

MEMORANDUM

April 17, 2012

TO: Program Directors and Residents
FROM: Council on Podiatric Medical Education
SUBJECT: Biomechanical Case Definition

Program directors and residents are reminded that effective July 1, 2011, a biomechanical case, as defined in CPME 320, *Standards and Requirements for Approval of Podiatric Medicine and Surgery Residencies* is an “. . . activity [that] includes direct participation of the resident in the diagnosis, evaluation, and treatment of locomotor disorders caused by congenital, neurological, and heritable factors. These experiences include, but are not limited to, performing complete lower extremity biomechanical examinations and gait analyses, comprehending the processes related to these examinations, and understanding the techniques and interpretations of gait evaluations of neurologic and pathomechanical disorders.”

To be counted in a resident log, a biomechanical case must include **three** components: **diagnosis, evaluation, and treatment**. The **evaluation** component must include a complete biomechanical examination on all patients and gait analysis on ambulatory patients. An appropriate biomechanical examination must include static and dynamic examination of the area of chief complaint as well as any areas of potential abnormal biomechanical function that may be contributing to the chief complaint.

Gait analysis may range from basic visual gait analysis to complex computerized gait analysis. Some indication of the performance or reason for nonperformance (e.g., patient was non-ambulatory) of a gait analysis as well as interpretation of the gait analysis must be documented.

The biomechanical examination and gait analysis must be comprehensive relative to the diagnosis and consistent with the clinical findings. There also must be a demonstration of an understanding of the thought process in determining a diagnosis and treatment as they relate to the evaluation.

As identified in Appendix A in CPME 320, the minimum activity volume of biomechanical cases a resident must log to receive either a PMSR certificate or a PMSR/RRA certificate is 75. A biomechanical case is identified by procedure code 7.1 (biomechanical case; must include diagnosis, evaluation [biomechanical and gait examination], and treatment) in Appendix B. Patient encounters such as taping and padding (6.9), orthotics (6.10), prosthetics (6.11), and other biomechanical experiences (6.12) that do not include a biomechanical evaluation and gait analysis are to be logged as appropriate, but will not be counted as a biomechanical case.

Biomechanical Case Definition

April 17, 2012

Page 2

The following progress notes are examples of unacceptable and acceptable biomechanical cases:

PLANTAR FASCIITIS

Example 1:

S: A 47-year-old patient presents with bilateral heel pain, present for three months, worse in the morning and after periods of rest.

O: Pain on palpation at the medial plantar calcaneal tubercle, bilateral. Decreased medial arch height bilateral.

A: Plantar fasciitis bilateral.

P: Casted patient for orthotics. Return in three weeks for orthotic pick up.

This cannot be counted towards the 75 biomechanical cases because there is no evidence of biomechanical evaluation, gait analysis, or the thought process. It may be counted as 6.10.

Example 2:

S: A 47-year-old patient presents with bilateral heel pain, present for three months, worse in the morning and after periods of rest.

O: Pain on palpation medial plantar calcaneal tubercle bilateral. Biomechanical examination reveals decreased ankle joint dorsiflexion bilateral, first metatarsophalangeal joint dorsiflexion 35 degrees bilateral. RCSP 5 degrees everted bilateral. Remaining evaluation of STJ, MTJ, and stance positions are non-contributory.

A. Plantar fasciitis, gastroc-soleal equinus, hallux limitus bilateral.

P: Cast patient for orthotics. Return in three weeks for orthotic pick up.

Although this note provides evidence of biomechanical examination, there is no evidence of gait analysis or the thought process connecting the findings to the diagnosis and treatment. This may not be counted towards biomechanical cases, but may be counted as 6.10.

Example 3:

S: A 47-year-old patient presents with bilateral heel pain, present for three months, worse in the morning and after periods of rest.

O: Pain on palpation medial plantar calcaneal tubercle bilateral. Biomechanical examination reveals decreased ankle joint dorsiflexion bilateral, first metatarsophalangeal joint dorsiflexion 35 degrees bilateral. RCSP 5 degrees everted bilateral. STJ ROM is normal and MTJ is inverted to rearfoot. Gait analysis reveals excessive pronation throughout midstance and propulsion, with the knees flexed throughout the gait cycle. Evaluation of shoes reveals

Biomechanical Case Definition
April 17, 2012
Page 3

excessive lateral heel wear, bilateral, with considerable breakdown of the heel counter and excessive flexibility of the soles.

A. Plantar fasciitis, with potential contributing factors of gastroc-soleal equinus, hallux limitus bilateral.

P: Discussed appropriate shoes, Achilles stretching, and provided patient education on the relationship between a tight Achilles and improper shoes contributing to the chief complaint. Negative cast impressions taken in neutral position for functional orthotic devices with a first ray cutout to improve first ray function. Return in three weeks for orthotic pick up.

This note provides all required components: diagnosis, biomechanical examination, gait analysis, thought process, and treatment. In this case, the note is adequate and appropriate even though it does not include malleolar position, or knee or hip evaluation.

