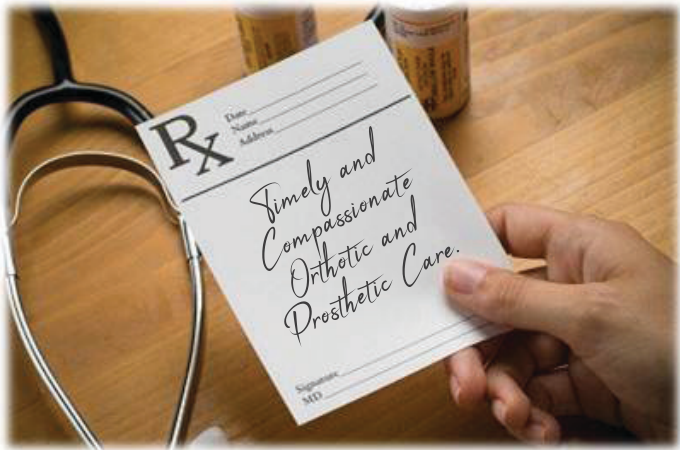


# ALJAN CO.

## Physicians Desk Reference

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## INTRODUCTION

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The Aljan Company has been improving the lives of people impacted by movement and limb disabilities since the 1960's. Over the last 60 years, Aljan has evolved into a leader of complete prosthetic and orthotic care.

Our mission is to continue to provide compassionate care to individuals that require artificial limb and bracing solutions. We look forward to carrying on the Aljan name and its legacy of serving the greater Madison area.

## WHY ALJAN?

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A local team built to deliver the comprehensive scope of orthotic and prosthetic services

- 3 Madison-Area Locations
- 8 North-Central WI Partner Locations
- Contracted with Virtually All Insurances and Medicare/Medicaid
- Consultations and Evaluations are Free Of Charge
- All Patients are Seen by a Board Certified Practitioner

It is Aljan's primary objective to provide quality and comprehensive Orthotic and Prosthetic services to the people of Madison in a timely, cost effective, and compassionate manner.

## JUST ASK...

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This prosthetic and orthotic product guide is intended to be used only as a reference. While comprehensive in scope, every product currently on the market could not be included.

Additionally, because technology is constantly evolving, the products shown are subject to change.

If there is a specific product or design that you may have in mind, please contact Aljan and a Board Certified Practitioner will be able to assist in providing a product that would fit the patient's current needs.

Upon the patient's free evaluation, we will contact the patient's insurance for coverage of the requested items.

Our services include  
but are not limited to:

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Lower extremity bracing

Upper extremity bracing

Spinal/Neck/Back bracing

Geriatric

Pediatric

Sports medicine

Trauma

Orthopedic shoes and inserts

Diabetic care

Prosthetic care

## ORTHOTICS SECTIONS

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## SOFT CERVICAL COLLAR

- **Design**
  - Offer support and some limitations of flexion, extension, lateral bending
- **DX**
  - Mild cervical pain
  - Sprain/strain
  - Whiplash
  - Muscular weakness



## PHILADELPHIA COLLAR

- **Design**
  - Restricts flexion, extension, lateral bending
  - Latex free, nontoxic, hypoallergenic
- **DX**
  - Post-operative stabilization
  - Stable cervical fracture
  - Degenerative pathologies



WATER-RESISTANT, CAN BE USED IN THE SHOWER AND AQUATIC THERAPY

## MIAMI-J COLLAR

## • Design

- Rigid two-piece/bivalve cervical collar
- Restricts flexion, extension, lateral bending
- X-ray, CT and MRI compatible
- Removable inner lining can be washed and replaced



## ASPEN/ASPEN VISTA COLLAR

## • Design

- Rigid two-piece/bivalve cervical collar
- Restricts flexion, extension, lateral bending
- X-ray, CT and MRI compatible
- Removable inner lining can be washed and replaced



## MIAMI COLLAR WITH EXTENSION

### Cervical Thoracic Orthosis

- **Design**
  - Restricts flexion, extension, lateral bending
  - X-ray, CT, MRI compatible
  - Rigid Miami J with thoracic extension
- **DX**
  - High thoracic injuries
  - Stable Fx
  - Post-op stabilization
  - Degenerative pathologies



## ASPEN CERVICAL-THORACIC STABILIZER

### Cervical Thoracic Orthosis

- **Design**
  - Restricts forward flexion and extensic
  - Reduces lateral bending
  - X-ray, CT, MRI compatible
  - Rigid Aspen vista with thoracic extension
- **DX**
  - High thoracic injuries
  - Stable Fracture
  - Post-op stabilization
  - Degenerative pathologies



- Telescoping hinges
- Quick disconnect strapping
- Set of replacement pads provided

## MINERVA ORTHOSIS

CERVICAL THORACIC ORTHOSIS

## • Design

- Two piece design restricts flexion, extension, lateral side bending
- Mandibular and occipital extensions modified to accommodate varying anatomical alignments



## • DX

- Low cervical/high thoracic fracture
- Stable fracture
- Post-operative stabilization
- Arthritis
- Degenerative pathologies



## SOMI ORTHOSIS

STERNAL OCCIPITAL MANDIBULAR IMMOBILIZATION

## • Design

- Two piece design restricts flexion, extension, lateral side bending
- Mandibular and occipital extensions modified to accommodate varying anatomical alignments

## • DX

- Low cervical/high thoracic fracture
- Stable fracture
- Post-operative stabilization
- Arthritis
- Degenerative pathologies



Anterior design allows supine donning/doffing

## CTLSO

- Design

- Custom-made to patient model or prefabricated
- Rigid plastic exterior shell with soft lining
- Closed cell foam does not absorb moisture and is water resistant
- Bivalve design with mandibular and Occipital extensions modified to accommodate varying anatomical alignment
- Custom-made to a patient model



## HALO

- Design

- Two piece thoracic vest
- Lambs wool liner
- CPR break for emergent issues
- MRI compatible

- DX

- Unstable cervical fracture
- Post operative stabilization



## TLSO (CHAIRBACK/CORSET)

- Design
  - Chairback design provides more total contact/postural support
  - Shoulder straps aid in postural support
  - Low profile design aids to decrease pain and increase patient mobility
- DX
  - Thoracic and lumbar compression fracture
  - Hyper-kyphosis
  - Chronic low back pain
  - Osteoarthritis



## TLSO (CORSET)

- Design
  - Corset design
  - Cotton and nylon designs
  - Removable moldable metal stays
  - Padded adjustable shoulder straps
- DX
  - Thoracic and lumbar chronic low back pain
  - Osteoarthritis



## LOW-PROFILE TLSO/HIGH-PROFILE

- Design
  - Custom-made to patient model or prefabricated
  - Extends from symphysis pubis to T-9/ xiphoid and SC Joint to inferior spine of the scapula
  - Chairback/corset design
- DX
  - Wheelchair seating support
  - Post-operative
  - Cancer patients
  - Muscular dystrophy
  - Spina bifida
  - Paraplegia



