord injury/myelopathy, so both table 17 and chapter 13 are used for impairment.

The patient is a class four on table 17-3 with a grade four functional history modifier, a grade three physical examination modifier, clinical studies modifier is not applicable, for a net adjustment of minus one, whole person impairment of 20 percent. Using chapter 13, tables 13-12, 13-13, 13-14, and 13-17, detailing station and gait disorders, neurogenic bladder, and dysesthetic pain as well as neurogenic bowel, I find that the patient was a class three gait and station, for an additional whole person impairment of 30 percent. He is a class zero on table 13-13, as he denied bowel problems. He is a class two on table 13-14 with bladder problems requiring catheterization. He is also a class three dysesthetic pain on table 13-17. Using the combined values chart on Appendix A, adding 30 plus 20 in Appendix A equals 44 percent,

(Continued)

Patient Name: MCMAHAN, TIM D.
Date of Birth: 08/31/1951
Patient ID: 532198
Date of Service: 02/27/2013
Provider Name: Patrick M. Bolt, M.D.

adding 44 percent to 10 percent equals 50 percent, adding 50 percent to 8 percent equals 54 percent whole person impairment. I filled out South Carolina Workman's Compensation Commission Form 14B in addition to this dictation.

Patrick M. Bolt, M.D.

PMB/asr

LOC: Regional
VF: 2417
DD: 02/27/2013
DT: 02/28/2013

Progress Notes

Page: 1

Name: MCMAHAN, TIM

Date Printed: 08/06/12

ID: 2657921 SEX:M AGE:60

08/02/11 : 03:36pm

NEUROSURGERY - GENERAL FOLLOW-UP NOTE
MEDICAL UNIVERSITY OF SOUTH CAROLINA
2LG:P7B

NAME: TIM MCMAHAN

AGE: 59 year old

GENDER: male

HISTORY OF PRESENT ILLNESS: This is a 59-year-old male status post crush injury by bus. The patient was working on a bus and it fell off the jack. Patient suffered a Thoracic-12 body burst fracture with spinal cord injury. Patient underwent the following on 6-15-11:

PROCEDURES:

1. Intraoperative fluoroscopy.
2. Reduction of T-12 fracture.
3. Transpedicular decompression.
4. Pars osteotomy.
5. Laminectomy at T12 and L1.
6. Open reduction of T12 fracture.

He complains of focal low back pain and sexual dysfunction, unable to have an erection. Patient is mobilizing well with a walker, given the initial spinal cord injury. He is working with rehab for his ambulation goals.

REVIEW OF SYSTEMS

Constitutional: No change in weight, fever, chills, night sweats, or fatigue.

Musculoskeletal: low back pain

Sensory: no numbness, tingling, paraesthesias

GU: sexual dysfunction

The remainder of the review of systems was negative.

PHYSICAL EXAM

Neurological - Mental Status/Speech/Language: The patient is oriented to person, place and time. Recent and remote memory appears intact. Attention, affect and speech are normal. Thought content appears normal. General fund of knowledge and vocabulary is appropriate for level of education.

CN I: No Abnormalities of smell

CN II: Optic fundi are normal, visual fields are intact to confrontation

CN III, IV, and VI: Pupils are equal round and reactive to light. Extraocular eye muscle movements are intact.

CN V: Facial sensation is intact and symmetrical

CN VII: Facial movement is normal and symmetrical.

CN VIII: Hearing is grossly intact to finger rub

CN IX: Palate moves normally. Normal gag reflex.

CN XI: Sternomastoids and trapezii strong

CN XII: Tongue has normal range of motion without fasciculations.

Skin: Good turgor, no rash or prominent lesions, incision well healed

Vascular: no bruit, 2+ pulses UE & LE

Musculoskeletal: ambulating with walker, 5/5 strength

Sensory: Normal LT/DT B/C UE & LE

Diagnosis: Thoracic-12 body burst fracture with spinal

Assessment and Plan: Patient will discuss with his wife undergoing a second surgery with corpectomy given his focal back pain. Patient will call our office when he is ready to schedule surgery. Xrays stable.

Printed using Practice Partner®



Progress Notes

Page: 2

Name: MCMAHAN, TIM

Date Printed: 08/06/12

ID: 2657921 SEX: M AGE: 60

Megan E. Fulton, PA-C

- # SIGNED BY MEGAN E FULTON, PA-C (2LG) 08/10/2011 03:45PM
- # REVISED BY MEGAN E FULTON, PA-C (2LG) 08/10/2011 03:45PM
- # CO-SIGNED BY RAYMOND TURNER, M.D. (ATTENDING) (P7B) 08/24/2011 03:46PM

Printed using Practice Partner®



Progress Notes

Page: 1

Date Printed: 08/06/12

Name: MCMAHAN, TIM

ID: 2657921

SEX: M AGE: 60

09/29/11 : 02:55pm

NEUROSURGERY -Clinic visit

MEDICAL UNIVERSITY OF SOUTH CAROLINA

2LG:P7B

NAME: TIM MCMAHAN

AGE: 59 year old

GENDER: male

HISTORY OF PRESENT ILLNESS: This is a 59-year-old male status post crush injury by bus. The patient was working on a bus and it fell off the jack. Patient suffered a Thoracic-12 body burst fracture with spinal cord injury. Patient underwent the following on 6-15-11:

PROCEDURES:

1. Intraoperative fluoroscopy.
2. Reduction of T-12 fracture.
3. Transpedicular decompression.
4. Pars osteotomy.
5. Laminectomy at T12 and L1.
6. Open reduction of T12 fracture.

He complains of focal low back pain and sexual dysfunction, unable to have an erection. Patient is mobilizing well with a walker, given the initial spinal cord injury. He is working with rehab for his ambulation goals.

He is receiving Oxycontin 20mg bid and Oxycodone 5mg po q 4 hours prn pain from rehab HealthSouth Dr. Levsey at 820-7777.

He is here with his daughter and case manager to discuss his surgical options.

REVIEW OF SYSTEMS

Constitutional: No change in weight, fever, chills, night sweats, or fatigue.

Musculoskeletal: low back pain

Sensory: no numbness, tingling, paraesthesias

GU: sexual dysfunction

The remainder of the review of systems was negative.

PHYSICAL EXAM

Neurological - Mental Status/Speech/Language: The patient is oriented to person, place and time. Recent and remote memory appears intact. Attention, affect and speech are normal. Thought content appears normal. General fund of knowledge and vocabulary is appropriate for level of education.

CN I: No Abnormalities of smell

CN II: Optic fundi are normal, visual fields are intact to confrontation

CN III, IV, and VI: Pupils are equal round and reactive to light. Extraocular eye muscle movements are intact.

CN V: Facial sensation is intact and symmetrical

CN VII: Facial movement is normal and symmetrical.

CN VIII: Hearing is grossly intact to finger rub

CN IX: Palate moves normally. Normal gag reflex.

CN XI: Sternomastoids and trapezii strong

CN XII: Tongue has normal range of motion without fasciculations.

Skin: Good turgor, no rash or prominent lesions, incision well healed

Vascular: no bruit, 2+ pulses UE & LE

Musculoskeletal: ambulating with walker, 5/5 strength

Sensory: Normal LT/DT B/C UE & LE

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Progress Notes

Page: 2

Name: MCMAHAN, TIM

Date Printed: 08/06/12

ID: 2657921 SEX:M AGE:60

Diagnosis: Thoracic-12 body burst fracture with spinal cord injury

MRI: Pelvis Normal---Outside hospital

Assessment and Plan: I have explained the risks and benefits of surgery with the patient and his daughter involving a T12 corpectomy with re-exploration of Lumbar Spine. We will him up for surgery on 10-10-11 with Stryker. Patient to complete preop today. We discussed likelihood of returning to rehab post op x 2 weeks. He is ammenable to the plan.

Megan E. Fulton, PA-C

SIGNED BY MEGAN E FULTON, PA-C (2LG) 09/29/2011 03:00PM

CO-SIGNED BY RAYMOND TURNER, M.D. (ATTENDING) (P7B) 09/29/2011 08:10PM

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Progress Notes

Page: 1

Date Printed: 08/06/12

Name: MCMAHAN, TIM

ID: 2657921

SEX: M AGE: 60

09/29/11 : 03:00pm

NEUROSURGERY -PREOP

MEDICAL UNIVERSITY OF SOUTH CAROLINA

2LG:P7B

NAME: TIM MCMAHAN

AGE: 59 year old

GENDER: male

HISTORY OF PRESENT ILLNESS: This is a 59-year-old male status post crush injury by bus. The patient was working on a bus and it fell off the jack. Patient suffered a Thoracic-12 body burst fracture with spinal cord injury. Patient underwent the following on 6-15-11:

PROCEDURES:

1. Intraoperative fluoroscopy.
2. Reduction of T-12 fracture.
3. Transpedicular decompression.
4. Pars osteotomy.
5. Laminectomy at T12 and L1.
6. Open reduction of T12 fracture.

He complains of focal low back pain and sexual dysfunction, unable to have an erection. Patient is mobilizing well with a walker, given the initial spinal cord injury. He is working with rehab for his ambulation goals.

He is receiving Oxycontin 20mg bid and Oxycodone 5mg po q 4 hours prn pain from rehab HealthSouth Dr. Levsey at 820-7777.

He is here for preop T12 corpectomy and re-exploration of Lumbar Spine.

REVIEW OF SYSTEMS

Constitutional: No change in weight, fever, chills, night sweats, or fatigue.

Musculoskeletal: low back pain

Sensory: no numbness, tingling, paraesthesias

GU: sexual dysfunction

The remainder of the review of systems was negative.

PHYSICAL EXAM

Neurological - Mental Status/Speech/Language: The patient is oriented to person, place and time. Recent and remote memory appears intact. Attention, affect and speech are normal. Thought content appears normal. General fund of knowledge and vocabulary is appropriate for level of education.

CN I: No Abnormalities of smell

CN II: Optic fundi are normal, visual fields are intact to confrontation

CN III, IV, and VI: Pupils are equal round and reactive to light. Extraocular eye muscle movements are intact.

CN V: Facial sensation is intact and symmetrical

CN VII: Facial movement is normal and symmetrical.

CN VIII: Hearing is grossly intact to finger rub

CN IX: Palate moves normally. Normal gag reflex.

CN XI: Sternomastoids and trapezii strong

CN XII: Tongue has normal range of motion without fasciculations.

Skin: Good turgor, no rash or prominent lesions, incision well healed

Vascular: no bruit, 2+ pulses UE & LE

Musculoskeletal: ambulating with walker, 5/5 strength

Sensory: Normal LT/DT B/C UE & LE

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Progress Notes

Page: 2

Name: MCMAHAN, TIM

Date Printed: 08/06/12

ID: 2657921 SEX:M AGE:60

Diagnosis: Thoracic-12 body burst fracture with spinal cord injury

MRI: Pelvis Normal---Outside hospital

Assessment and Plan: I have explained the risks and benefits of surgery with the patient and his daughter involving a T12 corpectomy with re-exploration of Lumbar Spine. We will him up for surgery on 10-10-11 with Stryker. Patient to complete preop today. We discussed likelihood of returning to rehab post op x 2 weeks. He is ammenable to the plan.

Megan E. Fulton, PA-C

SIGNED BY MEGAN E FULTON, PA-C (2LG) 09/29/2011 03:01PM

CO-SIGNED BY RAYMOND TURNER, M.D. (ATTENDING) (P7B) 09/29/2011 08:10PM

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Progress Notes

Page: 1

Name: MCMAHAN, TIM

Date Printed: 08/06/12

ID: 2657921 SEX: M AGE: 60

02/07/12 : 09:42am

NEUROSURGERY - GENERAL FOLLOW-UP NOTE
MEDICAL UNIVERSITY OF SOUTH CAROLINA
2LG:P7B

NAME: TIM MCMAHAN

AGE: 60 year old

GENDER: male

HISTORY OF PRESENT ILLNESS: Patient is a 60 year old s/p the following on 10-15-11

POSTOPERATIVE DIAGNOSIS: T12 compression fracture.

SURGERY PERFORMED: T11, T12, L1 laminectomy and bilateral foraminotomies. Placement of pedicle screws at T10. Removal and replacement of pedicle screws at T11. Placement of pedicle screws at L2 with a bilateral transpedicular approach to the anterior-posterior spine at T12 and a vertebral corpectomy, this will allow extracavitary approach and placement of interbody cages packed in morselized autograft and allograft for an anterior arthrodesis and a posterolateral arthrodesis at T10 to L2 using morselized autograft and allograft with correction of T12 compression fracture and restoration of normal alignment.

He presents with his wife today—He has been working with PT 3x/week at outpatient REHAB. His major complaint is left leg pain and bilateral foot swelling since his surgery, although not swollen today. He has been using compression hose as recommended from his last visit. He is followed at MUSC's coumadin clinic for LLE DVT. He reports that his INR has been stable around 2.3. In addition, he complains of low bilateral paraspinal back pain and "tightness." He has been sleeping in his recliner, as this is the only position that gives him relief.

He is taking the following medications and is followed by Dr. Duc for pain management:

- 1.) Neurontin 900mg po tid
- 2.) Valium 10mg po qhs
- 3.) Ambien 5mg po qhs
- 4.) Lidoderm 5% patch
- 5.) Norco 10-325 1-2 tabs every 6 hours pm pain (this was prescribed by us one month ago before he was with pain management, patient states this med is not helping)
- 6.) Flomax
- 7.) Coumadin 5mg po daily
- 8.) Baclofen 5mg po tid

Patient stating that he will be moving by the end of the month to Tennessee to take care of his father. He is requesting transfer of care and recommendations to go through his case manager James. He is needing enough pain medication to last through his transfer. He is following up with Dr. Duc tomorrow and we discussed sending this note.

REVIEW OF SYSTEMS

Constitutional: No change in weight, fever, chills, night sweats, or fatigue.

Musculoskeletal: left leg pain, low back pain

Neurological: generalized weakness, in wheelchair

Sensory: numbness and tingling in feet

The remainder of the review of systems was negative.

PHYSICAL EXAM

Gen: NAD, WM, cachetic appearance since surgery

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Progress Notes

Page: 2

Name: MCMAHAN, TIM

Date Printed: 08/06/12

ID: 2657921 SEX:M AGE:60

Neurological - Mental Status/Speech/Language: The patient is oriented to person, place and time. Recent and remote memory appears intact. Attention, affect and speech are normal. Thought content appears normal. General fund of knowledge and vocabulary is appropriate for level of education.

Skin: Good turgor, no rash or prominent lesions, incision intact

Vascular: no bruit, 2+ pulses UE & LE, no pitting edema bilateral feet,

Musculoskeletal: left leg 4/5 strength, right 3/5, tight bilateral lumbar paraspinal muscles to palpation, kyphosis

Sensory: Normal LT/DT B/C UE & LE

Imaging: from outside hospital Ct scan 11-23-11 was reviewed and demonstrates stable construct, lumbar DDD, thoracic DDD

Diagnosis: T12 compression fracture.

Assessment and Plan:

1.) Follow up with Dr. Duc for review of pain medications---Mr. McMahan has been somewhat confused on what he is on and we want to make sure that Dr. Duc has everything from our end to review. We will fax this note to his office.

2.) **I will recommend to James that he be followed by a PCP for his coumadin and set up with Rehab and Pain Management ASAP in Tennessee for a smooth transfer of care.** He does not necessarily need a Neurosurgeon in Tennessee rather a Physiatrist.

3.) At this time most of Tim's pain is secondary to his DVT and is the culprit of his feet swelling. We recommend that he continue with PT 3x/week and to focus on his lower lumbar paraspinals that are extremely tight from sitting all day in a wheelchair.

Megan E. Fulton, Pa-C

Rx: NEURONTIN 900mg 1 three times daily for 30 days, 90, Ref: 0

Rx: VALIUM 10mg 1 at bedtime for 30 days, 30, Ref: 0

Rx: AMBIEN 5mg 1 at bedtime for 30 days, 30, Ref: 1

SIGNED BY MEGAN E FULTON, PA-C (2LG) 02/09/2012 09:58AM

CO-SIGNED BY RAYMOND TURNER, M.D. (ATTENDING) (P7B) 02/10/2012 10:07AM

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Discharge/Op Notes

Page: 1

Name: MCMAHAN, TIM

Date Printed: 07/26/11
ID: 2657921 SEX:M AGE:59

06/16/11 : 00:00am

OUT

Accession number: 18267265303

MUSC Medical Center

HOSPITAL TRANSFER SUMMARY

Patient Name: MCMAHAN, TIM

MRN: 002657921

Patcom: 495729055

Admitted: 06/15/2011

Discharged: 06/16/2011

Service: STICU

Attending: Bruce A Crookes, MD

Referring: -

Primary Care Physician: -

This is a transfer summary from the ICU to the floor.

REASON FOR ADMISSION: Status post crush injury with T12 compression fracture and paraplegia.

BRIEF HISTORY: 59-year-old male who is status post crush injury by his bus while working on it. The patient was transferred to MUSC by EMS. He was complaining of severe back pain and tingling in bilateral lower extremity tingling. He was found to be paraplegic. CT scan obtained showed T12 compression fracture with retropulsion.

INJURY COMPLEX:

1. T12 compression fracture with retropulsion.
2. Paraplegia.

OPERATIVE PROCEDURES: On 06/15/2011 underwent a T12 corpectomy and fusion by Dr. Turner.

CONSULTS: On 06/15/2011, Neurosurgery was consulted for the T12 compression fracture. Patient went to the OR for a T12 decompression and fusion. Plan of care was to consult PT and get out of bed adlib.

BRIEF ICU COURSE: The patient was admitted to the ICU and placed on bedrest with log roll only. He was taken by Neurosurgery to the OR on 06/15/2011 and underwent a T12 corpectomy and fusion. Postoperative, patient was transferred to the STICU. He appeared to remain hemodynamically stable. His motor exam improved from 1/5 to 4/5 in the left lower extremity. His motor exam improved from 1/5 to 4/5 in both lower extremity. Patient was started on clear liquid diet. C-collar was cleared. PT consult was placed. Patient was also started on Lovenox for chemical DVT prophylaxis.

MEDICATION ON TRANSFER:

1. Dilaudid PCA.
2. Senna and Colace p.r.n. constipation.
3. Neurontin 300 mg t.i.d.

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MUSC PAGE 5 OF 82

Discharge/Op Notes

Page: 2

Name: MCMAHAN, TIM

Date Printed: 07/26/11

ID: 2657921 SEX: M AGE: 59

4. Lovenox 30 mg subcu b.i.d.

NUTRITIONAL STATUS: Patient was started on clear liquid diet and should be slowly advanced.

PRECAUTIONS: None.

WEIGHTBEARING STATUS: Patient has been WBAT in 4 extremities.

Dictated by: Abdalrahman Algendy, MD

Abdalrahman Algendy, MD

Bruce A Crookes, MD
Attending

265303 / 44076 /
JOB: 6049638
DD: 06/16/11 09:42 AM
DT: 06/16/11 10:17 AM

Additional CC:

Authenticated and Edited by ABDALRAHMAN ALGENDY, MD On 6/16/11 4:42:38 PM
Authenticated by BRUCE A. CROOKES, MD On 06/20/2011 10:28:38 PM

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MUSC PAGE 6 OF 82

Discharge/Op Notes

Page: 1

Name: MCMAHAN, TIM

Date Printed: 07/26/11

ID: 2657921 SEX:M AGE:59

06/21/11 : 00:00am

HOSPITAL DISCHARGE SUMMARY
OUT

Accession number: 18267305291

MUSC Medical Center

HOSPITAL DISCHARGE SUMMARY

Patient Name: MCMAHAN, TIM

MRN: 002657921

Patcom: 495729055

Admitted: 06/15/2011

Discharged: 06/21/2011

Service: Trauma

Attending: Stephanie Montgomery-Idema, MD

Referring: NONE PER PATIENT -

Primary Care Physician: -

HISTORY OF PRESENT ILLNESS: This is a 59-year-old male status post crush injury by bus. The patient was working on a bus and it fell off the jack. Per EMS, the patient was hypoxic en route with an O2 saturation 92%, but was hemodynamically stable. En route he was complaining of severe back pain. The patient was made a level B trauma alert. Per EMS, the patient did not sustain a loss of consciousness, and he was brought to MUSC ED via ground ambulance.

PAST MEDICAL HISTORY: Significant for COPD.

PAST SURGICAL HISTORY: Significant for the patient had a right lung nodule which was resected approximately 8 years ago. The patient states that the pathology was benign.

SOCIAL HISTORY: The patient states that he smokes 1-1/2 packs a day for 30 years. States he drinks 3-6 beers a day, and denies any illicit drug use.

FAMILY HISTORY: Noncontributory.

ALLERGIES: The patient is allergic to penicillin.

PRIMARY SURVEY: His airway was patent and stable. Breathing: His breath sounds were clear to auscultation bilaterally. Circulation: He had no signs or symptoms of shock, with a heart rate of 83, blood pressure 117/62. Disability: The patient had no abnormalities, with a GCS of 15. Resuscitation: Proper resuscitation was performed. He had peripheral IVs placed. An EKG monitor was placed. He was placed on supplemental oxygen. A pulse oximeter was placed.

PHYSICAL EXAMINATION:

HEENT: Head was normocephalic and there were 2 scalp lacerations on the right posterior aspect, which measured out to approximately a total length of 7 cm.

NECK: The patient did have a C-collar in place, but no obvious soft tissue damage.

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MUSC PAGE 1 OF 82

Discharge/Op Notes

Page: 2

Name: MCMAHAN, TIM

Date Printed: 07/26/11

ID: 2657921

SEX: M AGE: 59

CHEST: His lungs were clear to auscultation bilaterally.
HEART: Regular rate and rhythm. Chest wall had no crepitus appreciated.
BACK: The patient did have tenderness to palpation in his thoracic spine, but there were no obvious step-offs or deformities.
ABDOMEN: Soft, nontender, nondistended. Pelvis was stable.
GENITOURINARY: The patient had no blood at the meatus noted and he did have decreased sphincter tone.
EXTREMITIES: Exam within normal limits.
VASCULAR: His femorals were 2+ bilaterally.
NEUROLOGIC: Cranial nerves 2-12 were grossly intact overall. Sensory Exam: The patient upon arrival did have tingling and a pins-and-needles down his bilateral legs. Motor Exam: He had a 1/5 on his right lower extremity in his extensor hallucis longus, though the sensation was intact. The rest within normal limits.

After a full evaluation in the trauma bay, it was found that the patient did have the T12 vertebral body fracture with retropulsion. Neurosurgery was consulted and the patient was admitted to the STICU in serious condition.

HOSPITAL COURSE: The patient was transferred to the STICU. For his STICU hospital course, please see previously dictated transfer summary on 06/16/2011. The patient was transferred out to the floor in stable condition. Neurosurgery did continue to follow the patient postoperatively. At this time, the patient does have 4/5 strength in his bilateral lower extremities. He is experiencing some hyperesthesia and describing some burning pain in his bilateral lower extremities. The patient does state that any minimal pressure on any of his legs in the bilateral will cause intense tenderness. This has improved slightly over his hospital course. The patient did have a drain in place postoperatively which Neurosurgery did remove. At this time, they believe he is safe to discharge from their standpoint. His surgical incision is clean, dry, and intact. His drain site is clean, dry, and intact. They will follow the patient up in approximately 1 month and repeat his lateral T- and L-spine x-rays. Secondary to his injury, Occupational Therapy and Physical Therapy were consulted and did work extensively with the patient throughout his hospital course. The patient has made improvement, but at time of discharge both are recommending the patient would benefit from acute rehab for increased strength, endurance, and mobility. The patient's postoperative course was complicated by a bout of acute urinary retention. We did perform a bladder scan on the evening of 06/20, which did show patient had 600 cc within his bladder. At this time, we did replace his Foley. The patient would benefit from a voiding trial in approximately 3 days. The patient's staples were removed on day of discharge, and require no followup. Otherwise, the patient has remained stable on the floor.

CURRENT PHYSICAL EXAMINATION:

VITAL SIGNS: Temperature is 97.2. O2 saturation is 97% on room air. Respirations 20, pulse 77, blood pressure 115/71. The patient had adequate p.o. intake and has put out 1000 mL of urine output.
NEUROLOGIC: He is alert and oriented x3, with a GCS of 15. He still is complaining of hyperesthesia as well as strength 4/5 in his bilateral lower extremities.
CARDIOVASCULAR: He is regular rate and rhythm.

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MUSC PAGE 2 OF 82

Discharge/Op Notes

Page: 3

Name: MCMAHAN, TIM

Date Printed: 07/26/11

ID: 2657921

SEX: M AGE: 59

RESPIRATORY: Clear to auscultation bilaterally.
ABDOMEN: Soft, nontender, and nondistended.
EXTREMITIES: Exam within normal limits.
SKIN: The patient's surgical incision is clean, dry, and intact, and his drain site is clean, dry, and intact.

At this time, the patient is tolerating a regular diet. We are treating his acute urinary retention with a Foley catheter. He is able to get up and out of bed and ambulate and work with Physical Therapy towards goals. His pain has been well controlled on p.o. pain meds. He has had a stable neurological exam and he was deemed safe to discharge to acute rehab.

DISCHARGE DIAGNOSIS(ES): Primary Diagnosis: Acute urinary retention, T12 vertebral body fracture, scalp laceration x2.

Secondary Diagnoses: Chronic obstructive pulmonary disease.

SURGICAL PROCEDURE: T11 through L1 fusion performed by Dr. Turner on 06/15/2011. Incidental findings of a left renal calculi and right 6 mm upper lobe nodule, for which the patient will need a followup given his history of a lung biopsy approximately 8 years ago.

PATIENT DISPOSITION: He will be discharged to HealthSouth rehab in stable condition.

ACTIVITY: He has been instructed to walk with assistance or device and to not drive or operate machinery while taking narcotics.

WEIGHTBEARING STATUS: He has no restrictions.

DIET: He is on a regular diet.

WOUND CARE: Wound care for his surgical incision and his drain site as well as the scalp lacerations: You can cover with gauze as needed, clean with soap and water only. Okay to shower.

FOLLOWUP APPOINTMENTS: He has been encouraged to follow up with the primary care of choice after he is discharged from rehab for his lung nodule followup. He will follow up with Neurosurgery, Dr. Turner, in 1 month for a postop check.

ADDITIONAL INSTRUCTIONS: Please call if you have a temperature greater than 101.5; any diarrhea or constipation for more than 2 days; any numbness and tingling that has changed; any increased drainage, foul odor, or green drainage from your wounds; any nausea, vomiting; shortness of breath lasting greater than 5 minutes; pain not controlled with pain medications; dizziness or feeling lightheaded; or any other concerns.

At this time, the patient will be discharged from 9 West. Contact phone numbers are 557-3064 and 330-2986.

DISCHARGE MEDICATIONS: The patient will be discharged with the following medications: Milk of magnesia 30 mL p.o. q.6 hours p.r.n. constipation; Colace 100 mg p.o. b.i.d.; senna 8.6 mg p.o. b.i.d.

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Discharge/Op Notes

Page: 4

Name: MCMAHAN, TIM

Date Printed: 07/26/11

ID: 2657921 SEX: M AGE: 59

p.r.n. constipation; MS Contin 15 mg p.o. b.i.d.; gabapentin 400 mg p.o. t.i.d.; diazepam 5 mg p.o. t.i.d.; Lortab 7.5/500 mg p.o. 1 tablet q.4 hours p.r.n. pain; Zofran 4 mg IV q.4 hours p.r.n. nausea; and the patient is receiving Lovenox 30 mg subcu b.i.d. for DVT prophylaxis only.

Dictated by: Michael Mostoller, PA

Michael Mostoller, PA

Stephanie Montgomery-Idema, MD
Attending

305291 / 44076 /
JOB: 6050450
DD: 06/21/11 11:08 AM
DT: 06/21/11 12:44 PM

Additional CC:

Authenticated by MICHAEL C MOSTOLLER, MD On 06/21/2011 03:55:17 PM

Authenticated by STEPHANIE MONTGOMERY-IDEMA, MD On 06/22/2011 11:46:26 AM

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MUSC PAGE 4 OF 82

MUSC Medical Center
OPERATIVE NOTE

PATIENT NAME: MCMAHAN, TIM D
MRN: 002657921
PATCOM: 104407010
DATE OF SURGERY: 10/10/2011
SERVICE: Surgery, Neurological
SURGEON: Raymond D Turner IV, MD
ASSISTANTS:

PREOPERATIVE DIAGNOSIS: T12 compression fracture.

POSTOPERATIVE DIAGNOSIS: T12 compression fracture.

SURGERY PERFORMED: T11, T12, L1 laminectomy and bilateral foraminotomies. Placement of pedicle screws at T10. Removal and replacement of pedicle screws at T11. Placement of pedicle screws at L2 with a bilateral transpedicular approach to the anterior-posterior spine at T12 and a vertebral corpectomy, this will allow extracavitary approach and placement of interbody cages packed in morselized autograft and allograft for an anterior arthrodesis and a posterolateral arthrodesis at T10 to L2 using morselized autograft and allograft with correction of T12 compression fracture and restoration of normal alignment.

FIRST ASSISTANT: Steven Morgan, MD.

HISTORY OF PRESENT ILLNESS: The patient is a very pleasant 60-year-old gentleman who was involved in the bus accident and the patient was left to be paraplegic with T12 compression fractures initially decompressed and fixed in situ, and the patient recovered. The patient is able to regain some mobilization of his lower extremities, and he was able to ambulate with mild assistance. However, the patient did have deformity correction which left him with severe back pain. All the risks, benefits, and alternatives, indications with the surgery was discussed with the patient and his family. They agreed to proceed with the surgery.

OPERATIVE PROCEDURE: The patient was brought to the operating room, appropriately marked and identified and placed under general endotracheal anesthesia. He was placed prone on the Jackson table and prepped and draped in usual sterile manner. A time out was performed, antibiotics were given. A midline incision was then opened up in the soft tissue and was taken down to the paraspinal muscles. Those muscles were then dissected laterally off the spinous processes at T10, T11, L1, and L2. At which point in time meticulous hemostasis was achieved. Localizing x-rays confirmed the appropriate levels and positioning; then a laminectomy was performed at T10 and redo laminectomies at T11, T12, and L1. Once that was completed and meticulous hemostasis was achieved, pedicle screws were placed bilaterally at T10 to T11. Pedicle screws were removed bilaterally and repositioned and placed at T11, and pedicle screws were placed bilaterally at L2 using transpedicular approach. X-rays were used intermittently throughout the whole procedure. The Stryker Xia pedicle screws were used. Once that was completed and hemostasis was achieved, the transpedicular approach was taken down bilaterally at T12 to expose the vertebral body in nerve roots. A corpectomy was then performed at T12 as well as discectomies at T11-T12 and T12-L1 in the end plates of T11 and L1 were prepared. Once that was completed and hemostasis was achieved, using extracavitary approach Stryker VLIFT cage packed with morselized autografts

and allografts was placed via an extracavitary approach in the anterior part of the spine and placed in the appropriate position and expanded up. Once that was completed and hemostasis was achieved, rods were fashioned and placed into the rods and under the compression they were locked into position with the appropriate torque level which corrected his fracture dislocation and kyphosis at T12. Once that was completed and hemostasis was achieved, we confirmed with X-rays open reduction of his fracture dislocation. The posterolateral surfaces of the spine decorticated in the posterolateral arthrodesis with morselized allograft and autograft was placed at T10 to L2. Once that was completed and hemostasis was achieved, a cross-link was placed at the level of T12 and that was pinned into position. A dural opening that was encountered was repaired primarily using 4-0 Nurodon and then DuraSeal, and then a medium Hemovac was left in place and the muscle was reapproximated using 0 Vicryl and the muscle fascia was closed using 0 Vicryl. Subcutaneous layer was closed in 2-0 Vicryl and the skin was closed with 3-0 PDS. Sterile dressing was applied. The patient was placed supine on the back and emerged from anesthesia and taken to the PACU postoperative care.

COMPLICATIONS: None.

ESTIMATED BLOOD LOSS: Approximately 1200 mL.

Dictated by: Raymond D Turner IV, MD

Raymond D Turner IV, MD
Surgeon

484923251/medq/

JOB: 1013293

DD: 10/10/2011 12:05:52

DT: 10/11/2011 03:00:40

Authenticated by RAY TURNER, MD On 10/21/2011 09:46:02 AM

Authenticated and Edited by Ann Shuler, HIS Supervisor On 3/02/12 11:22:57 AM

Authenticated by RAY TURNER, MD On 03/05/2012 10:02:09 AM



Progress Notes

Page: 1

Name: MCMAHAN, TIM

Date Printed: 08/06/12

ID: 2657921 SEX: M AGE: 60

10/10/11 : 00:00am

MUSC UROLOGY RETURN VISIT

3UR

Tim McMahan was seen as an inpatient consultation. He is a 60-year-old man who suffered a T12 vertebral body fracture in June of 2011. He underwent a T11-L1 fusion at that time. He had urinary retention during that admission. He was then readmitted on 10/09/11 and underwent a T11, T12, L1 laminectomy and bilateral foraminotomy with placement of pedicle screws at T10 and removal of the pedicle screws at T11. He underwent in addition weak spinal reconstruction at that time as well. Postoperatively, he went into urinary retention. He has been placed on intermittent catheterization four times a day. He had no antecedent urological history.

He will have a renal ultrasound as an inpatient and then follow up as an outpatient in two to four weeks for reassessment of his voiding status and ability to do intermittent catheterization.

Eric S. Rovner, MD
Professor
Department of Urology
MUSC Department of Urology

ER/am1778

dd: 10/14/2011

dt: 10/20/2011

JobID: 4582012

SIGNED BY ERIC ROVNER, MD (ATTENDING) (3UR) 10/20/2011 08:23AM

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Progress Notes

Page: 1

Name: MCMAHAN, TIM

Date Printed: 08/06/12

ID: 2657921 SEX:M AGE:60

10/13/11 : 03:24pm

UROLOGY CONSULT

3UR

MEDICAL UNIVERSITY OF SOUTH CAROLINA

TIM MCMAHAN

60 year old male who suffered a crush injury when the bus he was working on fell on him in June, 2011. He presented as a level B trauma to MUSC and among other injuries was found to have a T12 vertebral body fracture with retropulsion. Neurosurgery took patient to the OR where he underwent T11 through L1 fusion. Patient had episode of urinary retention during this initial hospitalization but was able to void volitionally prior to discharge and denies any episodes of urinary retention after discharge. Patient subsequently represented to MUSC 10/10/2011 for correction of his prior spine surgery as he was having back pain from a deformity correction during initial surgery. Patient went to the OR with neurosurgery on aforementioned date for:

"T11, T12, L1 laminectomy and bilateral foraminotomies. Placement of pedicle screws at T10. Removal and replacement of pedicle screws at T11. Placement of pedicle screws at L2 with a bilateral transpedicular approach to the anterior-posterior spine at T12 and a vertebral corpectomy, this will allow extracavitary approach and placement of interbody cages packed in morselized autograft and allograft for an anterior arthrodesis and a posterolateral arthrodesis at T10 to L2 using morselized autograft and allograft with correction of T12 compression fracture and restoration of normal alignment."

