Unlocking the Fundamentals of Complex Amputation Management

Robert “Skip” Meier, MD

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First, a Few Housekeeping Points

- Slides will advance automatically
- Question & Answer period at end
- You may submit questions at any time
  - Q&A panel is on the lower right side (If you don’t see it, click the “Q&A” button in the upper right)
  - Type a question into the lower section of the Q&A panel that appears
  - Ask “All Panelists” and click “Send”
  - If we cannot answer during the session, we will e-mail you
- The presentation was emailed to you this morning; a copy of the replay will be sent to you via email
- When the webinar ends, a short survey will pop up
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When Was the First Prosthesis Used?

A. American Civil War
B. Napoleonic War
C. 500 B.C.
D. First World War
Complex Amputation Management

Management focus is on three primary goals.

- Returning the individual to highest level of independent function
- Meaningful adjustment to injury support and intervention
- Quality of care issues that should be identified and monitored
Our Presenters

Our two presenters are leaders in the fields of amputation rehabilitation and prosthetics.

Dr. Robert “Skip” Meier  
*Denver, CO*

- Director of Amputee Services of America
- 40 years of clinical practice and more than 4,000 patients
- Past president of Association of Academic Physiatrists and the American Congress of Rehabilitation Medicine

Rob Kistenberg  
*Atlanta, GA*

- Co-director and prosthetics coordinator for the master’s program in prosthetics and orthotics at Georgia Tech
- Awarded the Outstanding Educator Award by the American Academy of Orthotists and Prosthetists
- Lectures on topics related to amputation and prosthetics
Achieving Ideal Outcomes with Injured Workers with Amputations

Robert “Skip” Meier, MD
What is a Complex Amputation?

Complexity in amputation cases includes:

1. Adequate soft tissue coverage
2. Residual bone length
3. Associated injuries of the nerves, bones, opposite extremity and multi-limb amputations
Key Points in Managing Amputations

- Team and teamwork are essential to quality rehabilitation and proper outcomes
- Timelines for amputation rehab progress and goals to measure progress in rehab
- Measure emotional adaptation
- Amputation rehabilitation today is more about empowerment than just mobility or ADL
- Empowerment requires integrated amputee education
- Prosthetic training must come from an experienced therapist (OT and PT)
- Pain management is essential to obtain preferred outcomes
- Identifying a quality prosthetist
Functional Restoration: Lower Extremity Amputation

Establishment of effective management plan for post surgical edema control and limb shaping.

- Specifications developed and proper fit confirmed
- Demonstrated ability to ambulate
- Demonstrates prosthetic wearing tolerance
- Skin integrity maintained
- Functional prosthetic use training completed
- Definitive (not temporary) prosthetic fitting completed
- Education by a qualified physician, prosthodontist, therapist
- Psychological counseling by a qualified physician or therapist
Specifications for the device have been developed

Proper fit has been confirmed

Individual is independent in donning and doffing prosthesis

Able to use prosthesis for most bimanual activities and dominant hand for routine activities

Demonstrates sufficient wearing tolerance to participate in training for ADLs

Need for adaptive equipment evaluated

Demonstrated ability to perform routine household management, home maintenance

Residual limb skin integrity has been maintained

Has been taught to inspect skin and nails to include remaining extremities

Has completed functional prosthetic use training consistent with his/her residual physical capabilities
Progressing to Functional Independence In the Home and Community Settings

- Demonstrated ability to engage in fitness activities
- Return to independent driving
- Able to independently access the community for routine activities
- Ability to return to same/modified work activity has been evaluated
- Has been fitted with a definitive (not a temporary) prosthesis
- Education by a qualified physician, therapist or prosthetist
- The individual and family/support members have received psychological counseling by a qualified physician or therapist
Amputation Management Workflow: Weeks 1 - 4

**Week One**
- Ongoing evaluation of limb status, emotional state and pain management

**Week Two**
- Identify rehab team
- Limb shaping
  - Initiate therapy protocols
  - Monitor pain management + adjustment to injury status

**Week Four**
- Evaluate status of limb shaping
- Continue evaluation and monitoring of pain management and adjustment to injury status
  - Initial socket evaluation
  - Continue therapy protocols
Amputation Management Workflow: Weeks 8 and Beyond

**Week Eight**
- Socket fitting and adjustment
  - Continue therapy, pain management, adjustment to injury protocols
  - Evaluate status of ongoing functional progress

**Week Twelve**
- • Continue therapy, pain management, adjustment to injury protocols
  - Evaluate functional programs
  - Evaluate need for prosthetic adjustments/adaptations/upgrades

**Ongoing**
- Equipment maintenance
  - Confirmation of functional independence in residential and community settings
The Collaborative Model

The major players in the rehabilitative model.

- Injured worker
- Case manager
- Family/support system
- Prescribing/attending physician
- Transdisciplinary treatment team
- Prosthetist
- Psychological support and peer support services
Follow Up

Planning for life after the amputation is key.

- Follow-up is essential to measure progress since most rehab is provided in an outpatient setting.
- Other issues essential to amputee rehab: cessation of smoking, weight control, emotional well-being and functioning support group.
- Return to work issues should be considered.
- Return to role in family and community involvement.
Amputees may experience acute pain but should not expect to experience long-term pain that impacts quality of life for more than 3-6 months.
**Typical Types of Pain Management Challenges**

The pain management algorithm guides you through the process of evaluating an individual’s pain complaints and providing recommended interventions.

