Musculoskeletal

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MS OVERVIEW

- **Goal:** FMCSA CME will;
  - assess driver musculoskeletal system,
  - determine medical fitness for duty,
  - document examination findings & effect on fitness for duty in accordance FMCSA physical qualification standards & policies.
- **Competencies:** Training should prepare CME to appropriately apply knowledge of musculoskeletal standards & guidance to performance of these tasks. Test items directly assess these tasks.
- **Identification & History:** Id, query, & note issues in driver’s medical record &/or health history as available, which may include:
  - musculoskeletal disorders (amputations, arthritis, spinal surgery)
Musculoskeletal—Module Overview

• **Physical Examination and Evaluation:** Examine driver’s;
  • **Neck & note:** range of motion (ROM)
  • **Spine & note:**
    • o surgical scars & deformities
    • o tenderness & muscle spasm
    • o loss in ROM & painful motion
    • o kyphosis, scoliosis, or other spinal deformities
  • **Extremities & note:**
    • o gait, mobility, posture while bearing their weight; limping or signs of pain
    • o loss, impairment, or use of orthosis
    • o deformities, atrophy, weakness, paralysis, surgical scars
    • o elbow & shoulder strength, function, & mobility
    • o handgrip & prehension relative to requirements for controlling
      a steering wheel & gear shift, varicosities, skin
      abnormalities, cyanosis, clubbing, or edema
    • o LLD: lower extremity strength, motion, & function

MS

• **49 CFR 391.41(b)(1)**
  • "A person is physically qualified to drive a commercial motor vehicle if that person —
  • Has no loss of a foot, a leg, a hand, or an arm, or has been granted a skill performance evaluation certificate pursuant to §391.49."
MS

- 49 CFR 391.41(b)(2)
- "Has no impairment of:
  - (i) A hand or finger which interferes with prehension or power grasping; or
  - (ii) An arm, foot, or leg which interferes with the ability to perform normal tasks associated with operating a commercial motor vehicle; or any other significant limb defect or limitation which interferes with the ability to perform normal tasks associated with operating a commercial motor vehicle; or has been granted a skill performance evaluation certificate pursuant to §391.49."

Musculoskeletal—Module Overview

- 49 CFR 391.41(b)(7)
- "Has no established medical history or clinical diagnosis of rheumatic, arthritic, orthopedic, muscular, neuromuscular, or vascular disease which interferes with his/her ability to control and operate a commercial motor vehicle safely."
Musculoskeletal–Module Overview

• Disorders of the musculoskeletal system affect driving ability and functionality necessary to perform heavy labor tasks associated with the job of commercial driving. Medical certification means the driver is physically able to safely drive and perform non-driving tasks as described in the driver role section of the Federal Motor Carrier Safety Administration (FMCSA) Medical Examination Report form.

Musculoskeletal–Module Overview

• Drivers have a multitude of job demands. The least physically demanding part may be the actual driving. For example, the duties of a commercial driver may include loading and unloading, making multiple stops, driving cross-country and in heavy city traffic, working with load securement devices, and changing tires.
Musculoskeletal—Module Overview

- Other common driving tasks include:
  - Manipulating the wheel.
  - Shifting gears.
  - Maintaining pressure on the pedals.
  - Braking.
  - Monitoring traffic.

Musculoskeletal—Module Overview

- Other job tasks include:
  - Performing pre- and post-trip safety checks.
  - Ensuring the vehicle is loaded properly.
  - Securing the load.
  - Evaluating and managing vehicle breakdowns.
  - Responding to emergency situations.
Key Points for Musculoskeletal Examination

• Regulations — You must review and discuss with the driver any "yes" answers
• Does the driver have:
  • A muscular disease?
  • A missing hand, arm, foot, leg, finger, or toe?
  • A nonfunctioning or dysfunctional hand, arm, foot, leg, finger, or toe?
  • An injury or disease of the spine?
  • Chronic low back pain?

Musculoskeletal—Module Overview

• Recommendations — Questions that you may ask include
  • Does the driver:
  • Have physical limitations caused by weakness, pain, or decreased mobility and range of motion (nature and degree)?
  • Use musculoskeletal agents (effects and/or side effects)?
  • Have mild, moderate, or severe chronic musculoskeletal pain (frequency and intensity)?
Regulations — You must evaluate

- Does the driver have:
  - A missing or impaired leg, foot, toe, arm, hand, or finger?
  - Sufficient power grasp and prehension of hands and fingers to maintain steering wheel grip?
  - Sufficient strength and mobility in lower limbs to operate pedals properly?
  - A perceptible limp?
  - Signs of previous spine or other musculoskeletal surgery?
  - Deformities of the spine and/or torso?
  - Sufficient mobility and strength of spine and/or torso to drive safely and perform other job tasks?
  - Limitations of motion of the spine and/or torso?
  - Spine, torso, and/or other musculoskeletal tenderness?

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Musculoskeletal—Module Overview

- **NOTE**: As a medical examiner, you determine if the severity of a reversible or progressive musculoskeletal disease interferes with driving ability. If findings so dictate, radiology and other examinations should be used to diagnose congenital or acquired defects or spondylolisthesis and scoliosis.

