AMREF INTERNATIONAL UNIVERSITY
SCHOOL OF MEDICAL SCIENCE
DEPARTMENT OF REHABILITATION MEDICINE
BACHELOR OF SCIENCE IN PHYSIOTHERAPY
END OF JAN-APRIL 2025 TRIMESTER EXAMINATIONS

UNIT CODE: PHT 334 UNIT NAME: Prosthetics and orthotics

DATE: 5th August 2025
TIME: TWO HOURS
START: 6PM STOP: 8:30 PM

INSTRUCTIONS (Online examinations)

1. This exam is marked out of 70 marks
2. This Examination comprises 1 Sections
3. This online exam shall take 2.5 Hours
4. Late submission of the answers will not be accepted
5. Ensure your web-camera is on at all times during the examination period
6. No movement is allowed during the examination
7. Idling of your machine for 5 min or more will lead to lock out from the exam
8. The Learning Management System (LMS) has inbuilt integrity checks to detect cheating
9. Any aspect of cheating detected during and or after the exam administration will lead to nullification of your exam
10. In case you have any questions call the invigilator for this exam on Tel. 0705833434 and or the Head of Department on Tel 0720491032
11. For adverse incidences please write an email to: amiu.examinations@amref.ac.ke

Section A. Multiple choice questions. Answer all the questions

1. What are the primary reasons for prescribing a lower extremity orthosis?

A. To provide structural support and proper alignment for the limb.
B. To hinder the progression or rectify existing deformities.
C. To alleviate discomfort experienced during weight-bearing activities.
D. All of the aforementioned.

2. A 68-year-old male with a history of hypertension and well-controlled type 2 diabetes is scheduled for a total knee arthroplasty (TKA) in 3 weeks. During his pre-operative physiotherapy assessment, you note the following: a resting heart rate of 98 bpm, a blood pressure of 145/92 mmHg, a pain score of 7/10 at rest, and he reports increasing shortness of breath with exertion that has worsened over the past week, now limiting his ability to walk more than 50 meters. His baseline 6-minute walk test (6MWT) 3 months ago was 350 meters, but he is unable to complete a 6MWT today due to dyspnea. Which of the following is the MOST appropriate immediate action for the physiotherapist?

A. Proceed with a standard pre-operative exercise program focusing on quadriceps strengthening and gait training, while closely monitoring vital signs.
B. Recommend postponing the surgery until his pain is better managed with medication and his functional capacity improves.
C. Document findings and immediately refer him back to his orthopedic surgeon and/or general physician for further medical evaluation, specifically highlighting the worsening dyspnea and elevated vital signs.
D. Initiate respiratory physiotherapy interventions, including breathing exercises and airway clearance techniques, to improve his lung function prior to surgery.

3. A physiotherapist is evaluating an individual with weak ankle dorsiflexors. To best facilitate toe clearance during walking and prevent tripping, a dorsiflexion assist AFO is prescribed. In which cardinal plane will the primary corrective action of this AFO occur to achieve the desired functional outcome?

A. Sagittal
B. Frontal
C. Transverse
D. All of the above

4. A rehabilitation team is assessing a patient who presents with severe spasticity and fluctuating muscle tone in their lower extremity, leading to significant instability and unpredictable movements in all three planes (sagittal, frontal, and transverse) during both stance and swing phases of gait. The primary goal is to provide maximum external control to stabilize the limb and facilitate functional ambulation, even if it compromises some degree of natural movement. Given this patient's complex needs for comprehensive triplanar control of the lower extremity, which of the following orthosis designs would offer the most effective and rigid control?

A. A lightweight, posterior leaf spring plastic AFO.
B. A custom-molded, solid ankle-foot orthosis (SAFO) with high trimlines.
C. An articulated AFO with adjustable ankle joints and a free motion ankle.
D. A conventional double upright metal AFO with a plantarflexion stop and dorsiflexion assist spring.

5. A 45-year-old patient presents to an outpatient clinic after being diagnosed with a temporary common peroneal nerve palsy following a period of prolonged leg crossing. The examination reveals isolated, flaccid weakness in the ankle dorsiflexors (strength grade 3/5), resulting in foot drop during the swing phase of gait. There is no spasticity, no mediolateral ankle instability, and the ankle has full passive range of motion. The neurologist's prognosis is for a full recovery of strength over the next 8-12 weeks. The primary goal is to provide an immediate, cost-effective solution to enable safe ambulation and prevent falls while the patient engages in physical therapy. Given this specific clinical presentation and the stated goals, which of the following is the most appropriate orthotic recommendation?