Post-operatively the patient has been experiencing penile parathesia, numbness of his bilateral lower extremities and urinary retention. Patient was given a voiding trial which he failed and has subsequently been managed with CIC. Patient denies any prior history of urologic pathology, LUTS, or having been evaluated by a urologist. Otherwise patient denies any recent chest pain, shortness of breath, nausea, vomiting, diarrhea, or constipation.

PAST MEDICAL HISTORY: Significant for COPD.

PAST SURGICAL HISTORY: Significant for the patient had a right lung nodule which was resected approximately 8 years ago. The patient states that the pathology was benign.

SOCIAL HISTORY: The patient states that he smokes 1-1/2 packs a day for 30 years. States he drinks 3-6 beers a day, and denies any illicit drug use.

FAMILY HISTORY: Noncontributory.

ALLERGIES: The patient is allergic to penicillin.

MEDS:

Dexamethasone
Flomax
senna
colace
magnesium hydroxide
mineral oil suppository
mag citrate
neurontin
hydralazine
methocarbamol
SQH

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Progress Notes

Page: 2

Name: MCMAHAN, TIM

Date Printed: 08/06/12

ID: 2657921 SEX:M AGE:60

zofran
diazepam
tylenol
pepcid
zolpidem
tylenol
oxycodone

ROS: per hpi

PE:

36.4 93 24 98% 101/64

NAD

RRR

CTAB

soft/nt/nd

bilateral descended testicles with normal cord structures, uncircumcised phallus with orthotopic and patent urethral meatus which is insensate, normal rectal tone w stool in vault with 2/4 prostate without discrete nodules
patient sensitive to light touch on toes however says his lower extremities feel "numb"

4+ strength in bl upper extremities

1+ strength in bl lower extremities

A/P: 60 yo M with urinary retention after spinal surgery to correct prior sugery for T12 burst fracture.

-Patient should continue with CIC q4 hours.

-Patient should follow up with Dr. Rovner in 1 month.

Case discussed with Dr. Rovner.

as above.

urinary retention after spinal surgery. start CIC, get Renal us. followup in clinic.

SIGNED BY SAMUEL W NICKLES, MD (RESIDENT) (C8D) 10/13/2011 07:41PM
SIGNED BY ERIC ROVNER, MD (ATTENDING) (3UR) 10/14/2011 08:42AM

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Progress Notes

Page: 1

Name: MCMAHAN, TIM

Date Printed: 08/06/12

ID: 2657921 SEX: M AGE: 60

12/06/11 : 12:15pm

NEUROSURGERY - GENERAL FOLLOW-UP NOTE
MEDICAL UNIVERSITY OF SOUTH CAROLINA
2LG:P7B

NAME: TIM MCMAHAN

AGE: 60 year old

GENDER: male

HISTORY OF PRESENT ILLNESS: Patient is a 60 year old s/p the following on 10-15-11

POSTOPERATIVE DIAGNOSIS: T12 compression fracture.

SURGERY PERFORMED: T11, T12, L1 laminectomy and bilateral foraminotomies. Placement of pedicle screws at T10. Removal and replacement of pedicle screws at T11. Placement of pedicle screws at L2 with a bilateral transpedicular approach to the anterior-posterior spine at T12 and a vertebral corpectomy, this will allow extracavitary approach and placement of interbody cages packed in morselized autograft and allograft for an anterior arthrodesis and a posterolateral arthrodesis at T10 to L2 using morselized autograft and allograft with correction of T12 compression fracture and restoration of normal alignment.

He presents with his daughter and case manager--He is now home from acute rehab. His major complaint is left leg pain and bilateral foot swelling since his surgery. He is taking oxycontin and oxycodone prescribed by his PCP.

REVIEW OF SYSTEMS

Constitutional: No change in weight, fever, chills, night sweats, or fatigue.

Musculoskeletal: left leg pain

Neurological: generalized weakness, in wheelchair

Sensory: numbness and tingling in feet

The remainder of the review of systems was negative.

PHYSICAL EXAM

Gen: NAD, WM, cachetic appearance since surgery

Neurological - Mental Status/Speech/Language: The patient is oriented to person, place and time. Recent and remote memory appears intact. Attention, affect and speech are normal. Thought content appears normal. General fund of knowledge and vocabulary is appropriate for level of education.

Skin: Good turgor, no rash or prominent lesions, incision intact

Vascular: no bruit, 2+ pulses UE & LE, bilateral 2+ pitting edema bilateral feet, calf swelling bilateral

Musculoskeletal: left leg 4/5 strength, right 3/5

Sensory: Normal LT/DT B/C UE & LE

Imaging: from outside hospital Ct scan 11-23-11 was reviewed and demonstrates stable construct, lumbar DDD, thoracic DDD

Diagnosis: T12 compression fracture.

Assessment and Plan: Patient to undergo Duplex ultrasound to identify any DVT's due to his foot swelling--he will be in contactw with our office after this is complete. We have also prescribed compression stockings that he can obtain over

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Progress Notes

Page: 2

Name: MCMAHAN, TIM

Date Printed: 08/06/12

ID: 2657921 SEX:M AGE:60

the counter.

- # SIGNED BY MEGAN E FULTON, PA-C (2LG) 12/14/2011 12:26PM
- # REVISED BY MEGAN E FULTON, PA-C (2LG) 12/14/2011 12:36PM
- # CO-SIGNED BY RAYMOND TURNER, M.D. (ATTENDING) (P7B) 12/16/2011 03:11PM

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STATE OF SOUTH CAROLINA
DEPARTMENT OF EDUCATION

Mick Zais
Superintendent

1429 Senate Street
Columbia, South Carolina 29201

January 13, 2012

CERTIFIED MAIL
RETURN RECEIPT#: 7007 2560 0003 1090 4473

Timothy McMahan
123 Arnold Drive
Charleston, South Carolina 29456

Dear Mr. McMahan:

Our records indicate that your last day worked in the Office of Transportation, Summerville Bus Shop was June 15, 2011. Based on the restrictions by your doctor, coupled with exhausting your extended disability leave, your reinstatement privileges are forfeited and your employment was terminated effective January 12, 2012.

If you have any questions please contact me at 734-8505.

Sincerely,

A handwritten signature in cursive script, reading "Alfredia Boyd", is positioned above the typed name.

Alfredia Boyd
Employee Relations Manager
Office of Human Resources

AB/cre

cc: Tim Camp, Director of Transportation
Garry Fast, Area IV Supervisor
Kelly Price, Summerville Bus Shop Supervisor

phone: 803-734-8492 • fax: 803-734-3389 • www.ed.sc.gov

Chancery Court of Cocke County, Tennessee

IN THE MATTER OF THE ESTATE OF

NO. 2013-PR-71

TIMOTHY DONALD McMAHAN, SR. DECEASED
of Cocke County, Tennessee

DOROTHY M. McMAHAN
PERSONAL REPRESENTATIVE

ADDRESS: 760 Central Church Road
Morristown, TN 37814

Letters Testamentary

It appearing to the Chancery Court that the above named deceased person left a will, and said Court having appointed the above named Executor upon making bond and/or qualifying as directed by law;

It is therefore, ORDERED that Letters Testamentary are hereby issued to the above named Executor, being now empowered to enter into and take possession of all property rights and credits of this deceased person, and to administer this estate as required by law.

In witness whereof, I have issued these letters Testamentary, this the 1st day of

July, 2013

Craig Wild
Sr

Craig Wild, Clerk and Master

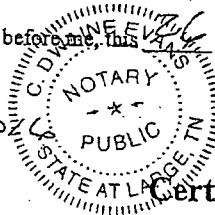
STATE OF TENNESSEE
COUNTY OF EMBLEN

I do solemnly swear that I will honestly and faithfully discharge the duties imposed on me, including the filing of inventory, settlement and inheritance tax return, as required by law.

Timothy McMahon

Subscribed and sworn to before me, this 1st day of June, 2013

My commission expires: 10/30/2014



NOTARY

Certificate

I, Craig Wild, Clerk and Master of the Chancery Court of Cocke County, Tennessee, hereby certify that: (1) this is a Court of Record; (2) the above is a true and correct copy of the Letters Testamentary issued by said Court in the above named estate; and (3) these letters are still in full force and effect as of this date.

Witness my hand and seal, this 1st day of July, 2013

Craig Wild
Sr

Craig Wild, Clerk and Master
360 East Main Street, Suite 103
Cocke County Courthouse Annex
Newport, Tennessee 37821

STATE OF TENNESSEE

Office of Vital Records

TENNESSEE DEPARTMENT OF HEALTH

CERTIFICATE OF DEATH

STATE FILE NUMBER

1. DECEDENT'S LEGAL NAME (First, Middle, Last, Suffix) Timothy Donald McMahon Sr.		2. SEX Male		3. DATE OF DEATH (Month, Day, Year) October 8, 2012	
4. TIME OF DEATH (Month, Day, Year) 8:55 PM		5a. UNDER 1 YEAR 81		5b. UNDER 1 DAY August 31, 1951	
6. PLACE OF DEATH (Check only one) ☐ Inpatient ☐ Outpatient ☐ OCA ☐ Hospice facility ☐ Nursing home/Long term care facility ☒ Decedent's home ☐ Other residence ☐ Other (Specify)		7. PLACE OF DEATH (Check only one) Newport			
8. FACILITY NAME (If not institution, give street and number) 1688 W. Hwy. 25/70		9. CITY OR TOWN Newport		10. COUNTY OF DEATH Cooke	
11. MARITAL STATUS ☒ Married ☐ Married, but separated ☐ Widowed ☐ Divorced ☐ Never married ☐ Unknown		12. SURVIVING SPOUSE (If wife, give name prior to first marriage) Dorothy Hurst		13. DECEDENT'S USUAL OCCUPATION Mechanic	
14. SOCIAL SECURITY NUMBER 415-90-3127		15. RESIDENCE STATE OR FOREIGN COUNTRY Tennessee		16. COUNTY Cooke	
17. STREET AND NUMBER 1688 W. Hwy. 25/70		18. INSIDE CITY LIMITS ☐ Yes ☒ No		19. ZIP CODE 37821	
20. DECEDENT'S EDUCATION (Check the best that best describes the highest degree or level of school completed at the time of death) ☐ 8th grade or less ☐ 9th-12th grade, no diploma ☒ High school graduate or GED completed ☐ Some college credit, but no degree ☐ Associate degree (e.g., AA, AS) ☐ Bachelor's degree (e.g., BA, BS) ☐ Master's degree (e.g., MA, MS, MEd, MEd, MEd, MBA) ☐ Doctorate (e.g., PhD, EdD) or Professional degree (e.g., MD, DDS, DVM, LLJ, JD) ☐ Unknown		21. DECEDENT'S RACE (Check one or more races to indicate what the decedent considered himself or herself to be) ☒ White ☐ Black or African American ☐ American Indian or Alaska Native (Name of the individual or principal tribe) ☐ Asian Indian ☐ Chinese ☐ Filipino ☐ Japanese ☐ Korean ☐ Vietnamese ☐ Other Asian (Specify) ☐ Native Hawaiian ☐ Guamanian or Chamorro ☐ Samoan ☐ Other Pacific Islander (Specify) ☐ Other (Specify) ☐ Unknown		22. DECEDENT'S PLACE OF BIRTH (City and State, Zip Code) 1688 W. Hwy. 25/70 Newport, TN 37821	
23. FATHER'S NAME (First, Middle, Last) Theodore Callett		24. MOTHER'S NAME (First, Middle, Last) Mary Manning		25. INFORMANT'S NAME Dorothy McMahon	
26. METHOD OF DISPOSITION ☐ Burial ☒ Cremation ☐ Donation ☐ Entombment ☐ Removal from State ☐ Other (Specify)		27. PLACE OF DISPOSITION (Name of cemetery, crematory, other place) Cremation Services of East TN		28. LOCATION - City or Town and State Monroeville TN 37810	
29. SIGNATURE OF FUNERAL DIRECTOR W. Jack Porter		30. LICENSE NUMBER TN 3389		31. SIGNATURE OF EMBALMER	
32. NAME AND ADDRESS OF FUNERAL HOME Farrar D Funeral Homes Corporation, 162 E. Meeting Street, PO Box 1025, Dandridge, Tennessee 37725		33. LICENSE NUMBER OF FUNERAL HOME 37725		34. LICENSE NUMBER 438	
35. SIGNATURE OF REGISTRAR Teresa S. Hendricks		36. DATE FILED (Month, Day, Year) October 9, 2012		37. CERTIFIER (Check only one) ☒ PHYSICIAN - To the best of my knowledge, death occurred at the date and place, and due to the cause(s) and manner stated. ☐ MEDICAL EXAMINER - On the basis of examination, and/or investigation, in my opinion, death occurred at the date, and place, and due to the cause(s) and manner stated.	
38. SIGNATURE OF CERTIFIER Teresa S. Hendricks		39. LICENSE NUMBER 39083		40. DATE SIGNED (Month, Day, Year) 10/10/12	
41. NAME AND ADDRESS Swanson, Dr. Rual, 118 E. Meeting St. Dandridge, TN 37725		42. PART I. Enter the chain of events (diseases, injuries, or complications) that directly caused the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the strategy. Enter only one cause on a line.			
IMMEDIATE CAUSE (First disease or condition resulting in death) a. End Stage CHF		b. Due to (or as a consequence of): End Stage CoPD		c. Due to (or as a consequence of): Due to (or as a consequence of):	
d. Underlying Cause (Disease or injury that initiated the events resulting in death) LAST		e. Due to (or as a consequence of):			
PART II. Enter significant conditions contributing to death but not resulting in the underlying cause given in PART I.		43. WAS AN AUTOPSY PERFORMED? ☐ Yes ☒ No			
44. MANNER OF DEATH ☒ Natural ☐ Homicide ☐ Accidents ☐ Pending investigation ☐ Suicide ☐ Could not be determined		45. DID TOBACCO USE CONTRIBUTE TO DEATH? ☐ Yes ☒ Probably ☐ No ☐ Unknown		46. IF FEMALE: ☐ Not pregnant within past year ☐ Pregnant at time of death ☐ Not pregnant, but pregnant within 42 days of death ☐ Unknown if pregnant within two past year	
47. IF TRANSPORTATION INJURY, SPECIFY: ☐ Driver/Operator ☐ Passenger ☐ Pedestrian ☐ Other (Specify)		48. DATE OF INJURY (Month, Day, Year) 14. DESCRIBE HOW INJURY OCCURRED		49. TIME OF INJURY 50. INJURY AT WORK? ☐ Yes ☒ No	
51. PLACE OF INJURY - at home, farm, street, factory, office, building, etc. (Specify)		52. LOCATION OF INJURY (Street and Number, City or Town, State)			

PH-1050 (Rev. 10/2011)

RDA 1386

I hereby certify the above to be a true and correct copy of the original document on file in this department. This certified copy is valid only when printed on security paper showing the red embossed seal of the Department of Health. Alteration or erasure voids this certification.

Tennessee Code Annotated 53-3-101 et seq., Vital Records Act of 1977.

5422564

Teresa S. Hendricks
Teresa S. Hendricks
STATE REGISTRAR

Vickie L. Sauceman
Vickie L. Sauceman, Local Registrar
Cooke County Health Department

Date Issued: OCT 9 2012

CERTIFICATION OF VITAL RECORD

If apportionment is needed, the analysis must consider the nature of the impairment and its relationship to each alleged causative factor, along with an explanation of the medical basis for all conclusions and opinions. Using this approach to apportionment requires accurate information and data to determine all impairment ratings both before and after the most recent injury. If different editions of the *Guides* have been used, the physician must assess their similarity. If the basis of the ratings is similar, a subtraction is appropriate. If the bases of the ratings differ markedly, the physician should evaluate the circumstances and determine whether conversion to the earlier or latest edition of the *Guides* for both ratings is possible. The determination should follow the local jurisdiction's guidelines and consider whichever edition best describes the individual's impairment. If no rating was previously assigned, the examiner must use available information to estimate what the rating was before the new injury, and subtract this from the "new" rating as noted earlier.

2.5d Changes in Impairment From Prior Ratings

Although a previous evaluator may have considered a medical impairment to be permanent, unanticipated changes may occur. The condition may have become worse as a result of aggravation or clinical progression, or it may have improved. The physician should assess the current state of the impairment according to the criteria in the *Guides*. If an individual received an impairment rating from an earlier edition and needs to be reevaluated because of a change in the medical condition, the individual is evaluated according to the latest information pertaining to the condition in the current edition of the *Guides*.

Valid assessment of a change in the impairment estimate depends on the reliability of the previous estimate and the evidence on which it was based. If a prior impairment evaluation was not performed, but sufficiently well documented information is available to currently estimate the prior impairment, the assessment would be performed based on the most recent *Guides'* criteria. However, if the information is insufficient to accurately document the change, the physician must explain the basis of a prior determination and should not estimate the change.

2.5e Maximum Medical Improvement

Maximum Medical Improvement refers to a status where patients are as good as they are going to be from the medical and surgical treatment available to them. It can also be conceptualized as a date from which further recovery or deterioration is not anticipated, although over time (beyond 12 months) there may be some expected change. The *Guides*, however, does not permit the rating of future impairment. There

can be some scenarios with individuals now at MMI but with potential for future progression of their disease. For example, an individual exposed to asbestos who is currently stable with perhaps some current objective findings that are unlikely to change in the next 12 months but with a potential for malignancy in the distant future. Nevertheless, these individuals can be rated based on the current findings with the notation of a potential for progression in the distant future.

Thus, MMI represents a point in time in the recovery process after an injury when further formal medical or surgical intervention cannot be expected to improve the underlying impairment. Therefore, MMI is not predicated on the elimination of symptoms and/or subjective complaints. Also, MMI can be determined if recovery has reached the stage where symptoms can be expected to remain stable with the passage of time, or can be managed with palliative measures that do not alter the underlying impairment substantially, within medical probability.

Maximum Medical Improvement does not preclude the deterioration of a condition that is expected to occur with the passage of time or as a result of the normal aging process; nor does it preclude allowance for ongoing follow-up for optimal maintenance of the medical condition in question.

In certain instances, the treatment of an illness may result in apparent total remission of the person's signs and symptoms. Examples include the treatment of hypothyroidism with levothyroxine and the treatment of type 1 diabetes mellitus with insulin. However, if the examiner concludes that with such permanent treatment based on objective findings, the patient has actually not regained his or her previous function, and if the *Guides* has not provided specific criteria to rate such impairment, the physician may choose to increase the impairment estimate by a small percentage (eg, 1% to 3%). Such a discretionary impairment is provided only once and is not to be duplicative of impairment provided for BOTC.

In some instances, as with organ transplant recipients who are treated with immunosuppressant pharmaceuticals or persons treated with anticoagulants, the pharmaceuticals themselves cause impairments. In such instances, if the impairment is permanent, the physician should use the applicable parts of the *Guides* to evaluate actual impairment related to pharmaceutical effects and combine it with the primary organ system impairment, by means of the Combined Values Chart (Appendix).

2.5f Permanency

Permanency is the condition whereby impairment becomes static or well stabilized with or without

medical treatment and is not likely to remit in the future despite medical treatment, within medical probability. This term is usually synonymous with MMI, usually occurring when all reasonable medical treatment expected to improve the condition has been offered or provided.

Impairment ratings are to be performed when an individual is at a state of permanency. However, many systemic or organ-based conditions are dynamic rather than static in nature and are, to some extent, never at permanency. In such cases, one can usually anticipate future functional decline based on the natural history of the disease process, which is generally well established in the literature.

2.5g Cultural Differences

Cultural differences between the examiner and the patient can greatly increase the risk of the examiner misinterpreting the patient's responses.⁵ For example, Waddell's signs are not valid in non-Anglo cultures, as their reliability has been tested only among English and North American patients. Effective medical communication requires an understanding of and respect for the patient's cultural background, religious beliefs, and ability to assimilate medical information. Examiners are expected to use qualified interpreters—not family members or untrained office staff—for impairment rating examinations.

Sensitivity and awareness are the keys for examiners. The examiner should ensure the involvement of a qualified interpreter for the impairment examination. In most systems the insurers are required to pay for the interpreter, but frequently the examiner must request the interpreter. When the examiner has established a level of comfort with the patient, questions about what the patient believes caused the condition and who has advised and/or treated them can be very revealing and lead to an accurate impairment rating. When patients from a different culture have an unexpected response to treatment of their condition, consider cultural differences.

2.6 Impairment Evaluation and the Law

Physicians have traditionally been regarded as an authority in their craft and are accustomed to getting their opinions accepted as the final truth.⁶ However, in a legal proceeding, the physician's opinion when unsupported by established science can lead to challenges and cause needless frustration and anxiety for the physician and others. Contemporary adjudication process increasingly questions the science behind

Cultural Differences Examples

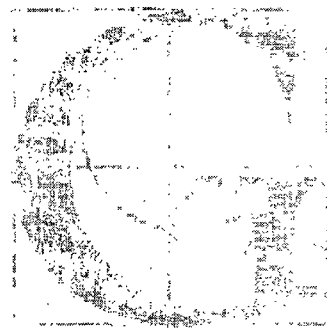
The examiner must be cognizant of the difference in the patient's fundamental cultural values and the traditional Western medical view. The following are examples of essential differences in philosophy toward disease and injury. American Native Indians may believe illness is a price to be paid for past or future personal deeds. Individuals from hierarchal cultures, such as traditional Asian and Hispanic cultures, are less likely to disagree with a physician out of respect for the physician's education and experience. This may lead a patient to be reluctant to answer open ended questions or to try and guess the answer desired by the physician when answering such questions. They are also likely to view the physician as an authoritative figure and as such be reluctant to participate in physician-patient decision making, since the physician is expected to know the correct treatment. Both cultures are also likely to seek care outside of the western medicine. Asians expect to experience some distance between the provider and themselves and may be uncomfortable with social physical contact. Hispanics, however, generally prefer a social situation and are more comfortable if the encounter includes some conversation about family and some physical contact such as a hand shake. In cultures where physical ability is considered an essential element of masculinity, males may suffer extreme psychological distress over a physical impairment that decreases their earning capacity and lowers their internal sense of masculinity⁷. Naturally, no generalization represents a culture accurately and all patients must be treated as individuals.

the doctor's assertions, and doctors are increasingly faced with the challenge of litigants demanding multiple opinions.

In the legal context, an impairment evaluation is a form of expert testimony. The use of the *Guides* requires the physician to use the same skills, knowledge, and ability as in the therapeutic practice of medicine in the collection of data and making of an accurate diagnosis. The *Guides* then is used to channel that information and translate it into an impairment number.

Judicial decisions state that arbitrary and dogmatic opinions, even from well-qualified experts, are not held credible. Therefore, doctors providing independent medical examinations and expert testimony

The Central and Peripheral Nervous System



- 13.1 Principles of Assessment
- 13.2 Method for Rating Impairments due to Nervous System Disorders
- 13.3 Criteria for Rating Cerebral Impairments
- 13.4 Criteria for Rating Impairment due to Spinal Cord Dysfunction and Movement Disorders
- 13.5 Criteria for Rating Impairments of the Upper Extremities due to CNS Dysfunction
- 13.6 Criteria for Rating Impairments of Speech, Hearing, and Movement Disorders
- 13.7 Criteria for Rating Neurogenic Bowel, Bladder, and Sexual Dysfunction
- 13.8 Criteria for Rating Neurogenic Respiratory Dysfunction
- 13.9 Criteria for Rating Peripheral Neuropathies, Neuromuscular Junction Disorders, and Myopathies
- 13.10 Criteria for Rating Impairments Related to Complex Regional Pain Syndrome
- 13.11 Criteria for Rating Impairments Related to Craniocephalic Pain
- 13.12 Criteria for Rating Miscellaneous Peripheral Nerves of the Head and Trunk
- 13.13 Nervous System Impairment Evaluation Summary

Introduction

The goals of this chapter of the *AMA Guides* are:

- To provide an evolutionary but not revolutionary revision of the chapter.
- To strive for a more concise presentation of material in concert with the general goals of the Sixth Edition.
- To clarify tables and improve the rater's ability to choose reliably between impairment rating categories.
- To offer single values rather than ranges for impairment categories. Ranges implied a level of impairment rating validity that does not exist.
- To avoid duplication of materials between chapters. It was the collaborative decision of the editorial board of the Sixth Edition of the *Guides* to maintain most ratings related to limbs in the upper and lower extremity chapters (Chapters 15 and 16, respectively), to refer visual disorder ratings to the visual disorders chapter (Chapter 12), and to provide most ratings of nerves of the head and neck in the ear, nose, and throat (ENT) chapter (Chapter 11). Complex Regional Pain

Syndrome (CRPS) is rated only in the upper extremities and lower extremities chapters.

- To maintain consistency between this chapter on neurology and the mental and behavioral disorders chapter (Chapter 14) in terms of ratings of higher cortical function.
- To maintain consistency between the neurology and upper and lower extremities chapters in terms of complete loss of limb function.
- To maintain consistency between the neurology and the digestive system chapter (Chapter 6) in terms of loss of bowel control.
- To maintain consistency between the neurology and the urinary and reproductive systems chapter (Chapter 7) in terms of bladder and sexual function.
- To provide impairment ratings for migraine headaches and miscellaneous peripheral nerves that were not ratable in the previous edition.

This chapter provides criteria for evaluating permanent impairments due to documented dysfunction of the various parts of the nervous system. The nervous system affects virtually every organ system in the body—gut, heart, bladder—and therefore not all disorders of nervous system function are rated within this chapter. To avoid duplication, readers will be referred as needed to other chapters in the *AMA Guides*.

- Disorders of the brain and spinal cord, painful neuropathies of the head and trunk, peripheral neuropathies, neuromuscular junction disorders, and myopathic disorders are rated in this chapter.
- Cranial neuropathies affecting cranial nerves I, V, VII, VIII, IX, X, XI, and XII are dealt with in the ENT chapter (Chapter 11) with the exception of trigeminal and glossopharyngeal neuralgia. Disorders of visual acuity and ocular motility (cranial nerves II, III, IV, and VI) are rated in the visual system chapter (Chapter 12).
- Disorders of the spinal nerves are most often rated when assessing the spine and are assessed in that chapter.
- Focal neuropathies are most often rated when assessing the upper and lower extremities. They have been assigned to those chapters and are *not* rated here. RPS is rated in the upper and lower extremity chapters.
- Expressive and receptive language disorders of language (dysphasias) are rated in this chapter.

Disorders of articulation (dysarthria) and phonation (dysphonia) are rated in the ENT chapter.

A summary of chapters to cross-reference appears in Table 13-1.

13.1 Principles of Assessment

This chapter emphasizes the deficits or impairments that may be identified during a neurologic evaluation. For some nervous system impairments listed, hand dominance is important to determine the degree of impairment.

Before using the information in this chapter, the *Guides* user should become familiar with Chapters 1 and 2 and the Glossary. Chapters 1 and 2 discuss the *Guides'* purpose, applications, and methods for performing and reporting impairment evaluations. The Glossary provides definitions of common terms used by many specialties in impairment evaluations.

Neurologic impairments should be assessed as they affect Activities of Daily Living (ADLs). ADLs reflect both the "basic" and "advanced" tasks that people ordinarily perform on a daily basis¹⁻³ (Table 13-2). The physician who rates impairment *should document which ADLs cannot be performed independently by the patient, and the severity of impairment of each loss*. The physician should note whether the patient's report of ADL loss is consistent with the neurologic impairment evident in the physician's office.

A minimal impairment in ADLs might be seen in a patient with epilepsy, in whom there are seizures approximately every 2 months despite optimal medical management. Such a patient would not be able to drive but would be able to carry out all other ADLs. Another example of minimal ADL impairment might be seen in a patient with mild hemiplegia who has recovered most of his or her motor abilities but cannot walk long distances, even with a cane, and cannot do heavy lifting or vigorous activities. All basic ADLs are intact.

Moderate impairment of ADLs might be seen in a patient who needs minimal to moderate assistance with basic ADLs but does not require extensive assistive care throughout the day. The patient with severe impairment of ADLs performs few or none of their basic ADLs and needs extensive assistive care throughout the day.

TABLE 13-1**Summary of Chapters Used to Rate Various Neurologic Disorders**

Disorder/Condition	Chapter Title	Chapter No.
Disorders of cerebral function	Central and Peripheral Nervous System	13
Disorders of spinal cord function	Central and Peripheral Nervous System	13
Craniocephalic pain	Central and Peripheral Nervous System	13
Trigeminal neuralgia, glossopharyngeal neuralgia	Central and Peripheral Nervous System	13
Miscellaneous nerves of the head and trunk	Central and Peripheral Nervous System	13
Disorders of the neuromuscular junction	Central and Peripheral Nervous System	13
Peripheral neuropathy	Central and Peripheral Nervous System	13
Myopathic disorders	Central and Peripheral Nervous System	13
Radiculopathy and other disorders of the spinal roots	Spine	17
Plexus injuries and other plexopathies	Upper Extremities Lower Extremities	15 16
Focal neuropathy or mononeuropathy relating to the limbs	Upper Extremities Lower Extremities	15 16
Complex Regional Pain Syndrome	Upper Extremities Lower Extremities	15 16
Visual disorders	Visual System	12
Vestibular disorders	Ear, Nose, Throat, and Related Structures	11
Disorders of cranial nerves except for trigeminal and glossopharyngeal neuralgia	Ear, Nose, Throat, and Related Structures	11
Dysarthria and dysphonia	Ear, Nose, Throat, and Related Structures	11
Primary mood disorders, anxiety disorders, and psychotic disorders*	Mental and Behavioral Disorders	14

* See Section 13.3d for further discussion.

TABLE 13-2**Activities of Daily Living**

Basic	Advanced
Bowel status	Driving a car
Bladder status	Sexual function
Grooming	Medical care: prepares and takes correct medications
Toileting	Money management
Feeding	Communicative activities: use of phone, writing checks, writing letters
Transfers from chair to bed	Traveling as passenger in car, bus, or train
Indoor mobility	Shopping: lifting or carrying groceries
Dressing	Food preparation
Stairs	Housework
Bathing	Community ambulation with or without assistive device, but not requiring a mobility device
	Moderate activities: moving table, pushing vacuum cleaner, bowling, golf
	Vigorous activities: running, heavy lifting, sports

13.1a Interpretation of Symptoms and Signs

Nervous system disorders can present with generalized or focal symptoms. Symptoms may include alterations in level of consciousness, confusion, memory loss, difficulties with language, headache, visual blurring, double vision, fatigue, facial pain and weakness, ringing in the ears, dizziness, vertigo, difficulty swallowing or speaking, weakness of 1 or multiple limbs, difficulty walking or climbing stairs, shooting pain, numbness and tingling in the extremities, tremor, loss of coordination, loss of bladder or rectal control, and loss of sexual function.

Note that many of these symptoms describe the functional impairment experienced by the individual. The neurologic evaluation and ancillary clinical testing determine the origin of these symptoms. Difficulty walking, for example, may result from problems in different areas of the central and/or peripheral nervous system, as well as for a wide variety of musculoskeletal dysfunctions. The neurologic examination may find a spastic paraparesis associated with a spinal cord lesion. Magnetic resonance

imaging (MRI) of the spine may show the cause to be demyelinating plaques, which also may show abnormal somatosensory evoked response since the pathway travels through the areas of demyelination in the spinal cord.

13.1b Description of Clinical Studies

A detailed neurologic examination enables the physician to identify the location of nervous system impairment. The purpose of ancillary testing is to assess the severity and location of the lesion and confirm the underlying pathology. It is important to remember that an abnormality found on ancillary testing (anatomic or physiologic) is not always assigned an impairment rating if ADLs are unaffected. The nervous system is able to compensate for a variety of lesions due to its plasticity and redundancy, sometimes resulting in limited representation on the neurologic examination.

Common clinical studies for evaluation of the nervous system include those described below. Readers are referred to standard textbooks for further discussion of these tests. The brief description below does not represent an endorsement of any of these tests or imply that they are required on a routine basis.

Neuropsychologic assessment and consultation can help characterize cognitive and behavioral alterations and therefore is useful in the clinical assessment and planning of patient management. The results of this assessment must be interpreted in the context of clinical and other test information. Many factors affect neuropsychological performance—age, education, socioeconomic status, and cultural background—and they must therefore be considered for their influence on test results. Neuropsychological tests may be able to distinguish between abnormal and normal performance but offers less information as to the cause of the problem. Traumatic brain injury, for example, may have a profile similar to that of other forms of dementia.

The neuropsychological assessment and test battery covers many functional domains—attention, language, memory, visuospatial skills, executive function, intelligence, motor speed, and educational achievement—using tests with established validity and reliability. Neurologic disorders that have different behavioral ramifications amenable to neuropsychological evaluation include traumatic brain injury, dementia, Parkinson's disease, human immunodeficiency virus, encephalopathy, multiple sclerosis, epilepsy, neurotoxic exposure, chronic pain, and personality assessment in individuals with neurologic disease.

Lumbar puncture (spinal tap) is a procedure by which cerebrospinal fluid is removed through a medium-sized needle, usually at the L3-4 interspace, in order to examine the presence of cells, proteins, glucose, or infection. Indications include evaluation of infections of the nervous system and, sometimes, multiple sclerosis.

An *electroencephalogram* (EEG) records the spontaneous electrical activity generated by the cerebral cortex and is useful for recording the site and type of electrical discharge associated with seizure activity. Remember that a large percentage of cortical spikes are not recorded because they arise from deeper structures and there is significant attenuation by the cerebrospinal fluid and dura. Therefore, a seizure disorder is not necessarily accompanied by an abnormal EEG. Also, many diseases and metabolic abnormalities produce nonspecific EEG abnormalities. The EEG may be normal when the neurologic examination is clearly abnormal since many areas of the brain are inaccessible to the recording electrodes and the EEG is time specific, that is, normal between discharges. Conversely, EEG abnormalities may be found in a significant number of "normal" asymptomatic persons.

Evoked potentials are able to record components of response in the nervous system following multiple somatosensory, visual, and auditory stimuli. The integrity of these afferent pathways is evaluated. These studies may be used in the clinical evaluation of multiple sclerosis, optic neuritis, and acoustic neuroma. Also, a variety of neurotoxins (eg, solvents or heavy metals) may produce alterations in the evoked potentials.

Carotid duplex examination includes Doppler flow velocity of different areas in the carotid artery and thus estimates the severity of stenosis in the carotid artery. It is performed in the evaluation of cerebrovascular disease.

Computed tomographic scan (CT) shows the anatomy of the brain, spinal cord, skull, and vertebral column. X-ray beams are used to differentiate densities of bone-calcified tissue, gray matter, white matter, cerebrospinal fluid, and air. Concomitant use of intravenous contrast demonstrates areas where the blood-brain barrier is disrupted. Although CT scans are not ideal for examination of soft tissue, they are useful when seeking to detect fresh central nervous system (CNS) hemorrhage or bone lesions.

