

# Flex Therapist CEUs

## Transtibial Amputation Prosthetic Comparisons

### Adaptation and Prosthesis Effects on Stride-to-Stride Fluctuations in Amputee Gait

**1. Which of the following could lead to a poor solution by the neuromuscular system as it attempts to accomplish the task of walking?**

- A. The prosthesis may present too many variables.
  - B. The variables presented by the prosthesis may be too different from those that were naturally occurring or accounted for in a previous prosthesis.
  - C. Either (A) and/or (B).
  - D. None of the above.
- 

**2. It is the lambda at the \_\_\_\_\_ ankle that was found to be strongly correlated with the patient's prosthesis preference.**

- A. Prosthetic
  - B. Sound leg
  - C. Both (A) and (B)
  - D. None of the above
- 

**3. The prosthetic ankle in the transtibial amputee is the sole joint that is directly influenced by the biological system and the mechanical system.**

- A. True
  - B. False
- 

### Gait Biomechanics of Individuals with Transtibial Amputation: Effect of Suspension System

**4. Gait asymmetry is one of the main concerns in unilateral lower limb amputees to avoid exertion of excessive load on the sound limb.**

- A. True
  - B. False
-

**5. Which of the following can relieve the distal end pressure by applying more loads to the proximal tissues of the residual limb?**

- A. The pin / lock system
  - B. The Seal-In suspension liner
  - C. The magnetic prosthetic suspension system
  - D. All of the above
- 

**6. To compensate for higher loading on the intact limb, transtibial amputees have which of the following?**

- A. Decreased walking speed
  - B. Increased knee and hip moments
  - C. Higher ankle range of motion on the sound limb
  - D. All of the above
- 

**7. This study found that pistoning values were significantly different among the suspension systems during level walking in the \_\_\_\_\_ phase.**

- A. Stance
  - B. Swing
  - C. Both (A) and (B)
  - D. None of the above
- 

**8. The participants showed higher first peak value for the sound limb with the:**

- A. Pin / lock system
  - B. Seal-In suspension liner
  - C. Magnetic prosthetic suspension system
  - D. All of the above
- 

**9. Which of the following exhibited more homogenous cadence values between the legs?**

- A. The pin / lock system
  - B. The Seal-In suspension liner
  - C. The magnetic prosthetic suspension system
  - D. All of the above
- 

**10. This study showed a significantly higher magnitude of hip ROM with the sound leg than the prosthetic leg.**

- A. True
  - B. False
-

**11. It may be concluded from the overall findings that \_\_\_\_\_ can be used clinically as an alternative for lower limb amputees.**

- A. The pin / lock system
  - B. The Seal-In suspension liner
  - C. The magnetic prosthetic suspension system
  - D. All of the above
- 

## **Effects of a powered ankle-foot prosthesis on kinetic loading of the unaffected leg during level-ground walking**

**12. When people with a leg amputation use a passive-elastic prosthesis, and walk at faster speeds, they experience greater kinematic and kinetic leg asymmetries, including greater unaffected leg forces.**

- A. True
  - B. False
- 

**13. Passive-elastic prostheses release less than one-half the mechanical energy, and less than \_\_\_\_\_ the mechanical power normally generated by the soleus and gastrocnemius during the stance phase of level-ground walking at moderate speeds and are therefore unable to replicate the function of a biological ankle.**

- A. 1/8
  - B. 1/6
  - C. 1/4
  - D. 1/2
- 

**14. There were statistical differences in unaffected leg loading rates for GRFs and knee EAMs when subjects used the powered prosthesis compared to the passive-elastic prosthesis.**

- A. True
  - B. False
- 

**15. At slow walking speeds, the passive-elastic and powered prostheses, as well as the biological ankle behave in a spring-like manner, where the net mechanical work is nearly zero across the entire \_\_\_\_\_ phase.**

- A. Stance
  - B. Swing
  - C. Both (A) and (B)
  - D. None of the above
-

**16. The results of this study show that use of a powered ankle-foot prosthesis decreases the unaffected leg peak impact resultant:**

- A. Force
  - B. Loading rate
  - C. Both (A) and (B)
  - D. None of the above
- 

**17. At the walking speed closest to preferred, subjects with an amputation using a powered ankle-foot prosthesis reduced their unaffected peak knee EAM by over:**

- A. 40%
  - B. 20%
  - C. 10%
  - D. None of the above
- 

**Muscle activation patters during walking from transtibial amputees recorded within the residual limb-prosthetic interface**

**18. Which of the following was the only muscle with a variance-to-signal ratio significantly greater in the amputee group compared to the control group?**

- A. The gastrocnemius medial head
  - B. The gastrocnemius lateral head
  - C. The tibialis anterior
  - D. Biceps femoris
- 

**19. All amputee subjects were able to differentiate tibialis anterior and gastrocnemii activation during volitional maximum activation.**

- A. True
  - B. False
- 

**20. The inter-subject variability in the biceps femoris and gluteus medius activation shape observed in the amputee subjects suggests that there are differences in compensatory muscle recruitment patterns used by transtibial amputees during walking.**

- A. True
  - B. False
-

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