



ECLIPSE

Prosthetic Rehabilitation Symposium 2015

Integration of care in lower
extremity prosthetic rehabilitation

3.21.15

**CSUN
SHINE**

 **ÖSSUR**[®]
LIFE WITHOUT LIMITATIONS

By the end of the course, the participant would have scored 90% or better on the post-test questions involving these items:

1. Analyze fundamental concepts underlying the selection, application and functional training associated with prosthetic use in patient/clients with functional limitations.
2. Describe how to accurately perform, document and score five functional measures that predict future function.
3. Given functional measure scores, objectively quantify current abilities of patients with limb loss for care coordination and reimbursement.
4. Describe benefits of recreational exercise to clients with limb loss.
5. List steps to develop and implement a customized recreational/adaptive sports program to enhance wellbeing and health of clients with limb loss.

Time	Topic	Speaker
8:30-9:00	Registration on site	N/A
9:00-9:45	Advances in Lower Extremity Prosthetics	Charissa Doerger, PT, CP
BREAK		
10:00-10:45	Collaborative Clinical Management	Kent Tracy, CPO & Victoria Graham, PT, DPT, OCS, NCS
11:00-11:30	Functional Testing	Victoria Graham
11:30-12:00	Gait Analysis Collaboration	Charissa Doerger/Kent Tracy
12:00-1:30	Hosted lunch and community resource fair including tours of Center of Achievement through Adapted Physical Activity	Community resource providers Kinesiology faculty
1:30-2:15	Introduction to Principles of Prosthetic Running	Lab activities led by V. Graham
2:15-3:30	Management of Environmental Obstacles	Lab activity led by C. Doerger
BREAK		
3:45-4:30	Strategies to improve gait quality	Lab activity led by K. Tracy, C. Doerger and V. Graham
4:30-5:00	Summary and closing remarks	All Instructors

K Levels

- **K-Level 0** - Does not have the ability or potential to ambulate or transfer safely with or without assistance, and a prosthesis does not enhance quality of life or mobility.
- **K-Level 1** - Has the ability or potential to use a prosthesis for transfers or ambulation in level surfaces at a fixed cadence. Typical of the limited and unlimited **household ambulator**.
- **K-Level 2** - Has the ability or potential for ambulation with the ability to transverse low-level environmental barriers such as curbs, stairs, or uneven surfaces. Typical of the **limited community ambulator**.
- **K-Level 3** - Has the ability or potential for ambulation with variable cadence. Typical of the **community ambulator** who has the ability to transverse most environmental barriers and may have vocational, therapeutic, or exercise activity that demands prosthetic use beyond simple locomotion.
- **K-Level 4** - Has the ability or potential for prosthetic ambulation that exceeds basic ambulation skills, exhibiting high impact, stress, or energy levels. Typical of the prosthetic demands of the **child, active adult, or athlete**.

Collaborative Clinical Management

Kent Tracy, CPO

Vicky Graham, PT, DPT, OCS, NCS

Pro-Bono Clinic

VOGUE Prosthetic & Orthotic Center



GENERAL
PHYSICIAN

WAL-EXRESS



CSUN/Vogue Collaboration

- 9 referrals from Vogue P&O
- 5 attended the pro bono clinic
- 1/week for 6 weeks during fall 2014

Pro Bono Student PT Clinic Referrals:

Traumatic onset

- Unilateral transfemoral
- Unilateral transtibial
- Bilateral transfemoral

Vascular onset

- Unilateral transtibial (4)
- Bilateral transtibial
- Unilateral transfemoral

Pro Bono Student PT Clinic:

Traumatic onset

- Unilateral transfemoral
- Unilateral transtibial
- One Patient declined to attend:
 - ~~Bilateral transfemoral~~

Vascular onset

- Unilateral transtibial (3)
- Two patients declined to attend:
 - ~~Bilateral transtibial~~
 - ~~Unilateral transfemoral~~

Outcomes:

- All 5 attendees had increase in K-level after only 6 sessions
- 100% positive response to care
- Patients required regular reminder calls to attend sessions
- Transportation was an ongoing challenge

Running, sports and adaptive recreation

Why participate in sports?



Impact of participation

Study of 130- no control - assessment via self report

Horseback riding or alpine skiing.

