



**AMREF INTERNATIONAL UNIVERSITY**  
**SCHOOL OF MEDICAL SCIENCES**  
**DEPARTMENT OF REHABILITATIVE MEDICINE**  
**BACHELOR OF SCIENCE IN PHYSIOTHERAPY**

**END OF TRIMESTER EXAMINATIONS MAY TO AUGUST 2023**

**UNIT CODE: PHT 334**

**UNIT NAME: PROSTHETICS, ORTHOTICS AND ASSISTIVE TECHNOLOGIES**

**DATE: 17<sup>th</sup> AUGUST 2023**

**TIME: 6PM-8PM**

**INSTRUCTIONS**

1. All students will have two (2) hours to complete the examination
2. This is an **online exam**, Attempt all questions as per the instruction
3. It is the student's responsibility to report any page and number missing in this paper.
4. Check that the paper is complete
5. Total number of pages is 10 including the cover.
6. Read through the paper quickly before you start.
7. Upon finishing the exam paper, on submission, the message 'Your examination has been submitted' will appear.

**All the Best!!**

**TOTAL: \_\_\_\_\_/70**

**PERCENT: \_\_\_\_\_/100%**

**POINTS EARNED TOWARDS FINAL GRADE \_\_\_\_\_/70**

1. Which of the following are indications for a lower extremity orthosis?
  - A. Support and alignment of the limb
  - B. Prevention or correction of a deformity
  - C. Weight bearing pain
  - D. All of the above
  
2. A reduction in plantarflexion strength can be assisted by a lower extremity orthosis
  - A) True
  - B) False
  
3. A lower extremity orthosis should be
  - A. A replacement to your physical therapy treatment
  - B. Used in every case of ankle weakness
  - C. An addition to your physical therapy treatment
  - D. None of the above
  
4. The role of the physical therapist in designing a lower extremity orthosis is
  - A. Defining the necessary control of the orthosis
  - B. Deciding which ankle or knee joint to use
  - C. Adjusting the fit of the orthosis
  - D. Waiting for full strength of the limb to return
  
5. When integrating the use of an orthosis into your treatment plan, you should
  - A. Tell the orthotist exactly what kind of orthosis you need
  - B. Decide when to introduce the orthosis into treatment
  - C. Adjust the orthosis yourself if it doesn't fit well
  - D. Have the patient decide how much to wear it
  
6. The professional role of the orthotist includes
  - A. Selection of the material used for fabrication
  - B. When to introduce use of the orthosis into physical therapy
  - C. Deciding if the prognosis is an acute or chronic need
  - D. Determining if there may be a temporary solution
  
7. When obtaining a cast of the limb, the orthotist will look for proper joint positioning and deformity correction if needed.
  - A) True
  - B) False
  
8. If your patient has a muscle grade of 3 or less quadriceps strength and knee ligament laxity, you should consider a
  - A. Solid ankle AFO
  - B. Articulated AFO
  - C. PTB AFO
  - D. KAFO

9. Which one orthosis can provide frontal plane stability of the subtalar joint?
- A. Leaf spring AFO
  - B. Solid ankle AFO
  - C. Knee orthosis
  - D. Arch support
10. A dorsiflexion assist AFO is most affective in which plane?
- A. Sagittal
  - B. Frontal
  - C. Transverse
  - D. All of the above
11. If control in all 3 planes of the lower extremity is needed, which orthosis design will offer the most control?
- A. Metal AFO attached to the shoe
  - B. Plastic total contact AFO
  - C. Articulated AFO with metal joints
  - D. All offer the same control
12. A simple plastic prefabricated AFO is most indicated for
- A. Maximum control of the affected joint
  - B. Long-term use of joint deformity
  - C. Temporary use as strength returns
  - D. Isolated plantarflexion weakness
13. A custom designed and fabricated orthosis is most commonly prescribed when
- A. The patient is in acute stages of illness
  - B. Minimal control is needed
  - C. Progression of the deficits are unlikely to occur
  - D. Moderate weakness and joint instability are present and progressive
14. A solid ankle AFO is indicated for
- A. Isolated dorsiflexion weakness
  - B. Combined dorsiflexion and plantarflexion ankle weakness
  - C. Muscle grade 4+ dorsiflexors
  - D. Coronal plane ligament laxity of the knee
15. Your patient has normal plantarflexion and dorsiflexion strength but has a posterior tibialis deficiency resulting in excess pronation and ankle instability in stance phase. What is the most indicated orthosis design?
- A. Free motion joint with coronal plane control
  - B. Solid ankle AFO
  - C. Dorsiflexion assist AFO
  - D. Patella tendon bearing (PTB) AFO

