

AQIPA & OAAC 2nd Joint Conference

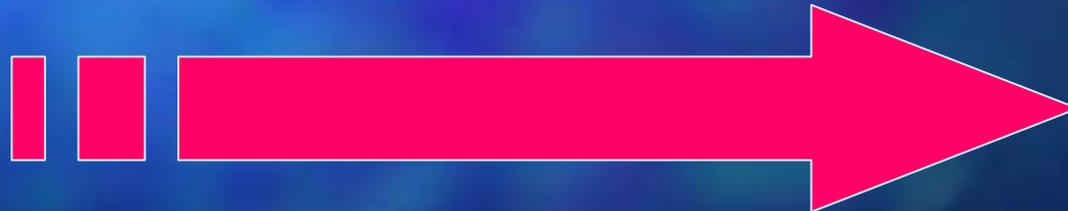
**The Evolution of Upper Extremity
Prostheses for Sports and
Recreation**

By

Robert (Bob) Radocy

GOAL

Achieving Competitive
Bimanual Performance in
Sports and Recreation



The Concept of Activity Specific Prostheses

A prosthesis designed for optimum performance for a single purpose or limited multiple purposes.

A prosthesis that may vary radically in design from a traditional prosthesis in order to satisfy the “optimum performance” criteria.

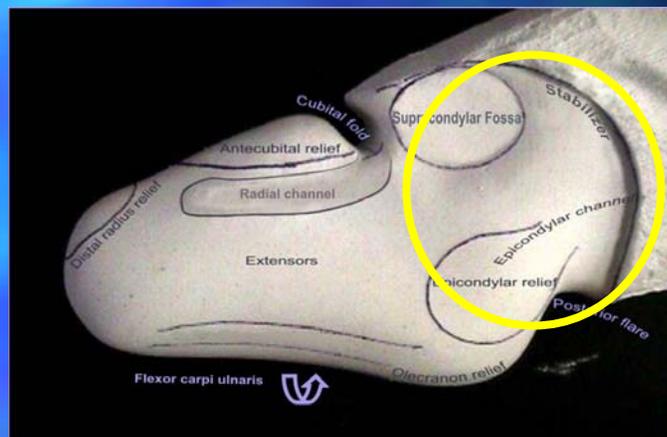
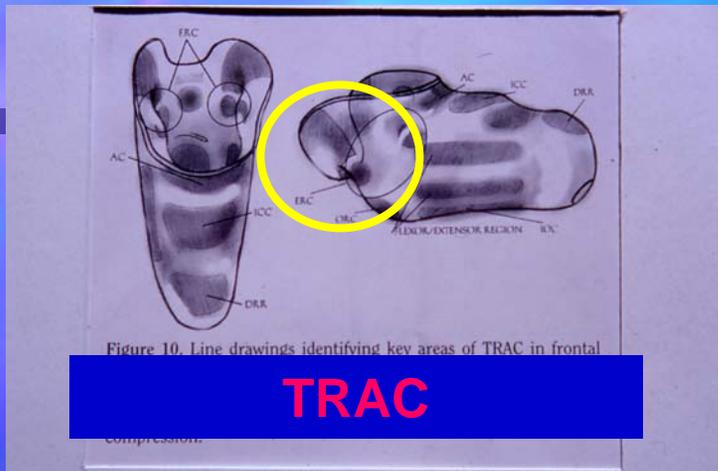
BALANCE