A. A custom-molded, solid plastic AFO to provide maximum tri-planar control of the ankle.
B. A custom-fabricated carbon fiber AFO with an anterior shell to maximize energy return during gait.
C. A simple, prefabricated posterior leaf spring (PLS) plastic AFO.
D. An articulated AFO with adjustable ankle joints and a plantarflexion stop.

6. A 10-year-old child with Duchenne Muscular Dystrophy (DMD) who has progressive lower extremity weakness, leading to significant foot drop and equinovarus foot deformities. They experience instability and frequent falls. Existing off-the-shelf orthoses are ineffective due to poor fit, inadequate stability, and inability to control the progressive contractures and deformities, causing skin irritation. The goal is to maintain functional walking, prevent further deformities, and enhance stability as the disease progresses.

A. A simple, prefabricated plastic posterior leaf spring (PLS) AFO for basic foot drop assistance.
B. A custom-designed and fabricated rigid ankle-foot orthosis (AFO) with precise anatomical contouring and high trimlines.

C. An articulated AFO with adjustable plantarflexion and dorsiflexion stops to allow for some ankle motion.
D. A soft, custom-fitted dynamic ankle brace to provide proprioceptive feedback and light compression.

7. Your patient has normal plantarflexion and dorsiflexion strength but has a posterior tibialis deficiency resulting in excess pronation and ankle instability in stance phase. Which of the following 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

8. A 52-year-old patient with poorly controlled type 2 diabetes sustained a non-displaced calcaneal stress fracture three months ago. Despite being immobilized in a controlled ankle motion (CAM) boot, they have developed significant heel pain and early signs of Charcot neuroarthropathy. Imaging confirms delayed fracture healing and osteopenia. The primary clinical objective is to enable ambulation while maximally offloading the calcaneus to prevent further collapse and allow the fracture to heal. The patient cannot tolerate crutches due to poor balance. Given the critical need to transfer weight-bearing forces away from the heel and onto a more proximal structure, which of the following AFO designs would be the most effective intervention for this patient?

A. A custom-molded, solid ankle AFO with a cushioned heel insert.
B. A prefabricated posterior leaf spring (PLS) AFO to assist with gait efficiency.
C. A patella tendon bearing (PTB) AFO.
D. An articulated AFO with adjustable dorsiflexion and plantarflexion stops.

9. 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

10. A 55-year-old patient with an incomplete L3 spinal cord injury has severe foot drop due to tibialis anterior weakness, causing tripping and safety concerns despite physiotherapy. They've been prescribed an AFO for safe ambulation but worry about relying on it and hindering their muscle recovery. Which of the following is the most crucial physiological consequence a physiotherapist

must address when educating this patient about the long-term use of their orthosis in conjunction with their ongoing rehabilitation?

A. The AFO will provide a consistent sensory input, which will help to retrain your brain to activate your weakened muscles more effectively over time.
B. Using the AFO consistently will directly facilitate neuroplastic changes, leading to faster regeneration of the damaged spinal cord segments responsible for your ankle strength.
C. While the orthosis offers vital support for safe mobility, prolonged reliance on external support can lead to disuse atrophy of the muscles it assists, making your active participation in strengthening exercises even more critical.
D. The primary long-term benefit of the AFO is to prevent secondary complications like contractures, ensuring your ankle maintains full passive range of motion even if muscle strength does not return.

11. Which of the following is the single most critical factor that must be addressed before proceeding with casting for a preparatory prosthesis to ensure a successful and functional initial fit?

A. The surgical staple sites must be completely faded and the scar tissue fully pliable to tolerate the pressures within a socket.
B. The patient must be able to ambulate 10 meters with a walker on their sound limb to demonstrate functional readiness for prosthetic gait.
C. The fluctuating edema must be controlled and the residual limb volume stabilized, as this is essential for creating an accurate and intimate-fitting socket mold.
D. The patient must report a complete absence of phantom limb sensation, as this can interfere with the proprioceptive feedback from the prosthesis.

12. Desensitizing the residual limb can be done by.

A. Applying consistent, light pressure through various forms of tactile stimulation, such as tapping or gentle kneading.
B. Utilizing sustained, deep pressure application to modulate the sensory receptors and accommodate the nervous system to contact.
C. Introducing a progressive hierarchy of sensory inputs, starting with soft textures and advancing to coarser materials.
D. All of the above.