A *CT myelogram* uses a CT scan, after contrast material is injected into the dural sac, to show alterations in the anatomy between the dural sac and the structures that surround it. Since this is an invasive

technique, it may be used for diagnostic aid or preoperative planning.

Magnetic resonance imaging uses a powerful magnetic field to align the protons of the tissue that are excited by a radio frequency, subsequently forming an image from the different intensities of radio waves emitted from the different tissues. T1-weighted images show soft tissue anatomy, while T2-weighted images demonstrate edema and cerebrospinal fluid. Contrast agents enhance lesions when there is disruption in the blood-brain barrier. A variety of MRI techniques enhance the ability to see different types of pathology.

Magnetic resonance angiography (MRA) allows vessel visualization with images of different intensities that reflect velocity and flow patterns. Basically, visualization of vessels reflects physical differences between moving and stationary protons.

Positron emission tomography (PET) allows examination of cerebral function by tomographic images. Because of the complexity, cost, and limitation of isotopes with short half-lives, most studies at present are limited to research protocols, although clinical studies are available to document, in some individuals, the presence of Parkinson's disease in its early stages.

Single-photon emission computed tomography (SPECT) assesses brain perfusion by use of tracers. Since there is a strong relationship between local metabolism and blood flow, SPECT provides indirect information about metabolism. Therefore, it may show abnormalities in dementia and neurodegenerative diseases.

Nerve conduction and needle electromyography (EMG) studies help to determine which nerves are involved and their anatomic location. Also evident will be whether sensory, motor, or both fibers are predominantly involved and whether axonal degeneration, demyelination, or a combination of both is present. Skillful differentiation of peripheral neuropathy and neuromuscular disorders may also be possible. Expert neuromuscular knowledge and understanding of pathologic manifestations of disease processes are necessary for the appropriate application and performance of these tests, particularly the EMG. These tests are mostly objective and require minimal cooperation from the individual being tested. They reflect pathology in the largest, fastest-conducting nerve fibers. The interpretation of these tests must be correlated with a detailed neurologic evaluation.

Quantitative sensory tests are portable tests, easily conducted in the clinician's office, which provide a quantitative assessment of sensation. The integrity of large myelinated fibers is monitored with vibration threshold. Warm and cold temperature thresholds assess medium myelinated and unmyelinated fibers not reflected in nerve conduction studies. Since these are psychophysical tests, the cooperation of the individual being tested is required to process information from cutaneous receptors and provide the appropriate response. These tests can provide information about nerve fibers not examined by nerve conduction studies.

Autonomic function assessment is performed when cardiovascular, thermoregulatory, sphincter, and/or sexual dysfunction is believed to be caused by dysautonomia. For example, postural hypotension tests would include measuring heart rate and blood pressure response to the Valsalva maneuver and heart rate response to deep breathing, postural change, and stress. The integrity of both the central and efferent autonomic pathways is examined with these studies. Sweating abnormalities can be documented by warming the individual and then applying a powder that changes color when wet.

13.1c Reaching Maximum Medical Improvement and Issues of Patient Compliance

Impairment ratings for conditions such as migraine headache, epilepsy, or neurologic disorders with behavioral dysfunction require special discussion. A general principle in the *AMA Guides* is that a condition is rated as "permanent" when it is not expected to change significantly over the next 12 months. However, with certain conditions, the clinician must also assess response to treatment before providing an impairment rating:

- A thorough assessment includes a history of the response to treatment, and a determination whether there has been an adequate treatment course.
- Has the treatment been sufficiently aggressive and of adequate duration?
- Has treatment resulted in improvement in patient function?
- Have a suitable number of treatment options been applied?
- Has medication compliance been assessed?
Has the patient been cooperative with treatment interventions?
- Response to treatment should be documented.
Treatment may result in only a partial remission.

One should attempt to evaluate whether residual problems represent symptoms or medication side effects. Limitations which remain after optimal treatment represents the degree of impairment.

- As medication side effects must be considered as part of the impairment, optimal pharmacological management includes trials of medications which both minimize side effects and maximize efficacy. This is of special importance to the patient with antileptic medications.
- The rating physician should seek *objective evidence* of impairment due to intermittent impairments. Seek documentation of missed work or school days. Examine medication records from pharmacy to assure what medications are being taken. Scrutinize medical and other records for corroboration of daytime sleepiness or seizures.

13.2 Method for Rating Impairments due to Nervous System Disorders

The first step in assessing CNS impairment is to assess the most severe category of cerebral impairment, if any, from 4 categories:

1. State of consciousness and level of awareness, whether permanent or episodic.
2. Mental status evaluation and integrative functioning.
3. Use and understanding of language.
4. Influence of behavior and mood.

Next, the rater assesses impairment (if any) of the cranial nerves, upper and lower extremities, bowel and bladder (due to neurogenic problems), sexual function, neurologic respiratory impairment, and peripheral nervous system. These are then combined with the single most severe category of cerebral impairment, as noted in Table 13-3, using the Combined Values Chart in the Appendix.

13.3 Criteria for Rating Cerebral Impairments

Step 1. The initial step in assessing cerebral function is to determine whether disturbance is present in the level of consciousness or awareness. This may be a

TABLE 13-3

Neurologic Impairments That Are Combined With the Most Severe Cerebral Impairment

Cranial nerve impairments
Upper extremity function
Lower extremity function
Neurogenic bladder function
Neurogenic bowel function
Neurogenic sexual function
Neurogenic respiratory function
Peripheral nervous system disorders
Migraine headaches and cranioccephalic pain

permanent alteration or an intermittent alteration in consciousness, awareness, or arousal (Tables 13-4 through 13-6).

Step 2. Evaluate mental status and highest integrative functioning (Tables 13-7 and 13-8).

Step 3. Identify any difficulty with understanding and use of language (Table 13-9).

Step 4. Evaluate any emotional or behavioral disturbances, such as depression, that can modify cerebral function (Table 13-10).

Step 5. Identify the most severe cerebral impairment listed above. Combine the most severe impairment from categories 1 through 4 with any or multiple distinct neurologic impairments listed in Table 13-3 using the Combined Values Chart in the Appendix.

13.3a Disturbances in Level of Consciousness and/or Awareness

Individuals experiencing disturbances in consciousness may be suffering from a range of symptoms from episodes of altered awareness to being in a persistent vegetative state or an unresponsive coma. These conditions are evaluated based on clinical findings on the neurologic examination and ancillary testing such as CT, MRI, SPECT, EEG, evoked potentials, and vestibular testing. The examination and tests will provide the extent of the underlying pathology and help examiners form a prognosis for patient management.

These neurologic disturbances may result in global loss of consciousness, responsiveness, or focal or lateral neurologic impairments. Table 13-4 lists criteria for determining permanent impairment ratings in individuals with these conditions, considering the severity of their condition and their ability to perform activities of daily living.

TABLE 13-4 Criteria for Rating Impairment of Consciousness and Awareness

Consciousness and Awareness					
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
WHOLE PERSON IMPAIRMENT RATING (%)	0%	1%–10%	11%–30%	31%–50%	51%–100%
DESCRIPTION	No alteration in state of consciousness or limitation in performance of ADLs	Brief repetitive or persistent alteration of state of consciousness and/or minimal limitation in performance of ADLs	Brief repetitive or persistent alteration of state of consciousness and moderate limitation in performance of ADLs	Prolonged alteration of state of consciousness, maximal assist of dependent for ADLs	State of semi-coma with total dependence and subsistence on nursing care and artificial medical means of support or irreversible coma requiring total medical support

CLASS 2

30% Impairment of the Whole Person

EXAMPLE 13-1: UREMIC ENCEPHALOPATHY

A 55-year-old man with progressive renal failure who receives renal dialysis 3 times a week has repeated episodes of lapses of concentration and alteration of awareness for the past 3 years. His physical exam reveals disheveled appearance and clear deficits on extended mental status examination. The EEG reveals poorly developed alpha activity with a preponderance of theta activity diffusely. The CT is normal. Serum urea nitrogen (BUN), creatinine, and calcium levels are elevated. He is partially dependent on others for many aspects of his basic ADL activities.

CLASS 4

100% Impairment of the Whole Person

EXAMPLE 13-2: PERSISTENT VEGETATIVE STATE

A 39-year-old woman suffered profound traumatic brain injury. After 2 months in a coma she progressed to a vegetative state. Eyes are now open, and eye movements are roving. There are no purposeful limb movements, no response to environmental stimuli, and no comprehension of

language. The CT and MRI reveal profound cortical and subcortical damage. She is totally dependent for all aspects of her care.

13.3b Episodic Neurologic Impairments

The *Guides* rates episodic neurologic impairments that are persistent and permanent. Episodic conditions involve syncope or loss of awareness, convulsive disorders, and arousal and sleep disorders. Episodic indicates more than 1 occurrence. When these conditions originate from a problem in the nervous system, they should be evaluated according to the guidelines given in this chapter. For similar manifestations that originate in other body systems (eg, cardiovascular or respiratory) and secondarily affect the CNS, see the chapter or chapters corresponding to the originating body systems.

In assessing permanent impairment due to episodic conditions, first ensure that the individual's condition has reached Maximum Medical Improvement (MMI) and is unlikely to change significantly. Document the pattern of occurrence, estimate the effect of the condition on the individual's ability to perform ADLs, and evaluate the effects of appropriate treatment. Record results from appropriate physiologic evaluations (eg, electrocardiogram, cardiovascular evaluations, or EEG) to document the disorder's severity and to provide information about prognosis.

Describe episodic disorders according to their onset, frequency, duration, and effect on performance of daily activities. Document and describe the results

of seizure control. Daytime loss of consciousness with tonic or clonic seizures, nocturnal episodes with daytime residua, or brief lapses of awareness or communication from minor seizures may interfere significantly with daily activities. Minor seizures with alterations of awareness or consciousness, transient manifestations of unconventional behavior, or interruptions of daytime activity can result in an inability to perform ADLs. Impairment ratings for major or minor seizures are calculated on the basis of how they affect the ability to perform ADLs.

The same criteria apply to impairments related to transient loss of awareness or consciousness (syncope or dizziness) after a period of cerebral ischemia that may be due to various mechanisms, including orthostasis, reflex actions, or cardiopulmonary disorders. Examiners may need to refer to other *Guides* chapters to estimate the magnitude of impairments related to cardiovascular disorders.

The criteria for evaluating episodic loss of consciousness or awareness are given in Table 13-5.

CLASS 1

10% Impairment of the Whole Person

EXAMPLE 13-3: PARTIAL EPILEPSY

A 20-year-old woman had onset of generalized tonic-clonic convulsions in middle school. She has sensations in the right hand progressing to generalized tonic-clonic convulsions and a brief postictal period lasting 2 to 3 hours. An EEG showed rare spikes in the left temporal area, and MRI was normal. Despite optimal antiepileptic therapy she continues to have 1 to 2 minor brief focal right-hand sensations and interruption of speech approximately every 2 months. She is unable to drive because of the persistent seizures.

TABLE 13-5 Criteria for Rating Impairment due to Episodic Loss of Consciousness or Awareness

Episodic Loss of Consciousness or Awareness					
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
WHOLE PERSON IMPAIRMENT RATING (%)	0%	1%–10%	11%–20%	21%–35%	36%–50%
DESCRIPTION	No alteration in state of consciousness or limitation in performance of ADLs	Paroxysmal disorder with predictable characteristics <i>and</i> unpredictable occurrence that does not limit usual activities but is a <i>risk</i> to the individual (eg, cannot drive) <i>or</i> blood pressure drop of 15/10 mm Hg without compensatory increase in pulse rate and lasting more than 2 minutes after precipitating event, with mild awareness loss that limits daily activities	Paroxysmal disorder that interferes with <i>some</i> daily activities <i>or</i> moderate blood pressure drop of 25/15 mm Hg, with loss of awareness or consciousness lasting 1 to 2 minutes and that interferes with <i>some</i> daily activities	Severe paroxysmal disorder of such frequency that it limits activities to those that are supervised, protected, or restricted <i>or</i> repeated severe blood pressure losses of 30/20 mm Hg, with loss of awareness or consciousness lasting 1 to 2 minutes <i>and</i> additional neurologic symptoms or signs of focal or generalized nature	Uncontrolled paroxysmal disorder of such severity and constancy that it severely limits the individual's daily activities <i>or</i> repeated severe blood pressure losses of 30/20 mm Hg, with uncontrolled loss of consciousness and muscle control without recognized cause and with risk of body injury

CLASS 3**35% Impairment of the Whole Person****EXAMPLE 13-4: PARTIAL EPILEPSY**

A 45-year-old police officer was shot in the left frontal area and recovered without neurologic paresis but experienced persistent seizures. Despite optimal medical management, the minor complex seizures of the right hand and leg continue to almost continuous seizures with loss of consciousness. Other than his inability to drive, ADLs are intact. The MRI revealed contusion of the left frontotemporal area, and EEG showed slowing in the same area with frequent polyspike waves. He is completely disabled from gainful employment due to the seizures.

13.3c Arousal and Sleep Disorders

Arousal and sleep disorders include disorders related to initiating and maintaining sleep or inability to sleep; excessive somnolence, including sleep-induced respiratory impairment; and sleep-wake schedules.

Impairment categories that may arise from sleep disorders relate to (1) the nervous system, with reduced daytime attention, concentration, and other cognitive abilities; (2) mental and behavioral factors,

including depression, irritability, interpersonal difficulties, and social problems; (3) the cardiovascular system, with systemic and pulmonary hypertension, cardiac enlargement, congestive heart failure, or arrhythmias; and (4) the hematopoietic system. The Respiratory System, Chapter 5, also discusses impairment as it relates to obstructive sleep apnea.

Neurologic disorders associated with increased daytime sleepiness include central sleep apnea syndrome, narcolepsy, idiopathic hypersomnia, periodic limb movement disorder, restless leg syndrome, depression, brain tumors, posttraumatic hypersomnolence, multiple sclerosis, encephalitis and post-encephalopathy, Alzheimer's disease, Parkinson's disease, multiple system atrophy, and neuromuscular disorders with sleep apnea. It is expected that the diagnosis of excessive daytime sleepiness has been supported by formal studies in a sleep laboratory. The Epworth Sleepiness Scale is an example of a scale that assesses the likelihood of dozing in different situations.⁴ Sleep problems associated with pain or orthopedic injury are *not* to be rated in this section.

See Table 13-6 for impairment due to sleep and arousal disorders.

TABLE 13-6 Criteria for Rating Impairment due to Sleep and Arousal Disorders

Sleep and Arousal Disorders					
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
WHOLE PERSON IMPAIRMENT RATING (%)	0%	1%–5%	6%–10%	11%–30%	31%–50%
DESCRIPTION	Normal daytime alertness; no impairment of ADLs	Reduced daytime alertness; sleep pattern such that individual can perform ADLs	Reduced daytime alertness; interferes with ability to perform ADLs (eg, cannot drive)	Reduced daytime alertness; moderate impairment in ADLs	Uncontrolled paroxysmal disorder of such severity and constancy that it severely limits the individual's daily activities or repeated severe blood pressure losses of 30/20 mm Hg, with uncontrolled loss of consciousness and muscle control without recognized cause and with risk of body injury

CLASS 1**5% Impairment of the Whole Person****EXAMPLE 13-5: OBSTRUCTIVE SLEEP APNEA**

A 47-year-old man is moderately obese after gaining 20.25 kg (45 lb) after a low back injury. Despite best efforts, he has been unable to lose the excess weight. He is able to complete most necessary work, but works less efficiently and cannot take on any special projects. Physical exam and CT were normal. Sleep laboratory study revealed sleep apnea. His daytime sleepiness persists despite optimal management.

CLASS 2**10% Impairment of the Whole Person****EXAMPLE 13-6: NARCOLEPSY**

A 37-year-old woman suffered 2 workplace demotions because of declining work performance and poor memory. She complains of morning headaches and excessive daytime somnolence. She has multiple daily irresistible urges to nap. If this occurs while driving, she has to pull off the road. She was advised to stop driving. Naps last 10 to 15 minutes, after which she feels refreshed. Physical exam and MRI of the brain were normal. Sleep laboratory study findings were consistent with narcolepsy. Her symptoms persist despite best medical management.

13.3d Mental Status, Cognition, and Highest Integrative Function

Mental status and integrative function deficits include the general effects of organic brain syndrome; dementia; and some specific, focal, and neurologic deficiencies. Mental status tests are used to screen and follow up individuals, frequently with repeated testing. They usually cover measures of orientation, attention, immediate recall, calculations, abstraction, construction, information, and recall. Diagnosis should be based on a detailed mental status examination, often in concert with neuropsychological assessment and testing.⁵ The mental status exam for the neurologically impaired patient is outlined in Table 13-7.

Neuropsychological test battery covers many functional domains—attention, language, memory, visuospatial skills, executive function, intelligence, motor speed, and educational achievement—using

TABLE 13-7**Mental Status Exam for the Neurologically Impaired Patient**

1. Level of consciousness
2. Attention
3. Memory
4. Intellectual function
5. Language function
6. Psychosensory function
7. Psychomotor function
8. Constructional ability
9. Higher cognitive function
10. Thought content
11. Behavioral observations
12. Mood and general emotional status
13. Emotional reactions

tests with established validity and reliability. Individuals with severe cognitive impairments that have been identified on mental status tests will usually not benefit from neuropsychological evaluation. Neuropsychological testing may offer the most insight into the patient with more subtle cognitive deficits. Neurologic disorders that have different behavioral ramifications amenable to neuropsychological evaluation include traumatic brain injury, dementia, Parkinson's disease, human immunodeficiency virus, encephalopathy, multiple sclerosis, epilepsy, neurotoxic exposure, chronic pain, and personality assessment in individuals with neurologic disease.

The criteria for evaluating mental status and cognitive impairment are based on the amount of interference with the ability to perform ADLs (Table 13-8). This information can be obtained from someone who has close and continual contact with the individual.

Special mention should be made of mild traumatic brain injury (MTBI), which has been the subject of extensive research in the last ten to twenty years. In contrast to previously held belief, the symptoms of mild traumatic brain injury generally resolves in days to weeks, and leave the patient with no impairment.^{6,7}

Patients with persistent postconcussive symptoms generally have noninjury related factors which complicate their clinical course. Postconcussive syndrome is a relatively rare sequelae of MTBI, seen in 1-5% of all MTBI patients.

TABLE 13-8 Criteria for Rating Neurologic Impairment due to Alteration in Mental Status, Cognition, and Highest Integrative Function (MSCHIF)

Alteration in MSCHIF					
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
WHOLE PERSON IMPAIRMENT RATING (%)	0%	1%–10%	11%–20%	21%–35%	36%–50%
EXTENDED MENTAL STATUS EXAM	Normal	Mild abnormalities	Moderate abnormalities	Severe abnormalities	Most profound abnormalities
NEUROPSYCHOLOGICAL ASSESSMENT AND TESTING*	Normal	Mild abnormalities	Moderate abnormalities	Severe abnormalities	Most profound abnormalities
DESCRIPTION	Normal MSCHIF	Alteration in MSCHIF but patient is able to assume all usual roles and perform ADLs	Alteration in MSCHIF that interferes with ability to assume some normal roles or perform ADLs	Alteration in MSCHIF that significantly interferes with ability to assume normal roles or perform ADLs	Alteration in MSCHIF that prohibits performance of normal roles or performance of ADLs

* Neuropsychological testing may not always be required but may serve as a useful resource.

CLASS 0

0% Impairment of the Whole Person

EXAMPLE 13-7: MILD TRAUMATIC BRAIN INJURY

A 62-year old man slips on an icy pavement, falling forward and striking his head anteriorly. He has a brief seizure, was unresponsive for approximately 30 seconds. He awakened with severe headache and nausea. He was brought to an emergency room by ambulance. Upon arrival in the emergency room he had a normal neurological exam, a brief period of retrograde amnesia, and a scalp contusion. Computerized tomography of the head was normal. His headache and nausea abated over the next week.

CLASS 3

35% Impairment of the Whole Person

EXAMPLE 13-8: TRAUMATIC BRAIN INJURY

A 25-year-old man had a head-on collision and was brought to the hospital unconscious. He had 4 weeks of posttraumatic amnesia. One year later he has moderate inability to follow commands and find his room. He is disoriented to time, person, and place. He wanders alone and gets lost in familiar surroundings. He has loss of interest in home activities and current

events. He has severe learning problems, impulsivity, and social disinhibition. There is no focal or lateral paralysis. Attention and gait are slow. He participates with some basic ADLs but needs direction for all and is dependent for all advanced ADLs.

13.3e Communication Impairments: Dysphasia and Aphasia

Communication involves comprehension, understanding, language, and effective interaction between and among individuals. Aphasia is a condition in which language function is defective or absent. It includes a lack of comprehension with deficits in vision; hearing, and language (both spoken and written) and also the inability to implement discernible and appropriate language symbols by voice, action, writing, or pantomime. Dysphasia is a language impairment that is less severe than aphasia (which literally means "no speech") but still is associated with a lesion in the dominant parietal lobe. It presents as a communication problem due to receptive or expressive dysphasia or a combination of the two. Inability to have a meaningful conversation because no nouns are used is an example of dysphasia. Other common errors include errors of grammatical structure, word-finding difficulties, and word substitution. Dysphasia and aphasia are different from dysarthria, which is imperfect articulation of speech due to disordered muscle control. Dysphonia is an impairment of sound production that causes difficulty speaking and understanding.

Dysphasia is the most common communication impairment diagnosis, since most individuals usually retain some ability to communicate. An inability to understand language has a poorer prognosis than an inability to express language. Speech therapy is of little value in the absence of comprehension; therefore, compensatory techniques may not be learned when a receptive aphasia or dysphasia exists. Tests for dysphasia should be conducted after it is established how confused or disoriented the individual is and which side of the brain is dominant for speech. Cognition should also be evaluated after dysphasia mechanisms have been excluded.

Aphasia and dysphasia test batteries are frequently devised by the clinician and cover the following simple tasks: (1) listening to spontaneous speech or responses to simple questions; (2) pointing commands and questions that can be answered "yes" or "no" to test comprehension; (3) repeating words and phrases; (4) naming objects that have high- and low-frequency use; (5) reading comprehension and reading aloud (reading is related to educational achievement, which must be known before interpreting reading comprehension and reading aloud results); and (6) writing and spelling.⁵

If comprehension is relatively intact, the aphasia screening battery may be adequate to place an individual in class 1 or 2. However, individuals with dysphasia may score poorly on aphasia and dysphasia test batteries while they demonstrate communicative competency for ADLs. This communicative competency may be measured by means of the Communicative Abilities in Daily Living, in which nonverbal communication is assessed⁶. Table 13-9 describes the criteria for rating impairment due to aphasia or dysphasia.

CLASS 1

10% Impairment of the Whole Person

EXAMPLE 13-9: DYSPHASIA

A 45-year-old right-handed woman suffered head trauma that resulted in periodic difficulty expressing herself in conversations. She is unable to name objects on sight but can point to an object when seen on a printed card. She is able to read and comprehend language. She has a mild periodic dysnomia in trying to name objects.

CLASS 3

35% Impairment of the Whole Person

EXAMPLE 13-10: APHASIA

A 45-year-old left-handed man was struck from the right side as a passenger in the front seat of a vehicle. He was not wearing a seat belt, and his head hit the windshield and mirror. Although there was no loss of consciousness, a contusion was noted over the left parietal area on CT. He does not comprehend simple commands, cannot work, and needs distant supervision in the home. He can name objects from sight but has difficulty understanding verbal and written commands.

13.3f Emotional or Behavioral Impairments

Emotional, mood, and behavioral disturbances illustrate the relationship between neurologic disorders and mental and behavioral disorders. Emotional disturbances originating in verifiable neurologic

TABLE 13-9 Criteria for Rating Impairment due to Aphasia or Dysphasia

Aphasia or Dysphasia					
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
WHOLE PERSON IMPAIRMENT RATING (%)	0%	1%-10%	11%-20%	21%-35%	36%-50%
DESCRIPTION	Normal mental status	Minimal disturbance in comprehension and production of language symbols for daily living	Moderate impairment in comprehension and production of language symbols for daily living	Severe inability in comprehension and production of language symbols for daily living	Total inability to communicate or comprehend language symbols

impairments (eg, stroke or head injury) are assessed using the criteria in this chapter. Psychiatric features may also exist with primary neurologic disorders. Psychiatric features can range from irritability to outbursts of rage or panic and from aggression to withdrawal. Neurologic impairments producing psychiatric conditions are assessed using the neurologic examination, with an expanded neuropsychiatric history and the necessary ancillary tests. Psychiatric impairments may include depression, manic states, emotional fluctuations, socially unacceptable behavior, involuntary laughing or crying, impulsivity, general disinhibition with obsessive and scatological behaviors, and other kinds of CNS responses. Just as in the chapter on impairment due to mental and behavioral disorders (Chapter 14), the rater should carefully assess 4 main parameters, including in patients with organic emotional and behavioral disorders: (1) ability to perform ADLs; (2) social functioning; (3) concentration; and (4) decompensation in formal settings. The reader should refer to Chapter 14, Mental and Behavioral Disorders, for additional background information.

Psychiatric manifestations and impairments that do not have documented neurologic impairments are evaluated using the criteria in Chapter 14.

Examples of neurologic conditions that are associated with changes in emotion and affect include the following: (1) right hemisphere infarct and inappropriate jocularity; (2) left hemisphere infarct and deep dejection and dysphasia; (3) left-sided temporolimbic seizure foci and ideational disorders; and (4) right-sided temporolimbic seizure foci and mood disturbances. Use Table 13-10 to determine impairments of emotional or behavioral disturbances due to neurologic disorders.

EXAMPLE 13-11: 10% IMPAIRMENT DUE TO EMOTIONAL OR BEHAVIORAL IMPAIRMENTS

A 60-year-old right-handed former boxer has been frequently knocked out for brief periods. He has episodes of mild confusion and occasional unsteadiness of gait, with difficulty in speech and articulation. He has mild head tremor. Physical exam reveals no paresis or sensory defect, but he has difficulty with higher cortical functions on mental status exam testing. He has difficulty with inappropriate jocularity and interpersonal relationships, *which are distinctly different than his personality and behavior when he was younger*. He has moderate symptoms in social and occupational settings. He would score a 51 to 60 on

the Global Assessment of Functioning (see Table 13-10).

EXAMPLE 13-12: 50% IMPAIRMENT DUE TO EMOTIONAL OR BEHAVIORAL IMPAIRMENTS

A 25-year-old right-handed man suffered severe frontal lobe damage due to a traumatic brain injury. He recovered to a point at which he has signs of frontal lobe release and upgoing plantar responses bilaterally, but no clinically notable paresis or sensory disorders. He has marked dementia and severely violent behavior, in which he is a constant physical threat to himself and others despite optimal psychopharmacological management. He requires institutionalization due to his constant violent behavior. He scores a 1 to 10 on the Global Assessment of Functioning.

13.4 Criteria for Rating Impairment due to Spinal Cord Dysfunction and Movement Disorders

13.4a Spinal Cord Disorders

The spinal cord conveys nerve impulses for motor, sensory, and visceral functions. Disorders of impulse transmission can result in permanent impairment. The magnitude of the impairment is estimated according to the effects on the ability to perform ADLs and the results of neurologic examination and testing.

Impairments resulting from spinal cord injuries and other adverse conditions include those relating to station and gait, use of the upper extremities, respiration, urinary bladder function, anorectal function, sexual function, and pain.

Sensory disturbances, including the loss of sense of touch, sense of pain, temperature perception, and sense of vibration and joint position, as well as paresthesias, dysesthesias, and phantom limb sensations, may indicate spinal cord dysfunction. Autonomic system disorders, including disturbances in sweating patterns, regulation of circulation, and regulation of temperature, may occur. Impairment is determined according to the amount of functional impairment and the level of involvement.

When an individual with a spinal cord injury has impairments of several functions or systems (eg, upper extremities, lower extremities, and of bladder,

TABLE 13-10**Global Assessment of Functioning (GAF) Impairment Score**

GAF	Description	GAF Impairment Score
91-100	Superior functioning in a wide range of activities; life's problems never seem to get out of hand; is sought out by others because of his or her many positive qualities. No symptoms.	0%
81-90	Absent or minimal symptoms (eg, mild anxiety before an exam), good functioning in all areas, interested and involved in a wide range of activities, socially effective, generally satisfied with life, no more than everyday problems or concerns (eg, an occasional argument with family members)	0%
71-80	If symptoms are present, they are transient and expectable reactions to psychosocial stressors (eg, difficulty concentrating after family argument); no more than slight impairment in social, occupational, or school functioning (eg, temporarily falling behind in school work)	0%
61-70	Some mild symptoms (eg, depressed mood and mild insomnia) or some difficulty in social, occupational, or school functioning (eg, occasional truancy, or theft within the household) but generally functioning pretty well; has some meaningful interpersonal relationships	5%
51-60	Moderate symptoms (eg, flat affect and circumstantial speech, occasional panic attacks) or moderate difficulty in social, occupational, or school functioning (eg, few friends, conflicts with coworkers)	10%
41-50	Serious symptoms (eg, suicidal ideation, severe obsessional rituals, frequent shoplifting) or any serious impairment in social, occupational, or school functioning (eg, no friends, unable to keep a job)	15%
31-40	Some impairment in reality testing or communication (eg, speech is at times illogical, obscure, or irrelevant) or major impairment in several areas, such as work or school, family relations, judgment, thinking, or mood (eg, depressed man avoids friends, neglects family, and is unable to work; child frequently beats up younger children, is defiant at home and is failing at school)	20%
21-30	Behavior is considerably influenced by delusions or hallucinations or serious impairment in communication or judgment (eg, sometimes incoherent, acts grossly inappropriately, suicidal preoccupation) or inability to function in almost all areas (eg, stays in bed all day; no job, home, or friends)	30%
11-20	Some danger of hurting self or others (eg, suicide attempts without clear expectation of death, frequently violent, manic excitement) or occasionally fails to maintain minimal personal hygiene (eg, smears feces) or gross impairment in communication (eg, largely incoherent or mute)	40%
1-10	Persistent danger of severely hurting self or others (eg, recurrent violence) or persistent inability to maintain minimal personal hygiene or serious suicidal act with clear expectation of death	50%

bowel, sexual functioning, or respiratory system neurologic impairments), the Combined Values Chart in the Appendix should be used to combine the whole person impairment estimates for the several functions. The clinician should use Tables 13-11 through 13-16. In this edition of the *Guides*, dyesthetic pain due to spinal cord impairment can be rated using Table 13-17.

Accompanying disorders, such as trophic lesions, urinary calculi, osteoporosis, nutritional disturbances, infections, and reactive psychological states, may occur. The degree to which any of these conditions augments spinal cord impairment should be based on the criteria given in the *Guides* chapters dealing with those disorders.

13.4b Movement Disorders

Movement disturbances resulting from cerebral dysfunction are impairments that may affect ADLs. Mild ties may have no impact on ADLs, while other involuntary movements, such as tremors (resting, postural, and intention), chorea, athetosis, hemiballismus, and dystonia tone may prevent meaningful use of the extremity. Besides abnormal movements, difficulty with coordination for either dexterous or precise movements may interfere with activity; these difficulties can develop from lesions in the basal ganglia or cerebellum. Coordinated movements include gait that may manifest as ataxia requiring use of an ancillary device. Movement disorders, therefore, are assessed for their interference with ADLs as described in Tables 13-11 and 13-12 for the upper and lower extremities.

13.5 Criteria for Rating Impairments of Upper Extremities due to CNS Dysfunction

The basic tasks of everyday living depend on dexterous use of the dominant upper extremity. Loss of use of that extremity results, in most instances, in greater impairment than would be the case with impairment of the limb on the nondominant side. Table 13-11 is used to rate upper extremity dysfunction from any lesion in the brain or spinal cord. Use this table for rating upper extremity dysfunction (manifested by weakness, tremor, or pain) that affects ADLs.

The upper extremity impairment may result from, but is not limited to, traumatic brain injury, stroke, neurodegenerative diseases (eg, Parkinson's disease, progressive supranuclear palsy), multiple sclerosis, spinal cord injury, and sequelae of CNS infection.

When the spinal cord disorder affects both upper extremities, combine the ratings for the dominant and nondominant upper extremity.

The impairment ratings given in Table 13-11 are determined from neurologic examination of motor strength, coordination, and dexterity. Functional activities such as buttoning a shirt, lacing shoes, writing, and performing a pegboard task can assess abilities needed for daily activities. Ratings are listed for the nondominant and dominant limb.

TABLE 13-11 Criteria for Rating Impairments of the Upper Extremities due to CNS Dysfunction

Upper Extremity CNS Dysfunction					
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
WHOLE PERSON IMPAIRMENT RATING (%)	0%	1%–5% Nondominant 1%–10% Dominant	6%–15% Nondominant 11%–20% Dominant	16%–30% Nondominant 21%–40% Dominant	31%–50% Nondominant 41%–60% Dominant
DESCRIPTION	Patient has no impairment of upper extremity function	Individual can use the involved extremity for ADLs and holding but has difficulty with digital dexterity	Individual can use the involved extremity for ADLs; can grasp and hold objects with difficulty, but has no digital dexterity	Individual can use the involved extremity only as a gross assist in ADLs	Individual cannot use the involved extremity for ADLs

TABLE 13-12 Criteria for Rating Impairments due to Station and Gait Disorders

Station and Gait Disorders					
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
WHOLE PERSON IMPAIRMENT RATING (%)	0%	1%–10%	11%–20%	21%–35%	36%–50%
DESCRIPTION	No disorder of gait or station	Rises to standing position; walks but has difficulty with elevations, grades, stairs, deep chairs, and/or long distances	Rises to standing position; walks some distance with difficulty and without assistance, but is limited to level surfaces	Rises and maintains standing position with difficulty; cannot walk without assistance	Cannot stand without help, mechanical support, and/or an assistive device

13.6 Criteria for Rating Impairments of Station, Gait, and Movement Disorders

Problems maintaining balance and a stable gait can develop from a CNS or peripheral neurologic impairment. On physical examination, the physician may observe loss of equal arm or leg movement, falling or staggering to one or the other side, inability to control starting or stopping, and arrhythmic body or extremity movements. Increased tone in the lower extremities from a CNS lesion such as traumatic brain injury, stroke, spinal cord injury, or multiple sclerosis may result in a spastic paraparesis or spasticity in 1 limb. Loss of station or Romberg sign (falling with eyes closed) may indicate dysfunction in the peripheral nerves or their ascending pathways to the brain. Peripheral neuropathy, identified by physical examination and electrodiagnostic tests, is frequently associated with complaints of imbalance or stumbling, since information from sensory receptors is altered.