- Examination by a neurologist or physiatrist who understands the functions and demands of commercial driving may be required to assess the status of the disease. However, as a medical examiner, it is your responsibility to determine certification status.
Regulations — You must document discussion with the driver about

- Any affirmative musculoskeletal history, including if available:
  - Onset date and diagnosis.
  - Medication(s), dose, and frequency.
  - Any current limitation(s).
- Potential negative effects of medication used while driving, including over-the-counter medication.
- Any abnormal finding(s), noting:
  - Effect on driver ability to operate a CMV safely.
  - Necessary steps to correct the condition as soon as possible, particularly if the untreated condition could result in more serious illness that might affect driving.
- Any additional tests and evaluation.

REMEMBER

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Musculoskeletal

- **Diagnostic Tests and/or Referrals:**
  - Refer if driver exhibits evidence of any of the following disorders for F/U care & evaluation by an appropriate specialist or PCP:
    - musculoskeletal (arthritis, neuromuscular disease)
  - Refer if driver: with limitations in extremity movement for an on-road performance evaluation &/or skill performance evaluation (SPE) **Documentation of Ancillary Information**

- **Integrate a specialist's evaluation with other information about driver**
  - Include if available: current SPE certificate

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**Musculoskeletal**

- **Health Education Counseling:**
  - Inform driver of rationale for delaying or potentially NPQ disqualifying certification, which may include
    - musculoskeletal challenges (arthritis, neuromuscular disease)
  - **Risk Assessment:** Consider Driver’s ability to
    - couple and uncouple trailers from a tractor.
    - load or unload several thousand pounds of freight.
    - install & remove tire chains.
    - manipulate and secure tarpaulins that cover open trailers.
    - move one’s own body through space while climbing ladders; bending, stooping, & crouching; entering & exiting cab.
    - manipulate an oversized steering wheel.
    - shift through several gears using a manual transmission.
    - perform precisionprehension & power grasping.
    - use arms, feet, & legs during CMV operation.
Musculoskeletal

• **Health Education Counseling:**
  
  • Review SPE certificate cases:
    o identify terms, conditions, & limitations set forth in driver’s SPE certificate
  
  • ensure that appropriate SPE certificate from FMCSA has been granted to driver who has lost a foot, leg, hand, or arm
  
  • For documented conditions, consider rate of progression, degree of control, & likelihood of sudden incapacitation (cardiovascular, neurologic, respiratory, musculoskeletal)

• **Certification Outcomes and Intervals:**
  
  • Indicate certification status, which may require a SPE certificate

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**Musculoskeletal**

• **FMCSA Content Sources:**
  
  • At completion of training, CME should be able to use following FMCSA regulations & guidance resources to correctly perform driver musculoskeletal assessment:
    • 49 CFR 391.41(b)(1)(2)(7) Physical qualifications for drivers
    • 49 CFR 391.43(f) Spine, musculoskeletal & (f) Extremities Medical examination; certificate of physical qualification
    • 49 CFR 391.49 Alternative physical qualification standards for the loss or impairment of limbs
    • FMCSA Web site, SPE program
    • Medical Examination Report form and Advisory Criteria
    • Medical examiner’s certificate
    • FMCSA Medical Examiner Handbook, Musculoskeletal (b)(1)(2)(7)
Examples

- **Self-checks:** are stem & key example resource for developing knowledge mastery learning strategies, as discussion, drill-and-practice, & pre- & post-topic comprehension assessment
- Interactions. Use of self-check content is optional.

- **Stems and Keys**

  - **Musculoskeletal Regulation Recall Stem:** According to 
    - **49 CFR 391.41**, is a CMV driver with loss of a leg, foot, hand, or arm qualified to operate a CMV?
    
    - **Key:** Yes, if driver meets all other standards except for a fixed deficit of lost extremity, & driver has been granted a Skill Performance Evaluation (SPE) certificate pursuant to 
    - **49 CFR 391.49.**

Scenarios

- **Musculoskeletal Alternate Standard Recall**
- **Stem:** According to regulation, only ________ can grant drivers a SPE certificate.
  
  - **Key:** Only FMCSA can grant drivers a SPE certificate. 4 FMCSA regional centers, including contact information & territory serviced, are listed on FMCSA Web site SPE program page.

  - **Stem:** According to regulation, what CME documentation is required when a driver applies for a SPE certificate?
    
    - **Key:** Driver must include copies of CME Report form, status section, & CME’s certificate, indicating that medical certification must be “accompanied by a SPE certificate.”

  - **Stem:** According to regulation, what is certification period for a SPE certificate? What is maximum certification period when medical certification must be accompanied by a SPE certificate?
    
    - **Key:** SPE certificate is issued for 2 yrs, Otherwise medically qualified driver with fixed deficit requiring SPE certificate may be certified for up to 2 yrs.
Examples

- **Musculoskeletal Regulations Analysis Stem:** Which of following conditions would require driver to complete qualifying procedures under 49 CFR 391.49?