70% agreed or strongly agreed that participation improved their life. ($\alpha=0.87$ indicating good internal consistency)

Scores were not correlated to their self perception of skill in sport. (They did not have to be expert to get the benefit)

■ (Zabriskie 2005)

Benefits to Veterans

- 18 veterans from Iraq and Afghanistan
- Participated in 3 week recreation program
- Acted as their own control, paired t-test
 - World Health Organization QOL
 - Profile of mood states
 - Perceived competence scale
- Results:
- No sig change in QOL
- Sig (0.001) improvement in mood states and perceived competence

■ Lundberg 2011

Deans 2014 Literature Review:

Motivations and barriers to prosthesis users participation in physical activity, exercise and sport: a review of the literature.

- 12 articles met criteria for inclusion:
 - Quality study of UE/LE prosthetic users during sport
 - Excluded swimming without prosthesis
 - Excluded mixed diagnostic studies

Deans 2014

- Are people with amputation participating in physical activity, exercise and sports?
- Are these people participating at the same level as they did before their amputation?
- And what are their motivations and barriers to participation?

Deans 2014

- Are these people participating at the same level as they did before their amputation?
- Not at same level. The drop off is not well documented.
 - There may be perceived barriers of technology as a requirement for participation in sports
- Predictors for prosthetic sports participation:
 - Prior experience with sports
 - Mentors
 - Accessible facilities

Deans 2014

- Are people with amputation participating in physical activity, exercise and sports?

	Non-Impaired Population	Prosthetic Users
% of population that is inactive	40%	68%

- Yes, but not as much as non-impaired population

Deans 2014

- And what are their motivations and barriers to participation?

Self Perceived Barriers:

- 1) Physical issues: pain/strength
- 2) Psychosocial issues: including embarrassment
- 3) Societal issues: work hours and cost

Summary: Adaptive Sports Influence on QOL

- Positive influence on QOL, overall health and quality of social life
- People with disabilities who remain physically active:
 - Are better adjusted,
 - Have less pain, depression and anxiety
 - Live longer
 - More likely to be employed

Summary: Barriers to Participation

- Health benefits well established in non-impaired population, yet only 16-22% of Americans participate in sports or exercise regularly (CDC)
- Level of participation is not well studied in adaptive sports.
- Assumption that disability is a primary barrier may be false.

Prosthetic Running: for everyone

Benefits:

- Improves walking confidence
- Teaches basic skill needed for recreational sports
- Enhances positive body image
- Understand how to run away from threat
- Increases self - efficacy

Prosthetic Running

Joint	Intact Limb	ROLES REVERSED	Prosthetic limb
Hip	Minor role		Major role
Knee	Major role		Minor role
Ankle	Major role		Minor role

The roles for muscle groups are reversed with prosthetics.
The main prosthetic issue is the socket fit.

The foot muscles are replaced with prosthetic componentry and the hip must generate 2-3 times more work (Czerniecki 1991).

Steps to develop and implement a customized recreational/adaptive sports program:

- Assess barriers to participation
- Provide education and support
- Refer to community based resources for ongoing peer/social support
- Ongoing access to integrated healthcare
 - Prosthetic components/fit
 - Injury/rehab needs
 - Nutrition
 - Psychosocial services

Clinical Bottom Line

- Sports/recreation are essential for a well balanced, happy and healthy life
- People with disabilities have same benefits in participation
- Barriers to participation can be overcome with support and resources
- Running is essential skill for safety as well, so teach the basic skills
- Help our patients transition to recreation and sports....
- **Go beyond “walking” as a therapeutic goal!!!!**

Note re: Dr. Gailey Reference

- Robert Gailey, PhD., PT Course 10/17/14
- The 5 Steps To Running were developed by Dr. Gailey after years of training thousands of athletes.
- His request is we pass this information forward to benefit everyone with LE limb loss.
- He also reports videos of his teaching are available on youtube.
- I recommend you see him teach – he is amazing!
- An interesting quote from the course:

“Although many people did not need or want to run in their daily activity, this ability is extremely important in a fight or flight situation” - Kegel 1980.

The rest of your day:

- Morning Lab sessions:
 - Interprofessional gait analysis
 - Functional measures
- Community resources:
 - Meet our community partners
 - Tour the CSUN Center of Achievement through Adaptive Physical Activity
- Afternoon Lab Sessions:
 - Teaching running
 - Skills for managing environmental barriers
 - Improving gait quality

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