Impairment ratings for station and gait disorders are determined according to the effect on ambulation (see Table 13-12). Other anatomic or functional changes from other body systems, such as the musculoskeletal system, are combined with the neurologic assessment for station and gait.

13.7 Criteria for Rating Neurogenic Bowel, Bladder, and Sexual Dysfunction

13.7a Neurogenic Bowel

The ability to control emptying provides the criterion for evaluating permanent impairment of the anus and rectum due to spinal cord or other neurologic dysfunction (Table 13-13).

13.7b Neurogenic Bladder

The ability to control bladder emptying provides the criterion for evaluating permanent bladder impairment resulting from spinal cord and CNS disorders (Table 13-14). Documentation by cystometric or other tests may be necessary. When evaluating impairments of the bladder, the physician also must consider the status of the upper urinary tract. Refer to Chapter 7, the Urinary and Reproductive Systems, and apply the Combined Values Chart in the Appendix if impairments of several organ systems are present.

13.7c Neurogenic Sexual Dysfunction

Awareness and capability of having an orgasm are the criteria for evaluating permanent impairment of sexual functioning that may result from spinal cord or other neurologic system disorders (Table 13-15). The individual's previous sexual functioning should be considered by the physician; age is only 1 criterion for evaluating previous sexual functioning. Adjust for age according to the criteria outlined in Chapter 7, The Urinary and Reproductive Systems.

TABLE 13-13 Criteria for Rating the Neurogenic Bowel

Neurogenic Bowel					
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
WHOLE PERSON IMPAIRMENT RATING (%)	0%	1%–5%	6%–10%	11%–20%	21%–50%
DESCRIPTION	Fully continent without special program	Continent with bowel program	Incontinent about once a week despite optimal bowel program	Incontinent about once a day despite optimal bowel program	Totally incontinent

13.8 Criteria for Rating Neurogenic Respiratory Dysfunction

Neurologic impairment of one's ability to breathe is considered in Table 13-16 only in terms of neurologic limitations. Other aspects of respiratory function are covered in Chapter 5, The Respiratory System.

CLASS 5

97% Impairment of the Whole Person

EXAMPLE 13-13: IMPAIRMENT SECONDARY TO COMPLETE C4 TETRAPLEGIA

A 23-year-old left-handed man suffered a C4 fracture dislocation resulting in C4 complete tetraplegia. He underwent acute surgical stabilization with

anterior and posterior fixation of the fracture. He has no sensation below the C4 dermatome, has no movement in his upper and lower extremities, and has been weaned from a ventilator. He still has a tracheostomy in place for intermittent suctioning. He does not suffer from dysesthetic pain.

Step 1. He has complete paralysis of both upper extremities. If one uses Table 13-11 to rate impairment, he would have a 50% impairment due to non-dominant limb function, and 60% impairment due to dominant limb function.

Step 2. He has complete paralysis of both lower extremities. Using Table 13-12, one finds that he has a 50% impairment due to complete loss of gait function.

Step 3. He is occasionally incontinent with his bowel management program. With use of Table 13-13, he has a 10% impairment due to occasional incontinence.

TABLE 13-14 Criteria for Rating the Neurogenic Bladder

Neurogenic Bladder					
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
WHOLE PERSON IMPAIRMENT RATING (%)	0%	1%–5%	6%–15%	16%–20%	21%–30%
DESCRIPTION	Fully continent without catheter or external device	Less than normal voluntary control but no incontinence with bladder management program	Requires indwelling or external catheter to maintain continence	Incontinent about once a day despite optimal bladder management	Total incontinence

TABLE 13-15 Criteria for Rating Neurogenic Sexual Dysfunction

Neurogenic Sexual Dysfunction				
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3
WHOLE PERSON IMPAIRMENT RATING (%)	0%	1%–5%	6%–10%	11%–15%
DESCRIPTION	No impairment of sexual function	Individual has some sexual function but with difficulty of erection or ejaculation in men or lack of awareness, excitement, or lubrication in either sex	Reflex sexual functioning is possible, but there is no awareness	No sexual function

Step 4. He is managed on an intermittent catheterization program 4 times per day, with frequent leakage requiring an external catheter in between. With use of Table 13-14, he has a 15% impairment due to neurogenic bladder.

Step 5. Reflex sexual functioning is possible, but he has no awareness. With the use of Table 13-15, there is a 10% impairment due to neurogenic sexual dysfunction.

Step 6. He requires a tracheostomy for frequent suctioning. Use of Table 13-16 results in a 50% impairment.

Step 7. Combine the impairments (50%, 60%, 50%, 10%, 15%, 10%, and 50%) using the Combined Values Chart in the Appendix. The resulting impairment

is 97% impairment of the whole person for C4 complete quadriplegia.

CLASS 4

57% Impairment of the Whole Person

EXAMPLE 13-14: IMPAIRMENT SECONDARY TO T10 COMPLETE PARAPLEGIA

A 55-year-old right-handed man suffered T10 complete paraplegia after an abdominal aneurysm repair. He has no sensation below the T10 dermatome and has no movement in the lower extremities, which are spastic.

TABLE 13-16 Criteria for Rating Neurogenic Respiratory Dysfunction

Neurogenic Respiratory Dysfunction						
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4	CLASS 5
WHOLE PERSON IMPAIRMENT RATING (%)	0%	1%–5%	6%–20%	21%–35%	36%–50%	51%–65%
DESCRIPTION	No neurologic impairment of respiration	Individual can breathe spontaneously but has difficulty performing ADLs that require intensive effort such as running	Individual is capable of spontaneous respiration but is restricted to any exertional activity such as hill climbing or prolonged exertion	Individual is capable of only sedentary activities	Tracheostomy	Individual has no capacity for spontaneous respiration, is ventilator dependent

Step 1. He has normal function in the upper extremities. If one uses Table 13-11, he would have a 0% impairment.

Step 2. He has complete paralysis of both lower extremities. Using Table 13-12, one finds that he has a 50% impairment due to complete loss of gait function.

Step 3. He is continent with his bowel management program. With use of Table 13-13, he has a 5% impairment due to occasional incontinence.

Step 4. He is managed on an intermittent catheterization program 4 times per day without leakage in between. When one uses Table 13-14, he has a 5% impairment due to neurogenic bladder.

Step 5. He has some sexual functioning, but difficulties with both erection and ejaculation. Erection is improved with medication. With the use of Table 13-15, there is a 5% impairment due to neurogenic sexual dysfunction.

Step 6. He has no impairment of neurogenic respiratory function. Use of Table 13-16 results in a 0% impairment.

Step 7. Combine the impairments (0%, 50%, 5%, 5%, 5%, and 0%) using the Combined Values Chart in the Appendix. The resulting impairment is 57% impairment of the whole person for T10 complete quadriplegia.

Step 8. If the patient suffers from dysesthetic pain, use Table 13-17 as described below, and combine with the Combined Values Chart.

13.9 Criteria for Rating Peripheral Neuropathy, Neuromuscular Junction Disorders, and Myopathies

Evaluating the peripheral nervous system requires documentation of the extent of loss of function due to sensory deficit, pain, or discomfort; loss of muscular strength and control of specific muscles or groups of muscles; and alteration of autonomic nervous system (ANS) control. Documentation of these deficiencies should include, if possible, descriptions of the abnormal finding on examinations of the spinal root or roots, portion of the plexus, and/or peripheral nerve or nerves that are involved. The mechanism or cause of the abnormality assists in determining the impairment duration and probable prognosis. Ancillary testing by neuroimaging (CT, MRI, and radiography) and physiologic tests (EMG, nerve conduction studies, and evoked responses) may assist in reaching final conclusions.

Neurologic evaluation of pain is based first on the individual's description of the character, location, intensity, duration, and persistence of the discomfort and on verification of the anatomic distribution of the neurologic defect. A description of the ways and the degrees to which the pain interferes with the individual's performance of ADLs and the factors that augment the discomfort should be included. Anatomic descriptions should be made according to the usual distributions of the roots, plexuses, and nerves of the nervous system when the distal digital nerves are being evaluated, especially in the hand, as indicated in the upper and lower extremities chapters (Chapters 15 and 16).

TABLE 13-17 Dysesthetic Pain Secondary to Peripheral Neuropathy or Spinal Cord Injury

Dysesthetic Pain				
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3
Document that individual has a peripheral neuropathy or spinal cord injury consistent with dysesthetic pain				
WHOLE PERSON IMPAIRMENT RATING (%)	0%	1%–3%	4%–7%	8%–10%
DESCRIPTION	No dysesthetic pain	Mild dysesthetic pain	Moderate dysesthetic pain	Severe dysesthetic pain

Grading procedures for sensory and motor impairments in single distal digital nerves of the hand are found in Chapter 15, The Upper Extremities. For evaluations of neurologic problems of the peripheral neuromuscular system, the standard techniques of neurologic examination are used. Muscle strength grading varies from 0 to 5, consistent with the Medical Research Council of the United Kingdom.⁹ The contralateral extremity is tested also, and the results are compared with those in the affected limb.

Symptoms of sensory deficits and pain in peripheral nerves include anesthesia, hypesthesia, dysesthesia, paresthesia, hyperesthesia, cold intolerance, and an intense burning pain. Sensory dysfunction associated with peripheral nerve disorders is evaluated according to the following criteria: (1) How does the pain or sensory deficit interfere with the individual's performance of daily activities? (2) To what extent does the pain or sensory deficit follow the defined anatomic pathways of the root, plexus, or peripheral nerve? (3) To what extent does the description of the pain or sensory deficit indicate that it is caused by a peripheral nerve abnormality? (4) To what extent does the pain or sensory deficit correspond to other disturbances of the involved nerve structure? Only persistent pain or discomfort that leads to permanent loss of function, despite maximum effort toward medical rehabilitation and allowing an optimal period for physiologic adjustment, should be evaluated as a permanent impairment. Pain that does not meet more than 1 of these criteria is not considered to be within the scope of this section.

Sensory dysfunction, to be rated, must be considered permanent. The methods used for spinal nerves, brachial or lumbosacral plexus, and individual nerves are described in the extremity chapters (Chapters 15 and 16). Terms used to describe sensory impairment that may not be readily apparent to all readers are defined here. *Sensation* refers to the sensory perception of the primary sensory modalities, pain, heat, cold, and touch, those involved in protective sensation. *Sensibility* refers to the discriminative features of sensation such as graphesthesia, stereognosis, or 2-point discrimination. The issue of sensibility is important to the normal function of the hand.

13.9a Peripheral Neuropathy and Dysesthetic Pain

Impairments due to peripheral neuropathy may affect motor, sensory, and autonomic function in the nervous system. Motor weakness is generally distal, and more commonly affects the

lower extremities earlier and to a greater extent. Impairment due to motor weakness is rated by the impact on ADLs,^{10,11} identical to the patient with spinal cord disorders.

Function of the ANS may result in difficulties with orthostasis, as well as gastrointestinal, urological, and sexual urological function. Difficulties with orthostasis may be rated using Table 13-5. Disorders of digestive dysfunction (eg, gastroparesis) should be rated in Chapter 6, The Digestive System. Urological, anorectal, and sexual dysfunction due to peripheral neuropathy may be rated using Table 13-15.

Many peripheral neuropathies will present with sensory but little or no evidence of motor or autonomic dysfunction. Painless sensory neuropathy, generally involving the lower extremities to a greater extent than the upper extremities, is assessed according to its effect on ADLs. Tables 13-11 and 13-12 are used for this purpose. Associated complications of peripheral neuropathy (eg, trophic ulcers and neurogenic arthropathy, or Charcot's joint) are rated in the extremity chapters.

Although not a frequent problem in impairment rating using the *Guides*, impairment due to painful peripheral neuropathy can be rated in this edition of the *AMA Guides* using Table 13-17.

EXAMPLE 13-15: 16% IMPAIRMENT DUE TO PAINFUL SENSORIMOTOR PERIPHERAL NEUROPATHY

A 55-year-old woman has a 45-year history of juvenile-onset diabetes mellitus. Over the last 10 years she has experienced increasing symptoms and signs of peripheral neuropathy in the lower but not the upper extremities. She has loss of lower extremity muscle stretch reflexes, mild bilateral foot drop, decreased pinprick sensation up to the midtibia, and reduced position and vibration sense. In the last 2 years the neuropathy has become markedly dysesthetic, and the dysesthesias persist despite treatment with neurogenic pain medications.

Step 1. She has no upper extremity impairment. According to Table 13-11, she has a 0% impairment of upper extremity function.

Step 2. She rises to standing position and walks but has difficulty walking long distances and on grades. If one uses Table 13-12, she has a 10% impairment of lower extremity function.

Step 3. She has no dysfunction of bowel, bladder, or sexual function, so use of Tables 13-13 through 13-15 results in a 0% impairment.

Step 4. She has moderate dysesthetic pain, and use of Table 13-17 results in an impairment rating of 7%.

Step 5. If the Combined Values Chart (see Appendix) is used, she has a combined impairment rating (10% and 7%) of 16%.

Comment: Rate other features of diabetes mellitus (eg, diarrhea from gastrointestinal motility problems, diabetic nephropathy, diabetic retinopathy, and trophic ulcers) in other chapters of the *AMA Guides*.

13.9b Neuromuscular Junction Disorders

Neuromuscular impairment as present in long-standing myasthenia gravis or myasthenic syndromes is accompanied by proximal weakness. Impairment is rated by the impact on ADLs and is rated using Tables 13-11 and 13-12.

13.9c Myopathy

Myopathies represent a varied group of disorders that includes muscular dystrophy, metabolic myopathy, abnormal potassium metabolism and muscle disease, endocrine myopathies, and inflammatory muscle disease. The unifying clinical feature is proximal weakness that, in some cases, may involve the neck and face. The proximal weakness is best rated by its effect on the ADLs. Use Tables 13-10 and 13-11 as well as the cranial nerve tables listed in Chapter 11, Ear Nose, Throat and Related Structures.

13.9d Autonomic Nervous System Disorders

The ANS influences the functioning of many organ systems; thus, failure of the system can increase impairment. Neurologic conditions that have ANS involvement include polyneuropathy of various causes, familial dysautonomia, neurodegenerative disorders, Landry-Guillain-Barré syndrome, syringomyelia, porphyria, spinal cord and brain tumors, and myelopathy.

Lack of control of blood pressure, abnormal body thermal regulation, and impaired bladder and bowel elimination are prominent signs of ANS failure. Impairments related to transient loss of awareness or consciousness after a period of cerebral ischemia may be due to various mechanisms, including orthostasis, reflex actions, or cardiopulmonary disorders, and may be estimated by means of Table 13-5. Referring to other *Guides* chapters also may be necessary to estimate the magnitudes of the impairments.

13.10 Criteria for Rating Impairments Related to Complex Regional Pain Syndrome

Complex Regional Pain Syndrome (CRPS), also known as Reflex Sympathetic Dystrophy (RSD) has been a troublesome area for impairment rating. Rating of CRPS in the Sixth Edition is carried out using Tables 15-22 and 16-14 in the chapters on impairment rating of the upper and lower extremities, respectively.

Although trauma and/or nerve injury are often a precipitating feature of CRPS, the pathophysiology remains unknown. Other precipitants of CRPS include neurologic disorders (stroke, tumor, or syringomyelia), herpes zoster infection, myocardial infarction, and malignancy.

Common clinical complaints include pain, edema, motor complaints, allodynia, hyperalgesia, hyperpathia, hypoesthesia, hypothermesthesia, and proprioceptive difficulties. The examiner may note edema, altered temperature or color compared with the asymptomatic side, alteration in motor function (difficulty initiating movement, weakness, tremor, muscle spasms, or dystonia), hyperhidrosis, dystrophic changes (skin, subcutaneous tissue, or muscle), range of motion loss, and changes in the hair growth pattern.

No diagnostic criteria have been accepted uniformly for CRPS, and no laboratory study is considered definitive. X-ray films, 3-phase bone scan, vascular studies (eg, thermography), tests of sudomotor function testing, electrodiagnostic studies, quantitative sensory testing, and laser Doppler imaging each have been shown to exhibit characteristic changes.¹²

Treatment has included various physical or occupational modalities, medications, anesthetics, and minimally invasive modalities. Analysis of systematic reviews reveal that interventional modalities used in routine clinical practice have disappointing levels of scientific support.¹³⁻¹⁵

13.11 Criteria for Rating Impairments Related to Craniocephalic Pain

13.11a Migraine Headaches

Migraine is a common neurologic disorder affecting more than 1 in 10 people. Disability from migraine

may manifest as lost time at work, household roles, school, family, and social or leisure activities.¹⁶ Common symptoms may include throbbing headache, moderate or severe pain intensity exacerbated by physical activity, photophobia, phonophobia, nausea, and vomiting. During a migraine attack 75% of patients have a reduced ability to function, and approximately 50% report severe disability or require bed rest.¹⁷ Migraines can be diagnosed with high sensitivity and specificity if 3 or 4 of the following criteria are met, summarized in the mnemonic POUNDing (Pulsating, duration of 4 to 72 hours, Unilateral, Nausea, Disabling).¹⁸

The physician should determine that migraine headaches have been diagnosed as accurately as possible using well-accepted criteria, that the patient has had a suitable therapeutic trial of appropriate treatment, and that the patient has reached a relative plateau in terms of migraine severity and frequency. The Migraine Disability Assessment (MIDAS) Questionnaire was developed to assess headache-related disability and has been shown to have favorable internal consistency, test-retest reliability, and validity.¹⁹

The MIDAS Questionnaire is as follows:

1. On how many days in the past 3 months did you miss work or school because of your headaches?
2. How many days in the past 3 months was your productivity at work or school reduced by half or more because of your headaches?
3. On how many days in the past 3 months did you not do household work because of your headaches?

4. How many days in the past 3 months was your productivity in household work reduced by half or more because of your headaches?
5. On how many days in the past 3 months did you miss family, social or nonwork activities because of your headaches?

Scores from the 5 questions are summed, and Table 13-18 is used to determine an impairment rating for migraine headache.¹⁹ Note that *nonmigrainous headaches are not ratable* using the AMA Guides. As discussed in Section 13.1c, Reaching Maximum Medical Improvement and Issues of Patient Compliance, the rater should assess treatment compliance, treatment efficacy, and whether MMI has been reached before assigning a rating. Documentation of impairment on the MIDAS Questionnaire should be sought from school and/or work records if possible.

CLASS 3

4% Impairment of the Whole Person

EXAMPLE 13-16: MIGRAINE HEADACHES

A 29-year-old man suffered a mild traumatic brain injury with brief loss of consciousness. Initial CT of the brain was normal. Two days later his symptoms of nausea and dizziness completely cleared, but he suffered a migraine headache. Review of his prior medical records confirmed his oral history that he had never previously suffered from migraine headaches. He progressed through a variety of acute and

TABLE 13-18 Grading System for Rating Impairment due to Migraine Headache

Migraine Headache					
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
History of migraine headache impairment despite optimal medical management. Headaches have reached a period of maximum medical improvement.					
MIDAS SCORE (SEE TEXT)	0	1-5	6-10	11-20	21+
DESCRIPTION	No migraine headaches	Minimal or infrequent disability	Mild or infrequent disability	Moderate disability	Severe disability
WHOLE PERSON IMPAIRMENT RATING (%)	0%	2%	3%	4%	5%

prophylactic medications for migraine management with only partial success in remedying the headaches. He misses work approximately 2 days per month because of migraine headaches, and this is documented by his payroll record. Review of the MIDAS questionnaire reveals:

- He missed 6 days in the past 3 months due to headaches.
- His productivity at work was decreased approximately 4 more days in the past 3 months due to headaches.
- He missed 0 days of household work because of headaches.
- He had 0 days with a change in household productivity due to headaches.
- He missed 1 weekend family occasion due to headaches.

The MIDAS score is $6 + 4 + 0 + 0 + 1 = 11$. He has a 4% impairment due to migraine headaches.

13.11b Trigeminal and Glossopharyngeal Neuralgia

The trigeminal nerve is a mixed nerve with sensory fibers to the face, cornea, anterior scalp, nasal and oral cavities, tongue, and supratentorial dura mater. The nerve also transmits motor impulses to the mastication muscles.

Evaluate sensation in the parts served by the 3 major divisions of the trigeminal nerve with the usual techniques: pain, temperature, and touch. Compare the 2 sides of the face or body. Bilateral loss of facial sensation is uncommon. Combine the impair-

ment percentage for sensation loss that involves the trigeminal nerve with the estimated impairment percentage for pain or motor loss. Pin, cold, and light touch are the best parameters for localization of sensory findings on the face. They can outline impairment of either side of the face, a branch of, or complete trigeminal nerve impairment.

Brief episodic trigeminal neuralgia or postherpetic neuralgia that involves a branch of the trigeminal nerve may be very severe and uncontrolled. Because there usually is no documented neurologic impairment except for a trigger point with trigeminal neuralgia or allodynia with postherpetic neuralgia, severe, uncontrolled, typical pain may be the impairment. Occasionally clinicians may observe patients with similar pain due to glossopharyngeal neuralgia. Both atypical, episodic facial pain and typical, neuralgic pain may be evaluated (Table 13-19) if they have occurred for months and interfere with ADLs.

13.12 Criteria for Rating Miscellaneous Peripheral Nerves of the Head and Trunk

In recent editions of the *AMA Guides*, certain peripheral nerves have been inadvertently omitted. Most cranial neuropathies (whether central or peripheral) are rated in the ENT and visual disorders chapters. Most focal neuropathies are rated in the chapters on upper and lower extremity disorders. The purpose of the following table is to rate

TABLE 13-19 Criteria for Rating Trigeminal or Glossopharyngeal Neuralgia

Trigeminal or Glossopharyngeal Neuralgia				
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3
History of trigeminal or glossopharyngeal neuralgia with impairment despite optimal medical management. Headaches have reached a period of maximal medical improvement.				
WHOLE PERSON IMPAIRMENT RATING (%)	0%	1%–2%	3%–5%	6%–10%
DESCRIPTION	No neuralgia	Mild uncontrolled facial neuralgic pain that may interfere with ADLs	Moderately severe, uncontrolled facial neuralgic pain that interferes with ADLs	Severe, uncontrolled, unilateral or bilateral, facial neuralgic pain that prevents performance of ADLs

miscellaneous peripheral nerves that are not ratable in other places in the *Guides*.

Sensory loss in these nerves results in little or no impairment in ADLs. However, burning dysesthetic pain may be the source of significant impairment. For example, a patient who has undergone an inguinal hernia repair may have the sequela of severe burning pain in the ilioinguinal nerve. Use Table 13-20 to rate such painful focal neuropathies that cannot be rated from other chapters.

13.13 Nervous System Impairment Evaluation Summary

- Rate the single most severe cerebral impairment (if any) from Tables 13-4 to 13-10.
- Rate impairments due to:
 - Upper extremity dysfunction (Table 13-11)
 - Lower extremity dysfunction (Table 13-12)

Neurogenic bowel, bladder, and sexual dysfunction (Table 13-13 to 13-15)

Neurogenic respiratory dysfunction (Table 13-16)

Dysesthetic pain (Table 13-17)

Craniocephalic pain (Table 13-18)

Trigeminal and glossopharyngeal neuralgia (Table 13-19)

Miscellaneous peripheral nerves (Table 13-20)

- Rate neurologic impairments from other chapters:

Radiculopathy (Chapters 15 and 16)

Plexopathy (Chapters 15 and 16)

Complex regional pain syndrome (Chapters 15 and 16)

Cranial neuropathies other than trigeminal/glossopharyngeal neuralgia (Chapter 11)

Dysarthria and dysphonia (Chapter 11)

Vestibular disorders (Chapter 11)

Visual disorders (Chapter 12)

- Combine the ratings using the Combined Values Chart (Appendix).

TABLE 13-20 Criteria for Rating Miscellaneous Peripheral Nerves

Miscellaneous Peripheral Nerves				
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3
WHOLE PERSON IMPAIRMENT RATING	0%	1%	2%–3%	4%–5%
GREATER OCCIPITAL NERVE LESSER OCCIPITAL NERVE GREATER AURICULAR NERVE INTERCOSTAL NERVE GENITOFEMORAL ILIOINGUINAL ILIOHYPOGASTRIC PUDENDAL	No neuralgia	Sensory loss only in an anatomic distribution	Mild to moderate neurogenic pain in an anatomic distribution	Severe neurogenic pain in an anatomic distribution

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The Spine and Pelvis

Introduction

17.1 Principles of Assessment

17.2 Diagnosis-Based Impairment

17.3 Adjustment Grid and Grade Modifiers: Non-Key Factors

17.4 Pelvic Impairment

17.5 Summary

17.6 Appendix 17-A Pain Disability Questionnaire

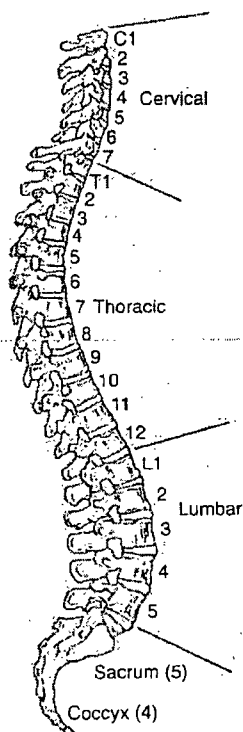
Introduction

This chapter provides criteria for evaluating permanent impairment due to impairments of the spine and pelvis. For evaluation purposes, as illustrated in Figure 17-1, the spine and pelvis are divided into four regions:

1. Cervical spine: including occiput through T1 (motion segments occiput-C1 through C7-T1).
2. Thoracic spine: including T1-T12 (motion segments T1-2 through T11-12).
3. Lumbar spine: including T12-S1 (motion segments T12-L1 through L5-S1).
4. Pelvis: including ilium, sacrum, and pubic rami.

Assessment of the spine requires evaluation of skeletal structures, soft tissues, intervertebral motion segments, and elements of the central and peripheral nervous system. Evaluation of the pelvis requires assessment of skeletal structures, soft tissues, and consideration of impairments related to other organ systems (genitourinary, gastrointestinal) that may occur after major trauma to the pelvis.

FIGURE 17-1
Spine and Pelvis Regions



In clinical situations and discussions with colleagues regarding the potential functional severity of an injury, there are typically four considerations: (1) what is the problem, (2) what difficulties does the patient report, (3) what are the examination findings, and (4) what are the results of clinical studies. In a similar manner, these are the steps used to assess most cases of musculoskeletal impairment.

Impairment ratings in the spine and pelvis are based on identification of a specific diagnosis or diagnoses. In the current method, this results in assignment to an impairment class (IC), using grids designed for this purpose. This method is, to some degree, an expansion of the diagnosis-related estimate (DRE) method used in the Fifth Edition of the *Guides*. The impairment value within a class is further refined by considering information related to functional status, physical examination findings, and the results of clinical testing. Range of motion is no longer used as a basis for defining impairment, since current evidence does not support this as a reliable indicator of specific pathology or permanent functional status. However, range of motion may be used to monitor clinical progress in individuals. The rationale for changes from previous rating methods is to stan-

dardize and simplify the rating process, to improve content validity, and to provide a more uniform methodology that promotes greater interrater reliability and agreement.

This chapter has been updated with information and research provided by the state and medical specialty societies listed in the preface. Impairment evaluations of the spine and pelvis must be performed within the context of the directives in Chapters 1 and 2 and only when conditions have reached Maximum Medical Improvement (MMI).

This chapter incorporates the following changes: (1) International Classification of Functioning, Disability and Health (ICF) Model is used to provide a common basis for the description of human functioning and impairments; (2) principles of assessment have been simplified and clarified; (3) specific diagnosis-based rating tables (referred to as grids) for the most common injuries and diagnoses have been added; (4) physical examination has been simplified; (5) functional assessment is provided through focused history-taking, including information about Activities of Daily Living (ADLs) and a functional assessment tool; and (6) a Spine and Pelvis Impairment Evaluation Record is provided as a template to simplify recording of the evaluation.

The authors have made every effort to provide the most current and comprehensive information for the impairment scenarios likely to be encountered. Although the chapter and impairment rating method may seem complex at first, information that is useful and necessary for impairment assessments has been presented. The reader is encouraged to read the entire chapter and review case examples before performing an assessment. The impairment rating process has been simplified by providing a congruent rating methodology among the three musculoskeletal chapters. Once the examiner masters the methodology in one chapter, that same methodology applies to the other chapters.

The authors of this chapter recognize that the process described is still far from perfect with respect to defining impairment or the complexities of human function; however, the authors' intent is to simplify the rating process, to improve interrater reliability, and to provide a solid basis for future editions of the *Guides*.

17.1 Principles of Assessment

Before using the information in this chapter, the *Guides'* user must become familiar with Chapters 1 and 2 and the Glossary. Chapters 1 and 2 discuss the

Guides' purpose, applications, and methods for performing and reporting impairment evaluations. The Glossary provides definitions of common terms used in impairment evaluation. Other commonly used terms are defined in the relevant sections.

The impairment evaluation and report should include a comprehensive, accurate medical history; a review and summary of all pertinent records; and a comprehensive description of the individual's current symptoms and their relationship to daily activities. The examiner should perform a careful, thorough physical examination and review findings of all relevant laboratory, radiographic (imaging), and ancillary tests.

Anatomic, diagnostic, and functional bases for determining impairment are part of the ICF Model. Diagnosis-Based Impairment (DBI) regional grids are provided for each of the four regions of the spine and pelvis (cervical, thoracic, lumbar, and pelvis). These regional grids include five columns containing impairment classes, numbered from 0 to 4 as summarized in Table 17-1, Definition of Impairment Classes and Impairment Ranges. These classes are designed to reflect the degree of impairment related to a condition, and numerical ranges of impairment have been assigned to each class.

Impairment values for the spine and pelvis are calculated using the DBI method. Impairment class is determined by the diagnosis and specific criteria that are considered the "key factor" and then adjusted by grade modifiers, or "non-key factors," that may include Functional History (FH), Physical Findings (PE), and relevant Clinical Studies (CS). The grade modifiers (non-key factors) are considered only if they are determined by the examiner to be reliable and associated with the diagnosis. The process for calculating impairment values is described in detail in Section 17.3f, Impairment Calculation Methodology.

Diagnoses for the spine and pelvis are defined in several major categories, based on the selected region. Categories include:

- Non-specific chronic, or chronic recurrent spine pain

- Intervertebral disk and motion segment pathology (single and multiple levels)
- Cervical and lumbar stenosis
- Spine fractures and/or dislocations
- Pelvic fractures and/or dislocations

In the event that a specific diagnosis is not included in the diagnosis-based regional grid, the examiner should use a similar listed condition as a guide to determining an impairment value. In the report, the examiner must fully explain the rationale for the analogy.

17.1a Interpretation of Symptoms and Signs

The medical history must describe the chief complaint and discuss the quality, frequency, and duration of symptoms, such as pain, numbness, paresthesias, weakness and functional difficulties; exacerbating and alleviating factors; and any interference with daily activities. The evaluation report should include the individual's description of how the symptoms and condition developed and the assumed cause. The evaluator should ask the patient about any perceived relationship between the current condition and any other musculoskeletal problems. The examiner should also clarify, to the extent possible, causation and apportionment (ie, document the mechanism of injury for the condition being evaluated and any prior problems). A complete report will include discussion of previous evaluations and therapeutic interventions as described in medical records, past medical history, review of systems, personal and social history, and family history. Available X rays and other imaging studies or reports should be reviewed and commented on in the report.

Case history is based on information presented by the patient and ascertained from medical records. The evaluating physician(s) should obtain objective data through physical examination and review of appropriate clinical studies. If information provided by the patient or noted in previous medical records or findings on physical examination are inconsistent, the evaluator's report should reference the inconsistencies. The diagnosis used for placement in an

TABLE 17-1

Definition of Impairment Classes and Impairment Ranges

CLASS	PROBLEM	Whole Person Impairment (%)			
		CERVICAL SPINE	THORACIC SPINE	LUMBAR SPINE	PELVIS
0	No objective findings	0%	0%	0%	0%
1	Mild	1%–8%	1%–6%	1%–9%	1%–3%
2	Moderate	9%–14%	7%–11%	10%–14%	4%–6%
3	Severe	15%–24%	12%–16%	15%–24%	7%–11%
4	Very severe	25%–30%	17%–22%	25%–33%	12%–16%

impairment class must be based on reliable findings reflective of the impairment that is being assessed, and supported by the clinical history, current examination, and clinical studies. Objective findings are always given the greater weight of evidence over subjective complaints.

Functional History, Physical Examination, and Clinical Studies all contribute to better understanding of the patient's condition. Each of these non-key factors is described in greater detail below. Adjustment grids (Tables 17-6, 17-7 and 17-9) related to each of these factors, and for use in the impairment calculation, are provided in Sections 17.3a Functional History, 17.3b Physical Examination, and 17.3c Clinical Studies.

Functional History

A proper functional history enables the physician to determine the impact of a given spine- or pelvis-related condition on basic function and activities as they pertain to ADLs. Cross-validation of the patient's reported functional limitations can occur by observing his or her activities in the examination room. The patient will usually be observed performing simple routine activities, including sitting, standing, walking, and transitioning from sit to stand or supine to stand. The physician should note inconsistencies and lack of congruence between reported limitations and observed activities when evident.

A functional assessment tool may be used in addition, to further evaluate this parameter. One example of a functional assessment tool, the Pain Disabilities Questionnaire (PDQ), is included in this chapter's appendix for convenience. The PDQ has been validated as an instrument for quantifying patient reports of function. The physician is expected to weigh the patient's subjective complaints and score on the functional assessment tool, relative to the expected severity for a given condition. The grade modifier that reflects functional assessment may or may not be accepted as a variable in the impairment calculation.

If multiple regions of the spine are being rated, the examiner should consider the relative contribution of each of these diagnoses to the functional complaints.

Physical Examination

Guided by the history, a physical examination is performed, documenting spine- and/or pelvis-related physical findings such as spinal alignment and the need for assistive devices. Neurologic findings, including root tension signs and sensory and motor deficits in the upper and/or lower limbs, should be described. The examiner may remove a collar or lumbar support or other external devices as appropriate, to permit

adequate and thorough examination. The examiner should consider the patient's diagnosis, the reliability of findings on examination, and the results of previous examinations and observations as recorded in the medical records documenting previous treatment.

Positive, negative, and nonphysiological findings should be documented in the evaluation report. Whenever possible, quantitative findings should be reported, rather than general descriptions (ie, document specific measurements of limb girth as opposed to reporting extent of atrophy). More objective findings, such as atrophy, are given greater relative weight over findings that require patient participation, including active range of motion or strength testing, and subjective reports of tenderness. Inconsistencies and discrepancies between what is observed and what has been reported previously, or what is otherwise expected, should be noted. Examination findings that differ significantly from previously recorded observations after the probable date of MMI should be reported, with comments noting the discrepancy. Some findings may be excluded from the impairment calculation, as described later in this chapter.