HALLUX ABDUCTO VALGUS

Example 1:

S: A 47-year-old female presents with a painful right bunion, present for quite some time. The patient states that the pain has gradually increased over the past year to the point where now it hurts whenever she wears shoes.

O: Lateral deviation of the hallux, right greater than left. Decreased medial arch height, bilateral.

A: Hallux Abducto Valgus, bilateral.

P: Cast for orthoses.

This note lacks the required components to be considered a biomechanical case. There is no biomechanical exam, gait analysis, or thought process demonstrated.

Example 2:

S: A 47-year-old female presents with a painful right bunion, present for quite some time, increasing in intensity, limiting activity and the ability to wear shoes.

O: Lateral deviation of the hallux with medial prominence of the first metatarsal head, right greater than left. First metatarsophalangeal joint range of motion is painful, trackbound, and limited to 20 degrees of dorsiflexion bilateral.

A: Hallux Abducto Valgus, bilateral.

P: Cast for orthoses.

Biomechanical Case Definition

April 17, 2012

Page 4

This note may not be counted as a biomechanical case. Although there is evidence of some biomechanical evaluation, it is insufficient. There is no evidence of gait analysis or the thought process connecting the biomechanical findings to the diagnosis and treatment.

Example 3:

- S: A 47-year-old female presents with a painful right bunion, present for quite some time, increasing in size and intensity, and limiting activity and shoes.
- O: Gait analysis reveals increased angle of gait, bilateral with excessive pronation, right greater than left. Lateral deviation of the hallux with medial prominence of the first metatarsal heads, right greater than left. First metatarsophalangeal joint range of motion is painful, trackbound, and limited to 20 degrees of dorsiflexion bilateral. First ray range of motion 5 mm dorsiflexion/5 mm plantarflexion bilateral. Limb length ASIS to medial malleolus reveals right lower extremity 2 cm longer than left. RCSP 5 degrees everted right and 2 degrees everted left. STJ ROM is adequate and MTJ is inverted to rearfoot bilateral.
- A: Hallux Abducto Valgus, right greater than left, possibly secondary to limb length discrepancy, with the right 2 cm longer than left.
- P: Discussed the potential contributing and aggravating factors including limb length discrepancy and excessive pronation, as well as treatments including shoe changes, limb length accommodation, orthoses, and surgical options. Negative cast impressions taken in neutral position for orthoses to include a right Morton's extension to address painful hallux limitus and ¼ inch left heel lift to address limb length discrepancy. Return when devices are fabricated.

This note includes biomechanical examination, gait analysis, and thought process. Although the evaluation does not include hip, knee, or transverse plane tibia evaluation, the examination is appropriate.

Example 4:

- S: A 47-year-old female presents with a painful right bunion, present for several years, states gradual increase in pain over the past year, and currently limiting activity and shoes.
- O: Gait analysis reveals increased angle of gait bilateral with excessive pronation bilateral. Lateral deviation of the hallux with medial prominence of the first metatarsal heads, right greater than left. First metatarsophalangeal joint range of motion is painful, trackbound, and limited to 20 degrees of dorsiflexion bilateral. First ray range of motion 5 mm dorsiflexion/5 mm plantarflexion bilateral. Limb length ASIS to medial malleolus reveals right lower extremity 2 cm longer than left. RCSP 5 degrees everted right and 2 degrees everted left. STJ ROM is adequate and the MTJ inverted to the rearfoot bilateral.

Biomechanical Case Definition
April 17, 2012
Page 5

- A: Hallux Abducto Valgus, right greater than left, possibly secondary to limb length discrepancy, right 2 cm longer than left, and Hallux Limitus.
- P: Discussed the potential contributing and aggravating factors with patient including limb length discrepancy and excessive pronation as well as treatments including shoe changes, limb length accommodation, orthoses, and surgical options. The patient will return in two weeks for surgical consultation.

This note may be counted as a biomechanical case. In this example, the treatment is surgical rather than orthopedic in nature.

Example 5:

A mother presents her six-month-old daughter for evaluation of “in-toed” feet. The mother relates that she has noticed the “deformity” since the child’s birth, but the pediatrician said the child would grow out of it. She relates that she has not seen any improvement. She is particularly concerned because the child’s father has a significant “in-toeing problem” as well. History-Full term vaginal delivery with normal APGAR scores. Vaccinations and pediatrician visits are up to date. Rolled over at two months, has begun to crawl, not cruising yet. No medications, no allergies or intolerances, no surgeries or hospitalizations.

Physical-Child appears alert and interested. Integument is without discoloration, lesions, or abnormalities. Neurovascular status is intact and consistent for the child’s age.

Hip range of motion is normal with no signs of being dislocated or dislocatable.

Forefoot appears adducted on the rearfoot, easily manually reduced. No limitation in ankle joint dorsiflexion, no limitation or excessive varus position of the rearfoot.

This case requires an understanding of developmental landmarks and evaluation of potential pediatric lower extremity deformity. This is an example of a case where gait analysis is not required because the patient has not begun cruising yet. With a statement for the reason for nonperformance, this may be counted as a biomechanical case.