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Upper Limb Prosthetic Rehabilitation for Occupational Therapists: MANAGEMENT

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Disclosures

Financial:
- Receives payment for this series
- Owner, Single-Handed Solutions, LLC
- Inventor of record of patented prosthetic technology and method of use
- Business relationship with TRS, Boulder, CO
- Business relationship with Handspring, Middletown, NY
- Business relationship with Liberating Technologies Inc., Hopkinton, MA
- Business relationship with Shriners Hospitals for Children
  * owner of patented technology mentioned in the series

Non-financial
- Member, Upper Limb Advisory Council, Amputee Coalition of America (ACA)
- Member, Association of Children’s Prosthetic Orthotic Clinics (ACPOC)
- Member, American Occupational Therapy Association (AOTA)
- Member, American Telemedicine Association (ATA)

Learning Objectives

By the end of the course, the participant will be able to:

- Identify the different factors involved with prosthetic management.
- List three areas of the preparatory phase.
- List three areas of prosthetic training.
- Identify three adaptive strategies.
OT

- Critical component of UL prosthetic rehabilitation
- Rarely see an individual with an UL amputation
- Often unfamiliar with UL prosthetic technology
- Specialty training is beneficial

OT

- Limb preparation
- Adjustment-Accommodation
- Prosthetic training
  - specific tasks
  - motor skills
  - positioning
  - posture
- Accelerates the rehabilitation process
- Essential to success in functional independence and achieving quality of life.
It is the fourth and final in a series building upon a foundation of understanding

- the types of limb deficiency/loss
- the diverse technologies available
- approaches to evaluation and management
- patient education and consumer advocacy

Course SERIES Overview

- Course 1: Overview and Introduction
- Course 2: Understanding Technology
- Course 3: Evaluation
- Course 4: Management and Resources
Management and Resources

- Phases of Treatment
- Treatment Methods
- Adaptive Strategies
- Assistive Devices
- Team Approach
- Psycho-Social Aspects
- Case Studies
- Resources and References
PHASES OF CARE

- Pre-prosthetic Readiness
- Prosthetic Training
- Refinement

PRE-PROSTHETIC readiness

- Patient Education
- Limb preparation

- The Goals:
  - Emotional Readiness
  - Physical Readiness
  - Functional Readiness
Patient Education

- Grieving the loss of a limb
- Peer Support
- Rehabilitation Psychology

PATIENT EDUCATION

- Understanding Condition
- Psycho-Social Support
- Prosthetic Options
- Understanding the Technology
- Choosing a Prosthetist
PATIENT EDUCATION

Prosthetic Options
- Components
- Function
- Relationship of technology to amputation level
- Benefits and Limitations

Expectations of Technology
- UL vs LL
  - LL: Replacement
  - UL: Tool
- Defining success
- Importance of tolerance
- Importance of use
- Client-centered choices

PATIENT EDUCATION

Understanding the Condition
- Accurate information
- Perception of Impact
- Function
- Social Implications
- Parent and Caregiver
**PATIENT EDUCATION**

**Psycho-Social Support**
- Professional Counseling
- Peer Support/ Modeling
- Family/ Caregiver Support
- Positive Vision

**PATIENT EDUCATION**

**Choosing a Prosthetist**
- Certification
  - Specialty training
- UL Experience
  - Myoelectrode Position
  - Fit of Socket
- Collaborative Approach
  - Communicate with Client
  - Consult with OT
  - Access to peer support
Limb preparation

- Edema Control
- Shaping of the Residual Limb
- Desensitization
- Management of the Scar
- Mirror Therapy
- Functional Movement and Strength
- Body Symmetry
- Change in Hand Dominance
- ADLs
- Myosite Training

Edema Control

Strategies to Shape the Residual Limb:

Compression Wrap  Shrinker
Desensitization

- Wands
- Soft tissue management
- Brushes
- Self-massage

Scar Management

- Wound care
- Soft tissue management
- Self-massage
PHANTOM PAIN

15 minutes/day
5-6 days/week
4 weeks

Graded schedule
30 minutes/session
2-3 sessions/day
5-6 days/week

Mirror Therapy

Preparatory Socket

Myosite Training

- Isolate muscles
- Co-contractions
- Home exercise program
- Pattern Recognition
prosthesis simulator

- Limb length
- Weight
- Grasp/release
- Skills drills
- Bilateral integration
- Movement in space

Functional Movement and Strength

- AROM
- Stretching
  - Glides
- Strengthening
- Weight-bearing
- Core strength
- Balance
Body Symmetry

- Muscle strength
- Posturing
- Mirror work

TRANSITIONING
Hand Dominance

- Coordination
- Radial digit
- Separation of radial-ulnar sides
- Handwriting Programs
- Keyboarding Programs
PROSTHETIC training

- Limb Awareness
- Care of the Prosthesis
- Skills Drills
- Functional Tasks
- To Wear /Use or To Not Wear/Use
- Adaptive Strategies~ Assistive Devices

Limb Awareness

- Skin Checks
- Pain
- Deep redness/purple
- Boney prominences
- Folds of skin, invaginations
Care of the Prosthesis

- Basic care
- Cleansing
- Batteries
- Maintenance of prosthetic components and accessories
- Repair
- Upgrades to software/technology

Initial use

- Wear Schedule
- Donning and doffing the liner
- Donning and doffing the prosthesis
- Positioning the residual limb in the socket
- Dealing with the harness
Controls training

- Terminal device function
  - Basic opening and closing
  - Grasp/release at various speeds
- Wrist function
  - Flexion/extension
  - Rotation
- Elbow function
  - Flexion/extension
- Shoulder function
  - Flexion/extension
  - Rotation

Skills Drills

- Repetitive Skills Drills
- Diverse objects
- Diverse Weights
- Varied planes
- Varied Positions
- Pre-positioning the terminal device
ADLs

- Toileting
- Eating
- Dressing
- Bathing
- Grooming
- Writing

Collaboration

- Confer with prosthettist
- Adjustments to the prosthesis:
  - alignment and controls
  - modifications to the shape of the interface/socket.
- Work together to quickly resolve any prosthetic and therapeutic issues
- Maintain steady progress toward patient's functional goals
The Question:

- To Wear/Use or To Not Wear/Use?