- 1. Missing 4th & 5th fingers of right hand; has strong hand grasp.
- 2. Missing right foot since age 2; uses prosthesis & runs marathons.
- 3. Status post-crush injury to left arm; has atrophy & weakness in ulnar distribution.
- 4. Suffering from carpal tunnel syndrome; has weak hand grasp.

Answer

- **Key:** 1. Does not require 49 CFR 391.4 for certification. CME can assess for adequate grip strength; if any question of ability exists, CME may request a treating or specialist evaluation.
- 2. Requires 49 CFR 391.4 for certification. Regardless of driver’s ability to adapt to other challenges, driver must still demonstrate adequate skill in operating CMV with their fixed deficit.
- 3. Requires 49 CFR 391.4 for certification, driver must demonstrate adequate skill in operating CMV with their fixed deficit, even if it is impairment & not loss of the extremity.
- **Only fixed deficits** can be qualified using the alternate standard. CTS can be treated or, left untreated, worsen causing increased impairment. Certification occurs only if weakness in grasp is fixed deficit, after maximal treatment, preventing any future deterioration from CTS.
Musculoskeletal Medical Clinical Application

**Stem:** Give examples of adapting clinical evaluation of musculoskeletal system to ensure applicability when assessing CMV driver fitness for duty.

**Key:** Examples could include: Using resistive force/dynamometer to have driver demonstrate grip strength.

- Have driver simulate ROM & coordination of hands & leg required for steering & changing gears when operating CMV.
- Having driver demonstrate shoulder joint mobility, arm & leg muscle strength required to enter & exit cab, & other driver-related duties.
- Having driver perform activity demonstrate ability to maneuver & maintain balance while under the trailer.
- Having driver demonstrate cervical ROM sufficient to look in either side mirror of oversized CMV.
- Instructing CMV driver to maintain an upright, seated posture against resistance, in all directions, to demonstrate stability of trunk muscles.

Musculoskeletal Medical Clinical Analysis

**Stem:** driver presents for clearance to return to driving CMV 6 wks after arthroscopic carpal tunnel repair on right hand. Can he be recertified, and, if so, for how long?

**Key:** CME would confirm that driver meets standards by testing to determine if grip strength, prehension, sensation, & ROM are sufficient to control steering wheel & shift gears, as well as to perform other job tasks, driver can be certified for 2 yrs, as long as they meets all other qualification standards.
Musculoskeletal Scenarios

• Ms. O’Dell—Recertification Examination
  • Sex: Female | Age: 42 | Height: 64" | Weight: 122 lbs.

• Health History
  • Yes response(s): Any illness or injury in the last 5 years?
  • Medication(s): None.

• Health History Comments
  • Ms. O’Dell had a cubital tunnel release in her right elbow 4 months ago, did not bring any documentation from surgeon & states physician retired 2 months after performing her surgery, & has not been seen by anyone else as part of surgical follow-up.
  • She denies any prescribed medications & admits to taking an occasional OTC ibuprofen (Motrin), mainly for menstrual cramps.

Scenarios

• Vision:
  • Uncorrected Acuity: Rt. Eye: 20/20 Lt. Eye: 20/20 Both: 20/20
  • Horizontal Field of Vision: Rt. Eye: 90° Lt. Eye: 90°
  • Meets standard only when wearing: corrective lenses? No
  • Color: Can distinguish red green and amber colors? Yes
  • Monocular Vision? No

• Hearing
  • Hearing aid used for test? No
  • Hearing aid required to meet standard? No
  • Whisper test: Rt. Ear: 5 Feet Lt. Ear: 5 Feet
  • Audiometric test hearing loss average: Rt. Ear: N/A Lt. Ear: N/A

• Blood Pressure/Pulse:
  • BP-122/72 P-67 & Regular

• Urinalysis
  • SP. GR.: 1.020 | Protein: Neg | Blood: Neg | Glucose: Neg
Physical Examination Comments:

10. Physical examination reveals a recent scar on right elbow, compatible with surgery about 4 months ago.

Careful examination of strength in upper extremities, focusing on grip strength, reveals symmetrical strength & mobility.

Right elbow flexes & extends to a full ROM.

Nothing else is notable in the examination.

Best Outcome:

Stem: What is certification decision in this scenario?

Key: Based on clinical examination, surgical site is completely healed, & no residual damage resulting from the surgery is apparent.

She meets all other standards.

Case-by-Case Assessment:

Stem: Is it reasonable to assume that she would not have been able to meet grip standards if she had not had surgery for cubital tunnel syndrome?

Key: No. Since cubital tunnel syndrome predominantly affects 4th & 5th fingers, & majority of grip strength is driven by thumb, index, & middle fingers, preservation of sufficient grip strength to meet standards is not unusual.

However, if left untreated in individual cases, it could progress to affecting the rest of the hand.
Scenarios

• **Stem:** when driver presents with symptoms of a condition, such as cubital tunnel syndrome, but meets standards, what would an examiner discuss with driver?

• **Key; CME** should encourage PCP evaluation &, as appropriate, may suggest driver inform PCP of specific job demands or qualification standards, since PCP may not be familiar with the physical demands of CMV driving or Federal regulations governing CMV driver medical certification.

Questions

• Many thanks to Dr. Walker and Dr. Callan