A Comparison of the Functional Properties of Dynamic Response Prosthetic Feet in Unilateral K-Level-3 Amputees
Vibhor Agrawal, PhD | Robert Gailey, PhD
Dynamic response prosthetic feet have similar energy return characteristics, but different functional properties due to variations in mechanical design. This presentation will discuss the effects of 3 commonly used prosthetic feet on unilateral K-Level-3 amputee gait. This study was funded through a research grant by AOPA.

Adjustable Custom Fit Liners and Sockets for Prosthetic Devices
Lenore Rasmussen, PhD
Ras Labs' Synthetic Muscle(TM) can actively expand or contract at low voltages, while offering impact resistance and pressure sensing. To resolve prosthetic slippage and addition/removal of prosthetic socks throughout the day, Ras Labs is working toward incorporating their materials into liners and sockets to create dynamic worry-free prosthesis for amputees.

Benefits Of Genium Microprocessor Controlled Knee: A Literature Review
Milana Mileusnic, PhD
This session will review and summarize published clinical evidence on Genium microprocessor controlled knee. The results suggest increased efficacy of Genium in comparison to C-Leg in the areas of safety, functional mobility, activities of daily living and quality of life.

Combined Gait Asymmetry Metric Based on Biomechanics: Comparison of IRC, Brimless, & Able-Bod
Tyagi Ramakrishnan | Kyle Reed, PhD

Comparing Prosthetic Socket Types with Regard to Distribution of Modulus of Elasticity within the Socket
Garrett Hurley, CPO
A prosthetic socket interfaces the human limb with distal componentry and functions to transfer biomechanical forces resulting from gait and other movements as well as weight bearing forces. The ability for a socket to function in this way is dependent on how the socket is configured or shaped to engage with the limb and the materials that comprise the socket. During this session, we will discuss our hypothesis that a greater variety of materials’ elastic moduli within a socket improves comfort and function by better managing pressure distribution and transitions between pressure distribution regions.
**Continuum of Care for Amputee Mobility: A Value Based Solutions Model for O&P Care**  
*Andrew Pedtke, MD*

Establishing a continuum of care for amputees is vital to the US healthcare system. By identifying and addressing gaps in service and care we can improve clinical and functional outcomes. The evolution of prosthetic socket design is one area of the continuum that offers advanced technology solutions for lower limb amputees with potential long-term cost savings.

**Differences in Healthcare Costs Borne Four Years after Receiving a Microprocessor or Non-microprocessor Controlled Above-knee Prosthesis**  
*Andrea Wanamaker, MS*

The goal of this investigation was to analyze if differences exist in healthcare costs within the first four years after receiving either a microprocessor or non-microprocessor controlled knee prosthesis. The results, which we will review in this session, indicate that the microprocessor group spends more on physical therapy, equipment, and non-narcotic pain medication.

**Donning and Doffing of Lower-Limb Prostheses: Development, Validity, and Reliability of the Prosthesis Donning and Doffing Questionnaire**  
*Kevin Matthews, CO | Arezoo Eshraghi, PhD*

Donning and doffing of prosthesis are challenging tasks for many lower-limb amputees. A questionnaire will be presented that evaluates the ability of transtibial amputees to don and doff prosthesis. It has the potential to help manufacturers, clinicians, and researchers gain knowledge and improve the donning and doffing qualities of prosthesis.

**First Results on Safety, Walking and Satisfaction with an Innovative Microprocessor-controlled Prosthetic Foot Component**  
*Andreas Hahn, PhD*

The data from 88 users who underwent the first fittings with a new microprocessor controlled (MPC) prosthetic foot (Meridium) will be analyzed in this session. The device was favored by subjects who needed to safely and comfortably negotiate level ground, uneven terrain and slopes. The weight of the device remains a limitation.

**First User Experiences with Next Generation of C-Leg**  
*Milana Mileusnic, PhD*

This session will discuss functionality and prosthetic users’ satisfaction with the new generation C-Leg (C-Leg 4). The results are promising due to improvements regarding walking on level ground and slopes, standing and activities of daily living. Moreover, satisfaction was high and majority of subjects prefer C-Leg 4 over their previous prosthesis.

