BRIGHAM AND WOMEN'S HOSPITAL
A Teaching Affiliate of Harvard Medical School
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Department of Rehabilitation Services
Physical Therapy

Standard of Care: Lower Extremity Amputation

Case Type / Diagnosis:

This standard of care applies to any patient s/p a lower extremity amputation, e.g. transfemoral (above-knee or AKA), transtibial (Below-knee or BKA), transmetatarsal (TMA), and toe amputations.

Indications for Treatment:

- New lower extremity amputation due to vascular disease, trauma or presence of tumor
- New admission for a patient who has had a previous lower extremity amputation and is at risk for edema, weakness and/or contractures due to their recent admission to BWH.

Contraindications / Precautions for Treatment:
Considerations

1. Positioning Guidelines for Patients with Transtibial and Transfemoral Amputations
   A. Residual limb should be elevated to ~20 degrees with knee immobilizer donned, POD #1-2.
   B. Knee immobilizer (for transtibial amputations if ordered by MD) on at all times except for exercises. Begin weaning immobilizer on POD #5, but the patient should wear it during all mobilization until he/she has good motor control of residual limb.
   C. Obtain MD order to initiate ACE wrapping for edema control and shaping (generally POD #5 in uncomplicated cases, but dependent on condition of incision). Tubigrip sock is an acceptable substitution to ACE wrap. Can use shrinker sock on POD#8 if wound is healing appropriately, clarify with M.D.
2. Positioning Guidelines for Patients with TMA or toe amputations
   A. Elevate surgical limb while sitting in chair and lying in bed.
3. Activity Guidelines
   The following guidelines are for patients without post-operative complications:
   A. For patient who are s/p BKA and AKA: Bed mobility POD #1, bed to chair POD #2, and ambulation with assist and assistive device on POD #3, as appropriate.
   B. For patients with transmetatarsal, forefoot, and toe amputations: Ambulation with assist, within room only and with heel-weight bearing on POD#1, and progress as tolerated. Consider heel weight bearing post-op shoe.
   C. Clarify orders for patients who have medical or wound healing complications. Refer to intensive care unit (ICU) standards of care if appropriate.

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Examination:

This section is intended to capture the most commonly used assessment tools for this case type/diagnosis. It is not intended to be either inclusive or exclusive of assessment tools.

1. Chart Review
   A. HPI & PMH
      - Onset and duration of symptoms and cause of amputation
   B. HC
      - Type and date of amputation and any post-operative complications
      - Pertinent laboratory and diagnostic tests
2. Social History
   - Prior functional level, use of assistive devices
   - Home environment and current/potential barriers to returning home
   - Family/caregiver support system available
   - Family, professional, social and community roles
   - Patient's expectations of returning to previous life roles
3. Physical Examination
   - Vital signs (HR, BP, RR, SpO2, as indicated)
   - Skin integrity: residual limb condition, edema, girth measurements, signs of infection, potential areas for breakdown, scar tissue
   - Pain
   - Sensation, including phantom limb sensation/pain
   - Range of motion (ROM)
   - Strength
   - Positioning: fit of knee immobilizer and position of residual limb
   - Balance
   - Mobility level
   - Endurance/ability to monitor fatigue
   - Prosthetic device for patients with previous amputation: assess prosthesis, fit of socket, number of ply used prior to admission and currently, ability to don/doff and care for prosthesis independently
4. Cognitive-Perceptual and psychological considerations
   - Mental status
     - Level of alertness, orientation, and ability to follow commands
     - Safety awareness
   - Psychological considerations
     - Assess patient's coping mechanisms and psychological adjustment to altered body image
     - Post-operative depression is common and the patient may require psych team consult, discuss as needed with primary team
   - Teaching/learning considerations
     - Patient's goals, motivators and learning style

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Evaluation / Assessment:

The primary goal for inpatient physical therapy for a patient s/p a lower extremity amputation is to maximize functional independence while minimizing impairments as a result of the amputation.

Potential impairments include but are not limited to: decreased strength, ROM, skin integrity, balance, endurance, knowledge of exercise program/ACE wrapping techniques and impaired gait.