13. Following a transfemoral amputation, a 55-year-old patient is 3 days post-op. As part of your initial comprehensive post-operative physiotherapy assessment, you observe the stump dressing is soiled with a small amount of serosanguinous fluid, the incision line appears slightly reddened, and the patient reports pain 7/10 on a visual analog scale. Additionally, you note a significant hip flexion

contracture developing, even with proper positioning. Which of the following aspects of your assessment requires the most urgent immediate intervention or communication with the medical team?

A. Assessment of the patient's current pain level and effectiveness of analgesia.
B. Re-education on proper prone positioning to prevent further hip flexion contracture.
C. Detailed assessment of the stump's skin integrity and signs of infection.
D. Early initiation of gentle range of motion exercises for the unaffected lower limb.

14. A 65-year-old patient with severe peripheral artery disease is being evaluated for a transtibial amputation. Which of the following combination of physical pre-operative assessments is MOST crucial for predicting functional outcomes and guiding surgical planning?

A. Measurement of bone density using DEXA scan, assessment of visual acuity, and analysis of pulmonary function tests.
B. Assessment of the patient's current walking speed and endurance over 6 minutes, along with a detailed lower limb neurological examination.
C. Evaluation of muscle strength in major lower limb groups, range of motion of adjacent joints, skin integrity over potential incision sites, and a cardiovascular fitness test.
D. Detailed dietary habits, psychosocial support network assessment, and cognitive function screening.

15. A 72-year-old patient has undergone a transtibial amputation due to osteomyelitis, resulting in a complex wound that requires daily inspection and frequent dressing changes. The surgical team also emphasizes the need for aggressive edema control and early limb shaping to prepare for prosthetic fitting. Considering these factors, which of the following post-amputation dressing type offers the MOST appropriate balance of advantages?

A. A semi-rigid dressing
B. A soft dressing
C. A rigid dressing
D. A removable rigid dressing

16. A 68-year-old patient underwent a transfemoral amputation 5 days ago. They report significant post-operative pain, experience mild dizziness upon standing, and have a history of moderate coronary artery disease. The rehabilitation goal is to ensure safe, early mobility within the hospital environment while minimizing cardiac strain. Considering the patient's current status, which of the following assistive equipment is the MOST appropriate initial recommendation for safe mobility and energy conservation?

A. A standard walker with partial weight-bearing
B. Bilateral axillary crutches
C. An immediate post-operative prosthesis (IPOP).

D. A wheelchair with stump support

17. A 40-year-old patient with an uncomplicated transtibial amputation is ready for discharge from inpatient rehab. They have excellent upper body strength and balance, and their residual limb is well-shaped with minimal edema. Their primary long-term goal is to return to active community ambulation with a definitive prosthesis. What combination of assistive equipment would be most beneficial for this patient during the transition from inpatient rehab to full community ambulation, leading up to and including definitive prosthetic fitting?

A. Immediate transition to a definitive prosthesis with no other assistive devices.

B. Temporary prosthesis for structured gait training and limb shaping, supplemented by crutches or a single cane for community ambulation and safety, especially on uneven terrain.

C. Continued use of crutches for all ambulation until the definitive prosthesis is perfectly fitted.

D. Exclusive use of a wheelchair for all mobility needs to conserve energy.

18. A patient is 3 days post-right transtibial amputation. The nurse reports moderate residual limb edema, and the patient is reluctant to move their knee. The physiotherapist's primary concern is preventing knee flexion contractures, managing edema, and promoting optimal wound healing. Which combined physiotherapy intervention is MOST crucial in the immediate post-operative period to address these concerns effectively?

A. Focus solely on pain management with medication, and wait for sutures to be removed before starting any limb movement.

B. Immediate aggressive resistive exercises for hip and knee, and continuous passive motion (CPM) for the knee.

C. Strict bed rest with the limb elevated on pillows, and ice packs applied hourly.

D. Gentle active range of motion (AROM) exercises for the knee and hip, proper positioning to prevent contractures, and consistent, appropriate residual limb compression.

19. A 55-year-old patient who underwent a transtibial amputation 3 days ago is beginning bedside sitting and transfers. They are experiencing mild dizziness and still require moderate assistance. The inpatient physiotherapy team's priority is to initiate a comprehensive fall prevention program. Which initial set of interventions would be MOST effective for immediate fall prevention in this acute inpatient setting?

