Prescription Writing and Components for Lower Limb Prosthetics

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The goal is to generate a treatment plan to rehabilitate the patient and maximize their functional outcome.
The treatment plan should include the prosthetic prescription, proper footwear, therapy program, education, and follow-up.
The prosthetic prescription should be formulated and agreed to by the physician, prosthetist, and patient (and insurance carrier if needed)
Prosthetic prescription

![Prosthetic Prescription Form](image-url)

The above prescribed devices are a medical necessity to increase the patient’s safety and functional status.

Duration of Necessity: ______________________

Date: ______________________

Physician Signature: ______________________
## LOWER EXTREMITY PROSTHETICS PRESCRIPTION (EXAMPLE)

**UNIVERSITY OF MICHIGAN HOSPITALS & HEALTH CENTERS**  
Orthotics and Prosthetics Center  

**LOWER EXTREMITY PROSTHETICS PRESCRIPTION**

**Prescribed by:**  
**Name:**  
**ID No:**

**Referred from:**

**Activity Level:** K0  K1  K2  K3  K4

**Limb Loss:**  
Right  Left  Bilateral  
Date of Onset:____

**Diagnosis:**  
<table>
<thead>
<tr>
<th></th>
<th>TT</th>
<th>TF</th>
<th>KD</th>
<th>Sym's</th>
<th>PF</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICD9</td>
<td>897.9</td>
<td>897.2</td>
<td>897.7</td>
<td>897.9</td>
<td>897.0</td>
<td>ICD9</td>
</tr>
</tbody>
</table>

**Design:**  
Preparatory  Definitive  ENCO  EXO  Water safe  Other

**Socket:**  
PTB  TSB  IC  NAS  Replacement socket  Other

**Socket options:**  
Total contact  Replacement socket  Knee liner (pad)  Knee pads & thigh liner  Custom foot  Other

**Suspension:**  
Locsion  Suspension liners (n of)  Longyard  suction  Suction (n of)  Other

**Knee:**

**Components:**  
Ultra-light wt  Alignable system  Shaped cosmetic cover  Knee rotation unit  Adjustible height  Heavy duty pt. Wt > 300 lbs

**Foot/Ankle:**

**Prosthetic Supplies:**  
Socks (n of)  Shrinker (n of)  Antiperspirant/deodorant  Lotion

**Repairs:**

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**NOTE:** A PHYSICIAN'S SIGNATURE IS MANDATORY

**Physician's Signature:**

**Date:**

**Certified By:**

**Date Issued:**

**Order Followed By:**

**Order Date:**

**Certified By:**

**Date:**
Key elements of the prosthetic prescription

- Patient name, age, sex, date of birth, identifying info
- All relevant diagnoses (diabetes, PVD, cardiac, dialysis)
- Level of amputation
- Prognosis
- Functional level (Medicare level 0-4)
- Prescribing physician and referring physician/surgeon
- Prosthetic provider
- Details of the prosthesis
- Justification or Letter of Necessity if needed
- Duration of Need
Details of the prosthetic Rx

- Preparatory, permanent, specialty (sports, waterproof)
- Overall design and construction (endo vs. exo)
- Socket design including soft interface materials, socket material, suspension mechanism, special features
- Pylon materials
- Knee unit (AK) with control features
- Foot/ankle unit with special features as needed
- Accessories (socks, shrinkers, liners, covers, chargers)
- Proper footwear and custom foot orthotic if appropriate
Trans-tibial Prosthesis Design and Options

- Weight-bearing: PTB, total contact, total surface bearing
- Interface material: Gel liner, foam (Pelite/Bocklite), socks, leather/rubber
- Socket materials: Thermoplastic, carbon lamination
- Suspension: Supra-condylar wedge, elastic sleeve, gel liner with pin or strap, vacuum (passive or active)
- Pylon/connector materials: aluminum, titanium, carbon fiber, steel
- Foot/ankle
Foot Selection

- Movable foot or not
- Single-axis or multi-axis movement
- Dynamic response or not (energy-storing)
- Hybrid/combo feet
- Supplemental ankle joints
- Shock and torque absorbers
- Heel height adjustable
- Cosmetic cover or shell profile
A correct prosthetic prescription can be derived from adapting the functional benefits of a prosthesis to the functional needs of the prosthetic user.

There seems to be no clear clinical consensus on the precise prescription criteria for the various prosthetic ankle-foot mechanisms.

There is insufficient evidence from high quality comparative studies for the overall superiority of any individual type of prosthetic ankle-foot mechanism.