## TLSO WITH STERNAL ATTACHMENT

- Design
  - Custom-made to patient model or prefabricated
  - Extends from symphysis pubis to sternal notch and SC Joint to inferior spine of the scapula
  - Chairback/corset design
- DX
  - Post-operative
  - Trauma





## POSTURAL KYPHOSIS SUPPORT

- Design
  - Velcro closure
  - Light weight
  - Low profile
  - Kinesthetic reminder to patients to strengthen core reducing effects of postural kyphosis
- DX
  - Postural Kyphosis



## CASH ORTHOSIS

### Cruciform Anterior Spinal Hyperextension

- Design
  - Hyperextension orthosis
  - Triplanar control
  - Rigid lateral/anterior frame
- DX
  - Maintain therapeutic immobilization
  - Reduce load on the anterior vertebral bodies (T7-L5)
  - Reduces pain
  - Provides protection



## JEWETT ORTHOSIS

- Design
  - Hyperextension Orthosis
  - Triplanar control
  - Hyperextensions
  - Rigid anterior and lateral frame
  
- DX
  - Maintain therapeutic immobilization
  - Reduce load on the anterior vertebral bodies (T7 through L5)
  - Reduce pain
  - Provide protection



## TLSO (BIVALVE)

- Design
  - Custom-made to patient model or prefabricated
  - 2 piece plastic shell
  - Lined with soft non-absorbent foam
- DX
  - Post op surgery from T8 - S1
  - Trauma
  - Degenerative pathologies
  - Vertebral displacement
  - Osteoporosis
  - Stenosis/disc herniation
  - Spondy's



## SOFT TLSO (BIVALVE)

- Design
  - Custom-made to patient model or prefabricated
  - Less rigid than thermoplastic TLSO
  - Provides less triplanar control/immobilization than Rigid TLSO
- DX
  - Wheelchair seating support
  - Post-operative
  - Cancer patients
  - Cerebral palsy
  - Muscular dystrophy
  - Spina bifida
  - Paraplegia
  - Geriatric population
  - Patients prone to bed sores



## LSO (BIVALVE)

- Design
  - Custom-made to patient model or prefabricated
  - Terminates from Xiphoid to symphysis pubis
  - Soft foam hypoallergenic lined
- DX
  - Lumbar fracture management
  - Post-operative
  - Trauma
  - Spinal Stenosis
  - Degenerative pathologies



## SOFT LSO (BIVALVE)

- Design
  - Custom-made to patient model or prefabricated
  - Less control than thermoplastic LSO
  - 2 piece plastic shell
  - Lined with soft non-absorbant foam
- DX
  - Ankylosing spondylitis
  - Lumbar stabilization
  - Postural support
  - Stenosis
  - Geriatric population
  - Patients prone to bed sores



## LUMBOSACRAL CORSET

- Design
  - Washable material
  - Removable metal stays
  - Velcro hook
  - Low profile design
- DX
  - Low back pain
  - Lumbar stenosis
  - Post-op stabilization



## POSTURAL SUPPORT

### Mother-to-be- back support

- **Design**
  - Elastic material
  - Heat moldable kydex material
  - Provides lumbar postural support
  - Reduced lordosis
- **DX**
  - Low back pain
  - Spondy's obesity/pregnancy support
  - Pain associated with lordotic angle
  - Stenosis
  - Nerve impingement



## SI BELT

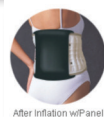
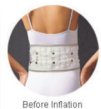
### Sacroiliac support

- **Design**
  - Elastic support
  - Provides Sacroiliac stabilization
- **DX**
  - Sacroiliac strains
  - Arthritis
  - Reduce Sacroiliac joint movement in hypermobile or weak patients
  - Sciatica pain
  - Hip pain



### SPINAL DECOMPRESSION LSO

- Design
  - Pneumatic pump inflates air bladders elongating the spine and unloading vertebral discs
  - Traction belt is vertically expanded by 7cm (2.8")
- DX
  - Herniated discs
  - Stenosis
  - Spondy's
  - Low back pain
  - Sciatica



### LSO (CORSET/PULL CORD DESIGN)

- Design
  - Ease of donning/doffing
  - Patients are usually very compliant
  - Extends from L1-L5
  - Produced intracavitary pressure
  - Reduced load on intervertebral discs
- DX
  - Herniated discs
  - Low back pain
  - Lumbar instabilities
  - Spondy's
  - Compression fracture
  - Degenerative disc disease
  - Post-op



## LSO (CHAIRBACK/CORSET PULL CORD DESIGN)

- Design

- Chairback design provides more total contact/postural support
- Pull cord design is easy for the patient to don/doff
- Patients usually very compliant with design



- DX

- Low back pain
- Lumbar stenosis
- Post-op
- Trauma
- Strains/sprains
- Spony's
- Disc herniation
- Degenerative disc disease







## LOWER EXTREMITY ORTHOTICS

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## FUNCTIONAL FOOT ORTHOTICS

- Design
  - Fabricated in non, semi, and full weight bearing positions to achieve neutral or functional alignment (subtalar neutral alignment)
  - Custom made to patient models
    - Multidensity
    - Rigid
    - Semi-rigid construction
  - Various materials available
- DX
  - Biomechanical insufficiencies



## ACCOMMODATIVE FOOT ORTHOT-

- Design
  - Multi-density semi-rigid
  - Custom made to a patient model
- DX
  - Diabetes
  - Vascular and sensory insufficiencies
  - Toe filler
  - Severe deformities



## UCBL FOOT ORTHOSIS

University California-Berkley Laboratories Orthosis

- **Design**
  - Semi-rigid orthosis encompassing medial and lateral borders of calcaneus
  - Usually fabricated from plastics
  - Custom made to a patient model
  
- **DX**
  - Hyper-pronation
  - Hypotonic patient
  - Posterior tibial tendonitis dysfunction
  - Tibial tendonitis



## HEALING SHOE

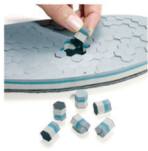
- **Design**
  - Provides immobilization and offloading:
    - Forefoot
    - Metatarsals
    - Heel
  - Can be custom modified for precise fit
  
- **DX**
  - Stable Fx
  - Ulcers
  - Post-op management



## PRESSURE RELIEF SHOE/BOOT

- Design

- Removable shock absorbing segments
- Removable toe piece
- Mesh upper
- Velcro closure



- DX

- Plantar surface ulcers
- Skin breakdown
- Irritation



## CUSTOM/OFF-THE-SHELF SHOES

- Design

- Shoes chosen based on patients foot presentation
- Measure for length, width and depth
- Casts taken semi-weight bearing for custom



custom

- DX

- Severe deformities
- Diabetic foot



## WALKING BOOT

- Design
  - Provides ankle and foot immobilization
  - Plastic or aluminum uprights
  - Solid or controlled ROM joints
  - Pneumatic or static options
- DX
  - Stable Fx
  - Post-op management
  - Soft tissue injury (grade 2 or 3 sprain)