A. Implementing a strict bed rest protocol with hourly vital sign checks to minimize movement.

B. Ensuring consistent use of non-slip socks/footwear, instructing on safe bed/chair transfers, maintaining clear pathways to bathroom, and promoting call-bell use.
C. Prescribing immediate, unsupervised ambulation with a walker and daily home hazard assessments.
D. Educating on prosthetic donning/doffing, practicing advanced balance exercises, and arranging for a community support group.

20. A 65-year-old patient with a transtibial prosthesis reports that their socket feels too loose, especially later in the day, causing a feeling of instability. As part of a fall prevention program, which of the following is the MOST appropriate initial action and piece of education for the physiotherapist to provide?

A. Recommend reducing their activity level to prevent further volume loss.
B. Instruct the patient on how to correctly add prosthetic socks to manage limb volume changes and ensure a snug fit.
C. Refer the patient back to the prosthetist for a completely new socket.
D. Advise the patient to wrap an elastic bandage around their prosthesis for a tighter fit.

21. A physiotherapy student is observing a physiotherapist applying an ACE wrap to a patient's new transtibial amputation. The physiotherapist applies the wrap with significantly more tension proximally than distally, and leaves a small, noticeable gap just below the knee. What is the MOST likely immediate complication of this specific application technique, and what underlying principle of ACE wrapping does it violate?

A. Increased risk of hip flexion contracture, violating the principle of joint positioning.
B. Development of a tourniquet effect and distal edema, violating the principle of graded compression.
C. Excessive limb protection leading to skin maceration, violating the principle of breathability.
D. Inadequate pain control due to insufficient compression, violating the principle of consistent pressure.

22. A 48-year-old patient has undergone a transtibial amputation. They express significant fear of accidental trauma to the residual limb, report moderate phantom limb pain, and show early signs of a knee flexion contracture. The surgeon emphasizes the importance of daily wound checks due to a history of delayed healing. Which post-amputation dressing type is

BEST justified for this patient, comprehensively addressing limb protection, pain control, contracture prevention, and enabling frequent wound inspection?

A. Semi-rigid Unna boot
B. Removable Rigid Dressing (RRD)
C. Soft elastic bandage
D. Non-removable rigid cast

23. A 50-year-old patient is 1-week post-transtibial amputation. They present with moderate residual limb edema, a mild knee flexion contracture, and express significant anxiety about future mobility. Their primary goal is to walk with a prosthesis. In this immediate pre-prosthetic phase, which combination of interventions MOST effectively addresses multiple core components of their rehabilitation and prepares them for prosthetic fitting?

A. Intensive core strengthening exercises and immediately starting prosthetic gait training with a temporary prosthesis.
B. Aggressive desensitization techniques for the residual limb and daily high-intensity cardiovascular training.
C. Consistent residual limb compression and shaping, daily prone positioning for contracture prevention, and patient education on the prosthetic process and realistic expectations.
D. Focusing primarily on pain medication management and encouraging complete bed rest to protect the surgical site.

24. A patient with a transtibial amputation, 2 months post-fitting of their definitive prosthesis, consistently reports localized redness and burning pain over the distal anterior tibia after 30 minutes of ambulation. They also mention that their limb feels like it's 'bottoming out' in the socket. What is the MOST probable socket-related issue contributing to this patient's symptoms, and what is the underlying mechanical problem?

A. An overly tight socket brim resulting in distal edema and numbness, indicative of a circulation restriction.
B. Insufficient total contact with the distal residual limb, leading to excessive pressure on the anterior tibia due to pistoning
C. Excessive pressure from the total surface bearing design, causing generalized redness and poor circulation distally.
D. Inadequate suspension of the prosthesis, leading to excessive friction and shear forces on the skin.

25. A 40-year-old patient with a transtibial amputation, 6 months post-prosthetic fitting, aims to return to their job as a warehouse supervisor (requiring walking on uneven surfaces and standing for prolonged periods) and wishes to improve their confidence and reduce their fear of falling during community ambulation. Which of the following combination of outcome measures is MOST appropriate to comprehensively assess this patient's progress towards their stated goals, considering their specific needs as a prosthetic user?

A. L-Test, ABC Scale, and the Orthotic and Prosthetic User's Survey (OPUS).
B. Timed Up and Go (TUG) Test on varied surfaces, ABC Scale, and the Prosthesis Mobility Inventory (PMI).
C. Prosthetic Evaluation Questionnaire (PEQ), Activities-specific Balance Confidence (ABC) Scale, and the Community Integration Questionnaire (CIQ).
D. Amputee Mobility Predictor (AMPPRO), Berg Balance Scale (BBS), and a 2-Minute Walk Test (2MWT).

