



Orthotics & Prosthetics

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Speaker



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Jan A. Saunders is a nationally certified prosthetist/orthotist with more than 40 years' experience. In addition to providing clinical oversight of Paradigm's prosthetic program, which includes peer-to-peer consultation and bill review, Saunders conducts continuing education programs, participates in carrier settlement planning discussions, and provides expert testimonies and depositions.

He began his career as a prosthetic technician before attending Northwestern University in Chicago and New York University's School of Medicine prosthetic and orthotics program. In addition to treating injured workers over the years, he owned and operated several P&O companies that were later sold to publicly traded companies.

Most recently, he was the President and Chief Clinical Officer of one of the largest multi-state, multi-clinic orthotic and prosthetic providers in the United States.

- ▶ The devastation a person faces due to the sudden loss of a limb, hand or arm cannot be overstated.
- ▶ Prosthetic fitting and training is vital to successful rehabilitation and reintegration of an injured worker into society and back in the workplace.



Pre-Prosthetic Intervention



- ▶ Reduce the injured worker's anxiety with CPO overview of what the future holds
- ▶ Contracture management
- ▶ Limb-guard protection can prevent revision surgery due to a fall
- ▶ Peer-to-peer discussion prior to injured worker seeing prosthetic provider

Residual Limb Preparation

Use of shrinker vs. elastic wraps



Temporary vs. Definitive

- ▶ Reduction in residual limb volume
- ▶ Normal muscle atrophy
- ▶ Activity atrophy
- ▶ Proportional subcutaneous tissue atrophy
- ▶ What is the difference?



Components of Above the Knee Prosthesis

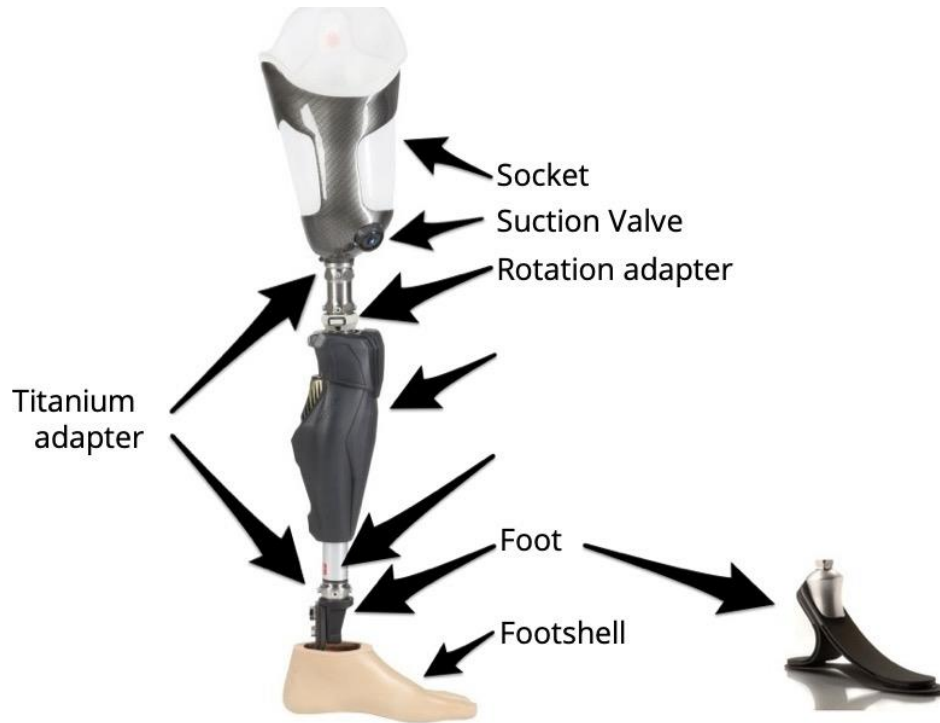
Standard



Microprocessor



What Makes an Above the Knee Prosthesis?