**How Well Can the Amputee Mobility Predictor and Patient Demographics Predict the Medicare Functional Classification Level (K-level) in People with Transfemoral and Transtibial Amputation?**  
*Mitchell Dillon, PhD, BPO (Hons)*

The Amputee Mobility Predictor (AMP) is frequently used to quantify mobility and aid categorization of people with lower limb loss into mutually exclusive K-levels. While research has shown differences in the average AMP score between K-levels, this does not demonstrate that the AMP can accurately predict K-level. There is a pressing need to determine how accurately the AMP can predict K-level using more appropriate statistical techniques.
Impact of the Proposed/Draft LCD Policy Change on Access to Care for Persons with Lower Limb Amputation

Brian Kaluf, BSE, CP

In response to Medicare's proposed draft LCD (DL33787) including proposed changes to the MFCL K-level descriptors, projections of the impact on access to prosthetic technology was examined and will be discussed in this presentation. Occurrences of patients that would lose access to the prosthetic technology were identified in all K-levels and also in patients with high levels of functional mobility (AMPPRO score), because of the ambulatory aid they typically use. Evidence of this detrimental impact was formulated in a response against Medicare's proposed LCD Policy.

Importance of Screening for Depression among Individuals with Lower Limb Amputations

Megan Sions, PhD, DPT, PT

Depression screening is not routine practice when evaluating individuals with lower limb amputations despite prevalence rates in this population that exceed those of the general population. This session will demonstrate that the use of a 2-item depression screen can identify those individuals who may benefit from a referral for further evaluation and subsequent management of their depressive symptoms.

Kenevo Microprocessor Controlled Knee: First Clinical Experiences

Milana Mileusnic, PhD

This presentation reviews first clinical experiences reported with Kenevo microprocessor controlled knee designed specifically for the needs of lower activity amputees. New knee functionalities are very effective and beneficial for this population resulting in high patient satisfaction. In addition to improved safety, the amputees report of improvement when negotiating various terrains typically encountered during activities of daily living.

Kinetic Visualization of the Ipecs "System" Lab Sensor System to Assess Prosthetic Componentry for Lower-Limb Amputees

Joel Kempfer, CP, FAAOP

In this climate of increasing scrutiny of documentation needed for justification of appropriate prosthetic componentry, the practitioner needs every tool necessary to support these choices. A commercially available device will be presented to provide empirical data to identify and support K-level categorization in lower limb amputees.

Responder Analysis: Factors Influencing Functional Benefit Investigated in 899 Genium Fittings

Andreas Hahn, PhD

Safety of Osseointegrated Implants for Transfemoral Amputees: A Multicentre Prospective Cohort Study

Munjed Muderis, MB, ChBM FRACS, FAOrthA | Jason Kahle, MSMS, CPO, FAAOP

Osseointegrated implants are an alternative for prosthetic attachment for individuals with amputation unable to wear a socket. However, the concept of a metal implant anchored to the bone, communicating with the external environment raises substantial concern about the risk of ascending infection. This presentation discusses safety of the press-fit type osseointegrated implants currently used in Australia and the Netherlands.
Socket-less Socket use in Developing Nations
Jay Martin, CP, LP, FAAOP
This presentation will discuss the end of Rigid Sockets – Socket-less Socket Transfemoral applied in developing nations provides expedited fittings, inherent volume accommodation, and long-term comfort. Instead of encapsulating the body with traditional rigid plastics and laminated materials, these sockets use lightweight compliant fabrics as the socket materials. No more static socket shape. No more hard ischial seat. No more loss of suction.

Specific Components for Lower Limb Amputees used in Leisure Sports: Assessment Based on Biomechanical Parameters
Thomas Schmalz, PhD
Innovative prosthetic components allow lower limb amputees to run nearly naturally. This session will present the use of new specific prosthetic components for TF and TT amputees and discusses newly available functions based on biomechanical tests.

Successful IPOP Program
Art Shea, CPO
Ever wonder how to set up an IPOP program in your area? A detailed description of how to do that and what is needed to be successful will be presented in this lecture.

Suspension with a Twist: A New Suspension Method
Pamela Hale, CPO
This presentation will introduce a new lanyard suspension concept that can be utilized for all prosthetic sockets - assists with donning, mechanical advantage for ease of use and user adjustable.

The PNS-MI Workgroup Collaborative
Michael Wininger, PhD
The PNS-MI Workgroup is a multi-national team of practitioners, researchers, industrial partners, and educators comprising 15 countries on 4 continents. We are publishing our second Workgroup proceedings as a special issue, and have broadened the Workgroup's scope to more than just innovative prosthetic control.

What Safety Potential do Currently Available Microprocessor-Controlled Prosthetic Knee Joints offer in Various Everyday Gait Situations?
Malte Bellmann, Dipl.-Ing
Many currently available microprocessor-controlled knee joints differ significantly in functional performances in different gait situations of the amputee. This presentation will review results that suggest a microprocessor stance and swing phase controlled system in combination with a linear hydraulic has major benefits in safety relevant situations like walking backwards, up and down ramps and down stairs and provides a significant higher prosthetic side load bearing capacity after stumbling. The safety potential of prosthetic knee joints not only depends on the technology implemented to generate movement resistances for flexion and extension but also on the sensor and control algorithms especially designed for safety relevant gait conditions.