26. A 60-year-old patient, 2 weeks post-right transfemoral amputation, is experiencing moderate residual limb edema, mild hip flexion contracture, and significant fear of moving the residual limb. Their primary goal is independent ambulation with a prosthesis. Which of the following is the MOST critical initial focus of the physiotherapist's role in this pre-prosthetic phase to optimally prepare the patient for prosthetic fitting and address their immediate challenges?

A. Implementing aggressive stretching for the hip flexors and instructing on phantom limb pain management techniques only.
B. Initiating consistent residual limb compression and positioning to manage edema and prevent contractures, alongside gentle active range of motion, and providing targeted education on limb care and early mobility strategies to build confidence.
C. Primarily focusing on bed mobility training and intense hip abduction strengthening to prepare for prosthetic ambulation.
D. Referral for immediate temporary prosthetic fitting to motivate the patient and starting gait training in the parallel bars.

27. A 52-year-old patient with a transtibial amputation, using a PTB (Patellar Tendon Bearing) socket, consistently reports sharp, localized pain and observes redness over the area inferior to the patella and along the anterior aspect of their residual limb after 15 minutes of standing. Based on these symptoms and their location, which of the following statement accurately identifies the affected areas and their implications for socket fit?

A. The tibial crest and distal anterior tibia, both pressure-sensitive areas, are receiving excessive contact or pressure, necessitating relief in the socket.

B. The patellar tendon, a pressure-tolerant area, is experiencing too much primary weight-bearing, requiring immediate relief.
C. The medial tibial flare, a primary weight-bearing area, is being overloaded due to insufficient relief elsewhere in the socket.
D. The fibular head and common peroneal nerve are experiencing compression, indicating a need for greater proximal support in the socket.

28. A 35-year-old active patient with a unilateral transtibial amputation consistently exhibits a vaulting gait during prosthetic ambulation, characterized by excessive plantarflexion of the sound ankle and elevation of the prosthetic side during swing. The patient also reports mild discomfort in the proximal anterior aspect of the residual limb. Which of the following prosthetic factors is MOST likely contributing to both the vaulting gait and the proximal discomfort, and what immediate physiotherapy consideration is indicated?

A. Inadequate prosthetic suspension leading to excessive pistoning, and an effectively long prosthetic limb causing inadequate toe clearance.
B. Improper socket alignment leading to a knee flexion moment, and insufficient residual limb volume causing distal discomfort.
C. A prosthetic foot with excessive plantarflexion resistance causing foot slap, and a socket that is too tight proximally.
D. A prosthetic knee with insufficient friction, and a lack of total contact in the socket causing distal bell clapping.

29. A highly active 28-year-old transfemoral amputee wants to return to recreational basketball. During assessment, the physiotherapist observes that while their gait is good on flat surfaces, they struggle with quick directional changes, jumping, and absorbing impact, reporting a lack of responsiveness from their prosthesis. Which of the following combinations of prosthetic factors and physiotherapy strategies would be MOST crucial to optimize this patient's ability to return to high-impact sports effectively?

A. Optimizing socket alignment for mediolateral stability and increasing residual limb strength, along with balance training on a static surface.
B. Ensuring a total surface bearing socket with maximum distal end weight bearing, and focusing on long-distance endurance training.
C. Using a single-axis prosthetic foot and a manual locking knee, while implementing proprioceptive neuromuscular facilitation (PNF) for hip control.

D. Prescribing a multi-axial prosthetic foot and a hydraulic knee unit, combined with plyometric training and agility drills.

30. A physiotherapist observes a patient with a transtibial prosthesis consistently demonstrating an 'early heel-off' pattern, where the prosthetic heel lifts prematurely from the ground before the sound limb makes initial contact, especially noticeable during faster ambulation. Compared to normal gait, which of the following is the MOST likely prosthetic factor contributing to this deviation and its biomechanical consequence?

A. A prosthetic foot with excessive dorsiflexion resistance, leading to a delayed toe-off and knee hyperextension.
B. An overly long prosthetic limb, forcing the patient to vault to achieve toe clearance during swing phase.
C. A prosthetic foot with insufficient plantarflexion resistance, causing a rapid progression over the foot and premature advancement of the tibia over the foot.
D. Inadequate prosthetic suspension causing pistoning within the socket during midstance, leading to instability.