Suspension

- ▶ Suction
- ▶ Elevated vacuum
- ▶ Silicone sleeve
- ▶ Pin systems
- ▶ Knees
- ▶ Feet

Knee Components



Below the Knee Prosthesis

- ▶ Socket
- ▶ Rotators
- ▶ Vertical shock pylons
- ▶ Energy storing feet



Finishing of a Prosthesis

- ▶ Covers
- ▶ Foam
- ▶ Silicone protective
- ▶ CAD-CAM



How Does the Injured Worker Adjuster the Fit of a Prosthesis?

Spacer socks

Sheaths



3 Ply



5 Ply



Why Does it Take So Long?

Steps to fabrications a prosthesis



- ▶ Molding process
- ▶ Negative to positive

Steps to Fabricating a Prosthesis



Mold modifications - pressure sensitive relief areas vs. pressure tolerant areas



Check socket - heat molding positive mold



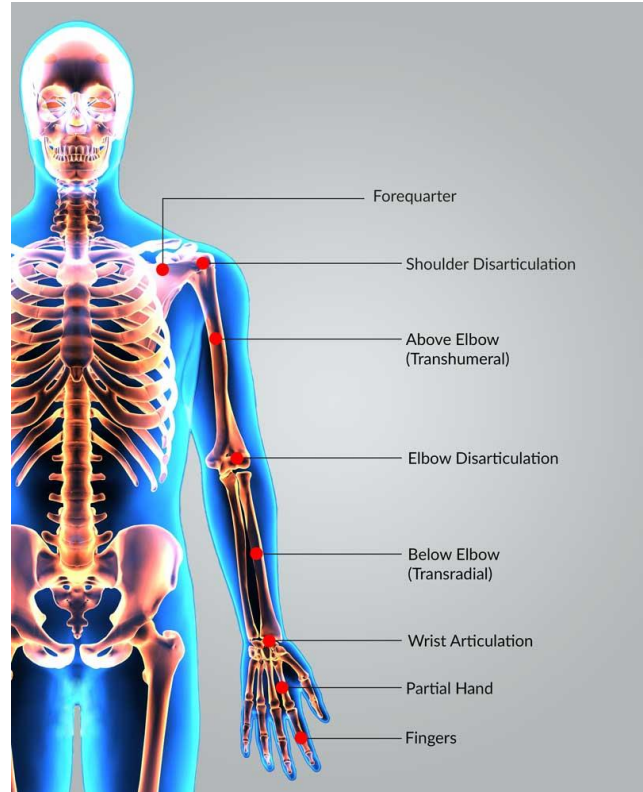
Lamination - carbon reinforcement - acrylic lamination

Sound Follow-Up Protocols Ensure Safety & Better Outcomes

- ▶ 1 week post delivery
- ▶ 1 month post delivery
- ▶ 3 months post delivery
- ▶ Every 6 months
- ▶ FU visits should document that fittings are torqued to manufacturer specs and have thread lock in place.