Clinical Studies

The physician needs to review and document actual studies and findings from relevant diagnostic studies, including laboratory tests, roentgenographic (X-ray) studies, computed tomographic (CT) scans, magnetic resonance images (MRI), nuclear medicine scans, ultrasound exams, and electrodiagnostic testing (EMG/NCS). In some cases, only reports may be available, and that should be noted in the record. Although imaging and other studies may assist physicians in making a diagnosis, they are not the sole determinants of a diagnosis. The examiner should comment on clinical test results that do not correlate with the patient's symptoms or support the patient's diagnosis.

17.2 Diagnosis-Based Impairment

Impairment ratings are calculated using the DBI method, in which impairment class (IC) is determined by the diagnosis and specific criteria and then adjusted by considering non-key factors or grade modifiers. As noted previously, this approach resembles the DRE method described in the Fifth Edition, with some enhancements.

Figure 17-2, Spine and Pelvis Evaluation Record, should be completed or all information on that record should be provided in the impairment

FIGURE 17-2

Spine and Pelvis Impairment Evaluation Record

Name:				Exam Date:	
ID Number:		Sex: F M	Side: R L	Birth Date:	
Diagnosis:				Injury Date:	
	Diagnosis-Based Impairments				
Grid	Diagnosis / Criteria	Class Diagnosis (CDX)	Grade Modifier Adjustments	Net Adjustment Value and Assigned Grade Modifier	Whole Person Impairment
Cervical (C)		0 1 2 3 4	GMFH 0 1 2 3 4 n/a GMPE 0 1 2 3 4 n/a GMCS 0 1 2 3 4 n/a Net Adjustment = (GMFH - CDX) + (GMPE - CDX) + (GMCS - CDX)	Adjusted Grade = Net Adjustment applied to Default Value C ≤2 -1 0 +1 ≥2 A B C D E	
Thoracic (T)		0 1 2 3 4	GMFH 0 1 2 3 4 n/a GMPE 0 1 2 3 4 n/a GMCS 0 1 2 3 4 n/a	Adjusted Grade ≤2 -1 0 +1 ≥2 A B C D E	
Lumbar (L)		0 1 2 3 4	GMFH 0 1 2 3 4 n/a GMPE 0 1 2 3 4 n/a GMCS 0 1 2 3 4 n/a	Adjusted Grade ≤2 -1 0 +1 ≥2 A B C D E	
Pelvis (P)		0 1 2 3 4	GMFH 0 1 2 3 4 n/a GMPE 0 1 2 3 4 n/a GMCS 0 1 2 3 4 n/a	Adjusted Grade ≤2 -1 0 +1 ≥2 A B C D E	
Signed:		Date:		Whole Person Impairment:	

GMFH= Grade Modifier Functional History GMPE= Grade Modify Physical Examination GMCS=Grade Modifier Clinical Studies

rating report. The terms *class*, *default impairment*, *adjustments*, and *assigned grade modifier* used in the evaluation record are described in detail in the sections that follow. An example of a completed Figure 17-2 is provided at the end of this chapter.

Diagnosis-based impairments are the method of impairment evaluation used for the spine and pelvis. Four regional grids, listing relevant diagnoses, are provided: one for each region of the spine (cervical, thoracic, and lumbar) and one for the pelvis.

There are five classes in the DBI grid:

- Class 0: no objective problem
- Class 1: mild problem
- Class 2: moderate problem
- Class 3: severe problem
- Class 4: very severe problem approaching total functional loss

Subjective complaints without objective physical findings or significant clinical abnormalities are generally assigned class 0 and have no ratable impairment.

After the impairment class has been determined based on the diagnosis, the final impairment grade within the class is determined using the grade modifiers, or non-key factors, described in the adjustment grids for the spine. Grade modifiers include Functional History (FH), Physical Examination (PE) and Clinical Studies (CS). The grade modifiers are used in the Net Adjustment Formula as described in the box in Section 17.3 to calculate a net adjustment. The final impairment grade is determined by adjusting the grade up or down from the default value "C," by the calculated net adjustment (≤ 2 to ≥ 2). The lowest possible grade is A, and adjustments equal to or less than -2 from the default value C will automatically be considered A; the highest possible grade is E, and adjustments equal to or greater than +2 will automatically be considered E. The regional grid is then consulted again, to determine the appropriate impairment value for the selected class and grade. Grade modifiers allow movement within a class but do not allow movement into a different class.

The regional grid is used for 2 purposes: (1) to determine the most appropriate class for a specific

regional diagnosis and (2) to determine the final numerical impairment rating after appropriate adjustments are made using the grade modifiers.

This process is repeated in each region of the spine that is involved in the injury being rated. In most cases only one diagnosis will be appropriate. If an examiner is routinely using multiple diagnoses without objective supporting data or rating multiple regions, the validity and reliability of the evaluation may be questioned.

Steps in Performing an Impairment Rating

1. Perform history and physical examination, and determine if individual is at MMI.
2. Establish the reliable diagnosis for each region of the spine to be rated.
3. Use the appropriate regional grid to determine the impairment class.
4. Use the adjustment grids to identify the grade modifiers for Functional History, Physical Exam, and Clinical Studies, as applicable. Then apply the Net Adjustment Calculation to determine the net adjustment and modification of the default value "C" within the class.
5. Use the regional grid to identify the appropriate numerical impairment rating for the impairment class and grade.
6. Combine whole person impairments (WPIs) for multiple spinal regions when appropriate, using the Combined Values Chart in the Appendix at the end of the book.

Diagnosis-Based Impairment Class Assignment: Regional Grids

As described above, the first step in determining an impairment rating is to choose the diagnosis that is most applicable in the region being assessed. Diagnoses are divided into categories, including soft tissues or strain/sprain, disk herniations and alteration of motion segment integrity (AOMSI), spinal stenosis, fractures, and fracture-dislocations. As much as possible, impairment values from prior editions of the *Guides* were retained unless adjustments were necessary to more appropriately reflect the impairment, or were required because of changes in the methodology. On the basis of the diagnosis and other specific differentiators that may be associated with that diagnosis, the condition is assigned to a specific impairment class in the regional grid.

Reliability of the diagnosis is essential, and the diagnosis should be consistent with the clinical history and findings at the time of impairment assessment, whether the condition has been treated medically or surgically. Treatment may alter the functional status of the condition evaluated at MMI. For example, treatment of a disk herniation for symptomatic radiculopathy can move the impairment rating from a higher class to a lower class if the radiculopathy is resolved. However, if a condition has been treated surgically, this does not result in an "add on" value or additional distinct impairment percentage; changes related to surgical intervention are reflected in the provided ranges for impairment values.

It is acknowledged that an injury and surgical management of that condition, including procedures that alter motion segment integrity, may increase the likelihood for additional procedures in the future. Anatomic changes resulting from surgical intervention are considered in the impairment ranges provided. Impairment ratings are based on the patient's condition at the time of the rating and do not otherwise anticipate the need for future interventions.

Selection of the optimal diagnosis requires judgment and experience. If more than one diagnosis can be used, the one that provides the most clinically accurate impairment rating is selected; this will generally be the more specific diagnosis. In cases where more than one diagnosis is applicable (eg, spinal stenosis and AOMSI), the causally-related diagnosis that provides the higher impairment rating should be used. In the event that a specific diagnosis is not listed in the DBI grid, the examiner should identify a similar listed condition to be used as a guide to the impairment calculation. The rationale for this decision should be described in the report.

The regional grids have one column that includes diagnoses and 5 columns reflecting impairment classes. Identify the applicable diagnosis in the left-most column. The permissible class assignments (0 to 4) are specified in the horizontal rows. Refer to the specific criteria in the row for that diagnosis to determine which class is appropriate. Above the criteria in each cell are 5 numbers reflecting the range of impairment associated with those specific diagnostic criteria. Each of these numbers corresponds to grades A, B, C, D, and E, with A representing the mildest form of the condition and E the most severe. The middle value is grade C and represents a default impairment value, which typically corresponds with the impairment value assigned in prior editions of the *Guides*. Class, grade and the corresponding final impairment value are modified by the use of the adjustment grids and the Net Adjustment Formula.

as discussed earlier. The impairment calculation process is described in detail in Section 17.3f, Impairment Calculation Methodology.

General Considerations

Instructions for using the DBI grids (Tables 17-2, Cervical Spine; 17-3, Thoracic Spine; and 17-4, Lumbar Spine) are provided in this section and in Section 17.3, Adjustment Grid and Grade Modifiers: Non-Key Factors. The evaluator should select the most accurate diagnosis and identify the class that best describes that diagnosis. As previously described, the numerical value within the range of impairment associated with that diagnosis, located above each diagnosis, will be determined using Section 17.3 and the Net Adjustment Formula.

Common conditions related to degenerative changes in the spine, including abnormalities identified on imaging studies such as annular tears, facet arthropathy, and disk degeneration, do not correlate well with symptoms, clinical findings, or causation analysis and are not ratable according to the *Guides*. Congenital anomalies such as spina bifida occulta, abnormal segmentation and conjoined nerve roots are not ratable as impairments. Developmental anomalies, including spondylolysis, some forms of spondylolisthesis, kyphosis and excessive lordosis or scoliosis are also not ratable. There may be exceptions to these rules in some jurisdictions, related to aggravation of preexisting conditions.

There is a category of patients who present with persistent pain and "nonverifiable" radicular complaints (defined in greater detail in Section 17.3, Adjustment Grid: Physical Examination) that are documented repeatedly after an identifiable injury. These patients have no objective findings and, therefore, are often given a diagnosis of "chronic sprain/strain" or "non-specific" back or neck pain. The current methodology allows these patients to be rated in impairment class I, with a range of impairment ratings from 1 to 3% whole person impairment (WPI). The percentage impairment within that range depends on functional assessment, since there are no reliable physical examination or imaging findings in this group.

The patient who is rated in this impairment class (IC I) and then presents with another episode that results in placement in this same impairment class (IC I) may move up or down a grade within the class with each successive assessment at MMI. However, this patient would not be entitled to an accumulation of 1% or 2% WPI ratings, or placement in a different class, unless the diagnosis changed. That is, the patient might, after a second injury, move from grade B to grade C within IC I, but successive evaluations

of 1% or 2% WPI would not be added to increase the impairment beyond the maximum impairment assigned for grade E in that diagnostic impairment class. Thus, a person with a grade B or 1% impairment who sustains a similar, subsequent injury that is rated as grade D or 2% WPI would then have a 2% WPI. In states where apportionment is appropriate, 1% impairment would have preexisted the new injury and 1% would be related to the new injury. A person who has a grade C or 2% WPI who sustains a new injury, and still falls in grade A, B, or C, still has a 2% WPI, meaning there is no new impairment (0%) for the new injury.

The term *alteration of motion segment integrity* was first used in the Fourth Edition of the *Guides* to describe loss of motion segment integrity, identified on flexion/extension X rays (following specific protocols) and related to either instability or fusion, regardless of the cause. In this edition, the term has been expanded to include surgical motion-preserving technologies such as disk arthroplasty and dynamic stabilization techniques. The current parameters for AOMSI are explained at the bottom of each regional grid for the cervical, thoracic, and lumbar spine.

If a diagnosis of AOMSI, pseudarthrosis, fracture or spondylolisthesis is made, imaging studies should be excluded as a grade modifier.

Many of the terms used in the grids are described in greater detail in the text following them.

17.2a Cervical Spine

The cervical spine is defined as the region from occiput to T1 (motion segments occiput-C1 through C7-T1), including all the vertebrae, intervertebral disks, joints, ligamentous, and soft-tissue structures. Instructions for determining the DBI are provided in Sections 17.1 and 17.3 and involve the use of Table 17-2, Cervical Spine Regional Grid: Spine Impairments.

In all cases, if there is documented myelopathy or spinal cord injury with findings of neurogenic bowel or bladder, or neurogenic sexual dysfunction related to spinal cord injury and other related findings, an additional impairment calculation is appropriate, using Chapter 13, The Central and Peripheral Nervous System. The neurologic WPI should be combined with the spine-related impairment.

17.2b Thoracic Spine

The thoracic spine is defined as the region from T1 to T12 (motion segments T1-2 through T11-T12), including all the soft tissues, motion segments, and neurologic structures. Instructions for determining the DBI are provided in Sections 17.1 and 17.3

TABLE 17-2 Cervical Spine Regional Grid: Spine Impairments

Cervical Spine Regional Grid					
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
IMPAIRMENT RATING (WPI %)	0	1%-8%	9%-14%	15%-24%	25%-30%
Non-specific chronic, or chronic recurrent neck pain (also known as chronic sprain/strain, symptomatic degenerative disc disease, facet joint pain, chronic whiplash, etc)	0 Documented history of sprain/strain-type injury, now resolved, or continued complaints of neck pain with no objective findings on examination	1 1 2 3 3 Documented history of sprain/strain-type injury with continued complaints of axial and/or non-verifiable radicular complaints; similar findings documented in previous examinations and present at the time of evaluation (see Section 17.2 General Considerations)			
MOTION SEGMENT LESIONS					
Intervertebral disc herniation and/or AOMSI Note: AOMSI includes instability (specifically as defined in the Guides), arthrodesis, failed arthrodesis, dynamic stabilization or arthroplasty, or combinations of those in multiple-level conditions	0 Intervertebral disk herniation or documented AOMSI at 1 or more levels (see definition in footnote), with medically documented injury; with or without surgery, with no residual signs or symptoms	4 5 6 7 8 Intervertebral disk herniation or documented AOMSI at a single level or multiple levels with medically documented findings; with or without surgery and with documented resolved radiculopathy or non-verifiable radicular complaints at the clinically appropriate levels present at the time of examination	9 10 11 12 14 Intervertebral disk herniation and/or AOMSI at a single level with medically documented findings; with or without surgery and with documented radiculopathy at the clinically appropriate level present at the time of examination (see Physical Examination adjustment grid in Table 17-7 to grade radiculopathy)	15 17 19 21 23 Intervertebral disk herniations and/or AOMSI at multiple levels, with medically documented findings; with or without surgery and with or without documented signs of radiculopathy at a single clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy)	25 27 28 29 30 Intervertebral disk herniations and/or AOMSI, at multiple levels, with medically documented findings; with or without surgery and with documented signs of bilateral or multiple-level radiculopathy at the clinically appropriate levels present at the time of examination (see Table 17-7 to grade radiculopathy)
Pseudarthrosis Note: <u>Only applies after spinal surgery intended for fusion</u> with resultant documented motion (not necessarily AOMSI by definition provided in footnote) with consistent radiographic findings or hardware failure; with or without surgery to repair	0 Pseudarthrosis (post surgery) with no residual signs or symptoms	4 5 6 7 8 Pseudarthrosis (post surgery) at a single level or multiple levels with medically documented findings and with documented resolved radiculopathy or non-verifiable radicular complaints at the clinically appropriate level present at the time of examination	9 10 11 12 14 Pseudarthrosis (post surgery) at a single level with medically documented findings and with documented radiculopathy at the clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy)	15 17 19 21 23 Pseudarthrosis (post surgery) at a multiple levels with medically documented findings and with or without documented radiculopathy at a single clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy)	25 27 28 29 30 Pseudarthrosis (post surgery) at a multiple levels with medically documented findings and with documented signs of bilateral or multiple-level radiculopathy at the clinically appropriate levels present at the time of examination (see Table 17-7 to grade radiculopathy)

(continued)

TABLE 17-2 (CONTINUED) Cervical Spine Regional Grid: Spine Impairments

CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
IMPAIRMENT RATING (WPI %)	0	1%–8%	9%–14%	15%–24%	25%–30%
Spinal Stenosis (may include AOMSI) Note: AOMSI includes instability (specifically as defined in the <i>Guides</i>), arthrodesis, failed arthrodesis, dynamic stabilization or arthroplasty, or combinations of those in multiple-level conditions	0 Cervical stenosis at 1 or more levels with or without AOMSI with medically documented symptoms, resolved without residual complaints or findings	4 5 6 7 8 Cervical stenosis at a single level or multiple levels with or without AOMSI with medically documented findings; with or without surgery and with documented resolved radiculopathy or non-verifiable radicular complaints at clinically appropriate level present at the time of examination	9 10 11 12 14 Cervical stenosis at a single level with or without AOMSI with medically documented findings; with or without surgery and with documented radiculopathy at the clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy) With signs of spinal cord injury or myelopathy: see Chapter 13, The Central and Peripheral Nervous System, for calculating additional impairment	15 17 19 21 23 Cervical stenosis at multiple levels with or without AOMSI with medically documented findings; with or without surgery and with or without documented radiculopathy at a single clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy) With signs of spinal cord injury or myelopathy: see Chapter 13 for calculating additional impairment	25 27 28 29 30 Cervical stenosis at multiple levels with or without AOMSI with medically documented findings; with or without surgery and with documented signs of bilateral or multiple-level radiculopathy at the clinically appropriate levels present at the time of examination (see Table 17-7 to grade radiculopathy) With signs of spinal cord injury or myelopathy: see Chapter 13 for calculating additional impairment
Compression fractures of 1 or more vertebral bodies and/or fracture of posterior element (pedicle, lamina, articular process, transverse process) and/or burst fracture	0 Single- or multiple-level fractures with no or minimal compression of any vertebral body; with or without pedicle and/or posterior element fracture (<5-mm displacement) Healed with or without surgical intervention; with no residual signs or symptoms	2 2 4 6 8 Single- or multiple-level fractures with <25% compression of any vertebral body; with or without minimal bony retropulsion; with or without pedicle and/or posterior element fracture (≤5-mm displacement) Healed, with or without surgery (including vertebroplasty or kyphoplasty) and with or without documented resolved radiculopathy or nonverifiable radicular complaints at clinically appropriate level(s) With signs of spinal cord injury or myelopathy: see Chapter 13, The Central and Peripheral Nervous System, for calculating additional impairment	9 10 11 12 14 Single- or multiple-level fractures with 25%–50% compression of any vertebral body; with or without moderate bony retropulsion; with or without pedicle and/or posterior element fracture (>5-mm displacement) Healed, with or without surgery (including vertebroplasty or kyphoplasty) with residual deformity and with or without documented radiculopathy at the clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy) With signs of spinal cord injury or myelopathy: see Chapter 13 for calculating additional impairment	15 17 19 21 23 Single- or multiple-level fractures with >50% compression of 1 vertebral body; with or without moderate to severe bony retropulsion; with or without pedicle and/or posterior element fracture (>5-mm displacement) Healed, with or without surgical intervention; with residual deformity and with or without documented radiculopathy at a single clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy) With signs of spinal cord injury or myelopathy: see Chapter 13 for calculating additional impairment	25 27 28 29 30 Single- or multiple-level fractures with >50% compression of 1 vertebral body; with or without moderate to severe bony retropulsion; with or without pedicle and/or posterior element fracture (>5-mm displacement) Healed, with or without surgical intervention; with residual deformity and with documented signs of bilateral or multiple-level radiculopathy at the clinically appropriate levels present at the time of examination (see Table 17-7 to grade radiculopathy) With signs of spinal cord injury or myelopathy: see Chapter 13 for calculating additional impairment

(continued)

TABLE 17-2 (CONTINUED) Cervical Spine Regional Grid: Spine Impairments

CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
IMPAIRMENT RATING (WPI %)	0	1%-8%	9%-14%	15%-24%	25%-30%
Dislocations/ fracture- dislocation	0 Dislocation or fracture-dislocation with no or minimal compression of any vertebral body; with or without pedicle and/or posterior element fracture (≤ 5 -mm displacement) Healed, with or without surgical intervention; with no residual signs or symptoms	2 2 4 6 8 Single-level dislocation with or without fracture Healed, with or without surgery <i>and</i> with documented resolved radiculopathy or non-verifiable radicular complaints at clinically appropriate level(s) With signs of spinal cord injury (SCI) or myelopathy: see Chapter 13, The Central and Peripheral Nervous System, for calculating additional impairment	9 10 11 12 14 Single-level dislocation with or without fracture Healed, with or without surgical intervention, including fusion <i>and</i> with documented radiculopathy at the clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy) With signs of spinal cord injury or myelopathy: see Chapter 13 for calculating additional impairment	15 17 19 21 23 Multiple-level dislocation with or without surgical intervention, including fusion <i>and</i> with or without documented radiculopathy at a single clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy) With signs of spinal cord injury or myelopathy: see Chapter 13 for calculating additional impairment	25 27 28 29 30 Single or multiple-level dislocation with or without surgical intervention, including fusion <i>and</i> with signs of bilateral or multiple-level radiculopathy at the clinically appropriate levels present at the time of examination (see Table 17-7 to grade radiculopathy) With signs of spinal cord injury or myelopathy: see Chapter 13 for calculating additional impairment
Postoperative complications (nonneurologic) Note: Neurologic complications are rated in Chapter 13, The Central and Peripheral Nervous System					25 27 28 29 30 Deep spinal wound infection requiring chronic suppressive antibiotics; or chronic osteomyelitis
Note: Alteration of motion segment integrity indicates AOMSI. It is defined using flexion/extension X rays (Figures 17-5 and 17-6). In the cervical spine, a diagnosis of AOMSI by translation measurements requires greater than 20% anterior or greater than 20% posterior relative translation of one vertebra on another, on flexion or extension radiographs, respectively; or angular motion of more than 11° greater than each adjacent level. Alternatively, there may be complete or near-complete loss of motion of a motion segment due to developmental fusion, or successful or unsuccessful attempts at surgical arthrodesis, including dynamic stabilization, or preserved motion with disk arthroplasty. In the cervical spine, these specific parameters apply to motion segments from C3 to C7.					

and involve the use of Table 17-3, Thoracic Spine Regional Grid: Spine Impairments.

In all cases, if there is documented spinal cord injury with findings of neurogenic bowel or bladder, or neurogenic sexual dysfunction related to spinal cord injury and other related findings, an additional impairment calculation is appropriate, using Chapter 13. The neurologic WPI should be combined with the spine-related impairment.

17.2c Lumbar Spine

The lumbar spine is defined as the region from T12 to S1 (motion segments T12-L1 through L5-S1) including all the soft tissues, motion segments, and neurologic structures. Instructions for determining the

Diagnosis-Based Impairment are provided in Sections 17.1 and 17.3 and involve the use of Table 17-4, Lumbar Spine Regional Grid: Spine Impairments.

In all cases, if there is documented cauda equina syndrome or spinal cord injury with findings of neurogenic bowel or bladder, or neurogenic sexual dysfunction related to spinal cord injury and other related findings, an additional impairment calculation is appropriate, using Chapter 13. The neurologic WPI should be combined with the spine-related WPI.

17.3 Adjustment Grids and Grade Modifiers: Non-Key Factors

The adjustment grids, as described in the introduction, are used to assign a grade within the class

TABLE 17-3 Thoracic Spine Regional Grid: Spine Impairments

 Thoracic Spine Regional Grid					
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
IMPAIRMENT RATING (WPI %)	0	1%-6%	7%-11%	12%-16%	17%-22%
Non-specific chronic, or chronic recurrent thoracic spine pain (also known as chronic sprain/strain, etc)	0 Documented history of sprain/strain-type injury, now resolved, or continued complaints of mid-back pain with no objective findings on examination	0 1 2 3 3 Documented history of sprain/strain type injury with continued complaints of axial and/or non-verifiable radicular complaints and similar findings documented in previous examinations and present at the time of evaluation (see Sec. 17.2 General Considerations)			
MOTION SEGMENT LESIONS					
Intervertebral disk herniation and/or AOMSI <i>Note:</i> AOMSI includes instability (specifically as defined in the <i>Guides</i>), arthrodesis, failed arthrodesis, dynamic supral stabilization or arthroplasty, or combinations of those in multiple-level conditions	0 Intervertebral disk herniation or documented AOMSI at 1 or more levels (see definition in footnote), with medically documented injury; with or without surgery, with no residual signs or symptoms	2 3 4 5 6 Intervertebral disk herniation or documented AOMSI, at a single or multiple levels, with medically documented findings; with or without surgery; findings and with documented resolved radiculopathy or non-verifiable radicular complaints at clinically appropriate level(s), present at the time of examination	7 8 9 10 11 Intervertebral disk herniation or AOMSI at a single level, with medically documented findings; with or without surgery and with documented radiculopathy at the clinically appropriate level present at the time of examination (see Table 17-7, Physical Examination Adjustment, to grade radiculopathy)	12 13 14 15 16 Intervertebral disk herniation or AOMSI at multiple levels with medically documented findings; with or without surgery and with documented signs of radiculopathy at a single clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy)	17 18 19 20 22 Intervertebral disk herniation or AOMSI, at multiple levels, with medically documented injury; with or without surgery and with documented signs of bilateral or multiple-level radiculopathy at the clinically appropriate levels present at the time of examination (see Table 17-7 to grade radiculopathy)
Pseudarthrosis <i>Note:</i> Only applies after spinal surgery intended for fusion with resultant documented motion (not necessarily AOMSI by definition provided in footnote) with consistent radiographic findings or hardware failure; with or without surgery to repair	0 Pseudarthrosis (post surgery) with no residual signs or symptoms	2 3 4 5 6 Pseudarthrosis (post surgery) at a single level or multiple levels with medically documented findings and with documented resolved radiculopathy or non-verifiable radicular complaints at the clinically appropriate level(s) present at the time of examination	7 8 9 10 11 Pseudarthrosis (post surgery) at a single level with medically documented findings and with documented radiculopathy at the clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy)	12 13 14 15 16 Pseudarthrosis (post surgery) at a multiple levels with medically documented findings and with or without documented radiculopathy at a single clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy)	17 18 19 20 22 Pseudarthrosis (post surgery) at a multiple levels with medically documented findings and with documented signs of bilateral or multiple-level radiculopathy at the clinically appropriate levels present at the time of examination (see Table 17-7 to grade radiculopathy)

(continued)

TABLE 17-3 (CONTINUED) Thoracic Spine Regional Grid: Spine Impairments

CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
IMPAIRMENT RATING (WPI %)	0	1%-6%	7%-11%	12%-16%	17%-22%
FRACTURES/DISLOCATION OF THE SPINE					
Compression fractures of 1 vertebral body and/or fracture of posterior element (pedicle, lamina, articular process, transverse process) and/or burst fracture of 1 or more vertebral bodies	0 Resolved with or without surgery, with no residual signs or symptoms	2 3 4 5 6 Single- or multiple-level fracture(s) with <25% compression of any vertebral body; with or without minimal bony retropulsion into the canal, pedicle and/or posterior element fracture (<5-mm displacement) Healed, with or without surgery (includes vertebroplasty or kyphoplasty) and with or without documented resolved radiculopathy or nonverifiable radicular complaints at clinically appropriate level, present at the time of examination	7 8 9 10 11 Single- or multiple-level fractures with 25%-50% compression of any vertebral body; with or without moderate bony retropulsion into the canal, pedicle and/or posterior element fracture (>5-mm displacement) Healed, with or without surgery (including vertebroplasty or kyphoplasty) with or without residual deformity and with or without documented radiculopathy at the clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy) With signs of spinal cord injury or myelopathy: see Chapter 13, The Central and Peripheral Nervous System, for calculating additional impairment	12 13 14 15 16 Single- or multiple-level fractures with >50% compression of any vertebral body; with or without moderate to severe bony retropulsion into the canal, pedicle and/or posterior element fracture (>5-mm displacement) Healed with or without surgery (including vertebroplasty or kyphoplasty) with or without residual deformity and with or without documented radiculopathy at a single clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy) With signs of spinal cord injury or myelopathy: see Chapter 13 for calculating additional impairment	17 18 19 20 22 Single or multiple-level fractures with >50% compression of any vertebral body; with or without moderate to severe bony retropulsion into the canal, pedicle and/or posterior element fracture (>5-mm displacement) Healed with or without surgery (including vertebroplasty or kyphoplasty) with or without residual deformity and with documented signs of bilateral or multiple-level radiculopathy at the clinically appropriate levels present at the time of examination (see Table 17-7 to grade radiculopathy) With signs of spinal cord injury or myelopathy: see Chapter 13 for additional impairment

(continued)

defined by the regional grid. The grade within a given class is determined by considering Functional History, Physical Examination Findings, and the results of relevant Clinical Studies. If any of these grade modifiers were used for primary placement in the regional grid (eg, clinical studies for determination of compression fracture), they may not be used again in the impairment calculation. The non-key factors must be consistent, reliable, and associated with the diagnosis. The process of determining the adjustments for spine-related conditions is based on the use of Table 17-5, Adjustment Grid: Summary.

The grade modifiers associated with Functional History, Physical Examination, and Clinical Studies will be used to calculate a net adjustment, according to Section 17.3f, that permits modification of the

default value, grade C, up or down within a given class. When determining the grade modifier, the evaluator should assess each of the components of the adjustment as listed in the grid (eg, soft-tissue findings, neural stretch test, reflexes, motor and sensory exam). The highest grade modifier identified for each category (FH, PE, CS) should be used as the value for that adjustment in the Net Adjustment Formula. For example, on physical examination, reflex findings may be characterized as grade 0 and neural tension signs/straight leg raise may be grade 2. The modifier for Physical Examination would then be grade 2, because it is the higher of the two grades within that grid.

As stated earlier, if a grade modifier has been used to determine the impairment class, it may not be

TABLE 17-3 (CONTINUED) Thoracic Spine Regional Grid: Spine Impairments

CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
IMPAIRMENT RATING (WPI %)	0	1%–6%	7%–11%	12%–16%	17%–22%
Dislocations/ fracture- dislocation	0 Resolved with or without surgery, with no residual signs or symptoms	2 3 4 5 6 Single- or multiple-level dislocation with or without fracture Healed, with or without surgery <i>and</i> with documented resolved radiculopathy or nonverifiable radicular complaints at clinically appropriate level(s) With signs of spinal cord injury or myelopathy: see Chapter 13, The Central and Peripheral Nervous System, for calculating additional impairment	7 8 9 10 11 Single-level dislocation with or without fracture Healed, with or without surgical intervention, including fusion <i>and</i> documented radiculopathy at the clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy) With signs of spinal cord injury or myelopathy: see Chapter 13 for calculating additional impairment	12 13 14 15 16 Multiple-level dislocation with or without fracture Healed with or without surgical intervention, including fusion <i>and</i> documented radiculopathy at a single clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy) With signs of spinal cord injury or myelopathy: see Chapter 13 for calculating additional impairment	17 18 19 20 22 Multiple-level dislocation with or without fracture Healed with or without surgical intervention, including fusion <i>and</i> with documented signs of bilateral or multiple-level radiculopathy at the clinically appropriate levels present at the time of examination (see Table 17-7 to grade radiculopathy) With signs of spinal cord injury or myelopathy: see Chapter 13 for additional impairment
Postoperative complications (nonneurologic) Note: Neurologic complications are rated in Chapter 13, The Central and Peripheral Nervous System					17 18 19 20 22 Deep spinal wound infection requiring chronic suppressive antibiotics; or chronic osteomyelitis

Note: Alteration of motion segment integrity indicates AOMSI. It is defined using flexion/extension X rays. In the thoracic spine, a diagnosis of AOMSI by translation measurements requires at least 2.5 mm of anterior or 2.5 mm of posterior translation of one vertebra on another, on flexion or extension radiographs respectively; or successful or unsuccessful attempts at surgical arthrodesis, including dynamic stabilization, or preserved motion with disk arthroplasty

used again in this calculation. In the spine, radiographic findings will often be excluded from the Net Adjustment Formula calculation because they are frequently used to determine the impairment class in the regional grid (eg, single or multiple level conditions). If any of these factors are determined by the examiner to be unreliable or inconsistent, they should be disregarded in the grading adjustment. The examiner should explain the basis for grade assignment or discounting of a specific adjustment for lack of reliability in the impairment report.

17.3a Adjustment Grid: Functional History
Grade assignment for Functional History is based on patient self-reports that are attributable to the impairment. Grading is based on the extent to which functional symptoms interfere with different levels

of activity, as summarized in Table 17-6, Functional History Adjustment. As explained in Section 1.8e, History of Clinical Presentation, in general, individuals with no symptoms will be assigned grade modifier 0, and those with constant symptoms accompanied by functional deficits that persist despite treatment will be assigned grade modifier 4.

Functional History grade modifier should be applied only to the single, highest spine-related DBI if multiple regions are being rated. Specific jurisdictions may modify this process such that Functional History adjustment is considered for each DBI or not considered at all as a grade modifier.