## MID-CALF WALKING BOOT

- Design
  - Provides ankle and foot immobilization
  - Plastic or aluminum uprights
  - Solid or controlled ROM joints
  - Pneumatic or static options
- DX
  - Stable Fx
  - Post-op management
  - Soft tissue injury (grade 2 or 3 sprain)



## PRAFO

### Pressure Relief AFO

- **Design**
  - Provides ankle immobilization and plantar flexion resistance
  - Soft synthetic sheep skin liner can be washed and replaced
  - Large area of relief for hindfoot/calcaneus
  - Posterior upright/bar resists external/internal rotation
- **DX**
  - Patients prone to bedsores
  - Patients prone to contractures
  - Derotational support



## PLANTAR FASCIITIS NIGHT SPLINT

- **Design**
  - Rigid posterior frame
  - Soft foam lining
  - Bilateral adjustable straps allow for variable dorsiflexion/plantarflexion settings
- **DX**
  - Plantar fasciitis
  - Tight gastroc-soleus complex
  - Achilles tendon injuries





## LACE-UP ANKLE ORTHOSIS

- Design
  - Bilateral semi-rigid inserts provide additional Medio-lateral support
  - Lace up design allows for increase stability
  - Ease of donning
- DX
  - Medial and lateral ankle instability
  - Sprains
  - Subtalar irritation/pain



## FIGURE 8 LACE-UP ANKLE ORTHOSIS

- Design
  - Ankle Surround Orthosis
  - Ligamentus stability
  - Often used in sports
  - Provide additional medio-lateral support to ankle by incorporating stays and figure 8 strapping
- DX
  - Medial and lateral ankle instability
  - Sprains
  - Subtalar irritation/pain



## AIR STIRRUP ANKLE ORTHOSIS

- Design
  - Pre-inflated air struts provide stability and patient comfort
- DX
  - Medial and lateral ankle instability
  - Sprains/strains



## PRE-FABRICATED ARTICULATED ANKLE ORTHOSIS

- Design
  - Light
  - Low-profile
  - Medial/lateral stability
- Dx
  - Medial/lateral ankle instability



## ARTICULATED ANKLE ORTHOSIS

### Articulated Supra-Malleolar Orthosis

- Design
  - Custom made to patient model
  - UCBL style foot bed
  - Variable ankle joints and design variation
    - Adjustable ROM
    - Free motion
    - Dorsi assist
    - Plantar flexion stop
- DX
  - Pes planus
  - Posterior tibial tendonitis dysfunction
  - Hyper pronation
  - Medial/lateral ankle instabilities
  - Ankle and/or foot injuries



## MOLDED LEATHER ANKLE GAUNTLET AFO

- Design
  - Custom-made to patient model
  - Leather outer
  - Plastic inner shell
  - Available with lacer/velcro design
- DX
  - Posterior tibial tendonitis dysfunction
  - Pes planus
  - Hyper-pronation
  - Osteoarthritis



## PRE-FABRICATED POSTERIOR LEAF SPRING AFO

- **Design**
  - Thermoplastic custom-fit
  - Provides dorsiflexion assist during swing phase
- **DX**
  - Drop foot
  - Stroke
  - Multiple sclerosis
  - Peroneal palsy



## CARBON FIBER DYNAMIC AFO

- **Design**
  - Custom-made and prefabricated designs
  - Available with medial, lateral or posterior struts
  - Anterior shell assist with knee extension
  - Posterior calf cuff available
  - Provides stability and energy return
  - Ultra-light weight
- **DX**
  - Drop foot
  - Stroke
  - Multiple sclerosis
  - Peroneal palsy



### DOUBLE UPRIGHT METAL AFO

- **Design**
  - Custom-made to patient model
  - Metal can be aluminum, stainless steel, titanium
  - Molded leather calf cuff
  - Ankle joints can vary
    - Full motion
    - Variable motion
    - Plantarflexion stop/Dorsiflexion assist
- **DX**
  - Drop foot
  - Peripheral vascular disease
  - Distal sensory impairment
  - Edema
  - Volumetric changes
  - Stable Charcot foot



### CROW BOOT

#### Charcot Restraint Orthotic Walker

- **Design**
  - Total contact custom-made
  - Clam shell design
  - Molded foam inner boot
- **DX**
  - Active Charcot foot
  - Diabetes
  - Chronic wound care/ulcerations
  - Arthritis
  - Degenerative joint disease



### POSTERIOR LEAF SPRING AFO

- Design
  - Custom-made to patient model
  - Intimately fits patients anatomy
  - Provides dorsiflexion assist during swing phase
  - Fabricated out of different thicknesses of plastics or carbon fibers
- DX
  - Drop foot
  - Stroke
  - Multiple sclerosis
  - Peroneal palsy



### SEMI-SOLID AFO

- Design
  - Custom-made with trimlines just posterior to medial and lateral malleoli
  - Adds additional support/stability
  - Allows some ankle motion in AFO
- DX
  - Drop foot
  - CMT
  - CVA
  - Spinal cord injury
  - Muscular dystrophy
  - MS
  - Low extremity weakness/instability



### SOLID ANKLE AFO

- Design
  - Trimlines anterior to malleoli
  - Provides maximum medial/lateral and dorsi/ plantar support
  - Available with various foot plate designs
    - Medial and lateral support flanges
    - Soft foam lined
- DX
  - Medial lateral instabilities
  - Plantar flexion/dorsiflexion muscular weakness/imbalance
  - Varus/valgus instabilities
  - Mild knee instabilities
  - CVA, MS, CMT, spinal cord injury
  - Plantar flexion tightness
  - Hypertonicity



### ARTICULATED AFO

- Design
  - Custom-made to patient model
  - Ankle joints allow for
    - Full ROM/Variable ROM
    - Dorsi assist/Plantar flexion stop
  - Numerous ankle joints and foot plate designs
  - Available in different plastics, carbon fiber design
- DX
  - Plantar flexion/dorsiflexion muscular weakness/imbalance
  - Varus/valgus instabilities
  - Mild knee instabilities
  - CVA, MS, CMT, spinal cord injury



## FNMES (WALKAIDE)

### Functional Neuromuscular Electrical Stimulation

- Design
  - Electrical impulse dorsiflexes patients foot during swing phase
  - Assists with neural plasticity
  - Minimizes the affects from disuse atrophy
- DX
  - Drop foot
  - Upper motor neuron injuries
    - Stroke
    - Multiple sclerosis
    - Cerebal palsy
    - Head trauma



## PATELLAR TENDON BEARING ORTHOSIS

- Design
  - Provides circumferential compression aiding in reducing axial loading
  - Numerous designs
- DX
  - Tibia and fibula fractures
  - Non-union
  - Mal-union
  - Chronic wound care and ulcers