Upper Extremity Amputation Classifications



Pre-Prosthetic Training

Range of motion exercise

- ▶ Muscle isolation
- ▶ Co-contraction
- ▶ Visual feedback
- ▶ Audio feedback



Body Powered Below Elbow Amputee



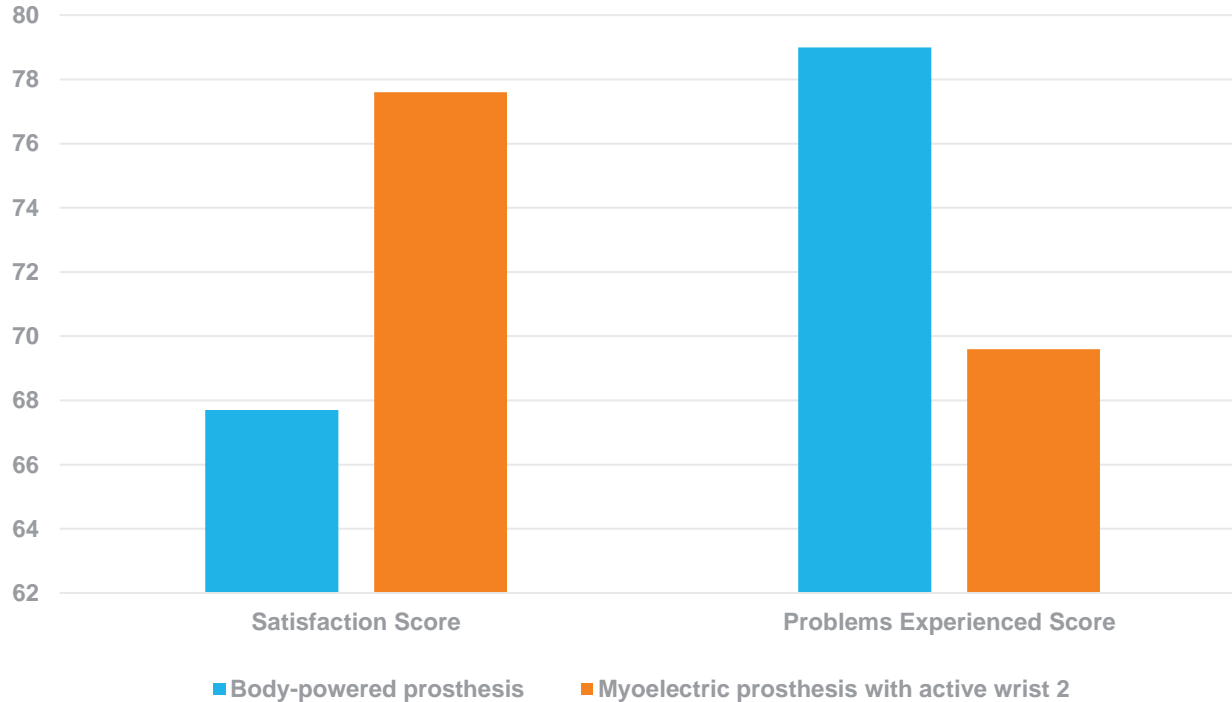
Advantages of Body Powered Prostheses

- ▶ Low cost
- ▶ More durable in dirt and water
- ▶ Less intensive training required
- ▶ Preferred for heavier and more vigorous sporting activities



Satisfaction and Problems Experienced Scores

Myoelectric prosthesis with active wrist and body-powered prosthesis



Advantages of Myoelectric Prosthesis

- ▶ Increased comfort
- ▶ Control of the prosthesis is more natural
- ▶ They give a greater range of motion to the user
- ▶ Users need less compensatory motion to execute ADLs
- ▶ Users report perceived sensory feedback
- ▶ Cosmetic acceptance



Advantages of Myoelectric Prosthesis

- ▶ Office related jobs, supervisory work or in contact with general public
- ▶ Superior pinch force (0 to 35 lbs.) compared with the cable operated hook (7 to 8 lbs.)
- ▶ When physical impairment is severe, the electrically powered prosthesis is the only viable alternative



Myoelectric Below Elbow Amputee



Partial Hands & I-Digits

Manual positioning



Myoelectric controlled



What is the Difference?

3 jaw chuck grip



Cylindrical grip



Why Multi-Articulating Fingers?

Manual dexterity is key



Hooks

Body powered & myoelectric



Off the Shelf vs. Custom

Orthotic considerations

- ▶ Angulation deformities
- ▶ Size & circumference
- ▶ Length of time to be required
- ▶ Patented orthosis



Orthotic Acronyms



- ▶ AFO - Ankle Foot Orthosis (25)
- ▶ KAFO - Knee Ankle Foot Orthosis (20)
- ▶ KO - Knee Orthosis (35)
- ▶ SO - Spinal Orthosis (25)
- ▶ FO - Foot Orthosis (20)
- ▶ CO - Cervical Orthosis (25)
- ▶ WO - Wrist Orthosis (20)
- ▶ WHFO - Wrist Hand Finger Orthosis (10)

Spinal Orthotics

Which & why



Questions?