31. During gait analysis, a physiotherapist observes a patient with a transfemoral prosthesis consistently exhibiting 'terminal impact' during the late swing phase, where the prosthetic shank abruptly extends with an audible thud. Compared to the controlled knee extension in normal gait, what is the MOST probable cause of this deviation in a transfemoral prosthetic user?

A. A prosthetic foot with inadequate dorsiflexion, causing a delayed rollover and requiring more force to advance the limb.
B. Excessive hip flexor strength causing an overactive knee extension moment during late swing.
C. An overly tight socket creating excessive friction on the residual limb, restricting knee flexion during swing.
D. Insufficient friction or extension resistance within the prosthetic knee unit, allowing uncontrolled pendulum swing of the shank.

32. A patient with a transtibial amputation consistently exhibits a vaulting gait during prosthetic ambulation, characterized by lifting the sound limb excessively to clear the prosthetic foot during swing. Which pair of potential causes (one prosthetic, one patient-related) MOST likely contributes to this deviation?

A. Prosthetic: Too much friction in the prosthetic knee joint; Patient: Hip extension contracture on the prosthetic side.

B. Prosthetic: Prosthesis is too long; Patient: Fear of stubbing the toe or limited residual limb motion
C. Prosthetic: Inadequate plantarflexion stop in the prosthetic foot; Patient: Shortened step length of the sound limb.
D. Prosthetic: Loose socket causing excessive pistoning; Patient: Weak hip abductors on the prosthetic side.

33. A transfemoral amputee consistently walks with an 'abducted gait,' meaning the prosthetic limb is swung out to the side in an arc during the swing phase. Which combination of prosthetic and patient causes MOST accurately explains this observed gait deviation?

A. Prosthetic: Prosthesis is too long or the medial brim of the socket is too high; Patient: Hip abduction contracture or fear of hitting the contralateral leg.
B. Prosthetic: Prosthetic foot is set in excessive dorsiflexion; Patient: Quadriceps weakness on the sound side.
C. Prosthetic: Prosthetic knee has too little friction; Patient: Weak hip flexors on the prosthetic side.
D. Prosthetic: Socket is too small, causing excessive pressure; Patient: Excessive hip adductor strength.

34. A 68-year-old patient with a new transtibial prosthesis is ambulating independently with a cane around their home. They report occasional redness after a full day of wear and are worried about tripping over rugs. They also ask about the best way to keep their liner clean. Which of the following is the MOST essential and comprehensive education advice the physiotherapist should provide to address the patient's immediate concerns and promote long-term prosthetic comfort and safety in their home environment?

A. Instruct on daily washing of the residual limb with mild soap and water, demonstrate proper donning technique for wrinkle-free liner application, and recommend removing all loose rugs in the home.
B. Emphasize consistent daily washing of both the residual limb and liner, teach proper visual skin inspection for pressure areas, ensure consistent heel height in all shoes, and discuss basic fall prevention strategies, including environmental hazard removal.
C. Educate on the importance of moisturizing the residual limb daily, suggest wearing the prosthesis at night to prevent falls, and provide a list of local support groups.

D. Advise daily residual limb and liner inspection for redness, emphasize the consistent use of shoes with a low, stable heel, and teach techniques for safely getting up from a fall.

35. A 68-year-old male presents with severe, chronic left knee osteoarthritis (Kellgren-Lawrence Grade IV), reporting significant pain and instability, particularly during ambulation and descending stairs. He has a 10-degree varus deformity. Conservative management, including NSAIDs, corticosteroid injections, and a comprehensive exercise program, has provided only minimal, temporary relief. He is not currently a candidate for total knee arthroplasty due to multiple comorbidities. Which of the following orthotic interventions is most likely to be indicated and why, considering his primary limitations and goals?

A. A rigid ankle-foot orthosis (AFO)
B. A custom-molded patellar-tendon bearing (PTB) orthosis
C. A valgus-producing unloader knee brace
D. A soft knee sleeve with patellar cut-out

36. A 45-year-old male presents with chronic foot pain and a history of pes planus. Following a comprehensive assessment, the orthopedic surgeon recommends a custom-molded ankle-foot orthosis (AFO) to control excessive pronation during gait. Which of the following scenarios best exemplifies the collaborative and distinct roles of the physical therapist and orthotist in ensuring optimal patient outcomes with this intervention?