## TIBIAL FRACTURE ORTHOSIS

- Design
  - Bivalve design for total contact and circumferential compression
  - Aids in reduction of axial loading and maintaining anatomical alignment of the injured site
- DX
  - Tibia and fibular fractures
  - Non-unions
  - Mal-unions



## FEMORAL FRACTURE ORTHOSIS

- Design
  - Aid in weight distribution and maintaining rotational control
  - Available in various style knee and ankle joints
  - Removable design allows for inspection
- DX
  - Femoral fracture
  - Pain management



## CONTRACTURE AFO

- Design
  - Tone reducing foot plate
  - Static or dynamic capabilities for conservative management for spasticity
  - Dynamic component minimizes skin breakdown
  - Soft foam lining prevents skin breakdown
  - Improves
    - Muscle length
    - Flexibility
    - Balance
    - Correction of postural deformities



## CONTRACTURE KAFO

- Design
  - Tone reducing foot plate
  - Static or dynamic capabilities for conservative management for spasticity
  - Provides stretch control across knee and ankle complex
  - Dynamic component minimizes skin breakdown
  - Soft foam lined preventing skin breakdown
  - Improves
    - Muscle length
    - Flexibility
    - Balance
    - Correction of postural deformities



### CONTRACTURE KNEE ORTHOSIS

- Design
  - Low load prolonged stretch across knee
  - Flexion and extension assist
  - Rigid lightweight frame
  - Machine washable breathable liner
- DX
  - Joint contracture
  - Knee tightness



### KNEE IMMOBILIZER

- Design
  - Contoured posterior, medial and lateral stays
  - Comfortable wide elastic straps
  - Variable lengths available
- DX
  - Knee instability
  - Post operatively
  - Fractures
  - Pain management



## RANGE-OF-MOTION KNEE ORTHOSIS

- **Design**
  - Incremental range of motion control
  - Buckles allow ease of donning/doffing
  - Reduced foam coverage for increased comfort and “cooler” fit
  - Polycentric knee range 0-120 deg
- **DX**
  - Post operative knee stability
  - Pain management



## PATELLAR STABILIZING KNEE ORTHOSIS

- **Design**
  - Proximal and distal straps
  - Medial and lateral polycentric hinges
  - Lateral buttress for patellar stabilization
- **DX**
  - Patellofemoral dysfunction
  - Mild medial/lateral instability



## PREFABRICATED FRAMED KNEE ORTHOSIS

- Design
  - Aluminum, lightweight, rigid frame
  - Polycentric hinges
  - Condyle pads
- DX
  - Moderate to severe ACL, MCL, LCL instabilities
  - Low impact patient



## CUSTOM FRAMED KNEE ORTHOSIS

- Design
  - Ultra lightweight construction
  - Very durable
  - Low profile
  - Patients whose anatomy doesn't fit in prefab measurements
  - High impact patients
  - Active people
- DX
  - Moderate to severe ACL, MCL, LCL instabilities/ injuries



## PREFABRICATED OFFLOADING KNEE ORTHOSIS

- Design
  - Can offload medial or lateral compartment
  - Light weight aluminum frame
  - 3-point loading system reduces degenerative knee joint compression
  - Telescoping condyle pad allows for patient to adjust according to activity
- DX
  - Unicompartmental knee osteoarthritis



## CUSTOM OFFLOADING KNEE ORTHOSIS

- Design
  - Custom-made to model of patients anatomy
  - Carbon fiber frame
  - Telescoping hinge
  - Patient anatomy does not come in prefab sizing
  - High activity patients
- DX
  - Moderate to severe osteoarthritis



## SINGLE UPRIGHT KNEE ORTHOSIS

### Design

- Low profile
- Cosmetic
- Patients that use brace when at work
  - Professional atmosphere
- Obese patients
  - When brace would rub on contralateral limb
- Custom or prefabricated options



## KAFO

### Knee-Ankle-Foot Orthosis

- Design
  - Various joints available
  - Fabricated out of different materials
- DX
  - Providing stability to knee and/or foot
  - Functional assist
  - Rigid support to anatomical structure
  - Therapeutic aid
  - Immobilization



## STANCE CONTROL KAFO

- Design
  - Cutting edge KAFO technology
  - Allows free swing with orthotic intervention provided during stance phase
  - More natural gait
  - Decreased patient energy expenditure
  - Minimized effects of disuse atrophy on skeletal muscles
  - Various designs and technologies available



## HIP ORTHOSIS

- Design
  - Velcro closure
  - Washable hypoallergenic lining
  - Fully adjustable hip joint
- DX
  - Hip Fracture
  - Post operative surgery
  - Hip pain
  - Knee alignment





### HKAFO

#### Hip-Knee-Ankle-Foot Orthosis

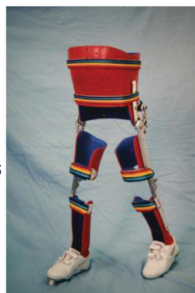
- Design
  - Provides maximum stability at the hip knee ankle foot complex
  - Can be fabricated from plastics, carbon composites, hybrid variations, leather and metal.
  - Various styles of hip, knee, ankle joints available per patient presentation



### RGO

#### Reciprocating Gait Orthosis

- Design
  - Allows for reciprocal ambulation
  - Hands free balance and support
  - Dynamic hip stretching
  - Various styles
  - Growth extension available for pediatrics
- DX
  - Muscular imbalance/weakness
  - Paralysis
  - Spinal cord injury
  - Spina bifida
  - Myelomeningocele





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## CRANIAL REMODELING ORTHOSIS

- Design
  - Custom-made to a patient model
  - Worn 23 hrs a day for approx 3-6 months
  - Follow up care ensures that appropriate modifications are made as baby develops
  
- DX
  - Deformational
    - Plagiocephaly
    - Brachycephaly
    - Scaphocephaly
  - Post-operatively



## SCOLIOSIS (BOSTON STYLE)

- Design
  - Custom-made to patient model
  - Rigid plastic shell with soft foam liner
  - Velcro closure for maximum abdominal compression and biomechanical control
  - Counter force re-directional pads
  
- DX
  - Idiopathic scoliosis



## NOCTURNAL SCOLIOSIS (CHARLESTON STYLE)

- **Design**
  - Custom-made to patient model
  - Rigid plastic shell with soft liner
  - Brace overcorrects curve worn only at night
  - Soft hypoallergenic design
- **DX**
  - Idiopathic scoliosis



## SOFT SCOLIOSIS ORTHOSIS

- **Design**
  - Custom-made to patient model
  - Semi-rigid foam exterior
  - Soft hypoallergenic lined
  - Closed celled foam doesn't absorb moisture
- **DX**
  - Idiopathic scoliosis



### MILWAUKEE BRACE

- Design
  - Rigid plastic shell with soft lining
  - Counter-force redirectional pads
  - Metal super structure with neck ring
  