TABLE 17-4 Lumbar Spine Regional Grid: Spine Impairments

Lumbar Spine Regional Grid					
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
IMPAIRMENT RATING (WPI %)	0	1%-9%	10%-14%	15%-24%	25%-33%
Non-specific chronic, or chronic recurrent low back pain (also known as: chronic sprain/strain, symptomatic degenerative disc disease, facet joint pain, SI joint dysfunction, etc)	0 Documented history of sprain/strain-type injury, now resolved, or continued complaints of back pain with no objective findings on examination	0 1 2 3 3 Documented history of sprain/strain type injury with continued complaints of axial and/or non-verifiable radicular complaints and similar findings documented in previous examinations and present at the time of evaluation (see Sec. 17.2, General Considerations)			
MOTION SEGMENT LESIONS					
Intervertebral disk herniation and/or AOMSI <i>Note: AOMSI includes instability (specifically as defined in the Guides), arthrodesis, failed arthrodesis, dynamic stabilization or arthroplasty, or combinations of those in multiple-level conditions</i>	0 Intervertebral disk herniation or documented AOMSI at 1 or more levels (see definition in footnote), with medically documented injury; with or without surgery, with no residual signs or symptoms	5 6 7 8 9 Intervertebral disk herniation or documented AOMSI, at a single level or multiple levels with medically documented findings; with or without surgery <i>and</i> with documented resolved radiculopathy at clinically appropriate level or nonverifiable radicular complaints at clinically appropriate level(s), present at the time of examination	10 11 12 13 14 Intervertebral disk herniation and/or AOMSI at a single level with medically documented findings; with or without surgery <i>and</i> with documented radiculopathy at the clinically appropriate level present at the time of examination (see <i>Physical Examination adjustment grid in Table 17-7 to grade radiculopathy</i>)	15 17 19 21 23 Intervertebral disk herniations and/or AOMSI at multiple levels, with medically documented findings; with or without surgery <i>and</i> with or without documented radiculopathy at a single clinically appropriate level present at the time of examination (see <i>Table 17-7 to grade radiculopathy</i>)	25 27 29 31 33 Intervertebral disk herniations and/or AOMSI, at multiple levels, with medically documented findings; with or without surgery <i>and</i> with documented signs of bilateral or multiple-level radiculopathy at the clinically appropriate levels present at the time of examination (see <i>Table 17-7 to grade radiculopathy</i>)
Pseudarthrosis <i>Note: Only applies after spinal surgery intended for fusion with resultant documented motion (not necessarily AOMSI by definition provided in footnote) with consistent radiographic findings or hardware failure; with or without surgery to repair</i>	0 Pseudarthrosis (post surgery) with no residual signs or symptoms	5 6 7 8 9 Pseudarthrosis (post surgery) at a single level or multiple levels with medically documented findings <i>and</i> with documented resolved radiculopathy or non-verifiable radicular complaints at the clinically appropriate level(s) present at the time of examination	10 11 12 13 14 Pseudarthrosis (post surgery) at a single level with medically documented findings <i>and</i> with documented signs of radiculopathy at the clinically appropriate level present at the time of examination (see <i>Table 17-7 to grade radiculopathy</i>)	15 17 19 21 23 Pseudarthrosis (post surgery) at a multiple levels with medically documented findings <i>and</i> with or without documented radiculopathy at a single clinically appropriate level present at the time of examination (see <i>Table 17-7 to grade radiculopathy</i>)	25 27 29 31 33 Pseudarthrosis (post surgery) at a multiple levels with medically documented findings <i>and</i> with documented signs of bilateral or multiple-level radiculopathy at the clinically appropriate levels present at the time of examination (see <i>Table 17-7 to grade radiculopathy</i>)

(continued)

TABLE 17-4 (CONTINUED) Lumbar Spine Regional Grid: Spine Impairments

CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
IMPAIRMENT RATING (WPI %)	0	1%–9%	10%–14%	15%–24%	25%–33%
Spinal stenosis <i>Note:</i> AOMSI includes instability (specifically as defined in the <i>Guides</i>), arthrodesis, failed arthrodesis, dynamic stabilization or arthroplasty, or combinations of those in multiple-level conditions	0	5 6 7 8 9 Lumbar stenosis, at a single level or multiple levels, with or without AOMSI with medically documented findings; with or without surgery (decompression) <i>and</i> with documented resolved radiculopathy at clinically appropriate level or nonverifiable radicular complaints at clinically appropriate level(s), present at the time of examination	10 11 12 13 14 Lumbar stenosis, at a single level with or without AOMSI with medically documented findings; with or without surgery (decompression) <i>and</i> with documented signs of radiculopathy at the clinically appropriate level present at the time of examination <i>and/or</i> documented intermittent neurogenic claudication (see Table 17-7 to grade radiculopathy, but not claudication) with signs of cauda equina syndrome: use Chapter 13 to calculate additional impairment	15 17 19 21 23 Lumbar stenosis, at multiple levels with or without AOMSI with medically documented findings; with or without surgery (decompression) <i>and</i> with documented signs of radiculopathy at a single clinically appropriate level present at the time of examination <i>and/or</i> documented neurogenic claudication, walking limited to <10 minutes (see Table 17-7 to grade radiculopathy, but not claudication) with signs of cauda equina syndrome: use Chapter 13 to calculate additional impairment	25 27 29 31 33 Lumbar stenosis, at multiple levels with or without AOMSI with medically documented findings; with or without surgery (decompression) <i>and</i> with documented signs of bilateral or multiple-level radiculopathy at the clinically appropriate levels present at the time of examination <i>and/or</i> severe neurogenic claudication and inability to ambulate without assistive devices with signs of cauda equina syndrome: use Chapter 13 to calculate additional impairment
SPONDYLOLISTHESIS					
Spondylolisthesis (L5-S1 or last mobile segment; nondegenerative)	0	5 6 7 8 9 Spondylolisthesis with medically documented injury; with or without surgery <i>and</i> with documented resolved radiculopathy or nonverifiable radicular complaints at clinically appropriate level, present at the time of examination	10 11 12 13 14 Spondylolisthesis with medically documented injury; with or without surgery at a single level <i>and</i> with documented signs of radiculopathy at the clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy)	15 17 19 21 23 Spondylolisthesis with medically documented injury; with or without surgery at multiple levels <i>and</i> with documented signs of radiculopathy at a single clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy)	25 27 29 31 33 Spondylolisthesis with medically documented injury; with or without surgery at multiple levels (including AOMSI) <i>and</i> with documented signs of bilateral or multiple-level radiculopathy at the clinically appropriate levels present at the time of examination (see Table 17-7 to grade radiculopathy)

(continued)

TABLE 17-4 (CONTINUED) Lumbar Spine Regional Grid: Spine Impairments

CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
IMPAIRMENT RATING (WPI %)	0	1%–9%	10%–14%	15%–24%	25%–33%
Degenerative spondylolisthesis with or without spinal stenosis	0 Degenerative spondylolisthesis with medically documented findings; with or without surgery; no residual signs or symptoms	5 6 7 8 9 Degenerative spondylolisthesis, at a single or multiple levels, with medically documented injury; with or without surgery <i>and</i> with documented resolved radiculopathy or non-verifiable radicular complaints at clinically appropriate level, present at the time of examination	10 11 12 13 14 Degenerative spondylolisthesis at a single level, with medically documented injury; with or without surgery <i>and</i> with documented radiculopathy at the clinically appropriate level present at the time of examination <i>and/or</i> documented intermittent neurogenic claudication (see Table 17-7 to grade radiculopathy, but not claudication)	15 17 19 21 23 Degenerative spondylolisthesis at multiple levels with medically documented injury; with or without surgery <i>and</i> with documented radiculopathy at a single clinically appropriate level present at the time of examination <i>and/or</i> documented neurogenic claudication, walking limited to <10 minutes (see Table 17-7 to grade radiculopathy, but not claudication) with signs of cauda equina syndrome: use Chapter 13 to calculate additional impairment	25 27 29 31 33 Degenerative spondylolisthesis at multiple levels with medically documented injury; with or without surgery <i>and</i> with documented signs of bilateral or multiple-level radiculopathy at the clinically appropriate levels present at the time of examination <i>and/or</i> severe neurogenic claudication and inability to ambulate without assistive devices with signs of cauda equina syndrome: use Chapter 13 to calculate additional impairment

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As in other chapters in the Sixth Edition of the *Guides*, a functional assessment tool consisting of measurements initially designed and validated for outcome measurement has been included in this chapter. Although many such tools have been developed and validated over the past 30 years, the PDQ was selected for reproduction in this chapter. (A description of the PDQ and instructions for administering this functional tool are provided at the end of this chapter in Appendix 17-A.) The Oswestry Disability Index is an alternative functional assessment that may be used for this purpose.

The evaluating physician may use the functional assessment outcome questionnaire as part of the process of evaluating functional symptoms. However, the inventory is used only to assist the examiner in defining the grade modifier for Functional History. The inventory score does not serve as a basis for defining further impairment; nor does the score reflect an impairment percentage.

The examiner must assess the reliability of the functional reports, recognizing the potential influence of behavioral and psychosocial factors. If the grade

for Functional History differs by two or more grades from that described by Physical Examination or Clinical Studies, the Functional History should be assumed to be unreliable. If the Functional History is determined to be unreliable or inconsistent with other documentation or clinical findings, it is excluded from the grading process.

17.3b Adjustment Grid: Physical Examination

When performing a physical examination, the clinician needs to determine the significance of physical findings as they relate to the impairment being evaluated. For the purposes of determining impairment, greater weight is given to those findings that are more objective. The highest grade modifier identified in each adjustment grid is chosen for use in the net adjustment calculation. Some parameters described in the adjustment grid may be region-specific.

If multiple diagnoses are rated, the examiner should determine the appropriate impairment class for each diagnosis, and the examiner must distinguish which physical examination findings are associated with each specific ratable condition. If Physical Examination

TABLE 17-4 (CONTINUED) Lumbar Spine Regional Grid: Spine Impairments

CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
IMPAIRMENT RATING (WPI %)	0	1%-9%	10%-14%	15%-24%	25%-33%
FRACTURES/DISLOCATIONS OF THE SPINE					
Compression fractures of 1 vertebral body <i>and/or</i> fracture of posterior element (pedicle, lamina, articular process, transverse process) <i>and/or</i> burst fracture of 1 or more vertebral bodies	0 Resolved with or without surgery, with no residual signs or symptoms	5 6 7 8 9 Single- or multiple-level fractures with <25% compression of any vertebral body; with minimal retropulsion into canal; with or without pedicle and/or posterior element fracture (<5-mm displacement) Healed, with or without surgery (includes vertebroplasty or kyphoplasty) <i>and</i> with documented resolved radiculopathy at clinically appropriate level or documented radiculitis (without radiculopathy) at clinically appropriate level, present at the time of examination with signs of cauda equina syndrome: use Chapter 13 to calculate additional impairment	10 11 12 13 14 Single- or multiple-level fractures with 25%-50% compression of any vertebral body; with or without moderate bony retropulsion into the canal; pedicle and/or posterior element fracture (>5-mm displacement) Healed, with or without surgery (including vertebroplasty or kyphoplasty) with or without residual deformity <i>and</i> with or without documented radiculopathy at the clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy) with signs of cauda equina syndrome: use Chapter 13 to calculate additional impairment	15 17 19 21 23 Single- or multiple-level fractures with >50% compression of any vertebral body; with or without moderate to severe bony retropulsion into the canal; pedicle and/or posterior element fracture (>5-mm displacement) Healed, with or without surgery (including vertebroplasty or kyphoplasty) with or without residual deformity <i>and</i> with or without significant radiculopathy at a single clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy) with signs of cauda equina syndrome: use Chapter 13 to calculate additional impairment	25 27 29 31 33 Single- or multiple-level fractures with >50% compression of any vertebral body; with or without moderate to severe bony retropulsion into the canal; pedicle and/or posterior element fracture (>5-mm displacement) Healed, with or without surgery (including vertebroplasty or kyphoplasty) with or without residual deformity <i>and</i> with significant radiculopathy at multiple clinically appropriate levels present at the time of examination (see Table 17-7 to grade radiculopathy) with signs of cauda equina syndrome: use Chapter 13 to calculate additional impairment

(continued)

findings are determined to be unreliable or inconsistent, or they are for conditions unrelated to the condition being rated, they are excluded from the grading process. In that case, the physician must explain the rationale for the exclusion in his or her report.

Impairment related to radicular complaints is included in the range of values for each diagnosis and accounted for by grade, using the adjustment grid. There is no separate impairment for radiculopathy, unless specified in the regional grid. Findings related to myelopathy, cauda equina syndrome, or spinal cord injury are rated according to Chapter 13, The Central and Peripheral Nervous System.

Alignment and deformity are determined clinically and/or on the basis of radiographic studies. In the spine, instability is confirmed by findings on imaging studies. For the purposes of this edition, instabil-

ity of the spine is determined radiographically and defined according to the criteria listed in each region (Section 17.3c, Adjustment Grid: Clinical Studies). Table 17-7, Physical Examination Adjustment, summarizes the grading process.

Commonly Used Terms

Although it is not the purpose of the *Guides* to discuss in detail how the basic physical examination is performed, some commonly used terminology is defined to promote consistency:

Nerve Tension/Compression Signs. Signs of nerve tension or compression include the following:

1. Straight leg raise.
2. Femoral stretch test
3. Spurling's maneuver; cervical compression.

TABLE 17-4 (CONTINUED) Lumbar Spine Regional Grid: Spine Impairments

CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
IMPAIRMENT RATING (WPI %)	0	1%-9%	10%-14%	15%-24%	25%-33%
Dislocations/ fracture- dislocation	0 Resolved without sur- gery with no residual signs or symptoms	5 6 7 8 9 Single- or multiple- level dislocations (with or without fractures) healed, with or without surgery <i>and</i> with documented resolved radiculop- athy or nonverifi- able radiculopathy at clinically appro- priate level(s), pres- ent at the time of examination with signs of cauda equina syndrome: use Chapter 13 to calculate additional impairment	10 11 12 13 14 Single-level disloca- tion with or with- out fracture healed, with or without surgi- cal intervention, including fusion <i>and</i> documented radiculopathy at the clinically appro- priate level pres- ent at the time of examination (see Table 17-7 to grade radiculopathy) with signs of cauda equina syndrome: use Chapter 13 to calculate additional impairment	15 17 19 21 23 Multiple-level dislo- cation with or without fracture healed, with or without surgi- cal intervention, including fusion <i>and</i> documented radiculopathy at a single clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy) with signs of cauda equina syndrome: use Chapter 13 to calculate additional impairment	25 27 29 31 33 Multiple-level dislo- cation with or without fracture healed, with or without surgi- cal intervention, including fusion <i>and</i> with documented signs of bilateral or multiple level radiculopathy at the clinically appropriate levels present at the time of examination (see Table 17-7 to grade radiculopathy) with signs of cauda equina syndrome: use Chapter 13 to calculate additional impairment
Post-operative complications (nonneurologic) Note: Neurologic complications are rated in Chapter 13, The Central and Peripheral Nervous System					25 27 29 31 33 Deep spinal wound infection requiring chronic suppressive anti- biotics; or chronic osteomyelitis
Note: Alteration of motion segment integrity indicates AOMSI. It is defined using flexion/extension X rays (Figures 17-5 and 17-6). In the lumbar spine (L1-S1), a diagnosis of AOMSI by translation measurements requires greater than 8% anterior or greater than 9% posterior relative translation of one vertebra on another, on flexion or extension radiographs, respectively. In the lumbosacral spine (L5-S1), it requires greater than 6% anterior or greater than 9% posterior relative translation of L5 on S1, on flexion or extension radiographs, respectively. A diagnosis of AOMSI by angular motion measurements requires greater than 15° at L1-2, L2-3, and L3-4; greater than 20° at L4-5, or greater than 25° at L5-S1 (compared to adjacent level angular motion). Alternatively, may have complete or near-complete loss of motion of a motion segment due to developmental fusion or to successful or unsuccessful attempts at surgical arthrodesis.					

Sciatic nerve tension signs are important indicators of lumbosacral nerve root irritation. Positive tension signs are most commonly seen in individuals with a herniated lumbar disk. The most commonly used sciatic nerve tension test is the straight leg raising (SLR) test. When performed in the supine position, the hip is flexed as the examiner raises the leg with the knee extended. In the sitting position, with the hip flexed 90°, the knee is extended. The test is positive when thigh and/or leg pain, often along the appropriate dermatomal distribution, is reproduced. The degree of elevation at which pain occurs is recorded. The L5 and S1 nerve roots are primarily affected by a change in their length when SLR is

performed. The L4 root moves a shorter distance. Therefore, the SLR test has the most value in assessing lesions of the L5 and S1 roots. The supine SLR test is considered positive when radicular pain is reproduced at between 35° and 70° of leg elevation with hip flexion. Back pain that occurs with the SLR is not a positive finding. Hamstring tightness must also be differentiated from posterior thigh pain due to root tension.

Pathology at higher levels of the lumbar spine is often associated with a negative SLR test result. A femoral nerve stretch test stretches the femoral nerve and tests the L2-4 roots. It involves prone extension

TABLE 17-5

Adjustment Grid: Summary

Non-Key Factor	Specific Adjustment Grid	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Functional History	Table 17-6	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
Physical Examination	Table 17-7	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
Clinical Studies	Table 17-9	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem

of the hip on the affected side. Root tension signs are most reliable when the pain is elicited in a dermatomal distribution.

Although the SLR test in disk herniation is relatively sensitive (72% to 97%), it is nonspecific (11% to 45%). The SLR test of the asymptomatic limb that produces sciatica in the symptomatic limb—the cross-positive SLR test—is specific (85% to 100%) but less sensitive (23% to 42%). Supine SLR testing can be further validated by gentle dorsiflexion and plantar flexion of the ankle, as well as internal and external rotation of the hip with the leg raised to the symptomatic level. A positive SLR test is validated by ankle dorsiflexion and hip internal rotation, increasing pain while the other movements decrease the pain. A sitting SLR test may be useful in validating supine SLR testing, but the examiner must interpret the findings cautiously, since the lumbar spine is generally more flexed in the sitting than in the supine position. In chronic nerve root compression due to spinal stenosis, tension signs are often absent.

Axial compression of the spine and rotation to the ipsilateral side of symptoms may reproduce or increase symptoms of cervical radiculopathy. Pain to the side of rotation is usually indicative of foraminal stenosis and nerve root irritation. Spurling's test is positive when upper extremity pain is reproduced by extending the neck and rotating the chin toward the affected extremity. The axial compression test repro-

duces pain when pressure is applied to the top of the patient's head; alternatively, relief of symptoms occurs when traction is applied under the chin and occiput.

Reflexes. Reflexes may be normal, increased, reduced, or absent. For reflex abnormalities to be considered clinically significant, the involved and normal limb or limbs should show marked asymmetry between arms or legs on repeated testing. For the purposes of impairment rating, abnormal and asymmetrical reflex should be a new finding, related to the diagnosis being evaluated. Once lost because of previous radiculopathy, a reflex rarely returns. Abnormal reflexes such as Babinski signs or clonus may be signs of corticospinal tract involvement.

Weakness and Loss of Sensation. A careful neurologic examination should be performed to assess dermatome-related sensory deficits and myotome-related motor deficits. Appropriate tables and figures are provided to identify common dermatome maps, (see Figures 17-3a, 17-3b and 17-4) and the muscles commonly affected by motor loss attributable to a specific nerve root (Table 17-8; Common Radicular Syndromes). In order to be considered valid, the sensory findings must be in an anatomic distribution (ie, follow dermatomal patterns) although some overlap may occur. Motor findings should also be consistent with the affected nerves or roots. Significant, long-standing weakness is usually accompanied by measurable atrophy.

TABLE 17-6

Functional History Adjustment: Spine

Functional History Factor	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Activity	Asymptomatic; problem resolved; inconsistent symptoms	Pain; symptoms with strenuous/vigorous activity	Pain; symptoms with normal activity	Pain; symptoms with less-than-normal activity (minimal activity)	Pain; symptoms at rest, limited to sedentary activity
PDQ or alternative validated functional assessment, scaled appropriately	No disability PDQ 0	Mild disability PDQ 0-70	Moderate disability PDQ 71-100	Severe disability PDQ 101-130	Extreme disability PDQ 131-150

Note: PDQ Indicates Pain Disabilities Questionnaire.

TABLE 17-7

Physical Examination Adjustment: Spine

Physical Examination Factor	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Lumbar Neural Tension Signs	Negative straight leg raising test for radicular pain or invalid examination		Positive straight leg raising test, with reproducible radicular pain at 35°–70°		
Cervical Compression/Foraminal Compression	Negative cervical compression/foraminal compression		Positive cervical compression/foraminal compression (Spurling's test) with reproducible radicular pain		
Reflexes	Normal and symmetrical		New and asymmetrical abnormality consistent with other radicular findings (ie, differentiate between old and new changes)		
Atrophy UE LE	<1 cm <1 cm	1.0–1.9 cm 1.0–1.9 cm	2.0–2.9 cm 2.0–2.9 cm	3.0–3.5 cm 3.0–3.5 cm	>3.5 cm >3.5 cm
Sensory Deficit	No loss of sensibility, abnormal sensation, or pain	Diminished light touch (with or without minimal abnormal sensations or pain) in a clinically appropriate distribution, that is forgotten during activity	Diminished light touch (with some abnormal sensations or slight pain) in a clinically appropriate distribution, that interferes with some activities	Decreased protective sensibility (with abnormal sensations or moderate pain in a clinically appropriate distribution) that may prevent some activities	Absent superficial pain and tactile sensibility or absent protective sensibility (abnormal sensations, or severe pain) that prevents all activity
Motor Strength	Normal Active movement against gravity with full resistance (5/5)	Active movement against gravity and some resistance (4/5)	Active movement against gravity only, without resistance (3/5)	Active movement with gravity eliminated (2/5)	Slight contraction and no movement or no contraction (0–1/5)

Atrophy. Atrophy is measured with a tape measure at identical levels on both limbs. The difference in circumferences is described by grade modifiers for both the upper and lower extremities in Table 17-7, Adjustment Grid: Physical Examination. Asymmetry for reasons other than atrophy does not affect the rating.

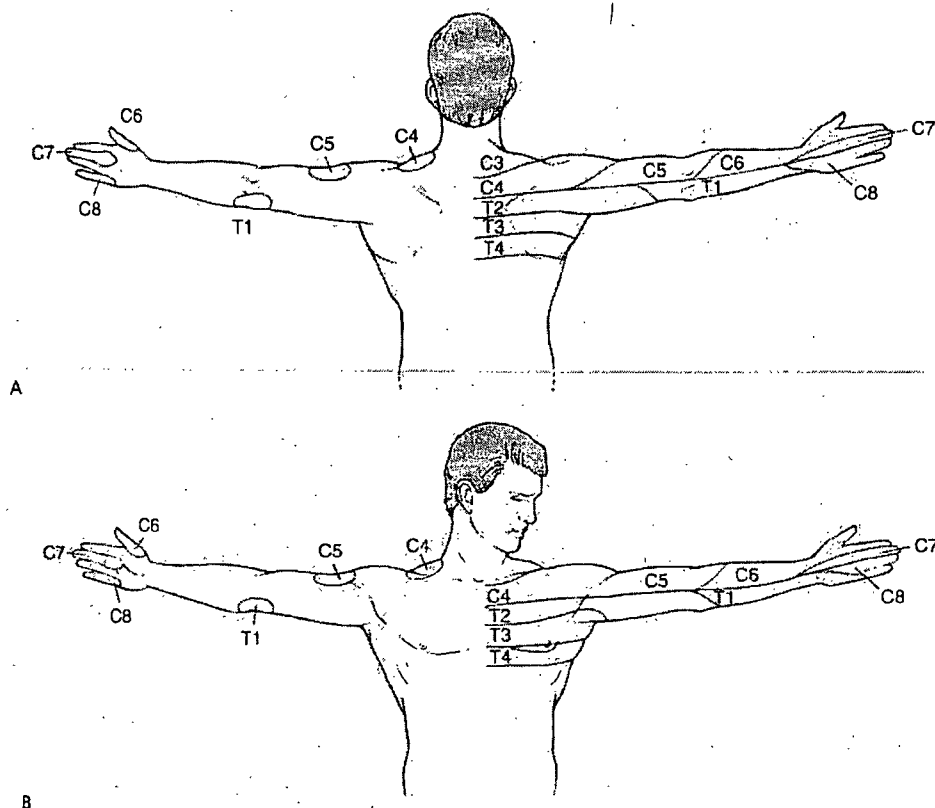
Radiculopathy. For the purposes of the *Guides*, *radiculopathy* is defined as significant alteration in the function of a single or multiple nerve roots and is usually caused by mechanical or chemical irritation of one or several nerves. The diagnosis requires clinical findings including specific dermatomal distribution of pain, numbness, and/or paresthesias. Subjective reports of sensory changes are more difficult to assess; therefore, these complaints should be consistent and supported by other findings of radiculopathy. There may be associated motor weakness and loss of reflex. A root tension sign is usually positive. The

identification of a condition that may be associated with radiculopathy (such as a herniated disk) on an imaging study is not sufficient to make a diagnosis of radiculopathy; clinical findings must correlate with the radiographic findings in order to be considered.

Nonverifiable Radicular Complaints. Nonverifiable radicular complaints are defined as chronic persisting limb pain or numbness, which is consistently and repetitively recognized in medical records, in the distribution of a single nerve root that the examiner can name and with the following characteristics: preserved sharp vs. dull sensation and preserved muscle strength in the muscles it innervates, is not significantly compressed on imaging, and is not affected on electrodiagnostic studies (if performed). Although there are subjective complaints of a specific radicular nature, there are inadequate or no objective findings to support the diagnosis of radiculopathy.

FIGURE 17-3

Skin Area Innervated by the Cervical and Thoracic Nerve Roots Showing Autonomous Zones

**17.3c Adjustment Grid: Clinical Studies**

The patient may have undergone a variety of special tests, including imaging studies and electrodiagnostic (EMG/ NCV) studies. The physician should review these studies, the findings, and note their interpretations. Whenever possible, the physician should personally review the studies and report agreement or disagreement with previous interpretations.

Although imaging and other studies may assist physicians in making a diagnosis, it is important to note that a positive imaging study, in and of itself, does not make the diagnosis. Several reports indicate that approximately 30% of persons who have never had back pain will have an imaging study that can be interpreted as positive for a herniated disk, and 50% or more will have bulging disks. The prevalence of degenerative changes, bulges, and herniations increases with advancing age. Developmental findings, such as spondylolysis, are found normally in 7% of adults, and spondylolisthesis is found in 3% of adults.

For imaging studies to be of diagnostic value, clinical symptoms and signs must be consistent with the

imaging findings. In other words, an imaging test is useful to confirm a diagnosis, but findings on an imaging study alone are insufficient to qualify for an impairment. In cases where the abnormalities just discussed are present on imaging studies, and are known (or assumed) to have preexisted an injury being rated, evaluators should acknowledge these antecedent conditions in the report.

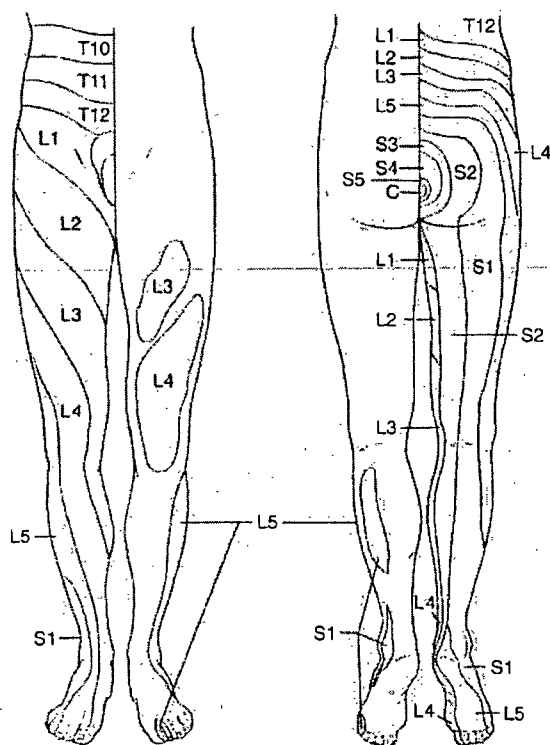
If a diagnosis of AOMSI, pseudarthrosis, fracture or spondylolisthesis is made, imaging studies should be excluded as a grade modifier.

Alteration of Motion Segment Integrity (AOMSI)

There are several technical considerations in obtaining and interpreting radiographic studies to evaluate AOMSI, including magnification, film quality and normal thresholds for translation and angular motion. AOMSI as defined in the *Guides* is assessed by plain film flexion-extension radiographs only. Source to image distance (SID) for flexion-extension X rays of the thoracic and lumbar spine

FIGURE 17-4

Skin Areas Innervated by the Thoracic and Lumbosacral Nerve Roots and Showing Autonomous Zones



is not defined in the literature or medical practice; however, 40" SID imaging parameters are most commonly used in the lumbar spine. The relative translation measurements are described in this text for each spinal region, corrected for magnification.

Cervical spine AOMSI is defined using flexion/extension X rays (Figures 17-5 and 17-6 describe similar technique for lumbar spine). A diagnosis of AOMSI in the cervical spine by *translation* measurements requires greater than 20% anterior or greater than 20% posterior relative translation of one vertebra on another, on flexion or extension radiographs, respectively; or *angular motion* of more than 11° greater than each adjacent level on the flexion radiograph. Alternatively, there may be complete or near-complete loss of motion of a motion segment due to developmental fusion; successful or unsuccessful attempts at surgical arthrodesis, including dynamic stabilization; or preserved motion with disk arthroplasty.

Thoracic spine AOMSI is defined using flexion/extension X rays (Figures 17-5 and 17-6). A diagnosis of AOMSI in the thoracic spine by *translation* measurements requires at least 2.5 mm anterior or 2.5 mm posterior translation of one vertebra on another, on flexion or extension radiographs respectively; or successful or unsuccessful attempts at surgical arthrodesis, including dynamic stabilization.

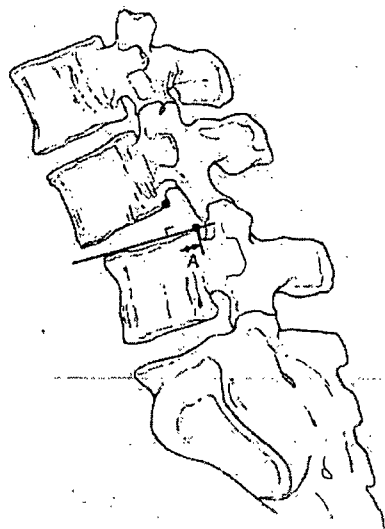
TABLE 17-8

Common Radicular Syndromes

Disk Level	Nerve Root	Motor Deficit	Sensory Deficit	Reflex Compromise
LUMBAR				
L3-4	L4	Quadriceps	Anterior thigh Anterior knee Medial leg and foot	Knee
L4-5	L5	Extensor hallucis longus	Lateral thigh Anterolateral leg Middorsal foot	Medial hamstrings
L5-S1	S1	Ankle plantar flexors	Posterior leg Lateral foot	Ankle
CERVICAL				
C4-5	C5	Deltoid Biceps	Anterolateral shoulder and arm	Biceps
C5-6	C6	Radial wrist extensor Biceps	Lateral forearm and hand Thumb	Brachioradialis Pronator teres
C6-7	C7	Wrist flexors Triceps Finger extensors Ulnar wrist extensor	Middle finger	Triceps
C7-T1	C8	Finger flexors Hand intrinsic	Medial forearm and hand, ring and little fingers	None
T1-T2	T1	Hand intrinsic	Medial forearm	None

FIGURE 17-5

Loss of Motion Segment Integrity, Translation



A dot is placed at the posterior superior corner of the lower vertebra, and a separate dot is placed at the posterior-inferior corner of the upper vertebra. The distance (A) is measured as illustrated by the figure, using two intersecting lines. Measurements are obtained in flexion and extension, and the difference is calculated. A value greater than 2.5 mm in the thoracic spine, greater than 4.5 mm in the lumbar spine, and greater than 3.5 mm in the cervical spine qualifies as loss of structural integrity.

Lumbar spine AOMSI is defined using flexion/extension X rays (Figures 17-5 and 17-6). A diagnosis of AOMSI in the lumbar spine (L1-L5) by *translation* measurements requires greater than 8% anterior or greater than 9% posterior relative translation of one vertebra on another, on flexion or extension radiographs respectively. In the **lumbosacral spine (L5-S1)**, it requires greater than 6% anterior or greater than 9% posterior relative translation at L5-S1 of L5 on S1 on flexion or extension radiographs, respectively. A diagnosis of AOMSI in the lumbosacral spine by *angular motion* measurements requires greater than 15° at L1-2, L2-3, and L3-4; greater than 20° at L4-5, or greater than 25° at L5-S1 (compared with adjacent level angular motion).

Alternatively, there may be complete or near-complete loss of motion of a motion segment due to developmental fusion or to successful or unsuccessful attempts at surgical arthrodesis; including dynamic stabilization; or preserved motion with disk arthroplasty.

Some relevant information on selected clinical tests is provided in the following subsections.

Imaging Studies

X ray and CT may be very useful in detecting bony abnormalities. These studies can help detect fractures, dislocations, joint narrowing, and lesions associated with alteration of bony architecture (tumor, infection, etc). Flexion/extension X rays may provide useful information on AOMSI (instability or loss of motion) at a given level. MRI is more useful for detection of soft tissue lesions, including disc and nerve root pathology. The identification of degenerative disk disease at one or multiple levels, similar to the finding of arthrosis in an extremity joint, is not diagnostic of injury- or disease-related pathology because such degenerative changes can be a natural consequence of the aging process.

Electrodiagnostic Verification of Radiculopathy

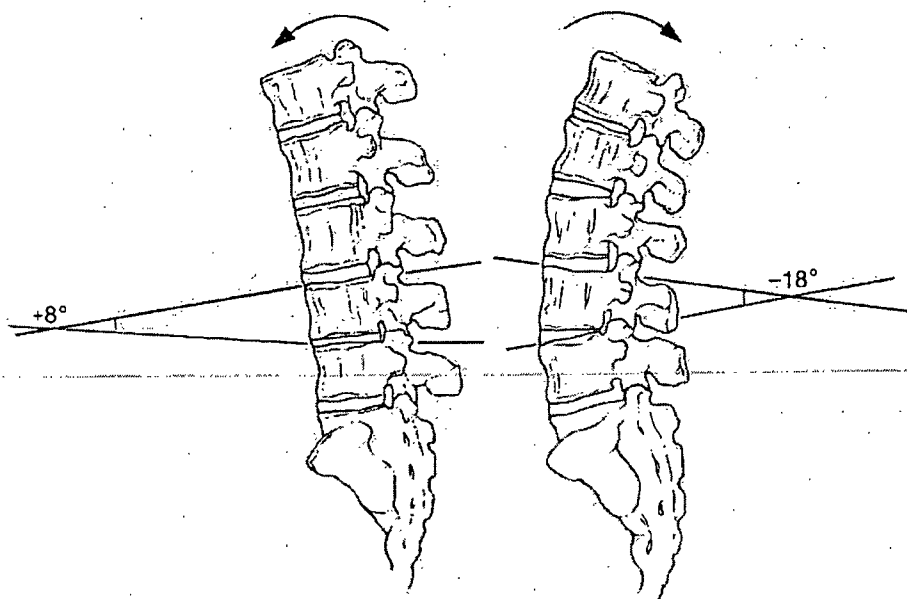
Electrodiagnostic studies should be performed only by a licensed physician qualified by reason of education, training, and experience in these procedures. Typically, these studies are performed by board-certified neurologists and physical medicine specialists. The quality of the test and interpretation of the results depend on the skill and knowledge of the physician performing the study. The technique and documentation of the electromyographer may be considered in assessing "EMG evidence" and validity. The EMG/NCV is considered to be an extension of the history and physical examination, and interpretation should correlate with the clinical findings.

Evidence of radiculopathy (axonal injury of the nerve root) on EMG is based on the finding of reproducible positive sharp waves and/or fibrillation potentials in muscles innervated by one or more nerve roots. These "spontaneous potentials" result from ongoing axonal loss with denervation of the muscle. Abnormalities should be observed in a myotomal distribution. So-called "chronic" radiculopathy is a confusing term that generally refers to findings indicative of old nerve root injury. Interpretation of EMG findings as reflecting old axonal injury is more subjective and includes identifying motor unit configuration changes such as increased amplitude and duration. These are not usually quantitated in routine EMG testing.

Electrodiagnostic testing does not detect all compressive radiculopathies, cannot detect sensory root involvement, and cannot determine the cause of the nerve root pathology. However, EMG can detect noncompressive radiculopathies that are not identified by imaging studies when there is axonal loss. Paraspinal muscle needle EMG findings in patients with previous spine surgery must be interpreted with caution, as the paraspinal muscles may exhibit abnormalities for a prolonged time after surgery.

FIGURE 17-6

Loss of Motion Segment Integrity, Angular Motion (Sagittal Rotation), Lumbar Spine



Lines are drawn along the superior border of the vertebral body of the lower vertebrae and the superior border of the body of the upper vertebrae and the lines extended until they join. The angles are measured and subtracted. Note that lordosis (extension) is represented by a negative angle and kyphosis (flexion) by a positive angle. Loss of motion segment integrity is defined as motion greater than 15° at L1-2, L2-3, and L3-4 and greater than 20° at L4 to L5. Loss of integrity of the lumbosacral joint is defined as angular motion between L5 and S1 that is greater than 25° . The flexion angle is $+8^\circ$ and the extension angle is -18° . In the illustration, the flexion angle is $+8^\circ$. Therefore $(+8) - (-18) = +26^\circ$ and would qualify for loss of structural integrity at any lumbar level.