In high activity transfemoral amputees, there is limited evidence for the superiority of the Flex foot during level walking compared with the SACH foot in respect of energy cost and, gait efficiency. This benefit has only been confirmed in transtibial amputees during decline and incline walking and increased walking speeds.
No Movement and No Energy
SAFE and SACH
Single Axis Feet
Allow PF at heel strike (soft bumper)
Block tibial progression at TS (firm bumper)
Early Energy-Storing Feet
Seattle (delrin) and Carbon Copy 2
Flex-Foot
(carbon fiber heel and J-shank)
Flex-Foot series
Longer carbon fiber shank in a short version
Dynamic Response with Pseudo-multi-axis
Carbon fiber plate with single axis ankle
Carbon fiber plate with hydraulic ankle
Carbon fiber foot/shank with vertical shock
Carbon fiber foot/shank with vertical shock
Carbon fiber foot/shank with adjustable pneumatic shock
Carbon fiber plate with true multi-axis motion
Carbon fiber foot/shank with Unity vacuum pump
Fiberglass foot with shock pylon
Sprinters Foot (no heel)
Torque Absorbers for rotational control
Interface - Gel Liners

- Gel Materials
  - Silicone
  - Urethane
  - Thermoplastic Elastomer
  - Polymer Gel
- Gel Thickness - 2 mm to 9 mm
- Options - Distal matrix, flexed knee
- Pre-fab or Custom-molded
- Pin, strap, sealing ring for suspension
Trans-femoral Prosthesis
Design and Options

- Weight-bearing: Ischial and gluteal containment, total contact, total surface bearing, Quad socket design
- Interface material: Socks, gel liner, thermoplastic, foam (Pelite/Bocklite),
- Socket materials: Thermoplastic, carbon lamination
- Suspension: Suction, elastic belt, gel liner with pin or strap, vacuum (passive or active), hip joint and belt
- Pylon/connector materials: aluminum, titanium, carbon fiber, steel
- Rotators, quick disconnect (Ferrier coupling)
- Knee and Foot
Prosthetic Knees

- Manual lock (simple and safe)
- Stance control (weight activated locking)
- Poly-centric (migrating axis of rotation)
- Pneumatic (variable cadence swing control)
- Hydraulic (swing and stance control)
- Hybrids (polycentric plus hydraulic)
- Micro-processor control hydraulic ($$$)
Stance control knee unit with fixed cadence
4-bar polycentric for knee dis-artic
Full-size hydraulic knee with swing and stance phase control for variable cadence
6-bar polycentric with hydraulics
Micro-processor control
hydraulic knees
Competition may drive the pricing down (C-leg, Adaptive, Rheo, SLK, Plie’)
Waterproof swim/sports knee
Decision-Making Process for Prosthetic Components

- Patient medical status
- Previous level of function
- Level of amputation
- Anticipated Medicare Functional Level
Medicare Functional Levels

- **Level 0** - Patient is non-ambulatory
- **Level 1** - Transfers or limited household
- **Level 2** - Limited community ambulator
- **Level 3** - Unlimited community ambulator
- **Level 4** - High energy activities
Prosthetic Components

Feet
- Level 1: SACH, single-axis feet
- Level 2: Multi-axis feet
- Level 3&4: Energy-storing feet

Knees
- Level 1: Manual lock, stance control
- Level 2: Polycentric
- Level 3&4: Hydraulic, micro-processor
Ideal Candidate for Micro-Processor Control Knee

• Active adult who ambulates indoors and outdoors on uneven terrain regularly without an assistive device
• High risk adult who cannot tolerate a fall or the consequence of a fall
• Young, healthy adult with bilateral AKA
Therapy Prescription (PT/OT)

- Level of amputation, medical diagnoses
- Precautions (cardiac, falls)
- Frequency and duration of treatment
- Treatment:
  1. Prosthetic training, progressive ambulation
  2. Strengthening, conditioning
  3. Stretching, AAROM, back program
  4. ADL review and training
  5. Home exercise and instruction on home use
  6. Driver assessment and training if appropriate
Driver Testing and Training

- In New Jersey cannot use prosthesis to control any pedal in passenger car
- Right foot amputation requires left foot accelerator pedal installed in car
- Testing and training by certified provider is recommended but not required
- Left foot pedal requires prescription from physician, but usually not covered by insurance
- Patient must submit to voluntary road test at DMV and license re-issued with restriction code
Follow-up

- See patient after prosthesis delivered for fit and function of device
- See patient every 4 weeks during therapy training
- See patient 2-3 months after therapy completed and then every 6 months after permanent prosthesis fitted
- Sometimes additional therapy is needed for higher level activities with permanent prosthesis
- Lifetime follow-up for long-term problems and residual limb changes
Insurance denials

- Was all the appropriate documentation submitted?
  - Fifty percent of appeals are won with essentially the same information
  - Peer-to-peer review is often successful
- Does the policy cover the product ordered?
- Will further explanation resolve the problem, or should you change your plan/prescription?
- Write a separate “Letter of Medical Necessity” with more functional detail
Make sure the medical documentation meets the Medicare requirements
Letter of Medical Necessity