- DX
  - Idiopathic scoliosis
  - Cervical and high thoracic involvement
  - Kyphosis management



### RGO

#### Reciprocating gait orthosis

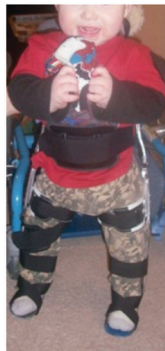
- Design
  - Allows for reciprocal ambulation
  - Hands free balance and support
  - Dynamic hip stretching
  - Various styles
  - Growth extension available for pediatrics
  
- DX
  - Muscular imbalance/weakness
  - Paralysis
    - Spinal cord injury
    - Spina bifida
    - Myelomeningocele



## HKAFO

Hip-Knee-Ankle-Foot Orthosis

- Design
  - Provides maximum stability at the hip knee ankle foot complex
  - Can be fabricated from plastics, carbon composites, hybrid variations, leather and metal.
  - Various styles of hip, knee, ankle joints available per patient presentation



## KAFO

Knee-Ankle-Foot Orthosis

- Design
  - Various joints available
  - Fabricated out of different materials
- DX
  - Providing stability to knee and/or foot
  - Functional assist
  - Rigid support to anatomical structure
  - Therapeutic aid
  - Immobilization



## HIP ABDUCTION ORTHOSIS

- **Design**
  - Rigid pelvic and thigh section
  - Soft lined material
  - Hip joint options include
    - Variable
    - Static
    - Free range of motion
    - Adduction/Abduction
    - Flexion/Extension
- **DX**
  - Post operative stabilization
  - Soft tissue release
  - Osteotomies
  - Hip subluxation
  - Hip dislocation



## HIP ABDUCTION ORTHOSIS - INFANT

- **Design**
  - Soft interface prevents skin breakdown
  - 90 degrees hip flexion
  - 160 degrees abduction
  - Closed cell foam
- **DX**
  - Congenital hip dysplasia
  - Developmental hip dysplasia





## SWASH

Standing Walking And Sitting Hip-Orthosis

- **Design**
  - Bilateral thigh cuff and pelvic band
    - Aids in proper positioning of hip/sitting balance
    - Reduces subluxation/dislocation
    - Prevention of scissoring gait pattern
- **DX**
  - Pre and post operative management of the pediatric hip
  - Cerebral palsy
  - Spinal cord injury
  - Hypertonicity
  - Traumatic brain injury
  - Stroke



## PAVLIK HARNESS

- **Design**
  - Strapping design allows for variable hip flexion and abduction positioning
  - Soft interface to avoid skin breakdown
  - Available in 0-9 months of age
- **DX**
  - Congenital hip dysplasia
  - Developmental hip dysplasia



## 2 STAGE AFO

- **Design**
  - Removable flexible inner boot with rigid outer shell
  - Various footplate configurations
  - Ideal for people with plantarflexion contractures and hypertonicity
- **DX**
  - Medial and lateral instabilities
  - Neuromuscular and neuromuscular imbalance
  - Cerebral palsy
  - Spina bifida
  - Muscular dystrophy
  - Ligamentous laxity
  - Dorsi and plantar flexion weakness



## ARTICULATED AFO

- **Design**
  - Bilateral ankle joints allow for
    - Full ROM/variable ROM
    - Dorsi assist/plantar flexion stop
  - Numerous ankle joints and foot plate designs
  - Available in different plastics, carbon fiber design
- **DX**
  - Medial lateral instabilities
  - Plantar flexion/dorsiflexion muscular weakness/imbalance
  - Varus/valgus instabilities
  - Mild knee instabilities
  - CVA, MS, CMT, spinal cord injury,
  - Plantar flexion tightness



## SOLID ANKLE AFO

- **Design**
  - Trimlines anterior to malleoli
  - Provides maximum medial/lateral and dorsi/plantar support
  - Available with various foot plate designs
    - Medial and lateral support flanges
    - Soft foam lined
- **DX**
  - Medial lateral instabilities
  - Plantar flexion/dorsiflexion muscular weakness/imbalance
  - Varus/valgus instabilities
  - Mild knee instabilities
  - CVA, MS, CMT, spinal cord injury,
  - Plantar flexion tightness
  - Hypertonicity



## SEMI-SOLID AFO

- **Design**
  - Custom-made with trimlines just posterior to medial and lateral malleoli
  - Adds additional support/stability
  - Allows some ankle motion in AFO
- **DX**
  - Drop foot
  - CMT
  - CVA
  - Spinal cord injury
  - Muscular dystrophy
  - Multiple sclerosis
  - Low extremity weakness/instability



## DYNAMIC AFO

- **Design**
  - Aids in controlling
    - Hyperpronation
    - Supination
  - Tone reducing foot plate option
  - Assists in controlling medial/lateral ankle instability
- **DX**
  - Neurological and neuromuscular imbalance
  - Cerebral palsy
  - Spina bifida
  - Muscular dystrophies
  - Ligamentous laxity
  - Calcaneal inversion/eversion
  - Severe pes planus
  - Hyperpronation/supination



## SMO

### Supramalleolar orthosis

- **Design**
  - Assists with medial/lateral ankle instability
  - Aids in controlling hyperpronation/supination
  - Provides hind and forefoot control during gait
- **DX**
  - Neurological and neuromuscular imbalance
  - Cerebral palsy
  - Ligamentous laxity
  - Calcaneal inversion/eversion
  - Severe pes planus
  - Hyperpronation/supination



## WALKING BOOT

- Design
  - Provides ankle and foot immobilization
  - Plastic or aluminum uprights
  - Solid or controlled ROM joints
  - Pneumatic or static options
- DX
  - Stable Fx
  - Post-op management
  - Soft tissue injury (grade 2 or 3 sprain)



## UCBL

University California-Berkeley Laboratories Orthosis

- Design
  - Semi-rigid orthosis encompassing medial and lateral borders of calcaneus
  - Usually fabricated from plastics
  - Custom made to a patient model
  - Fabricated in
    - Non
    - Semi
    - Full weight bearing positions
- DX
  - Hyper-pronation
  - Hypotonic patient
  - Posterior tibial tendonitis dysfunction
  - Navicular accessory
  - Midfoot collapse



## FUNCTIONAL FOOT ORTHOTICS

- Design
  - Fabricated in non, semi, and full weight bearing positions to achieve neutral or functional alignment (subtalar neutral alignment)
  - Custom made to patient models
    - Multidensity
    - Rigid
    - Semi-rigid construction
  - Various materials available
- DX
  - Biomechanical insufficiencies
  - Hyperpronation/supination
  - Calcaneal inversion/eversion



## DENNIS BROWN BAR

- Design
  - Provides correction for
    - Rotational
    - Torsional
    - Angular deformities
- DX
  - Club foot/feet
  - Tibial torsion
  - Congenital deformity