BIMANUAL INTEGRATION
Adaptive Strategies~ Assistive Devices

SKILLS/TASK REFINEMENT

- Post-prosthetic care
- To develop greater independence, address higher level skills
- Home Evaluations
- Work/school evaluations
- Leisure activities
- Referrals to resources for home modifications, driver rehabilitation services and work hardening programs
- Driver training
SKILLS/TASK REFINEMENT

- Home Management
- Caring for Others
- Community
- The World of Work and School
- Leisure Time and Pursuing Passions
  - Music, Sports
- Social Integration
- Moving Beyond…

Home Management

- Cooking
- Laundry
- Vacuum/Sweep/Rake
- Trash
- Dusting, Windows
- Making Beds
Caring for Others

- Spouse
- Children
- Aging parents

Community

- Driving
  - Evaluation
  - Modifications
- Banking
  - Signatures
  - ATM machines
- Shopping
  - Pushing cart
  - Reaching
  - Lifting
  - Cashing out
  - The Dressing Room
**Work AND SCHOOL**

- Site evaluation
- Ergonomic station
- Duties and responsibilities
- Modifications

**Pursuing Passions**

- Work-Play Balance
- Physical Activity
- Sports
- Music
- Crafts and The Arts
- Other
Social Integration

- Greetings
- Shaking Hands
- Embracing
- Holding Hands
- Answering Questions
- Stares
- Personal Statements

Moving Beyond:

- Prosthetic success rates improve dramatically…
- Move beyond basic prosthetic operation
- Address specific activities, interests of individual client
- Home
- Vocational
- Recreational
- Integration!
Pediatric

- Parents; grandparents
- Siblings
- Friends
- Developmental
- Prosthetic technology

BILATERAL INVOLVEMENT

- Prosthesis use dependent on levels
- Not always symmetrical deficiency/loss
- Importance of core strength and balance
- Use of feet; toes as manipulators
- Skills 4 Life
  - San Antonio, TX
  - October 2015
PRECAUTIONS

▶ Posturing
▶ Asymmetry
▶ Spine Health
▶ Overuse of Presumed Intact Side

Adaptive Strategies

Use of surfaces to support
Use of body parts, tools
Assistive Devices

Case Studies

continued
A

Acquired Loss

Prosthesis Simulators

B

Acquired Loss

Initial Trial
Vincent Digit

Passive Aesthetic Functional

Acquired Loss

Harnessing Trials
C

Function  Self-Esteem

D

Acquired Loss  Pro Digits
Digit Adaptation

TAB assistive device

Adaptive Strategies
Posturing

RESOURCES

Amputee Coalition:  www.amputee-coalition.org
Amplitude:  www.oandp.com
Amputee Empowerment Partners:  www.empoweringamputees.org
Association of Children’s Prosthetic and Orthotic Clinics:  www.acpoc.org
American Occupational Therapy Association:  www.aota.org
American Academy of Orthotics and Prosthetics:  www.oandp.com
American Orthotic and Prosthetic Association:  www.aopanet.org
RESOURCES

CampNoLimits  www.nolimitsfoundation.org
Helping Hands Foundation  www.helpinghandsgroup.org
Lucky Fin Project  www.luckyfinproject.org
Paddy Rossbach Youth Camp  www.amputee-coalition.org
Shriners Hospitals for Children  www.shrinershospitalsforchildren.org
Skills for Life 4  www.usispo.org/skills_for_life.asp

Local Support Groups

RESOURCES

COAPT Engineering  coaptengineering.com
Fillauer  fillauer.com
Infinite Biomedical Technologies  i-biomed.com
Liberating Technologies  liberatingtech.com
Livingskin  touchbionics.com
Motion Control  utaharm.com
Otto Bock  ottobockus.com
RSL Steeper  steeperusa.com
Texas Assistive Devices  n-abler.org
Touch Bionics  touchbionics.com
TRS Prosthetics  trsprosthetics.com
Vincent Systems  vincentsystems.de
TIP Sheet

- Certified by the American Board for Certification (ABC)
- Minimum of five years of current UL experience and has fit >10 patients in the last year
- Can specify what types of electrically-powered prostheses they have fit in the past two years
- Received certification/training from the following prosthetic component manufacturers:
  - Motion Control:
  - Otto Bock:
  - RSL Steeper:
  - Touch Bionics:
  - Liberating Technologies:
  - Hosmer:
- Works with an OT who has extensive UL prosthetic rehabilitation experience
- Will arrange for you to speak with some of their patients to discuss care experience

REFERENCES

- Atlas of Amputations and Limb Deficiencies, edited by Douglas G. Smith, MD, John W. Michael, MEd, CPO, and John H. Bowker, MD (Specific chapters by Thomas Passero, CP, Kim Doolan, John R. Fisk, MD, and Douglas G. Smith, MD, Joan E. Edelstein, MA, PT, and Donald R. Cummings, CP, LP.


REFERENCES


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