Josh Dvorin is a 49 year old male with history of Right transfemoral amputation due to infected hardware as complications from Ewing sarcoma, was seen today for re-evaluation of the residual limb and prosthesis. Overall, there is good fit and function of his new Right AKA socket. He has no pain or skin irritation. He tolerates this socket all day. However, the remaining components of the prosthesis are not tolerating his level of activity. He has had multiple mechanical failures of the prosthesis knee because his high level activity. The patient’s current knee is undergoing repairs and he is using a loaner C-Leg 4 knee and foot. The patient is very active throughout the day with work activities both indoors and outdoors. Then, he is involved in high level, high impact activities for fitness and exercise, including golf and tennis on a regular basis. He also plays with his children outdoors requiring extremely high level of balance and stability. After lengthy discussion with the patient and prosthetist, I feel that the X3 prosthetic knee and a high performance carbon fiber foot with shock and torque absorption would be most appropriate selection of components to accommodate the patient’s level of activity. This is medically necessary and appropriate to allow the patient to continue with his high level activities without risk of injury or fall. Clearly the current microprocessor knee is insufficient to tolerate his level of activity. Other non-microprocessor knees do not provide adequate stabilization for these high level activities. Therefore, there is no suitable substitute for the requested componentry. I provided a detailed presentation today including the X3 prosthetic knee and dynamic response carbon fiber foot with shock/torque absorption. These components would be attached to his current socket. The plan was reviewed in detail with the patient today. The patient will follow up after delivery of the new components.

If there are any further questions or concerns regarding this complex case, please feel free to contact my office at (732) 321-7070.

Thank you for the anticipated assistance and cooperation.

Sincerely,

[Signature]

Electronically signed by Helkki Uustal, MD

Helkki Uustal, M.D.
Medical Director
Prosthetic and Orthotic Team
JFK Johnson Rehab Institute
Edison, NJ
Make sure the prosthetist’s detailed order matches your prescription and notes.

Make sure the components match the K level. Provide documentation for the Functional Level (K level).
### Amputee Mobility Predictor

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.</td>
<td>Pick up objects off the floor</td>
<td>Unable to pick up object and return to standing: 0 &lt; 0 = 0; Performs with some help (table, chair, walking aid): 0 = 1; Performs independently without help: 0 = 2</td>
</tr>
<tr>
<td>13.</td>
<td>Hitting object</td>
<td>Unsafe (missed target): 0 = 0; Uses arm, assistive device, or not noticeable: 0 = 1; Safe, smooth motion: 0 = 2</td>
</tr>
<tr>
<td>14.</td>
<td>Initiation of gait</td>
<td>Any hesitancy or multiple attempts to start: 0 = 0; No hesitancy: 0 = 1</td>
</tr>
<tr>
<td>15.</td>
<td>Step-length and height</td>
<td>Swing feet: 0 = 0; Does not advance a minimum of 12in: 0 = 1; Advances a minimum of 12in: 0 = 2</td>
</tr>
<tr>
<td>16.</td>
<td>Step Continuity</td>
<td>Swing or discrepancy between steps (step &amp; go again): 0 = 0; Steps appear continuous: 0 = 1</td>
</tr>
<tr>
<td>17.</td>
<td>Turning</td>
<td>180-degree turn when returning to chair: 0 = 0; Unable to turn, requires intervention to prevent falling: 0 = 1; Greater than three steps but completes task without intervention: 0 = 2</td>
</tr>
<tr>
<td>18.</td>
<td>Variable cadence</td>
<td>Unable to vary cadence in a controlled manner: 0 = 0; Asymmetrical increase in cadence controllable manner: 0 = 1; Symmetrical increase in speed in a controlled manner: 0 = 2</td>
</tr>
<tr>
<td>19.</td>
<td>Stepping over an obstacle</td>
<td>Cannot step over the box: 0 = 0; Catches foot, interposes stride: 0 = 1; Steps over without interposing stride: 0 = 2</td>
</tr>
<tr>
<td>20.</td>
<td>Stairs</td>
<td>Must have at least 3 steps: 0 = 0; Must hold on to handrail: 0 = 1; Don’t hesitate to permit pt. to hold on to rail: 0 = 2</td>
</tr>
<tr>
<td>21.</td>
<td>Assistive device selection</td>
<td>Wheelchair/Parallel Bars: 0 = 0; Walker: 0 = 1; Cane (straight or quad): 0 = 2; None: 0 = 3</td>
</tr>
</tbody>
</table>

### Total Score

<table>
<thead>
<tr>
<th>Test</th>
<th>AMProPro</th>
<th>AMPPro</th>
</tr>
</thead>
<tbody>
<tr>
<td>No prosthesis</td>
<td>45</td>
<td>47</td>
</tr>
<tr>
<td>With prosthesis</td>
<td>31</td>
<td></td>
</tr>
</tbody>
</table>

**K LEVEL (converted from AMP score)**


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Abbreviations: PF = partial foot; TT = transfemoral; KD = below disarticulation; TF = transfemoral; HD = hip disarticulation

Test: ☑ no prosthesis  ☑ with prosthesis  Observer: [Signature] Date: [Date]

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Thank You