## EXTRA DEPTH SHOES

- Design
  - Wide, low, blucher style openings
  - Ease in donn/doffing
  - Extra depth toe-box
  - Triple layer removable inserts
  - Measure for length, width and depth
  - Casts taken semi-weight bearing for

custom

## • DX

- Accommodative shoes for orthotic designs
  - UCBL
  - AFO
  - KAFO
  - Custom FO's







## UPPER EXTREMITY ORTHOTICS

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## COCK-UP SPLINT

- Design
  - Rigid moldable stay to reduce unwanted flexion and extension
  - Rigid removable stays
  - Velcro closure
- DX
  - Carpal tunnel syndrome
  - Tendonitis
  - Wrist strain/sprain



## CUSTOM WRIST HAND ORTHOSIS

- Design
  - Heat moldable material
  - Total contact support
  - Boa technology closure
- DX
  - Carpal tunnel syndrome
  - Sprains, strains
  - Fractures



## THUMB SPICA SPLINT

- **Design**
  - One piece semi rigid design incorporates thumb for increased stability and immobilization
  - Materials include
    - Canvas
    - Neoprene
    - Plastic
- **DX**
  - Carpal tunnel syndrome
  - Tendonitis
  - Wrist sprain/strain
  - Post-fracture management



## RESTING HAND SPLINT

- **Design**
  - Maintains wrist, hand and fingers in functional position
  - Moldable plastic shell
  - Soft synthetic washable lambs wool liner
- **DX**
  - Pain management
  - Stroke
  - Paralysis
  - Post-operative management
  - Spasticity



## DYNAMIC HAND SPLINT

- Design
  - Therapeutic aid
  - Graded Range of motion stays
  - Assists with neural plasticity through dynamic motion
- DX
  - Post- op management
  - CVA
  - Paralysis
  - Paresis
  - Brachial plexus injuries



## TENNIS ELBOW STRAP

- Design
  - Wrap around splint
  - Directional padding
  - Velcro closure
- DX
  - Medial or lateral epicondylitis



## ELBOW PAD

- Design
  - Elastic elbow sleeve with foam padding to prevent excessive pressure over bony prominence
- DX
  - Ulnar neuropathy



## RANGE-OF-MOTION ELBOW ORTHOSIS

- Design
  - Rigid exterior shell
  - Soft removable Variable ROM controlling flexion and extension
  - Optional wrist and hand extension available
  - Shoulder harness with adjustable straps for added comfort and suspension
- DX
  - Elbow dislocations
  - Post-operative management
  - Fracture management
  - Contracture management



## CLAVICLE STRAP

- Design
  - Foam padded shoulder straps
  - Increased shoulder retraction
- DX
  - Clavicle Fracture
  - Pain management
  - Postural support



## ARM SLING

- Design
  - Canvas material
  - Shoulder harness
  - Adjustable straps
- DX
  - Immobilization for mild strains/sprains
  - Fracture management
  - Shoulder injuries
  - Post operative management



### ABDUCTION SLING

- Design
  - Custom fit to patient
  - Variable degrees of abduction
  - Maintains upper extremity in neutral position to aid in healing
- DX
  - Rotator cuff repairs
  - Shoulder capsule injury
  - Glenohumeral dislocation/subluxation
  - Soft tissue injury



### WRIST HAND FRACTURE ORTHOSIS

- Design
  - Custom-made or prefabricated
  - Immobilization of wrist and hand
  - Soft interface
- DX
  - Wrist and hand fractures
  - Post-operative or post-cas stabilization



## ULNAR/RADIAL FRACTURE ORTHOSIS

- Design
  - Custom-made or prefabricated
  - Plastic semi-rigid design
  - Total contact with circumferential compression
  - Soft interface
- DX
  - Mild ulnar and radial fractures
  - Post-operative stabilization
  - Post-cast stabilization



## ELBOW-WRIST-HAND FRACTURE ORTHOSIS

- Design
  - Plastic semi-rigid design
  - Unilateral or bilateral elbow joints
  - Joints can be
    - Locked
    - Free motion
    - Variable motion
  - Soft interface
  - Numerous design options
- DX
  - Distal humeral fractures
  - Proximal radial and ulnar fractures
  - Post-operative management
  - Post-cast stabilization





## HUMERAL FRACTURE ORTHOSIS

- Design
  - Custom-made or prefabricated
  - Total contact design
  - Circumferential compression for increased stabilization
  - Shoulder cap optional
  - Soft interface
- DX
  - Mid-humeral fractures
  - Post-operative stabilization
  - Post-cast stabilization



## WRIST-HAND CONTRACTURE ORTHOSIS

- Design
  - Positional orthosis with dynamic wrist joint
  - Aids in contracture/spasticity management
  - Aids in soft tissue release
- DX
  - Wrist and hand contracture management



## ELBOW CONTRACTURE ORTHOSIS

- Design
  - Custom-made or prefabricated
  - Positional orthosis with dynamic elbow joint
  - Aids in contracture/spasticity management
  - Aids in soft tissue release
  - Variable range of motion joint can be
- DX
  - Elbow contracture management



## PROSTHETICS: LOWER EXTREMITY

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## INTRODUCTION TO PROSTHETICS

A Certified Prosthetist (CP) or Certified Prosthetist/Orthotist (CPO) provides clinical care to patients with amputated or congenitally absent limbs. They design, fabricate and fit prosthetic devices (artificial limbs). These devices replicate the function and appearance of a limb so that patients can resume activities of daily living and work.

Significant developments in the last twenty years have dramatically advanced the field of prosthetics. Improvements in material science have provided stronger, more durable, light weight materials (composites, titanium, carbon fibers) that enable users to function and ambulate with greater ease and less stress. Soft materials that absorb axial loading and shearing forces are commonly used to enhance the fit and feel of the prosthesis. New designs in feet, knees, hands, arms, sockets and interface liners have brought us closer to the goal of completely restoring lost function and appearance.

## INTRODUCTION TO PROSTHETICS

The future of prosthetic lies in microprocessors integrated into prostheses to assist with specific functions and computers to diagnose and design. The prosthetic profession is moving toward evidence-based practice with clinical protocols based on scientific research.

Advanced technology does not guarantee optimal rehabilitation outcomes. The prosthetist's role is to provide each patient with an appropriate prosthesis and to deliver ongoing care to ensure optimal fit and function. Every patient has different functional and lifestyle requirements that must be met for that person to regain functional independence. The prosthetist incorporates expertise in anatomy, socket design, materials, components, gait analysis, and biomechanics in their evaluation of the patient to design the most appropriate prosthetic system for each patient. Patients have the best chance for successful rehabilitation when the prosthetist works closely with doctors, therapists, social workers, and other professionals, as well as the patients family and insurance company.

## INTRODUCTION TO PROSTHETICS

**Post-operative Protocols:** The physician will generally determine which prosthetic treatment protocol is utilized following surgery. These commonly include:

**Rigid Dressing (RD):** Used to prevent knee flexion contracture, manage edema, and protect the surgical site. A second RD is usually applied 7-10 days following surgery as part of protocol.