A. The physical therapist fabricates the AFO, and the orthotist then teaches the patient gait re-education exercises while wearing it.
B. The orthotist performs the biomechanical assessment and determines the AFO specifications, while the physical therapist is solely responsible for patient education on donning/doffing.
C. The physical therapist conducts a detailed gait analysis, identifies functional limitations and goals, and communicates these to the orthotist who then designs and fits the AFO. Subsequently, the physical therapist integrates the AFO into a comprehensive rehabilitation program, focusing on strengthening, balance, and functional training with the device.
D. The orthotist is responsible for all aspects from assessment to fitting and training, with the physical therapist only consulted if the patient reports discomfort.

37. A 68-year-old patient with a CVA presents with significant foot drop and impaired balance, requiring an orthotic intervention. The team is considering an off-the-shelf ankle-foot orthosis versus a custom-molded AFO. During the decision-making process and subsequent management, which of the following best describes a crucial, unique contribution of the physical therapist that complements the orthotist's expertise?

A. The physical therapist's primary role is to measure the patient's limb circumference and length to ensure proper sizing of the orthosis.
B. The physical therapist evaluates the patient's functional mobility, compensatory strategies, and tolerance to the orthosis during dynamic activities, providing critical feedback to the orthotist for fine-tuning and guiding the patient's functional integration of the device into daily life.
C. The physical therapist performs the casting for a custom-molded AFO and determines the specific material properties based on their understanding of biomechanics.
D. The physical therapist’s main responsibility is to provide the patient with a list of orthotic vendors and assist with insurance claims.

38. A 68-year-old male presents with a chief complaint of chronic right ankle pain and instability following a severe inversion sprain two years prior. He reports frequent "giving way" sensations, especially on uneven terrain, and states his recreational golf game is significantly impacted due to pain during his swing's follow-through. Clinical examination reveals 2+ anterior drawer sign, mild subtalar joint hypermobility, and pain with resisted eversion. Radiographs show no acute fractures but demonstrate mild talar tilting. The patient is hesitant about surgical intervention. Which of the following orthotic prescriptions would be most appropriate to address his functional limitations and promote participation in his desired activities?

A. A custom-molded semi-rigid foot orthosis with medial arch support and a lateral flare.
B. A prefabricated ankle-foot orthosis (AFO) with a dorsiflexion assist and a medial whip.
C. A custom-fabricated carbon fiber ankle-foot orthosis (AFO) with a rigid stirrup and an articulating ankle joint with adjustable plantarflexion and dorsiflexion stops.
D. A lace-up ankle brace with figure-eight strapping and a silicone heel cup.

39. An elderly woman has severe medial knee osteoarthritis and genu varum, wanting to avoid surgery. Which of the following orthosis will effectively offload her knee to reduce pain and slow progression?

A. Bilateral custom-molded ankle-foot orthoses (AFOs) with a lateral wedge.
B. Bilateral unloader knee braces with a valgus corrective strap and adjustable condylar pads.
C. Bilateral patellofemoral knee braces to offload the medial compartment.
D. Bilateral neoprene knee sleeves with medial buttresses for compression and warmth.

40. A 72-year-old male presents with progressively worsening right knee instability and pain due to advanced genu recurvatum (hyperextension) secondary to long-standing quadriceps weakness (2/5) following a stroke 5 years prior. He ambulates with a wide-based gait, relying heavily on a cane, and reports frequent falls due to his knee buckling backward. His ankle plantarflexors have moderate spasticity (2 on Modified Ashworth Scale). He is highly motivated to improve his gait safety and reduce reliance on his cane. Which of the following orthotic solutions would be most appropriate and effective for this patient?

A. A lightweight, off-the-shelf single-axis knee brace to prevent hyperextension.
B. A custom-molded Ankle-Foot Orthosis (AFO) with a dorsiflexion stop to promote knee flexion during stance.
C. A custom-molded Knee-Ankle-Foot Orthosis (KAFO) with a stance control knee joint.
D. A double upright metal Ankle-Foot Orthosis (AFO) with a free ankle joint and a posterior stop to block hyperextension.

41. Which of the following is the primary purpose of an Ankle-Foot Orthosis (AFO) for a patient with foot drop?

A. To provide warmth and compression to the ankle.
B. To assist with ankle dorsiflexion during the swing phase of gait.
C. To limit knee flexion during the stance phase.
D. To reduce swelling in the foot and ankle.

42. A patient with medial compartment knee osteoarthritis is prescribed an "unloader brace." What is the main biomechanical effect of this type of brace?