16. Your patient has full coronal plane control of the ankle but shows mild dorsiflexion weakness as they get more tired throughout the day. What AFO design would recommend?
- A. Solid ankle AFO
  - B. Free motion joint plastic AFO
  - C. Simple leaf-spring AFO
  - D. PTB AFO
17. You observe your patient to have muscle grade of 3 plantarflexors. Her knee flexes rapidly in terminal stance. What will help to control tibial advancement during this phase?
- A. Plantarflexion stop
  - B. Dorsiflexion stop
  - C. Either will help to control tibial advancement
18. If your patient has severe pain in their heel (calcaneus) when walking, what AFO design would be most helpful?
- A. Solid ankle
  - B. Leaf spring
  - C. Patella tendon bearing
  - D. Total contact plastic
19. When recommending a wearing schedule for your patient with a new orthosis, you should tell them to
- A. Wear it as much as they can tolerate
  - B. Limit the first day to only 5 minutes
  - C. Use it only non-weight bearing for several days
  - D. Limit the use at first, and gradually increase the wear time
20. When the orthosis is used to compensate for muscle weakness, you should tell the patient that atrophy of the leg musculature may occur.
- A) True
  - B) False
21. How long after amputation surgery will an individual begin a prosthetic fitting?
- A. Once the wound is closed
  - B. Once their sound foot can tolerate weight
  - C. When limb edema has been reduced
  - D. All of the above
22. Desensitizing the residual limb can be done by
- A. Use of an ace wrap
  - B. Massaging the limb
  - C. Rubbing the limb with different materials
  - D. All of the above

23. Knee flexion contracture of the transtibial limb are often caused by
- A. Prolonged periods of time sitting
  - B. Delayed time to fitting
  - C. Insufficient cardiovascular exercise
  - D. Both a and b
24. What should be done prior to the prosthetic fitting?
- A. Regular use of compression such as a limb shrinker
  - B. Ensure the patient is capable of pre-running activities
  - C. Purchase new shoes for use with the prosthesis
  - D. Ensure the patient is fully trained on crutch use
25. Removeable rigid dressings are effective in
- A. Preventing falls
  - B. Edema reduction
  - C. Stopping limb pain
  - D. Eliminating the need for limb shrinkers prior to first fitting
26. Use of ace wraps is still considered useful because they
- A. provide even, gradient pressure
  - B. are inexpensive
  - C. prevent contractures
  - D. all of the above
27. A transfemoral ace wrap is most effective when
- A. A hip spica technique is used
  - B. Self-applied by the patient
  - C. It provides concentrated pressure in the proximal third
  - D. None of the above
28. Gel liners can be used prior to the prosthetic fitting to
- A. Shape the residual limb
  - B. Ensure the first fitting is comfortable
  - C. Reduce the discomfort of the surgery
  - D. Reduce the healing time of the suture line
29. The first prosthetic fitting can begin when
- A. The wound is well healed
  - B. There is no longer discomfort in the residual limb
  - C. Phantom limb sensation is controlled
  - D. Contractures are completely reduced
30. Removeable rigid dressings on a transtibial residual limb will
- A. Prevent unexpected falls
  - B. Prevent knee flexion contractures