**Removable Rigid Dressing (RRD):** Used for the same purpose as the RD, with added benefit of being able to remove the dressing and monitor the surgical site as needed. Prosthetic socks of varying thickness are used to ensure continued fit as the edema in the residual limb decreases.

**Immediate Post-operative Prosthesis (IPOP):** A combination of a RRD with the addition of a pylon and foot or hand system. The IPOP allows the patient to ambulate with controlled partial weight-bearing shortly after surgery. Applied early and correctly, an IPOP provides protection, volume management and early function, while preparing the residual limb for prosthetic wear and/or ambulation. This protocol is more common in a hospital or rehab facility because it requires that the patient be closely monitored by a physical therapist and rehab nurse.

## INTRODUCTION TO PROSTHETICS

**Compression Therapy:** The use of a compressive wrap or sock shrinker to control edema when none of the previous treatment protocols are appropriate. Compression therapy is often utilized as part of the previous treatment protocols.

**Preparatory Prosthesis:** Following the successful use of any of the listed post-operative processes, the physician will order the fitting of a preparatory prosthesis. The preparatory prosthesis is designed to allow the patient to begin rehabilitation before the residual limb has completely stabilized in size. Its design allows the prosthetist to continuously adjust the prosthesis to mirror the progress achieved by the amputee as the patient regains strength and confidence.

A preparatory prosthesis can be used as soon as six weeks post-surgically and throughout rehabilitation until the residual limb edema has stabilized. Should larger reduction in limb volume occur, the modular design allows the socket segment to be replaced and refit to ensure optimal fit of the prosthesis.



## INTRODUCTION TO PROSTHETICS

**Definitive Prosthesis:** The design and fitting of this prosthesis is a reflection of all the rehabilitation processes that have previously occurred. The prosthetist considers the strength, motivation, functional requirements, and daily needs of the user when recommending the design, components and materials utilized for each prosthesis. The goal of the definitive prosthesis is to allow the patient to fulfill the requirements and functions unique to his or her daily activities.

All definitive prostheses are custom-made utilizing a mold of the remaining residual limb. The mold may be generated from a plaster cast impression or using Computer Automated Design (CAD). After the mold is created, a series of diagnostic test sockets are often set up for trial as part of the dynamic alignment process.

Once the alignment and proper fit of the prosthesis are determined, the definitive prosthesis is fabricated and delivered to the patient for use. Cosmetic enhancements (shaped foam covers and latex skins) are usually delayed until all follow-up adjustments have been made. Regular long-term follow-up is essential to ensure optimal prosthetic rehabilitation for the patient.

## INTRODUCTION TO PROSTHETICS

### Walkabout Lower Extremity Prosthetics Program

The Walkabout lower extremity prosthetic program is comprised of practitioners certified and specifically trained in all aspects of lower extremity prosthetics. We use state-of-the-art prosthetic components such as microprocessor knees and feet, and a variety of different socket designs specifically selected based on patient presentation (goals, anatomy, ROM, MMT). When we evaluate the patient for a new prosthesis, we perform a thorough analysis that evaluates the patient's particular circumstances in terms of lifestyle, health, capabilities and goals.

### Lower Extremity Functional Classifications

Prosthetic components and design elements are selected based on the patient's functional level or "K" levels 0 to 4. Functional level is determined by the reasonable expectations of the Certified Prosthetist, Physical and Occupational Therapists, and the referring Physician. Considering factors include, but are not limited to:

- The patient's past history (including prior prosthetic use (if applicable))
- The patient's current and potential abilities and condition including the status of the residual limb and the nature of other medical problems

## INTRODUCTION TO PROSTHETICS

### Lower Extremity Functional Classifications Level (Cont'd)

- The patient's desire to ambulate with a prosthesis  
Clinical assessments of a patient's functional level are based on these classification levels:

Level 0: Does not have the ability or potential to ambulate or transfer safely without assistance and a prosthesis does not enhance quality of life or mobility.

Level 1: Has the ability or potential to use a prosthesis for transfers or ambulation on level surfaces at a fixed cadence. Typical of the limited and unlimited household ambulator.

Level 2: Has the ability or potential for ambulation with the ability to traverse low level environmental barriers such as curbs, stairs or uneven surfaces. Typical of the limited community ambulator.

Level 3: Has the ability or potential for ambulation with variable cadence. Typical of the community ambulator who has the ability to traverse most environmental barriers and may have vocational, therapeutic or exercise activity that demands prosthetic utilization beyond simple locomotion.

## INTRODUCTION TO PROSTHETICS

### Lower Extremity Functional Classifications Level (Cont'd)

Level 4: Has the ability or potential for prosthetic ambulation that exceeds basic ambulation skills, exhibiting in high impact, stress or energy levels. Typical of the prosthetic demands of a child, active adult or athlete.

Note: Bilateral amputees often cannot be strictly bound by functional level classifications.

-----  
-----

The prescription and design of a prosthesis is based on the patient's level of amputation, functional level classification (K0 - K4), and stage of healing (preparatory or definitive). Multiple descriptors are used to specify all the required elements of an appropriate prosthesis specific to each amputee. The most important part of any prosthesis is a comfortable socket.

## LOWER EXTREMITY PROSTHETIC PRESCRIPTIONS

---

### Usually Associated Prescription Terms

- Test socket(s) - used to diagnose socket fit before final fabrication
- Total contact - technique for preparing the socket to prevent skin problems
- Alignable system - allows for alignment adjustments and the interchanging of components
- Ultra-light material - increases material strength without adding weight
- Acrylic socket - allows socket to be adjusted after fitting
- Flexible inner - socket/external frame- permits muscle movement within the socket
- Suction socket - provides enhanced suspension of prosthesis

## LOWER EXTREMITY PROSTHETIC PRESCRIPTIONS

### Usually Associated Prescription Terms Continued

- Gel socket inserts (liner) – locking or non-locking. Provides comfort, skin protection, suspension
- Locking mechanism or suspension sleeve - provides suspension
- Foot - based on the patient's potential functional level and expected activities
- Knee - based on the patient's potential functional level and expected activities
- Custom shaped cover - cosmesis and protection of internal componentry
- Flexible outer surface cover (skin) - provides moisture protection
- Sheaths - used by the patient to make fine adjustments to prosthetic fit
- Socks - used by the patient to make adjustments to socket

## LOWER EXTREMITY PROSTHETIC PRESCRIPTIONS

---

### Usually Associated Prescription Terms Continued

- Shrinkers - Edema control, limb shaping, phantom pain control

### Specialty Prescription Terms

- Microprocessor control - improves stability and function
- Replacement socket - required for changes in the size and shape of residual limb that can't be achieved by adding socks
- Elevated vacuum socket - optimal suspension socket fit and reduced perspiration
- Axial rotation unit - allows lower limb to rotate at the knee allowing more natural gait, less strain on residuum
- Repairs - regular follow-up necessary to ensure optimal function and fit