The predicted optimal level of improvement for these patients is to return to their previous life roles and lifestyle using a prosthetic and/or assistive devices and adaptive equipment, as appropriate, in 4-6 months. This prognosis may need to be modified due to any of the following factors: presence of co-morbidities, complications or secondary impairments, decreased cognitive status, barriers to returning to previous living environment and any other factors that may influence the patient's ability to use a prosthetic device and decrease their independence.

Age specific considerations in this population include all the normal physiological changes that occur with aging. See Geriatric Physical Therapy: A Clinical Approach, by Lewis and Bottomley for more details. The physical therapist will consider all of the patient's impairments whether they are disease or age based and will determine a comprehensive assessment, prognosis and rehabilitation plan for each patient.

Suggested goals: (4-6 weeks)

1. Return to independent pre-prosthetic mobilization
2. ROM WFL and strength > 3/5 throughout affected and non-affected limb, as appropriate
3. Good balance in sitting and/or standing with device
4. Demonstrate independent exercise program
5. Demonstrate good understanding of residual limb management and edema control
6. Good safety awareness with all functional mobility

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Treatment Planning / Interventions

Established Pathway ___ Yes _X__ No

Established Protocol ___ Yes _X__ No

This section is intended to capture the most commonly used interventions for this case type/diagnosis. It is not intended to be either inclusive or exclusive of appropriate interventions.

1. Intervention
   A. Progression of therapeutic exercise program
      - Initiate AA/AROM for UEs and non-affected limb (POD#1)
      - Initiate isometrics → AAROM → AROM for residual limb (POD # 2-3)

   B. Edema control and residual limb shaping
      - Initiate residual limb ACE wrapping (with MD order on POD# 5) if dressings are off and wound is healing appropriately. Tubigrip sock may be used as substitute to ACE wrap. Shrinker sock may be used on POD#8 if wound is healing appropriately, clarify with M.D.

   C. Mobility and Gait Training
      Initiate functional training, as appropriate, given the patient's medical status using the following activity guidelines:
      - Bed mobility (POD #1)
      - Sitting edge of bed and transfer training (POD#2)
      - Gait training (POD#3) with assistive device prescription as indicated.

2. Patient/Family Education
   A. Discuss realistic expectations regarding function, appropriate level of assist that patient requires from family, rehab progression, changes in body image, and potential for phantom sensation/pain
   B. Provide emotional support to the patient and family
   C. Instruct the patient and family members in the following techniques and assess their understanding via return demonstration:
      - Proper residual limb positioning and use of knee immobilizer, prone positioning as appropriate
      - Therapeutic exercise program
      - Safe mobility techniques encouraging maximal independence
      - ACE wrapping or shrinker sock use, as appropriate

3. Available handouts (post in room and/or distribute to patient upon discharge):
   A. Amputee exercise program (see Appendix I)
   B. Amputee positioning (see Appendix II)
   C. Residual limb wrapping (see Appendix III)

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4. Frequency of Treatment
   Initially these patients are seen 5-7 times weekly to implement positioning, exercise, mobility programs, depending on medical status and appropriateness to participate with therapy program.

   Treatment can be decreased to 3 times weekly when patient is independent with exercises and positioning. Treatment continues at 5-7 times weekly if the discharge plan is to home or patient's function is severely decreased.

5. Recommendations and referrals to other providers
   Recommend an Occupational Therapy consult for patients who present with impairments that affect their ability to perform activities of daily living independently and who may have adaptive equipment needs. This applies for most patients s/p a lower extremity amputation being discharged to home.

Re-evaluation / assessment

Reassessment will occur under the following circumstances: if all physical therapy goals are met, significant change in medical status occurs; patient is discharged from services or BWH, and/or within 10 days from the previous assessment.

Discharge Planning

Commonly expected outcomes at discharge:

Most patients are discharged to inpatient rehabilitation (acute or sub-acute) or skilled nursing facilities and will continue to progress toward their physical therapy goals, initiate prosthetic fitting and home planning as appropriate.

If the patient has met all physical therapy goals, he/she may be discharged home with services. Consider the following resources for continued therapy:

- VNA PT
- Prosthetic evaluation when appropriate
- Outpatient PT for patients with high level of function and for prosthetic gait training as appropriate.

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Rand JD, Paz JC. Amputation. In JC Paz, MP West (eds), Acute Care Handbook for Physical Therapists, Second Edition. Boston: Butterworth-Heinmann, 2002, 887-896.

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