**Residual Limb Pain**

- Psychological factors
- Sleep disturbance
- Pain issues related to use of prosthetic
- Possibility of infection
- Problems with edema in the residual limb
- Skin abrasions
- Problems with autonomic imbalance

**Phantom Limb Pain**

- Psychological factors
- Sleep disturbances
- Consider medication, therapy, electroconvulsive therapy, neuro-modulation, neuro-destructive intervention

Everyone who registered for the live webinar received a copy of the pain algorithm via email this morning.
Prosthetics, Prosthetists and Payment?

Robert S. Kistenberg, MPH, L/CP, FAAOP
Case Study: Joseph’s Severe Crush Injury

A right hand crush/degloving injury with secondary industrial trauma.

- A right-hand dominant 27-year-old Hispanic male with good family support and a high school education
- Caught in cardboard box printing press for 45 minutes, flooded with ink at 350 degrees
- No comorbidities except right elbow flexion/extension limitations
- Initial surgery and skin grafts
Terminology: What is a prosthesis anyway?

Prosthetists
- Credentialed?
  - National certification vs. state licensure
- Experienced? In years? With your injured worker’s population?
- Same one throughout injured worker’s treatment plan?

Practice
- Local?
- Single office? Multi-Offices? Nationwide chain?
- Peer Counseling?

Got a good one. Now what?
Look for these components of a comprehensive plan.

- Findings from the initial evaluation
- Projected timeline for treatment including estimated delivery dates for device(s)
- Detailed description of the device or devices
- Service estimate
  - L-codes for each device
  - Justifications and fees for each L-code
- Plan for coordination with PT, OT and counseling
- Follow-up and maintenance schedule
Joseph’s Severe Crush Injury: 2 – 6 Weeks Post

A right hand crush/degloving injury with secondary industrial trauma.

- Initial evaluation done, treatment plan received
- 2 weeks post injury:
  - Grafting procedures healing well
- Post-operative management/pre-prosthetic conditioning
  - Expectations management
  - Education
  - Peer visit
  - One-handed reality hits, pain, nightmares, etc.
  - Ongoing occupational/physical therapy
- 6 weeks out:
  - R transradial (below elbow) amputation with grafted skin
  - Ready for “fitting”
- What does that really mean?
If the socket doesn’t fit, nothing else matters.

- Socket fit depends on residual limb stability
  - First six months to eighteen months
- Ongoing fitting challenges
  - Daily residual limb volume changes
  - Weight fluctuations
  - Activity level changes
- Suspension mechanisms
  - May need to try more than one
- Other components
  - Ordered from catalogs
Joseph’s Severe Crush Injury: 8 weeks Post

A right hand crush/degloving injury with secondary industrial trauma.

- Pain Management: phantom and residual limb
- Psychological: PTSD, anxiety about his future, return to work?
- 8 weeks out: Excellent prosthetic candidate (2 prostheses)
  - Externally powered (myoelectric) prosthesis
  - Aesthetic restoration prosthesis
- Two bills totaling $45 - $55K and $12 - $18K respectively
- Why so costly?
The L-Code System

An insider view into how prosthetists get paid.

■ Subsection of CMS’ DMEPOS Fee Schedule ([www.cms.gov](http://www.cms.gov))
  – Contains BASE codes and ADDITION codes and FEES
  – One prosthesis may include 10 or more codes (1 BASE plus many addition codes)
  – Contains “Not Otherwise Specified” codes ending in LXX99 or “99” Codes
    • **NOTE:** Watch out for more than 1 or 2 “99’s” for any one prosthesis

■ Upon delivery: prosthesis is billed

■ Price includes everything
  – Time
  – Components and materials
  – Follow-up care
  – Overhead
Joseph’s Severe Crush Injury: 3 to 6 Months Post

A right hand crush/degloving injury with secondary industrial trauma.

- 3 months out: Full time wearer, discontinue OT/PT, ongoing counseling
- 5 month post:
  - Neuroma revision
- 6 month post:
  - Sockets loose
  - New Socket: Replacement only
- Request for a weight lifting prosthesis
  - Activity specific
- Do they all go this smoothly?
Prosthetic Management

Challenges and Pitfalls.

- Transdisciplinary team identification and integration
- Delay in initiation of treatment
- Unrealistic expectations
- Preventable complications
- Nonexistent treatment plan
  - What happens if we fail to plan?
Technologic Advances: What’s Here, What’s on the Horizon?

The most advanced technology is not necessarily the best technology.

Now

- Microprocessor knees (MPKs)
- Microprocessor ankle/foot mechanisms
- Multi-articulating digits for externally powered hands

Future

- Osseointegration: Directly anchoring prostheses to existing skeletal structures
- Sensation and control via implantation: Surgically implanted electrodes communicate

Image of microprocessor knee from US Army Medicine used under Creative Commons
Question and Answer Session

Submit your questions in the Q&A panel on the right of your screen.

Dr. Robert Meier

Rob Kistenberg

Leslie Small

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