### TYPES OF PROSTHETIC FEET

- Solid ankle cushion heel (SACH)
- Flexible keel
- Single axis
- Multi axial
- Dynamic response
- Energy-storing
- Combination of above



### TYPES OF PROSTHETIC KNEES

- Manual locking
- Stance/weight-activated locking
- Polycentric
- Pneumatic
- Hydraulic
- Microprocessor
- Combination of the above





## IMMEDIATE POST-OPERATIVE CARE

- Removable rigid dressing
  - Protect the patient from damaging limb due to falls
  - Prevention of flexion contractures
  - Aids in volume reduction and shaping the limb



## AMPUTATION LEVEL: PARTIAL FOOT

- Design
  - Type of amputation can have dramatic effect on gait due to loss of lever arm (toes and metatarsals)
  - Variety of prosthesis may be used depending on level of amputation



## AMPUTATION LEVELS: SYMES

- Design
  - Amputation level is an ankle disarticulation
  - Prosthetic socket usually extends to the knee due to increased forces on the limb
  - A low profile foot is used to match the height of the opposite side



## AMPUTATION LEVELS: TRANSTIBIAL

- Design
  - Numerous styles and configurations available
  - Considerations of selection include
    - Diagnosis
    - Past medical history
    - Shape
    - Length of residuum
    - Activity level
    - Surgical issues
    - Cognition
    - Goals of the patient



## AMPUTATION LEVELS: TRANSFEMORAL (AK)

- Transfemoral or above knee (AK)
  - Numerous styles and configurations available
  - Considerations of selection include
    - Diagnosis
    - Past medical history
    - Shape
    - Length of residuum
    - Activity level
    - Surgical issues
    - Cognition
    - Goals of the patient



## AMPUTATION LEVELS: HIP DISARTICULATION

- Hip disarticulation/hemipelvectomy
  - Socket is designed around a total contact shell
  - Uses contralateral side for suspension and stabilization
  - Numerous feet and knees available to provide individual with appropriate prosthesis that will maximize their potential functional ability





## PROSTHETICS: UPPER EXTREMITY

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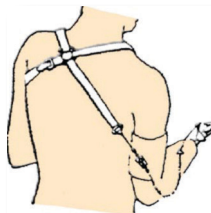
### UPPER EXTREMITY PROSTHETIC OPTIONS

- **Oppositional (Passive)**
  - Devices meant to oppose the sound hand/or remaining digits of partial hand
  - Made for specific tasks or for high definition cosmetics
  - Does not provide active prehension



### UPPER EXTREMITY PROSTHETIC OPTIONS

- **Cable-Operated (Body-Powered)**
  - Uses a cable and harness for control of terminal device and suspension of the prosthesis
  - Can be made very heavy duty for rough environments
  - A minimum amount of range of motion and strength are required for use
  - Easily maintained
  - A minimum amount of occupational therapy is required



### UPPER EXTREMITY PROSTHETIC OPTIONS

- **External-Powered**
  - Uses a battery to operate a terminal device
  - Most often controlled by EMG signals on residual limb
  - Not recommended around certain environments or for rough activities
  - May require more maintenance
  - Increased grip force compared to other systems



### UPPER EXTREMITY PROSTHETIC OPTIONS

- **Hybrid System**
  - Combines the technology of above systems
  - Heavier duty and lighter weight than pure electric system
  - May require harness for suspension
  - Lower amounts of body motion and energy are required



## UPPER EXTREMITY PROSTHETIC OPTIONS

- Activity Specific
  - Specialty terminal device
  - Designed for specific activity
  - Can attach to existing device
  - Wide variety of tools and adaptations available depending on activities of daily living needs



## UPPER EXTREMITY TERMINAL DEVICES

- Passive Hand
  - Meant to provide the appearance of sound hand
  - Does not provide prehension
  - Can be covered with a high-definition glove for maximum cosmetics





### UPPER EXTREMITY TERMINAL DEVICES

- **Mechanical Hand**
  - Used on cable operative devices
  - Moderate durability
  - Provides appearance of hand
  - Moderate function



### UPPER EXTREMITY TERMINAL DEVICES

- **Mechanical Hook**
  - Used on cable-operated devices
  - Highest durability for prosthetic terminal devices
  - Many different shapes sizes
  - Poor cosmetics



## UPPER EXTREMITY TERMINAL DEVICES

- Electric Hand
  - Used on external powered devices
  - Heavier than mechanical
  - Provides grip force of over 20 lbs with minimal effort
  - Very natural appearance



## UPPER EXTREMITY TERMINAL DEVICES

- Electric Hook
  - Used on external-powered devices
  - Very high grip strength
    - Some over 40lbs
  - Moderate durability
  - Some are resistant to water/dirt



### UPPER EXTREMITY AMPUTATION LEVELS

- **Partial Hand**

- Cosmetic restorations are very lifelike and well-accepted
- Wide variety of oppositional devices
- Advancements with body-powered and external- powered devices provide enhanced grasping patterns



### UPPER EXTREMITY AMPUTATION LEVELS

- **Wrist Disarticulation**

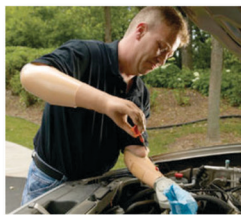
- Various socket designs used
- Various suspension available
  - Suction
  - Gel liner with pin
  - Harness
- Length of limb determines components used to prevent length discrepancy



### UPPER EXTREMITY AMPUTATION LEVELS

- **Transradial**

- AKA Below elbow(BE)
- Various socket designs used
- Based on length of residual limb
- Various suspension available
  - Suction
  - Gel liner with pin
  - Harness
- Numerous terminal devices available



### UPPER EXTREMITY AMPUTATION LEVELS

- **Elbow Disarticulation**

- Provides longer lever-arm for axial loading and control
- Outside hinges often used
  - Assist with flexion
  - Make prosthesis more bulky
- Various suspension available
  - Suction
  - Gel liner with pin
  - Harness
- Components
  - Reduce cosmesis
  - Limit wearing certain clothes



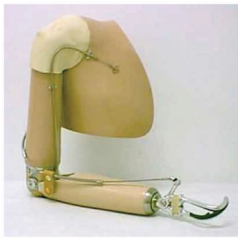
## UPPER EXTREMITY AMPUTATION LEVELS

- **Transhumeral**
  - AKA. Above Elbow (AE)
  - Suspension usually achieved by harness
  - Requires more body motion for control



## UPPER EXTREMITY AMPUTATION LEVELS

- **Shoulder Disarticulation**
  - Suspension is achieved through harness
  - Experience and expertise in fitting and attaining appropriate function are key to positive results
  - With addition of a shoulder joint, this level incorporates all the components of transhumeral level



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**ALJAN CO.**

Phone: **(608) 257-4256** Fax: **(608) 257-7220**

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