- C. Allow for wound inspection
  - D. Have no effect on the severity of injury in a fall
31. Which of the following amputation levels has the highest energy cost?
- A. Transtibial
  - B. Chopart partial foot
  - C. Transfemoral
  - D. Knee disarticulation
32. When considering an appropriate wheelchair, a provider should consider
- A. The individual
  - B. User needs
  - C. The environmental conditions
  - D. All of the above
33. Choose the most important benefit of wheelchair use from the following:
- A. Enhances mobility and participation in community life
  - B. Allows access to small spaces
  - C. Teaches mechanical maintenance skills
  - D. Leg extensions can be used to reduce knee flexion contractures
34. Pressure sore incidence can be reduced with wheelchair use by
- A. Widening the base of the wheels
  - B. Using higher back support
  - C. including leg extensions
  - D. having a well-fitting and appropriate cushion
35. In many developing countries, what percentage of people with disabilities have access to the rehabilitation services they need?
- A. 3%
  - B. 30%
  - C. 75%
  - D. 95%
36. Unemployment rates of people with disabilities reach an estimated 80% or more in many developing countries.
- A) True
  - B) False
37. Which of the following is a characteristics of transfemoral prosthetic gait?
- A. Greater ground reaction forces on the sound limb
  - B. decreased stance time on the sound limb
  - C. Lower energy cost than transtibial amp
  - D. Decreased ankle range on the sound side ankle

38. Your patient with a transfemoral amputation has lateral trunk bending during gait. What will you recommend?
- A. Hip extensor strengthening and gait training
  - B. Balance and coordination exercises
  - C. Abductor strengthening
  - D. All are equally important
39. When your patient needs to add socks to accommodate volume changes of their limb, the socks will be added
- A. Under the liner
  - B. On the outside of the liner
  - C. Either a or b depending on the patient preference
  - D. Socks should only be used in an emergency
40. What is the most common hip contracture seen with transfemoral amputation?
- A. Flexion
  - B. Extension
  - C. Abduction
  - D. Adduction
41. Which outcome measure is utilized before the first prosthetic fitting?
- A. 2 minute walk test
  - B. AmpPro
  - C. AmpnoPro
  - D. Socket comfort score
42. Prosthetic training should include orientation of the center of gravity, improvement of proprioception, and weight bearing on the prosthetic side
- A) True
  - B) False
43. When training your patient to do lateral weight shifting while in the parallel bars you will teach them to
- A. Contract their gluteus medius on the amputated side
  - B. Co-contract their quadriceps and hamstrings on the sound side
  - C. Activate their hip flexors on the amputated side
  - D. Contract their hip extensors on the sound side
44. When training the transtibial amputee pt to step up on a stool with the sound side, you are encouraging
- A. Sound side hip extensor strengthening
  - B. stability strength of the affected side hip
  - C. confidence in balance for walking down a ramp
  - D. lateral trunk lean for weight shifting

45. Effective gait training should address
- A. Stride length symmetry
  - B. Transverse pelvic rotation on the affected side
  - C. A wide base of support
  - D. A and B only
46. Ascending and descending slopes with a transfemoral prosthesis is often done by
- A. Using a wheelchair
  - B. Side stepping
  - C. Using only a locking knee
  - D. Taking longer strides
47. A test socket is used by the prosthetist before fabricating a definitive socket in order to
- A. Assess the quality of the fitting
  - B. Add to the final cost of the prosthesis
  - C. Prepare the patient to progress to higher activity
  - D. Evaluate the skill of the prosthetist
48. A patella tendon bearing supracondylar socket for a below knee limb is used when
- A. The residual limb is long
  - B. Suspension over the femoral condyles is desired
  - C. The patella doesn't track properly during flexion
  - D. There is arthritis present in the knee joint
49. When the suspension of the prosthesis is inadequate, the
- A. stance phase will be uncomfortable
  - B. energy cost will not increase
  - C. limb may feel heavy
  - D. step lengths will be unequal
50. An osseointegrated prosthesis on a transfemoral limb will
- A. Add weight to the limb
  - B. Be less restrictive in ROM than a socket
  - C. Decrease the cost of the limb
  - D. Reduce the risk of infection