A. To increase the load on the medial compartment of the knee.
B. To reduce the load on the medial compartment of the knee.
C. To primarily stabilize the patellofemoral joint.

D. To provide general warmth and proprioceptive feedback to the knee.

43. Which component of a KAFO (Knee-Ankle-Foot Orthosis) is primarily responsible for preventing knee flexion and providing stability during the stance phase of gait?

A. The shoe insert

B. The calf band

C. The ankle joint

D. The knee joint mechanism

44. Which of the following is the primary purpose of a rigid Ankle-Foot Orthosis (AFO)?

A. To provide dynamic assistance for ankle dorsiflexion during swing phase.

B. To allow unrestricted ankle motion while providing mediolateral stability.

C. To fully control ankle plantarflexion and dorsiflexion, providing maximum stability.

D. To only prevent foot drop, without affecting mediolateral stability.

45. A patient presents with acute plantar fasciitis. Which type of foot orthosis is most commonly recommended as an initial intervention to reduce pain and support the arch?

A. A rigid, custom-molded accommodative orthosis.

B. A prefabricated, semi-rigid arch support insert.

C. A silicone heel cup with no arch support.

D. A solid Ankle-Foot Orthosis (AFO).

46. A patient presents with persistent medial knee pain diagnosed as early-stage osteoarthritis. Which type of orthosis is commonly used to help offload the painful compartment of the knee?

A. Patellofemoral knee brace.

B. Unloader knee brace.

C. Neoprene knee sleeve.

D. Ankle-foot orthosis (AFO).

47. When assessing a patient for a knee orthosis, which of the following is a key consideration for determining the most appropriate brace type?

A. The patient's preferred shoe size.

B. The specific ligament(s) involved or compartment of the knee affected.

C. The patient's daily fluid intake.

D. The color preference for the brace.

48. A patient with medial compartment knee osteoarthritis consistently demonstrates a genu varum (bow-legged) deformity and reports increased pain with weight-bearing on the medial

aspect of their knee. Which type of knee brace control option is most appropriate to address these findings?

A. Patellar tracking control
B. Hyperextension stop
C. Valgus corrective force
D. Compression only

49. When fitting a patient with a new orthosis, which of the following is the most important initial step for the physiotherapist?

A. Providing detailed instructions on cleaning the orthosis.
B. Checking the orthosis for proper alignment and fit on the patient's limb.
C. Scheduling the next follow-up appointment immediately.
D. Discussing the potential cost and insurance coverage of the orthosis.

50. A client presents with a history of C5 spinal cord injury and requires a new wheelchair. Which of the following wheelchair features would be MOST crucial for optimizing their independence in propulsion and daily activities?

A. Heavy-duty frame for bariatric support
B. Solid rear wheels with high rolling resistance
C. Lightweight, rigid frame with adjustable rear axle position
D. Standard sling upholstery with no pressure relief features

51. A physiotherapist is assessing a patient who reports recurring shoulder pain and skin breakdown on their ischial tuberosities since receiving their new wheelchair. Which aspect of the wheelchair design is LEAST likely to be a direct contributing factor to these issues?

A. Incorrect seat width
B. Inadequate cushion material
C. Excessive seat depth
D. Footrest length that is too short, causing knees to be too high

52. 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

53. 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

54. 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

55. 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

56. 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

57. Which of the following amputation levels has the highest energy cost?

A) Transtibial

B) Chopart partial foot

C) Transfemoral

D) Knee disarticulation

58. When considering an appropriate wheelchair, a provider should consider

A) The individual

B) User needs

C) The environmental conditions

D) All of the above

59. 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

60. 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

61. 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%

62. Which of the following is a characteristic 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

63. Your patient with a transfemoral amputation has lateral trunk bending during gait. Which of the following will you recommend?

A) Hip extensor strengthening and gait training

B) Balance and coordination exercises

C) Abductor strengthening

D) All are equally important

64. 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

65. 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

66. Which of the following is the most common hip contracture seen with transfemoral amputation?

A) Flexion

B) Extension

C) Abduction

D) Adduction

67. Which of the following outcome measure is utilized before the first prosthetic fitting?

A) 2 minute walk test

B) AmpPro

C) AmpnoPro

D) Socket comfort score

68. 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 quadraceps and hamstrings on the sound side

C) Activate their hip flexors on the amputated side

D) Contract their hip extensors on the sound side

69. 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

70. 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