At present, only the needle EMG is considered diagnostic of radiculopathy. H reflex, F wave, nerve conduction studies, and evoked potentials are adjuncts in the testing and can help evaluate for other pathology. For the purposes of Table 17-9, Clinical Studies Adjustment, EMG evidence of acute radiculopathy requires findings of positive sharp waves and/or fibrillation potentials (as described in detail in Chapter 15, The Upper Extremities). A report concluding evidence of "chronic" radiculopathy should be thoroughly scrutinized and not necessarily interpreted as evidence of an active axonal lesion.

17.3d Corticospinal Injury

In this edition of the *Guides*, rating corticospinal cord injury is deferred to Chapter 13, The Central and Peripheral Nervous System. Only objective impairments secondary to a corticospinal injury are rated. It is not appropriate to separately rate subjective complaints such as sexual or sleep dysfunction that are not of a neurogenic origin; these complaints are considered in the Functional History as a component of activities of daily living.

In cases of myelopathy or other central nervous system (CNS) involvement, the rating physician *independently* assesses impairments for the musculoskeletal injury or illness, and for the CNS neurologic loss. The spinal cord level of involvement is determined by identifying the lowest normally functioning nerve root, which determines the cord level. Identifying the level of nerve root function helps to determine the degree of residual function. The total impairment for the spinal region results from *combining* the values for the musculoskeletal impairment and the CNS impairment.

In this chapter, when conditions that include a clinical component best rated using CNS impairment criteria are identified, reference is made to Chapter 13, The Central and Peripheral Nervous System.

17.3e Mental and Behavioral Problems and Chronic Pain

In unusual cases, a musculoskeletal injury or incident may be accompanied by a primary mental health disorder, which is rated independently using the Mental and Behavioral Disorders chapter (Chapter 14). Under most circumstances, however,

TABLE 17-9
Clinical Studies Adjustment: Spine

Clinical Studies Factor	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Imaging studies: Radiographs, bone scan, MRI	Imaging findings do not support symptoms or structural diagnosis within normal limits or normal age-related changes or clinically insignificant degenerative changes, or findings on the side opposite clinical presentation		CT/MRI/other imaging findings consistent with clinical presentation, including evidence of AOMSI with segmental instability, fusion, or motion preservation device defined by region (see row below)		Imaging evidence of major surgical complications, including infection or major deformity
Electrodiagnostic testing	Normal		EMG evidence consistent with single nerve root radiculopathy		EMG evidence consistent with multiple nerve root radiculopathy

Note: CT indicates computed tomography; MRI, magnetic resonance imaging; AOMSI, alteration of motion segment integrity; and EMG, electromyographic.

impairment rating for mental health disorders related to the stressors that often accompany a chronic, disabling musculoskeletal disorder, is captured within the rating for the musculoskeletal disorder itself. An independent mental health impairment rating is considered duplicative. In addition, Chapter 3, Pain-Related Impairment, provides impairment ratings for chronic pain conditions that arise independent of any organ system that is rated by usual methods. Impairment ratings for those conditions are calculated using either a musculoskeletal chapter (Chapter 15, 16, or 17) or Chapter 3. Adding or combining ratings from a musculoskeletal chapter and Chapter 3 is not permissible.

17.3f Impairment Calculation Methodology

As described in the preceding parts of this chapter, impairment is calculated by identifying an impairment class that reflects the diagnosis, and a grade that considers functional, physical, and clinical facets of the condition. The impairment class (IC) is determined first, using the corresponding diagnosis-based regional grid. The grade within the class is then using the adjustment grids and the Net Adjustment Formula.

The regional grids provide a range of impairment values for each specific diagnosis. Each cell within the regional grid contains a series of five numbers that correspond to grades A through E in

the impairment range. Once the impairment class is determined according to diagnostic criteria, the impairment grade within the class is calculated using the non-key factors, or grade modifiers from the adjustment grids and the Net Adjustment Formula. The first grade (A) is the lowest impairment rating that could be assigned for the class; the last grade (E) is the highest.

Within the specified class, the grade should initially be assigned to the default (C) rating. This initial default value may be modified up or down within a class depending on the net adjustment, which is calculated by using the grade modifiers in the **Net Adjustment Formula**. The grade modifiers are designed to reflect specific functional, physical, and clinical findings specific to the patient. Using the **Net Adjustment Formula**, the assigned value for each grade modifier (0 to 4) is compared with the number of the impairment class (0 to 4) using the **Net Adjustment Formula**, described in the box on page 582, **Net Adjustment Formula: Mathematical Explanation**. The calculated *net adjustment value* is used to move up a grade (+ net adjustment value) or down a grade (− net adjustment value) within a class. If all the grade modifier numbers are the same as the impairment class number, the net adjustment value will be 0 and the default value (C) will be the impairment rating value for that diagnosis. A change in class is not permitted, regardless of the magnitude of the net adjustment.

TABLE 17-10 Methodology for Determining the Grade in an Impairment Class

IMPAIRMENT CLASS	0	1	2	3	4
IMPAIRMENT RATING (%)	0	1%-9%	10%-16%	17%-25%	26%-30%
GRADE		A B C D E	A B C D E	A B C D E	A B C D E
Example Rating		3 4 5 6 7 ↑ Class 1 Default	10 11 12 13 14 ↑ Class 2 Default	17 18 19 20 21 ↑ Class 3 Default	26 27 28 29 30 ↑ Class 4 Default

METHOD

- Using the relevant regional grid, choose the appropriate diagnosis for the condition, located in the left-most column. Select the appropriate class for that diagnosis, based on the criteria specified in the columns for classes 0 to 4.
- Using the adjustment grids for Functional History, Physical Examination, and Clinical Studies, identify the appropriate grade using grade modifiers:
 - If there are multiple components to a grade modifier, such as Physical Examination (which may include findings on palpation, alignment, instability), choose the highest grade modifier that is objective and is associated with the diagnosis being rated. *If a grade modifier is found to be unreliable or inconsistent, it should be disregarded and eliminated from the calculation.*
 - If a particular component, such as findings on X ray, was used to determine impairment class, it may not be used again to determine the grade and is disregarded in the impairment calculation.
 - The Functional History grade modifier should be applied only to the highest DBI. Specific jurisdictions may modify this process so that Functional History adjustment is considered for each DBI or not considered at all as a grade modifier.
- Apply the **Net Adjustment Formula**, as shown in the box, and calculate the *net adjustment value* by subtracting the numerical value of the class (CDX) from the numerical value of the grade modifier for each adjustment (Functional History, Physical Examination, and Clinical Studies) and

Net Adjustment Formula: Mathematical Explanation

Net adjustment may be obtained by a mathematical formula and then use of the resultant value to define the grade. The following abbreviations are used:

CDX = Class of Diagnosis (Regional Grid)
 GMFH = Grade Modifier for Functional History
 GMPE = Grade Modifier for Physical Examination
 GMCS = Grade Modifier for Clinical Studies

$$\text{Net Adjustment} = (\text{GMFH} - \text{CDX}) + (\text{GMPE} - \text{CDX}) + (\text{GMCS} - \text{CDX})$$

Grade Assignments:

Net Adjustment (from default C)	Grade
-2	A
-1	B
0	C
1	D
2	E

For example, if the diagnosis is in impairment class 2, then $\text{CDX} = 2$. If net adjustment value is -2, then Grade is A.

adding those values. That net adjustment value will determine how many places up or down from the default value "C" the rating should move. The corresponding numerical value for the impairment can then be identified in the regional grid and impairment class selected initially.

Example: Lumbar Discectomy With Residual Radiculopathy

The use of the 2-grid process can be illustrated by the rating of a lumbar laminectomy and partial discectomy with residual radiculopathy. According to the lumbar regional diagnosis-based grid, this results in class 2 impairment. If, on the basis of the use of the adjustment tables, it was determined that the non-key factors were PDQ score of 80 (grade modifier = 2), straight leg raising (SLR) test was positive (grade modifier 2), and MRI study confirmed the diagnosis (grade modifier 2), the net adjustment is calculated as follows:

$$\text{Net Adjustment} = (\text{GMFH} - \text{CDX}) + (\text{GMPE} - \text{CDX}) + (\text{GMCS} - \text{CDX})$$

$$\text{Net Adjustment} = (2 - 2) + (2 - 2) + (2 - 2) = 0$$

A net adjustment of 0 does not move the grade up or down within the class, and therefore the grade remains at the default rating (C) for the diagnosis, that is, it would remain at 7% whole person impairment (WPI).

To further illustrate this process, if the key factor identifies class 3, and non-key factors identify grade modifier 1 and grade modifier 4 with the third non-key factor determined to be unreliable, this would produce differences of -2 ($1 - 3$) and $+1$ ($4 - 3$), respectively. These values ($-2 + 1$) add to a net adjustment of -1 , moving the rating to 1 lower grade within that class (ie, 1 position to the left) and the corresponding impairment percentage. In this example, if the non-key factors both identified grade modifier 1, the differences would total -4 [Net Adjustment = $(1 - 3) + (1 - 3) = -4$]. Since this procedure does not allow jumping from 1 class to a lower (or higher) class, the rating would move to the lowest grade within a class. In this example, if all non-key factors identified grade modifier 3, the impairment would remain at the default midposition.

As explained in other chapters, a modification of this process is required for class 4 impairments. If the key factor is class 4, and all non-key factors were grade modifier 4 (the highest value), the differences would summate to zero, and placement in a grade above the default value C in class 4 would not be possible. To correct this deficiency, if the key factor is class 4, automatically add $+1$ to the value of each adjustment grade modifier. For example, if the first non-key factor was grade modifier 3, the second was grade modifier 4, and the class is 4, the differences are -1 and 0 (see Net Adjustment Formula above). Adding $+1$ to each grade modifier raises the values to 4 and 5, and the calculation yields values of 0 and $+1$, which sum to a net adjustment value of $+1$. The final grade is D, and the final impairment is the numerical rating associated with class 4 grade D.

17.3g Spine Impairment Case Examples**Cervical Spine Examples****CLASS 0**

0% Whole Person Impairment

EXAMPLE 17-1: CERVICAL SPRAIN/STRAIN

Subject: 22-year-old woman.

History: The patient was rear-ended at a stoplight in a motor vehicle accident and sustained a "whiplash-type" neck injury. She was seen in an emergency room, where X rays revealed straightening of the lordotic curve without other abnormalities. She missed 2 days of work and then returned to the job. She saw her family doctor who provided anti-inflammatory analgesic medication and muscle relaxants, which she uses sparingly. The physical exam revealed some paravertebral C3-6 tenderness, with mild mobility deficit primarily affecting rotation to the right, but with no neurologic signs. No further imaging studies were ordered. She had 3 visits with a physical therapist and, 4 weeks after the accident, was discharged to a home exercise program. Her doctor saw her again 6 weeks after injury and determined that the injury had resolved.

Current Symptoms: occasional pain with vigorous activity; she has returned to full function.

Physical Examination: Normal examination.

Clinical Tests: None repeated.

Diagnosis: Resolved cervical sprain/strain.

Impairment Rating: Regional Impairment:
Diagnosis is consistent with "Documented history

of sprain/strain type injury, now resolved or continued complaints of neck pain with no objective findings on examination," and therefore assigned to class 0. With class 0, adjustment is not required; however, the Functional History reported full function. No objective physical examination or clinical test findings at MMI also support class 0. Regional Impairment: 0% WPI.

CLASS 1

1% to 8% Whole Person Impairment

EXAMPLE 17-2: INTERVERTEBRAL DISK HERNIATION

Subject: 36-year-old man.

History: A construction worker fell 0.9 m (3 ft) from a ladder, injuring his neck. Six months later he is determined to be at MMI after nonoperative care, with persistent neck pain radiating to his right arm. Over the course of the 6 months he has been assessed with a number of clinical tests. Two doctors have documented mild hypesthesia in the C6 distribution on the right side, without motor or reflex changes. At the time of impairment rating, the examining physician verifies that MMI has been reached; the patient is medically stable and prepared for return to work, and no further treatment recommendations have been made.

Current Symptoms: The patient describes his pain as constant, rating 8/10.

Functional Assessment: The PDQ score is 135, consistent with extreme disability.

Physical Examination: Severe guarding and no neurological deficits.

Clinical Tests: Include a normal set of cervical X rays, normal EMG, and MRI demonstrating mild bulges and desiccation at C4, C5, and C6 with a right-sided disk herniation at C5-6.

Diagnosis: Cervical disk herniation with resolved right-sided C6 radiculopathy.

Impairment Rating: Regional Impairment: Diagnosis is consistent with "Intervertebral disk herniation and/or documented AOMSI at a single level with medically documented findings; with or without surgery, AND with documented resolved radiculopathy or non-verifiable radicular complaints at the clinically appropriate level present at the time of examination," and therefore, assigned to class 1. Adjustment Grids: Functional History grade modifier would be 4 (based on his reports and PDQ)

however, this is 2 or more points higher than the class assignment and therefore discounted. Physical Examination: Grade modifier 0 based on no objective neurological deficits. Clinical Studies: Grade modifier 2. Net adjustment is 0, and there is no adjustment to the default impairment (C), resulting in class 1 grade C. Impairment 6% WPI.

Class 1 Example Calculation

CDX	GMFH	GMPE	GMCS
1	n/a	0	2
Net adjustment			
(GMFH - CDX) n/a			
+ (GMPE - CDX) + (0 - 1) = -1			
+ (GMCS - CDX) + (2 - 1) = 1			
Net adjustment = 0			
Result is class 1, adjustment 0, which equals class 1, grade C impairment = 6%.			

Note: CDX indicates class of diagnosis; GMFH, grade modifier for Functional History; GMPE, grade modifier for Physical Examination; GMCS, grade modifier for Clinical Studies; and n/a, not applicable.

EXAMPLE 17-3: INTERVERTEBRAL DISK HERNIATION OR AOMSI AT A SINGLE LEVEL

Subject: 35-year-old woman.

History: The patient had an onset of neck pain and left arm pain after repetitive lifting of boxes while stocking shelves at work. She was treated with epidural injections and physical therapy. Ultimately, she underwent an anterior cervical fusion.

Current Symptoms: Resolution of neck pain and only occasional pain in the left arm. Symptoms occur only with strenuous activity.

Functional Assessment: The PDQ is 50 consistent with mild disability.

Physical Exam: Slightly decreased range of motion of the cervical spine and slight weakness of wrist extensors on the left, with no other evidence of significant radiculopathy.

Clinical Studies: Preoperative MRI showed a disk herniation at C5-6, left. Postoperative films show a healed anterior interbody fusion at C5-6.

Diagnosis: Status post herniated nucleus pulposus and anterior cervical discectomy and fusion at C5-6 with intermittent left arm pain.

Impairment Rating: Regional Impairment: Diagnosis is consistent with "Intervertebral disk herniation and/or documented AOMSI at a single level with medically documented findings; with or without surgery, and with documented resolved radiculopathy

or non-verifiable radicular complaints at the clinically appropriate level present at the time of examination," and therefore, assigned to class 1. Adjustment Grids: Functional History: Grade modifier 1 based on both functional symptoms and PDQ. Physical Examination: Grade modifier 1 based on motor strength. Clinical Studies: Grade modifier 2 based on imaging studies. Net adjustment is +1 and the impairment is class 1 grade D. Impairment is 7% WPI.

Class 1 Example Calculation			
CDX	GMFH	GMPE	GMCS
1	1	1	2
Net adjustment			
$(GMFH - CDX) (1 - 1) = 0$			
$+ (GMPE - CDX) + (1 - 1) = 0$			
$+ (GMCS - CDX) + (2 - 1) = 1$			
Net adjustment = +1			
Result is class 1 with an adjustment +1; therefore, this impairment is class 1, grade D, which equals 7% impairment			

Note: CDX indicates class of diagnosis; GMFH, grade modifier for Functional History; GMPE, grade modifier for Physical Examination; and GMCS, grade modifier for Clinical Studies.

CLASS 2

9% to 14% Whole Person Impairment

EXAMPLE 17-4: INTERVERTEBRAL DISK HERNIATION OR AOMSI AT A SINGLE LEVEL

Subject: 44-year-old man.

History: The patient sustained a blow to the posterior aspect of his neck from a machine support that slipped. Studies revealed a C7-8 disk herniation. He was managed conservatively, and in spite of persistent symptoms, refused surgery. He was evaluated for impairment one year after his injury.

Current Symptoms: The patient reports neck pain with radiation to the ulnar aspect of the hand and numbness of the ring and little fingers. He is unable to use his dominant left hand for ADLs without considerable pain in the neck, left upper back, and ulnar side of the left upper limb, with minimal activity.

Functional Assessment: The PDQ score is 120, consistent with severe disability.

Physical Exam: Decreased range of motion in the neck, positive cervical compression with severe radiating pain to the left arm in a C8 distribution. He has decreased finger strength, and on demonstrating some grasping activities he drops small objects.

Clinical Tests: MRI: left posterolateral disk herniation C7-T1. EMG: left C8 fibrillation potentials.

Diagnosis: Cervical disk herniation with C8 radiculopathy.

Impairment Rating: Regional Impairment:

Diagnosis is consistent with "Intervertebral disk herniation and/or AOMSI at a single level with medically documented findings; with or without surgery and with documented radiculopathy at the clinically appropriate level present at the time of examination" and therefore, assigned to class 2. Adjustment Grids: Functional History: Grade modifier 3 based on symptoms with minimal activity and PDQ score. Physical Examination: Grade modifier 2 based on sensory and motor findings. Clinical Studies: Grade modifier 2. Net adjustment is +1, resulting in class 2, grade D. Impairment is 12% WPI.

Class 2 Example Calculation			
CDX	GMFH	GMPE	GMCS
2	3	2	2
Net adjustment			
$(GMFH - CDX) (3 - 2) = 1$			
$+ (GMPE - CDX) + (2 - 2) = 0$			
$+ (GMCS - CDX) + (2 - 2) = 0$			
Net adjustment = +1			
Result is class 2 with an adjustment +1 from the default value C, which equals class 2, grade D = 12% impairment			

Note: CDX indicates class of diagnosis; GMFH, grade modifier for Functional History; GMPE, grade modifier for Physical Examination; and GMCS, grade modifier for Clinical Studies.

CLASS 3

15% to 24% Whole Person Impairment

EXAMPLE 17-5: INTERVERTEBRAL DISK HERNIATIONS AND AOMSI AT MULTIPLE LEVELS

Subject: 37-year-old woman.

History: The patient had onset of pain in the neck and right arm along the radial aspect and into the thumb, following a medium-speed rear-end auto collision. Conservative treatment failed, and she subsequently underwent an anterior cervical discectomy and fusion at 2 levels from C5 to C7. Her fusion healed uneventfully and she returned to work 6 months after the injury.

Current Symptoms: Upper extremity pain has improved; however, she reports cervical pain and right arm pain with less than normal activity.

Functional Assessment: The PDQ score is 120 consistent with severe disability.

Physical Exam: Slight loss of cervical spine motion. Neurologic examination reveals diminished light touch on the right in the distribution of C6 and C7.

Clinical Studies: Original MRI demonstrated right-sided disk protrusions at C5-6 and C6-7. Post-operative EMG demonstrated significant C6 radiculopathy on the right. Post-operative X rays showed healed fusion from C5-7 with anterior plate in good position.

Diagnosis: Cervical disk herniations at 2 levels, with unresolved radiculopathy at a single level.

Impairment Rating: Regional Impairment:

Diagnosis is consistent with "Intervertebral disk herniations and/or AOMSI, at multiple levels with medically documented findings; with or without surgery and with documented radiculopathy at a single clinically appropriate level present at the time of examination" and therefore, assigned to class 3. Adjustment Grids: Functional History: Grade modifier 3 based on pain with less than normal activity and PDQ score. Physical Examination: Grade modifier 2 based on sensory findings. Clinical Studies: not applicable, define class. Net adjustment is +1, resulting in class 2, grade D. Impairment is 12% WPI.

Class 3 Example Calculation			
CDX	GMFH	GMPE	GMCS
3	3	2	n/a
Net adjustment			
$(GMFH - CDX) (3 - 3) = 0$			
$+ (GMPE - CDX) + (2 - 2) = 0$			
$+ (GMCS - CDX) + (2 - 2) = 0$			
Net adjustment = 0			
Result is class 3 with an adjustment 0 from the default value C, which equals class 3, grade C = 19% impairment			

Note: CDX indicates class of diagnosis; GMFH, grade modifier for Functional History; GMPE, grade modifier for Physical Examination; and GMCS, grade modifier for Clinical Studies.

CLASS 4

25% to 30% Whole Person Impairment

EXAMPLE 17-6: VERTEBRAL FRACTURES AT MULTIPLE LEVELS

Subject: 47-year-old woman.

History: The patient fell and struck the posterior part of her head and neck on a conveyor machine while working on an assembly line. She complained

of immediate motor and sensory deficit in the right upper limb and was taken to the emergency room, where compression fractures of C5 and C6 vertebral body were identified. Shortly thereafter, she underwent a fusion from C4 to C7. She participated in appropriate rehabilitation and was evaluated one year later.

Current Symptoms: Severe neck pain and right upper extremity pain with some limitation of cervical mobility and weakness in the right arm. Pain is constant and present at rest.

Functional Assessment: PDQ score of 140, consistent with extreme disability.

Physical Exam: C6 motor deficit is graded 4/5; C7 triceps weakness is graded 4/5; there is absent and asymmetrical triceps reflex since the injury. The upper arm is 2 cm smaller in diameter than the opposite and uninvolved side.

Clinical Tests: Initial X rays revealed compression fractures at C5 and C6 both with more than 50% compression of C5 and 25% compression of C6. Imaging findings at MMI of healed C4-7 arthrodesis with hardware in place. The EMG confirms significant motor findings in right C6 and C7 nerve roots.

Diagnosis: Vertebral fracture with C4-7 fusion and unresolved radiculopathy at 2 levels.

Impairment Rating: Regional Impairment:

Diagnosis is consistent with "Single or multiple level fractures with >50% compression of one vertebral body; with or without moderate to severe bony retropulsion; with or without pedicle and/or posterior element fracture (>5mm displacement); Healed; with or without surgical intervention; with residual deformity and with or without documented multiple level radiculopathy at the clinically appropriate levels present at the time of examination," and is therefore assigned to class 4. Adjustment Grids: Functional History: Grade modifier 4 based on pain/symptoms at rest and PDQ. Physical Examination: Grade modifier 2 based on atrophy, noting the 4/5 weakness would have resulted in grade modifier 1. Clinical Studies: not applicable, used to determine class. Since the diagnostic class is 4, the Net Adjustment Calculation requires that +1 be added to each grade modifier to calculate the net adjustment. Net adjustment compared with diagnostic class is 0, resulting in class 4, grade D. Impairment = 29% impairment of the whole person.

Class 4 Example Calculation			
CDX	GMFH	GMPE	GMCS
4	4 (+1 for class 4) = 5	3 (+1 for class 4) = 4	n/a
Net adjustment $(GMFH - CDX) (5 - 4) = 1$ $+ (GMPE - CDX) + (4 - 4) = 0$ Net adjustment = +1			
Result is class 4 with an adjustment +1. Therefore, this impairment is class 4, grade D, which equals 29% impairment.			

Note: CDX indicates class of diagnosis; GMFH, grade modifier for Functional History; GMPE, grade modifier for Physical Examination; and GMCS, grade modifier for Clinical Studies.

Thoracic Spine Examples

CLASS 0

0% Whole Person Impairment

EXAMPLE 17-7: THORACIC SPRAIN/STRAIN

Subject: 44-year-old man.

History: The patient works from home and spends many hours on the phone and computer. He complains of chronic, bilateral, upper back discomfort under the scapula area, which worsened 3 to 4 months ago, but improved with physical therapy.

Physical Exam: Hunched posture. Moderate tenderness to deep palpation over the descending trapezius muscles and the periscapular area, with right side more pronounced. Otherwise, normal examination.

Clinical Studies: None.

Diagnosis: Postural discomfort.

Impairment Rating: Regional Impairment: Patient has a resolved thoracic sprain/strain and class 0 impairment with 0% WPI. With class 0, adjustment is not required; however, the Functional History shows that he has full function. No objective physical examination or clinical test findings at MMI also support class 0. Regional Impairment: 0% WPI.

CLASS 1

1% to 6% Whole Person Impairment

EXAMPLE 17-8: INTERVERTEBRAL DISK HERNIATION OR AOMSI AT ONE OR MORE LEVELS

Subject: 56-year-old man.

History: A laborer had a prior history of multiple musculoskeletal injuries during college football.

from which he had fully recovered. He experienced severe right-sided, radiating arm pain with tingling along the chest and the underside of the right arm while moving a refrigerator.

Current Symptoms: Pain has disappeared, but he still has some discomfort when lifting the arm above shoulder level or with strenuous activity. Reports occasional numbness along the medial right arm.

Functional Assessment: The PDQ score is 40, consistent with mild disability.

Physical Exam: Normal examination, including neurological evaluation. He describes a sensation of numbness in a T1 distribution; however, no sensory deficits are documented.

Clinical Studies: MRI: degenerative disk changes at T1-2 with a disk herniation to the right.

Diagnosis: Herniated nucleus pulposus T1-2 with thoracic radiculopathy at T2.

Impairment Rating: Regional Impairment: Diagnosis is consistent with "Intervertebral disk herniation and/or documented AOMSI at a single level with medically documented findings; with or without surgery, and with documented resolved radiculopathy or non-verifiable radicular complaints at the clinically appropriate level present at the time of examination," and therefore, assigned to class 1. Adjustment Grids: Functional History: Grade modifier 1 based on pain with strenuous activity; Physical Examination: Grade modifier 0, no objective sensory deficits. Clinical Studies: Grade modifier 2. Net adjustment compared with diagnostic class is 0, resulting in class 1, grade C. Impairment is 4% WPI.

Class 1 Example Calculation			
CDX	GMFH	GMPE	GMCS
1	1	0	2
Net adjustment $(GMFH - CDX) (1 - 1) = 0$ $+ (GMPE - CDX) + (0 - 1) = -1$ $+ (GMCS - CDX) + (2 - 1) = 1$ Net adjustment = +2			
Result is class 1 with an adjustment 0. The adjustment does not move the impairment; therefore, this impairment is class 1, grade C which equals 4% impairment.			

Note: CDX indicates class of diagnosis; GMFH, grade modifier for Functional History; GMPE, grade modifier for Physical Examination; and GMCS, grade modifier for Clinical Studies.

CLASS 3

12% to 16% Whole Person Impairment

EXAMPLE 17-9: VERTEBRAL FRACTURES AT MULTIPLE LEVELS**Subject:** 35-year-old man.

History: A window washer fell from the second floor of a building on which he was working and sustained compression fractures of T7 and T8. The patient was treated with vertebroplasty and did well. After a short course of physical therapy, he was able to perform ADLs and resume most activities.

Current Symptoms: Moderate back pain with heavy physical activity. Left chest wall numbness over the seventh and eighth ribs.

Physical Exam: Mild hypesthesia, left posterior chest following left eighth rib; mild motion deficits with more limitation on right rotation than left.

Clinical Tests: Compression fractures of T7 (about 40%) and T8 (about 60%), treated with vertebroplasty.

Diagnosis: Compression fractures, T7 and T8, treated with vertebroplasty.

Impairment Rating: Regional impairment: Diagnosis consistent with "Single or multiple level fractures with >50% compression of one vertebral body; with or without moderate to severe bony retropulsion; with or without pedicle and/or posterior element fracture (>5 mm displacement); Healed; with or without surgical intervention; with residual deformity and with or without documented radiculopathy at a single clinically appropriate level present at the time of examination," and therefore is assigned to Class 3 with default impairment of 14% WPI. Adjustment Grids: Functional History: Grade modifier 1 based on pain with strenuous activity; Physical Examination: Grade modifier 2, for sensory abnormalities. Clinical Studies: Clinical tests are not included because they are part of the class determination. Net adjustment compared with diagnostic class is -5, resulting in class 3, grade A. Impairment is 12% WPI.

Class 3 Example Calculation

CDX	GMFH	GMPE	GMCS
3	1	0	n/a
Net adjustment			
$(GMFH - CDX) (1 - 3) = -2$			
$+ (GMPE - CDX) + (0 - 3) = -3$			
Net adjustment = -5			
Result is class 3 with an adjustment of -5. An adjustment ≤ -2 moves the impairment to grade A; therefore, this impairment is class 3, grade A, which equals 12% WPI.			

Note: CDX indicates class of diagnosis; GMFH, grade modifier for Functional History; GMPE, grade modifier for Physical Examination; GMCS, grade modifier for Clinical Studies; WPI, whole person impairment; and n/a, not applicable.

Lumbar Spine Examples**CLASS 0**

0% Whole Person Impairment

EXAMPLE 17-10: LUMBAR SPRAIN/STRAIN**Subject:** 24-year-old man.

History: The patient hurt his back while lifting a large, heavy box; he described the pain as being in the lumbosacral region. Examination shortly after the injury was normal, except for a slight decrease in lumbar motion due to pain. He had no muscle spasm or weakness. The individual was treated with an analgesic. He was off work for 3 days and then returned and has continued to work.

Current Symptoms: Occasional soreness in the low back with heavy lifting; denies leg pain or numbness.

Physical Exam: No positive findings were present, including a negative SLR test, normal strength, and normal sensory examination. No atrophy.

Clinical Studies: X rays demonstrated spina bifida occulta, and otherwise normal.

Diagnosis: Non-specific low back pain, resolved.

Impairment Rating: Regional Impairment: Diagnosis is consistent with "Documented history of sprain/strain type injury, now resolved or continued complaints of lumbar spine pain with no objective findings on examination," and therefore, assigned to class 0. With class 0, adjustment is not required; however, the Functional History reported full function. No objective physical examination or clinical test findings also support class 0. Impairment is 0% WPI.

Comment: This patient has a history of low back pain without objective findings on exam. Spina bifida occulta is a radiographic finding without clinical significance.

EXAMPLE 17-11: INTERVERTEBRAL DISK HERNIATION AT A SINGLE LEVEL

Subject: 28-year-old man.

History: Onset of low back and left posterior thigh pain while removing and replacing windows at work. He was treated with physical therapy, improved, and returned to work after 6 weeks.

Current Symptoms: Asymptomatic.

Physical Exam: Normal examination.

Clinical Studies: The MRI shows a small disk herniation at L5-S1 on the left.

Diagnosis: Herniated nucleus pulposus L5-S1, left, now asymptomatic.

Impairment Rating: Regional Impairment: Diagnosis is consistent with "Intervertebral disk herniation or AOMSI at a single level or multiple levels with medically documented findings; with or without surgery; no residual signs or symptoms" and therefore, assigned to class 0. With class 0, adjustment is not required; however, the Functional History reported full function. No objective physical examination findings were noted at MMI. Impairment is 0% WPI.

CLASS 1

1% to 9% Whole Person Impairment

EXAMPLE 17-12: RECURRENT LOW BACK PAIN WITHOUT OBJECTIVE FINDINGS

Subject: 44-year old man.

History: Experienced onset of low back pain and right leg pain after moving a refrigerator while working as an appliance repairman. He saw his PCP who referred him physical therapy, and his back pain and leg pain improved. He continued to do his exercises and do well for about four weeks and then had a recurrent episode of low back pain, which again responded to physical therapy. He was referred to a physiatrist who recommended continued exercise, and the patient again noted improvement. Six weeks later he had another episode of back pain, which required regular use of NSAID and he continued to work. He discontinued his regular exercise program. He noted increased pain with more vigorous activities including heavy yard work and improvement in his symptoms with rest.

Current Symptoms: Frequent low back pain which responds to non-steroidal anti-inflammatory medication, occasional right leg pain in the distribution of the S1 nerve root.

Physical Exam: Cautious movement in transitioning from sitting to standing. No specific neurologic findings, except failure to perceive some light touch stimuli of the lateral calf and foot. Straight leg raise caused back pain only.

Clinical Studies: MRI was negative for any specific findings; disk dessication reported at multiple lumbar levels.

Diagnosis: Recurrent low back pain without objective findings on examination or clinical studies.

Impairment Rating: Regional Impairment: Diagnosis is consistent with documented history of sprain/strain type injury with continued complaints of axial and/or non-verifiable radicular complaints and similar findings documented in previous examinations and present at the time of evaluation, and therefore, assigned to class 1. Functional History: Grade modifier I: Pain; symptoms with strenuous, vigorous activity. Physical Examination: Grade 1 based on reported decreased sensation in S1 root distribution. Clinical Studies: Grade modifier 0. Net adjustment is -1 and the impairment is class 1, grade B. Impairment is 1%.

Class 1 Example Calculation

[CH]CDX	GMFH	GMPE	GMCS
[TB]1	1	1	0

Net adjustment

$$\begin{aligned}
 &(\text{GMFH} - \text{CDX}) \quad (1 - 1) = 0 \\
 &+ (\text{GMPE} - \text{CDX}) \quad (1 - 1) = 0 \\
 &+ (\text{GMCS} - \text{CDX}) \quad (0 - 1) = -1 \\
 &\text{Net adjustment} = -1
 \end{aligned}$$

Result is class 1 with an adjustment of -1; therefore, this impairment is class 1, grade B and impairment = 1%

Note: CDX indicates class of diagnosis; GMFH, grade modifier for Functional History; GMPE, grade modifier for Physical Examination; GMCS, grade modifier for Clinical Studies; and n/a, not applicable.

CLASS 2

10%-14% Whole Person Impairment

EXAMPLE 17-13: INTERVERTEBRAL DISK HERNIATION OR AOMSI AT A SINGLE LEVEL

Subject: 38-year-old man.

History: The patient had an onset of back and left posterior thigh and leg pain while twisting in a flexed position when lifting a moderately heavy package. Initially he presented with muscle spasm, a positive SLR test on the side at 60°, a positive crossed SLR test at 70°, and decreased dorsiflexion strength of the left ankle. Treatment with physical therapy did not produce significant improvement. Three months

after the injury, he underwent surgical discectomy at L4-L5. He improved and returned to work with restrictions after 4 months of rehabilitation.

Current Symptoms: Persistent left leg pain with normal activity, aggravated by walking and sitting, for which he takes medication occasionally. He is able to do most ADLs, but complains of back pain with any activity.

Physical Exam: Slightly decreased dorsiflexion strength of the left ankle and normal sensory function. SLR test positive at 60°.

Clinical Studies: Original MRI showed a herniated disk at L4-5. No additional studies have been done.

Diagnosis: Lumbar disk herniation, L4-5, left posterolateral, with left L5 radiculopathy

Impairment Rating: Regional Impairment: Diagnosis is consistent with "Intervertebral disk herniation and/or AOMSI at a single level with medically documented findings; with or without surgery, and with documented radiculopathy at the clinically appropriate level present at the time of examination," and therefore, assigned to class 2 with default impairment of 12% WPI. Adjustment Grids: Functional History: Grade modifier is 2 based on report of pain with normal activity. Physical Exam: Grade modifier 2 for positive SLR, noting that 4/5 strength would only be grade modifier 1. Clinical Testing: Grade modifier 2 as well. The net adjustment is 0, and therefore this patient's impairment is grade 2, class C, which equals 12% WPI.

Class 2 Example Calculation			
CDX	GMFH	GMPE	GMCS
2	2	2	2
Net adjustment			
$(GMFH - CDX) (2 - 2) = 0$			
$+ (GMPE - CDX) + (2 - 2) = 0$			
$+ (GMCS - CDX) + (2 - 2) = 0$			
Net adjustment = 0			
Result is class 2 with an adjustment of 0; therefore, this impairment is class 2 default grade C, which equals 12% impairment			

Note: CDX indicates class of diagnosis; GMFH, grade modifier for Functional History; GMPE, grade modifier for Physical Examination; and GMCS, grade modifier for Clinical Studies.

EXAMPLE 17-14: INTERVERTEBRAL DISK HERNIATION OR AOMSI AT A SINGLE LEVEL

Subject: 52-year-old man.

History: The patient had an onset of back pain and right thigh and calf pain after digging trenches to lay cable. He was treated with physical therapy

and medications, without resolution of symptoms. Subsequently he underwent a laminectomy and disk excision at L4-5 but failed to note improvement with surgery. Flexion/extension X rays after surgery documented instability within the parameters described for AOMSI. The patient was treated with a lumbar fusion at L4-5 one year prior to evaluation.

Current Symptoms: Reported some improvement in his back pain and continued to experience symptoms consistent with right L5 radiculopathy.

Functional History: PDQ score of 120, consistent with severe disability.

Physical Exam: Decreased lumbar range of motion, positive SLR test on the right at 30°, and decreased sensation in the right L5 distribution.

Diagnosis: Status post lumbar fusion at L4-5 with persistent L5 radiculopathy.

Impairment Rating: Regional Impairment: Diagnosis is consistent with "Intervertebral disk herniation and/or AOMSI at a single level with medically documented findings; with or without surgery, and with documented radiculopathy at the clinically appropriate level present at the time of examination," and therefore, assigned to class 2 with default impairment of 12% WPI. Adjustment Grids: Functional History: Grade modifier 3. Note history is consistent with grade modifier 2 and PDQ score is consistent with grade 3 (assuming both are reliable, select highest value for net adjustment calculation). Physical Examination: Grade modifier is 2 based on both positive SLR test and sensory loss. Clinical Testing: Grade modifier 2 based on imaging studies. The net adjustment is +1 and the impairment is class 2 grade D. Impairment is 13% WPI.

Class 2 Example Calculation			
CDX	GMFH	GMPE	GMCS
2	3	2	2
Net adjustment			
$(GMFH - CDX) (3 - 2) = 1$			
$+ (GMPE - CDX) + (2 - 2) = 0$			
$+ (GMCS - CDX) + (2 - 2) = 0$			
Net adjustment = +1			
Result is class 2 with a net adjustment of +1; therefore, this impairment is class 2, grade D, which equals 13% impairment			

Note: CDX indicates class of diagnosis; GMFH, grade modifier for Functional History; GMPE, grade modifier for Physical Examination; and GMCS, grade modifier for Clinical Studies.

CLASS 3

15% to 23% Whole Person Impairment

EXAMPLE 17-15: INTERVERTEBRAL DISK HERNIATION OR AOMSI AT MULTIPLE LEVELS**Subject:** 65-year-old man.

History: The patient had a new onset of back and left leg pain while lifting on the job. Initially, he presented with muscle spasm and positive SLR test on the left side at 60° with difficulty toe standing and an absent Achilles tendon reflex. He failed to improve with nonoperative care and had progressive left S1 root motor loss. He underwent L5-S1 diskectomy 3 months after injury but failed to improve. Eight months after injury he underwent L4-S1 arthrodesis but still complained of severe back and leg pain. Fusion was extended to L3 12 months after injury. He is still off work 18 months after injury, having dropped out of a functional rehabilitation program. He is found to be at MMI.

Current Symptoms: Complaints of persistent back and left leg pain, which is constant and present at rest.

Functional Assessment: The PDQ score is 135, consistent with extreme disability.

Physical Exam: Marked pain behaviors, including grimacing and moaning. Axial loading and trunk rotation both result in increased complaints. Neurological examination reveals positive SLR test, absent ankle reflex and numbness along the lateral side of the foot. He had difficulty toe standing on the left, 3/5.

Clinical Tests: Postoperative imaging reveals solid L3-S1 fusion with epidural fibrosis around left S1 nerve root without foraminal encroachment. The EMG shows no radiculopathy.

Diagnosis: Lumbar disk herniation L5-S1 with multiple level fusion.

Impairment Rating: Regional Impairment: Diagnosis is consistent with "Intervertebral disk herniations and/or AOMSI at multiple levels with medically documented findings; with or without surgery; AND with or without documented radiculopathy at a single clinically appropriate level present at the time of examination," and therefore, assigned to class 3.

Adjustment Grids: Functional Assessment: Grade modifier 4 based on PDQ score of 135. Physical Examination: Grade modifier 2 based on positive SLR and absent reflex as well as motor weakness. Findings are consistent with grade modifier 2.

Clinical Studies: do not apply, determined class. Net adjustment score is 0, and the patient's impairment is class 3, grade C, which is 19% WPI.

Class 3 Example Calculation

CDX	GMFH	GMPE	GMCS
3	4	2	n/a

Net adjustment

$$\begin{aligned} &(\text{GMFH} - \text{CDX}) (4 - 3) = 1 \\ &+ (\text{GMPE} - \text{CDX}) + (2 - 3) = -1 \\ &\text{Net adjustment} = 0 \end{aligned}$$

Result is class 3 with an adjustment of 0; therefore, this impairment is class 3, grade C, which equals 19% impairment

Note: CDX indicates class of diagnosis; GMFH, grade modifier for Functional History; GMPE, grade modifier for Physical Examination; GMCS, grade modifier for Clinical Studies; and n/a, not applicable.

CLASS 4

25% to 33% Whole Person Impairment

EXAMPLE 17-16: LUMBAR SPINAL STENOSIS AT MULTIPLE LEVELS**Subject:** 56-year-old man.

History: Back and bilateral leg pain developed after the patient repetitively lifted 22.5-kg (50-lb) sacks of fertilizer. Initially, he presented with muscle spasm and subsequently experienced loss of the left knee reflex with an L5 root sensory deficit with mild foot drop. He reported inability to ambulate outside his home without a scooter. He continued to complain of severe persistent pain despite extensive nonoperative efforts and 7 months later underwent lumbar spinal decompression without fusion for a diagnosis of spinal stenosis at L3-4 and L4-5. Postoperatively, he remained limited in his ability to walk and reported relief of his leg pain with sitting. He required a wheelchair or scooter to ambulate any significant distance. Bowel and bladder function remained intact.

Current Symptoms: Complaints of severe pain and inability to walk any significant distance.

Functional Assessment: PDQ score of 118, consistent with severe disability.

Physical Exam: Persistent severe back pain and palpable spasm with persistent L5 sensory deficit and 3/5 ankle dorsiflexion weakness. SLR test was negative, and walking in the hallway outside the office provoked bilateral buttock and leg pain, which was relieved with rest.

Clinical Tests: EMG: mild chronic L5 radiculopathy bilaterally.

Diagnosis: Lumbar spinal stenosis, multiple levels.

Impairment Rating: Regional Impairment:

Diagnosis is consistent with "Lumbar stenosis at multiple levels with or without AOMSI with medically documented findings; with or without surgery and with documented signs of bilateral or multiple-level radiculopathy at clinically appropriate levels at the time of examination and/or severe neurogenic claudication and inability to ambulate without assistive devices," and therefore, assigned to class 4 with default impairment of 29% WPI. Adjustment Grids: Functional Assessment: Grade modifier 4, based on limited activity. Note that PDQ is grade modifier 3, but the higher of the two ratings is used to calculate net adjustment. Physical Examination: Grade modifier 2 based on decreased motor strength (3/5). Clinical Studies are not included because they were used to make the diagnosis. Because this is a class 4 impairment, the net adjustment calculation requires that +1 be added to each adjustment calculation. Therefore, the net adjustment is 0, and the impairment is class 4, grade C. Impairment rating is 29%.

Class 4 Example Calculation			
CDX	GMFH	GMPE	GMCS
4	4(+1)=5	2(+1)=3	n/a
Net adjustment			
(GMFH - CDX) (5 - 4) = 1			
+ (GMPE - CDX) + (3 - 4) = -1			
Net adjustment = 0			
Result is class 4 with an adjustment of 0. Therefore, the result is class 4, default grade C = 29% impairment.			

Note: CDX indicates class of diagnosis; GMFH, grade modifier for Functional History; GMPE, grade modifier for Physical Examination; GMCS, grade modifier for Clinical Studies; and n/a, not applicable.

17.3h Combining and Converting Impairments

If there are multiple diagnoses at MMI, the examiner should determine if each should be considered or if the impairments are duplicative. If there are multiple diagnoses within a specific region, then the most impairing diagnosis causally related to the injury is rated, because it is likely this will incorporate the functional losses of the less impairing diagnoses. In very rare cases, the examiner may combine multiple impairments within a single region if the most impairing diagnosis does not adequately reflect the losses; the examiner must fully explain the rationale for this approach. When uncertain about whether diagnoses are duplicative, the evaluator should calculate the impairment using each diagnosis and choose the diagnosis that gives the most clinically accurate impairment rating. The evaluating physician

must explain in writing the rationale for combining impairments. Unless otherwise directed by a specific jurisdiction, Functional History is used only for the single most significant ratable diagnosis.

If there are multiple spine-related impairments, they are combined at the whole person level. The combined value determination is based on the following formula:

$$A\% + B\% (100\% - A\%) = \text{Combined Value of } A\% \text{ and } B\%$$

The Combined Values Chart (end-of-book Appendix) is used to determine the combined value of two impairment percentages. *All percentages being combined must be expressed using a common denominator or same unit relative value.* Multiple impairments are successively combined by first combining the largest number with the next largest remaining number, and then further combining it with the next largest remaining number. This process is repeated until all given impairment values have been combined.

17.4 Pelvic Impairment

The pelvis has three bilateral components—ilium, ischium and pubis—forming a ringlike structure around the sacrum. Each ilium is attached to the sacrum via the sacroiliac synchondrosis. The pelvis, including the symphysis pubis, assists in the transfer of body weight to the lower extremities. In females, the pelvic structure and function are also of paramount importance in pregnancy and delivery. Separation of the pubic symphysis is common after pregnancy, and should be differentiated from traumatic separation of the joint as the result of an injury when rating impairment.

Traumatic pelvic fractures are frequently associated with other injuries that may cause substantial bleeding, sensory and motor dysfunction, and other injuries. Although the fractures may heal in acceptable alignment, subsequent problems including pain, impaired mobility, bowel and bladder impairment, and sexual dysfunction are usually the result of damage to nerves and organs that occurred concurrently with the fracture.

Rating impairment of the pelvis (Table 17-11) may require consideration of concomitant injuries, including injuries to the spine (Section 17.2), injuries to the sciatic nerve and hip (Chapter 16, The Lower Extremities), and urogenital injuries and sexual dysfunction according to the relevant chapters (The Digestive System, The Urinary and Reproductive

TABLE 17-11 Diagnosis-Based Impairment Grid: Pelvis

Diagnosis-Based Impairment Grid: Pelvis					
CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
IMPAIRMENT RATING (%)	0	1%-3%	4%-6%	7%-11%	12%-16%
FRACTURES/DISLOCATIONS					
Fractures of the pubic rami; fractures of the ilium, ischium, and/or sacrum	0 Nondisplaced, healed fractures without residual structural deformity; no residual symptoms or healed fracture with or without surgery with no residual symptoms related to fracture	1 2 2 3 3 Nondisplaced or minimally displaced fractures, with or without surgery healed and stable, including minor separation of the pubic symphysis (>1 cm and <3 cm; unrelated to childbirth); with residual signs and symptoms	4 5 5 6 6 Displaced fractures (<1 cm) of the ilium, ischium, sacrum, or coccyx healed, with or without surgery or traumatic separation of the pubic symphysis (≥ 3 cm) with residual signs but no instability fractures displaced >1 cm and <2 cm of the ilium, ischium, and sacrum; traumatic separation of the pubic symphysis (≥ 3 cm) with or without surgery with minimal deformity and without instability with residual signs	7 8 9 10 11 Fractures displaced ≥ 2 cm of the ilium, ischium, sacrum, or coccyx healed, with or without surgery and with deformity and instability; traumatic separation of the pubic symphysis ≥ 3 cm with or without surgery with residual deformity and instability with residual signs	12 13 14 15 16 SI joint dislocations, or fracture-dislocations with rupture of the SI ligaments; transverse sacral fractures with spinopelvic dissociation or severe complications after surgery, including pseudoarthrosis, osteomyelitis, or documented instability
Fracture of the acetabulum	Nondisplaced, healed fractures without residual structural deformity; no residual symptoms or healed fracture with or without surgery, with no residual symptoms related to fracture	Evaluate based on restricted motion of the hip joint (Chapter 16, The Lower Extremities)			

Note: SI indicates sacroiliac.

Systems, The Central and Peripheral Nervous System: Chapters 6, 7, and 13, respectively).

17.4a Adjustment Grid: Functional History (Pelvic Impairments)

Grade assignment for functional symptoms is based on subjective reports that are attributable to the impairment. Grading is based on the severity of functional symptoms associated with different level of activities, as summarized in Table 17-12, Functional History Adjustment: Pelvis. As explained in Section 1.8e, History of Clinical Presentation, in general, individuals with no symptoms will be assigned grade modifier 0, and those with constant symptoms accompanied by functional deficits that persist despite treatment will be assigned grade modifier 4.

Functional History grade modifier should be applied only to the single highest DBI. Jurisdictions may modify this process such that Functional History adjustment is considered for each DBI or none at all.

As in other chapters in the Sixth Edition of the *Guides*, a functional assessment tool consisting of measurements initially designed and validated for outcome measurement has been added to this chapter; after careful consideration, the PDQ was selected.

The evaluating physician may use the PDQ functional assessment outcome questionnaire or another validated functional tool as part of the process of evaluating functional symptoms. The inventory is used only to assist the examiner in defining the grade modifier for Functional History, and does not serve as a basis for defining further impairment, nor does the score reflect an impairment percentage. (A description of the PDQ and instructions for administering this functional tool are provided at the end of this chapter in the appendix.)

The examiner must assess the reliability of the functional reports, recognizing the potential influence of behavioral and psychosocial factors. If the grade for Functional History differs by two or more grades from that described by Physical Examination or Clinical

Studies, the Functional History should be assumed to be unreliable. *If the Functional History is determined to be unreliable or inconsistent with other documentation, it is excluded from the grading process.*

17.4b Adjustment Grid: Physical Examination (Pelvic Impairments)

When performing a physical examination, the clinician needs to determine the significance of the findings related to the impairment being evaluated. For the purposes of this evaluation, greater weight is given to those findings that are more objective. Some parameters described in the adjustment grid (Table 17-13) may be region-specific.

If multiple diagnoses are rated, the examiner should determine the appropriate impairment class in the relevant chapter and diagnostic grid for each diagnosis. The examiner must distinguish which physical examination findings are associated with each specific ratable condition. If x-ray or imaging study findings of fracture displacement have been used to determine impairment class placement, they should not be considered again as a Clinical Studies adjustment to determine grade. If Physical Examination findings are determined to be unreliable or inconsistent, or they are for conditions unrelated to the condition being rated, they are excluded from the grading process. The physician must explain the rationale for the choice of grade in his or her report.

Alignment and deformity are determined clinically and/or on the basis of radiographic studies. In the pelvis, stability is usually determined by findings on imaging studies. For the purposes of this edition, instability of the pelvis is determined radiographically and is described in the next section.

17.4c Adjustment Grid: Clinical Studies (Pelvic Impairments)

The patient may have undergone a variety of special tests, including imaging studies and electrodiagnostic studies. Impairment ratings for other organ sys-

TABLE 17-12

Functional History Adjustment: Pelvis

Functional History Factor	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Activity	Asymptomatic; problem resolved; inconsistent symptoms	Pain; symptoms with strenuous/vigorous activity	Pain; symptoms with normal activity	Pain; symptoms with less than normal activity (minimal activity)	Pain; symptoms at rest, limited to sedentary activity
PDQ (score)	No disability PDQ (0)	Mild disability PDQ (0-70)	Moderate disability PDQ (71-100)	Severe disability PDQ (101-130)	Extreme disability PDQ (131-150)

TABLE 17-13**Physical Examination Adjustment: Pelvis**

Physical Examination Factor	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Soft tissue	No tenderness	Mild localized tenderness	Moderate to severe localized tenderness		
Gait <i>Note: Not applicable in spinal stenosis or in conditions for which central nervous system ratings are combined</i>	No disorder of gait or station	Rises to standing position; walks but has difficulty with elevations, grades, stairs, deep chairs, and/or long distances	Rises to standing position; walks some distance with difficulty and without assistance but is limited to level surfaces	Rises and maintains standing position with difficulty; cannot walk without assistance	Cannot stand without help, mechanical support, and/or an assistive device
Deformity	No deformity	Mild detectable deformity or pelvic obliquity	Moderate deformity or pelvic obliquity affecting sitting or standing, produced by displaced pelvic fracture and/or dislocation	Severe deformity or pelvic obliquity affecting gait, sitting, and standing or posttraumatic leg length discrepancy ≥ 2.5 cm to 4 cm	Posttraumatic leg length discrepancy ≥ 4 cm or instability produced by pseudarthrosis or other posttraumatic complications

tems and the lower extremities may require the use of other appropriate chapters. The physician should identify these studies, the findings, and their interpretation. Whenever possible, the physician should personally review the studies and report agreement or disagreement with previous interpretations.

For imaging studies to be of diagnostic value, clinical symptoms and signs resulting from an injury must be consistent with the imaging findings. In other words, an imaging test is useful to confirm a diagnosis, but an imaging result alone is insufficient to qualify for an impairment. In cases when the abnormalities discussed earlier are present on imaging studies and are known (or assumed) to have preexisted an injury being rated, evaluators should acknowledge these antecedent conditions in the report (see Table 17-14).

17.4d Pelvic Impairment Case Examples**CLASS 1**

1% to 3% Whole Person Impairment

EXAMPLE 17-17: ISCHIOPUBLIC STRESS FRACTURE

Subject: 22-year-old man.

History: The patient participated in military intensive training involving running with a backpack weighing 27 kg (60 lb) over an extended time and distance. He had difficulty standing up due to pain in the pelvis and right upper thigh, which increased with walking and running. Pain was initially felt while jumping over a boulder two weeks before the time of the medical exam.

TABLE 17-14**Clinical Studies Adjustment: Pelvis**

Clinical Studies Factor	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Imaging studies: radiographs, bone scan, MRI	No clinical test verification of symptoms or structural diagnosis		CT/MRI/other imaging findings consistent with clinical presentation		Imaging findings consistent with pseudarthrosis or other posttraumatic complications, including infection

Note: MRI indicates magnetic resonance imaging; CT, computed tomography.

Current Symptoms: Pain in the right groin and medial upper thigh, aggravated by standing, walking, and running and improved in the supine position.

Physical Exam: Tenderness to palpation and pressure on the right pubic bone and on the right adductor and hamstrings origin at the inferior ischiopubic junction.

Clinical Tests: Pelvic X rays show a transverse fissure at the upper border of the obturator foramen; there is already callous development in the area.

Diagnosis: Ischiopubic stress fracture.

Impairment Rating: Regional Impairment:

Diagnosis is consistent with "Non-displaced or minimally displaced fractures, with or without surgery; healed and stable; including minor separation of the pubic symphysis (unrelated to childbirth) with residual signs and symptoms," and therefore, assigned to class 1 with default impairment 2% WPI. Adjustment Grids: Functional History: Grade modifier 2 based on pain with normal activity. Physical Exam: Grade modifier is 1. Clinical Testing is not included because it is used to determine class. The net adjustment is +1, and the impairment is class 1, grade D, for a 3% impairment.

Class 1 Example Calculation

CDX	GMFH	GMPE	GMCS
1	2	1	n/a
Net adjustment			
$(GMFH - CDX) (2 - 1) = 1$			
$+ (GMPE - CDX) + (1 - 1) = 0$			
Net adjustment = 0			
Result is class 1 with an adjustment 0; therefore, this impairment is class 1, grade C, which equals 2% impairment			

Note: CDX indicates class of diagnosis; GMFH, grade modifier for Functional History; GMPE, grade modifier for Physical Examination; GMCS, grade modifier for Clinical Studies; and n/a, not applicable.

CLASS 2

4 to 6% Whole Person Impairment

EXAMPLE 17-18: TRAUMATIC SEPARATION OF THE SYMPHYSIS PUBIS

Subject: 26-year-old woman.

History: The patient was involved in a crushing pelvic injury, and developed immediate pelvic pain. She underwent catheterization, with resulting clear urine and no evidence of ureteral injury.

Functional Assessment: Distance walking is limited to flat surfaces. Patient reports pain with normal activity.

Physical Exam: Tenderness, swelling and ecchymosis over symphysis pubis with a palpable defect noted acutely. At MMI, local tenderness and antalgic gait due to symphysis defect.

Clinical Tests: Initial x-rays reveal separation of symphysis by approximately 3.5 cm. Follow-up X rays 6 months later reveal persistent displacement.

Diagnosis: Traumatic separation of the symphysis pubis.

Impairment Rating: Regional Impairment:

Diagnosis is consistent with "Displaced fractures (<1 cm) of the ilium, ischium sacrum or coccyx; Healed; with or without surgery; or traumatic separation of the pubic symphysis (≥ 3 cm) with residual signs but no instability," and therefore, assigned to class 2 with default impairment 5% WPI. Adjustment Grids: Functional History: Grade modifier is 3 because distance walking is limited to flat surfaces and patient reports pain with normal activity. Physical Examination: Grade modifier 2. Clinical Studies are excluded because the symphysis separation is an X ray finding and the net adjustment is +1. The impairment is class 2, grade D. Impairment is 6% WPI.

Class 2 Example Calculation

CDX	GMFH	GMPE	GMCS
2	3	2	n/a
Net adjustment			
$(GMFH - CDX) (3 - 2) = 1$			
$+ (GMPE - CDX) + (2 - 2) = 0$			
Net adjustment = +1			
Result is class 2 with an adjustment +1; therefore, this impairment is class 2, grade D, which equals 6% impairment			

Note: CDX indicates class of diagnosis; GMFH, grade modifier for Functional History; GMPE, grade modifier for Physical Examination; GMCS, grade modifier for Clinical Studies; and n/a, not applicable.

CLASS 4

12% to 16% Whole Person Impairment

EXAMPLE 17-19: COMPLEX PELVIC RING FRACTURE DISLOCATION

Subject: 34-year-old man.

History: The patient was pinned in a car after running into a light pole while intoxicated. After

extraction from the vehicle, he was noted to have severe pelvic deformity with hypotension, and he underwent surgical reduction and stabilization for intrapelvic bleeding with a displaced fracture dislocation involving the left sacroiliac joint with bilateral pubic rami fractures. There was no urethral injury.

Functional Assessment: PDQ score 135, extreme disability.

Physical Exam: The patient is able to rise from a sitting position and walks with a walker. He has residual partial loss of bladder control due to a left S3 nerve root involvement, with sensory loss estimated at 80% affecting the left S3 dermatome.

Clinical Tests: X rays identify left sacroiliac fracture dislocation with residual displacement postoperatively, and moderately displaced bilateral pubic ramus fractures with 4-cm shortening of left leg at MMI.

Diagnosis: Complex pelvic ring fracture dislocation, surgically treated, reduced and stabilized, with persistent deformity, with residual left S3 nerve root involvement.

Impairment Rating: Diagnosis is consistent with "SI joint dislocations, or fracture-dislocations with rupture of the SI ligaments; transverse sacral fractures with spino-pelvic dissociation or severe complications after surgery including pseudoarthrosis, osteomyelitis or documented instability," and therefore, assigned to class 4 with default impairment 14% WPI. Adjustment Grids: Functional History: Grade modifier 4 based on PDQ score. Physical Examination: Grade modifier is also 4. Clinical Testing is not included because it is used to determine class. Net adjustment for the pelvic fracture must include the add-in of +1 for the adjustment factors and is therefore +2, for a rating of class 4, grade E. Impairment is 16% WPI for the fracture.

Comment: Impairment rating for the fractures must be combined with impairment for neurological deficit, using Chapter 13, The Central and Peripheral Nervous System and urogenital impairment, using Chapter 7, The Urinary and Reproductive Systems to evaluate urogenital function.

Class 4 Example Calculation			
CDX	GMFH	GMPE	GMCS
4	4 (+1) = 5	4 (+1) = 5	n/a
Net adjustment $(GMFH - CDX) (5 - 4) = 1$ $+ (GMPE - CDX) + (5 - 4) = 1$ Net adjustment = +2			
Result is class 4 with an adjustment +2, therefore class 2 grade E. Impairment for pelvic fractures is 16% WPI.			

Note: CDX indicates class of diagnosis; GMFH, grade modifier for Functional History; GMPE, grade modifier for Physical Examination; and GMCS, grade modifier for Clinical Studies.

17.5 Summary

When evaluating an individual with spinal or pelvic impairment, follow these suggested steps:

1. Obtain detailed medical history and perform an appropriate physical examination, as explained in Section 17.1a.
2. Record process and results using Spine and Pelvis Impairment Evaluation Record (Figure 17-2) and using the completed record as a guide (Figure 17-7).
3. Review clinical studies, as explained in Section 17.1a.
4. Determine the diagnosis or diagnoses to be rated.
5. Determine the DBI for each ratable diagnosis, using the regional grids, as explained in Section 17.2. This includes selection of the appropriate impairment class for that diagnosis.
6. Use the adjustment grids for Functional History, Physical Examination, and Clinical Studies, as described in Section 17.3, to define the grade modifier for each factor. Functional History adjustment is performed only for the single most significant diagnosis unless otherwise specifically stated by a jurisdiction. Impairment related to radiculopathy is a grade modifier, rather than an additional value.
7. Apply the Net Adjustment Formula to calculate the net adjustment value to be applied to the default value C.
8. Use the regional grid to identify the numerical impairment value associated with the impairment class and grade.

FIGURE 17-7

Spine and Pelvis Impairment Evaluation Record Example (Based on Example 17-2)

Name: <i>John Smith</i>				Exam Date: <i>11/04/07</i>	
ID Number: <i>356-92-XXXX</i>		Sex: F (M)	Side: (R) L	Birth Date: <i>12/07/1971</i>	
Diagnosis:				Injury Date:	

Grid	Diagnosis-Based Impairments	Class Diagnosis (CDX)	Grade Modifier Adjustments	Net Adjustment Value and Assigned Grade Modifier	Whole Person Impairment
Cervical (C)	<i>Cervical disk herniation with resolved right-sided C6 radiculopathy</i>	0 1 2 3 4	GMFH 0 1 2 3 4 n/a GMPE 0 1 2 3 4 n/a GMCS 0 1 2 3 4 n/a Net Adjustment = (GMFH - CDX) + (GMPE - CDX) + (GMCS - CDX)	Adjusted Grade = Net Adjustment applied to Default Value C ≤2 -1 0 +1 ≥2 A B C D E	6%
Thoracic (T)		0 1 2 3 4	GMFH 0 1 2 3 4 n/a GMPE 0 1 2 3 4 n/a GMCS 0 1 2 3 4 n/a	Adjusted Grade ≤2 -1 0 +1 ≥2 A B C D E	
Lumbar (L)		0 1 2 3 4	GMFH 0 1 2 3 4 n/a GMPE 0 1 2 3 4 n/a GMCS 0 1 2 3 4 n/a	Adjusted Grade ≤2 -1 0 +1 ≥2 A B C D E	
Pelvis (P)		0 1 2 3 4	GMFH 0 1 2 3 4 n/a GMPE 0 1 2 3 4 n/a GMCS 0 1 2 3 4 n/a	Adjusted Grade ≤2 -1 0 +1 ≥2 A B C D E	

Signed: *Dr. Know*Date: *11/04/07*

Whole Person Impairment: 6%

17.6 Appendix 17-A: Pain Disability Questionnaire

Overview

The Pain Disability Questionnaire (PDQ) was specifically developed for evaluating clinical outcomes in a population of patients with disabling musculoskeletal disorders, primarily spinal, using a 10-cm VAS format. It yields a total functional disability score ranging from 0 (perfect function) to 150 (total disability). The focus, much like other health inventories, is primarily on function, disability, and ADLs. Unlike many other measures, this instrument is designed for any musculoskeletal disorders, rather than low back pain alone. Psychosocial variables, which have been shown to play an integral role in the development and maintenance of chronic disability, are also a component of the PDQ. The psychometric properties of the PDQ demonstrate strong reliability, responsiveness, and validity. The predictive validity of the PDQ with 1-year socioeconomic outcomes following rehabilitation has been demonstrated.

Administering the Pain Disability Questionnaire

Follow these instructions for administering and scoring the PDQ:

1. Reproduce the PDQ (Figure 17-A) and ask the patient to complete all items on the questionnaire.
2. If necessary, the patient may complete the form with the assistance of a translator or reader. Be certain all 15 questions are answered. If the patient is unable to complete the PDQ, no functional assessment score will be given.
3. The evaluating doctor or an assistant will score the PDQ by giving an integer score from 0 to 10 for each question and adding the item scores, by using the line dividers every 2 cm or using a 10-cm ruler.
4. If the patient fails to mark a question, the default score for that question is 0.
5. Apply the final score to Table 17-A and consider this in the Net Adjustment Formula as described in Section 17.3f.

The PDQ scores can be divided into 5 distinct categories: *no disability* (score of 0); *mild* (scores of 1 to 70); *moderate* (scores of 71 to 100); *severe* (scores of 101 to 130); and *extreme* (scores of 131 to 150).

TABLE 17-A
PDQ Scoring

Pain Disability	Questionnaire Score	Grade Modifier
0	No disability	A
1-70	Mild disability	B
71-100	Moderate disability	C
101-130	Severe disability	D
131-150	Extreme disability	E

Pain Disability Questionnaire (PDQ)

NAME: _____ DATE: _____

This survey asks for your views about how your pain now affects how you function in everyday activities. This information will help you and your doctor know how you feel and how well you are able to do your daily tasks at this time.

Please answer every question by making an "X" along the line to show how much your pain problem has affected you (from having no problems at all to having the most severe problems you can imagine).

BE SURE TO ANSWER ALL QUESTIONS.

1. Does your pain interfere with your normal work inside and outside the home?
Work normally _____ Unable to work at all
2. Does your pain interfere with personal care (such as washing, dressing, etc.)?
Take care of myself completely _____ Need help with all my personal care
3. Does your pain interfere with your traveling?
Travel anywhere I like _____ Only travel to see doctors
4. Does your pain affect your ability to sit or stand?
No problems _____ Cannot sit/stand at all
5. Does your pain affect your ability to lift overhead, grasp objects, or reach for things?
No problems _____ Cannot do at all
6. Does your pain affect your ability to lift objects off the floor, bend, stoop, or squat?
No problems _____ Cannot do at all
7. Does your pain affect your ability to walk or run?
No problems _____ Cannot walk/run at all
8. Has your income declined since your pain began?
No decline _____ Lost all income
9. Do you have to take pain medication every day to control your pain?
No medication needed _____ On pain medication throughout the day
10. Does your pain force you to see doctors much more often than before your pain began?
Never see doctors _____ See doctors weekly
11. Does your pain interfere with your ability to see the people who are important to you as much as you would like?
No problem _____ Never see them
12. Does your pain interfere with recreational activities and hobbies that are important to you?
Normal activity _____ No recreation/hobbies at all
13. Do you need the help of your family and friends to complete everyday tasks (including both work outside the home and housework) because of your pain?
Never need help _____ Need help all the time
14. Do you now feel more depressed, tense, or anxious than before your pain began?
No depression/tension _____ Severe depression/tension
15. Are there emotional problems caused by your pain that interfere with your family, social, or work activities?
No problems _____ Severe problems

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APPEAL FROM THE SOUTH CAROLINA
WORKERS' COMPENSATION COMMISSION

SC Court of Appeals

Melody L. James, Appellate Panel Chairman, Commissioner

App. Case No. 2014-002294
WCC File No. 1106833

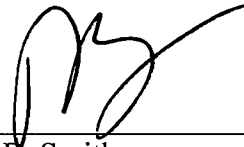
TIMOTHY MCMAHAN, APPELLANT/RESPONDENT,

V.

SC DEPARTMENT OF EDUCATION – TRANSPORTATION,
EMPLOYER, AND STATE ACCIDENT FUND, CARRIER,
RESPONDENTS/APPELLANTS.

CERTIFICATE OF COUNSEL

Counsel hereby certifies that this Record on Appeal contains no material which is
irrelevant to the appeal.



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Attorney for Appellant

North Charleston, South Carolina

February 10, 2014

THE STATE OF SOUTH CAROLINA
In The Court of Appeals

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APPEAL FROM THE SOUTH CAROLINA **SC Court of Appeals**
WORKERS' COMPENSATION COMMISSION

Melody L. James, Appellate Panel Chairman, Commissioner

App. Case No. 2014-002294
WCC File No. 1106833

TIMOTHY MCMAHAN, APPELLANT/RESPONDENT,

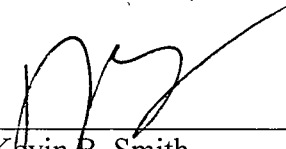
V.

SC DEPARTMENT OF EDUCATION – TRANSPORTATION,
EMPLOYER, AND STATE ACCIDENT FUND, CARRIER,
RESPONDENTS/APPELLANTS.

PROOF OF SERVICE

I certify that I have served the Amended Record on Appeal by depositing a copy of it in the United States Mail, postage prepaid, on February 10, 2015, addressed to the attorneys of record, George T. Miars, Jr., Esquire, Willson Jones Carter & Baxley, P.A., 421 Wando Park Boulevard, Suite 100, Mt. Pleasant, SC, 29464 and John Gabriel Coggiola, Esquire, Willson, Jones, Carter & Baxley, 4500 Fort Jackson Blvd., Columbia SC 29209

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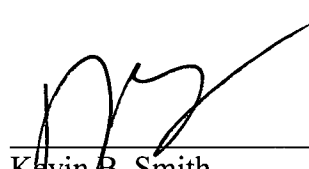
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