PERFORMANCE



Physical Rehabilitation Prosthetic Rehabilitation

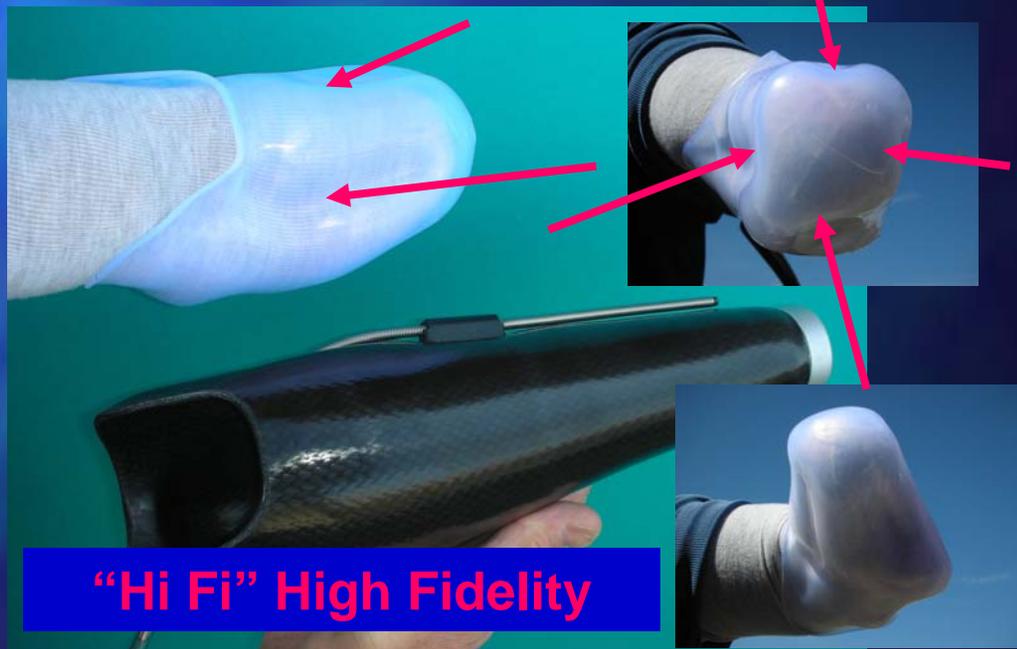
21 Century Sockets and Interfaces



ACCI



“Open” Lattice Interface

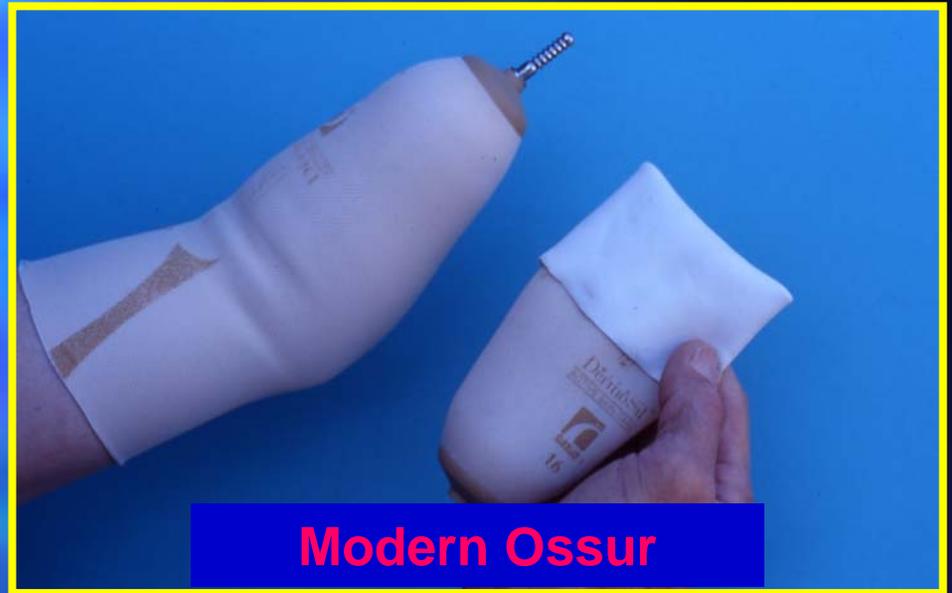


“Hi Fi” High Fidelity

Socket and Interface Designs



Coyote Custom Silicone

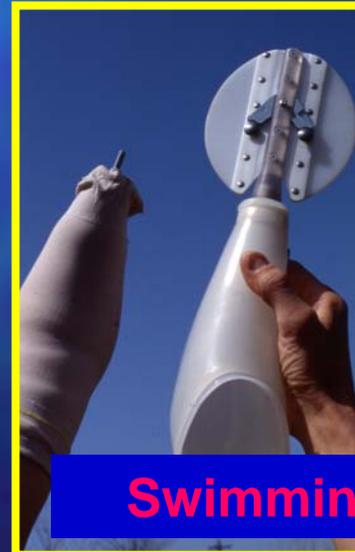


Modern Ossur



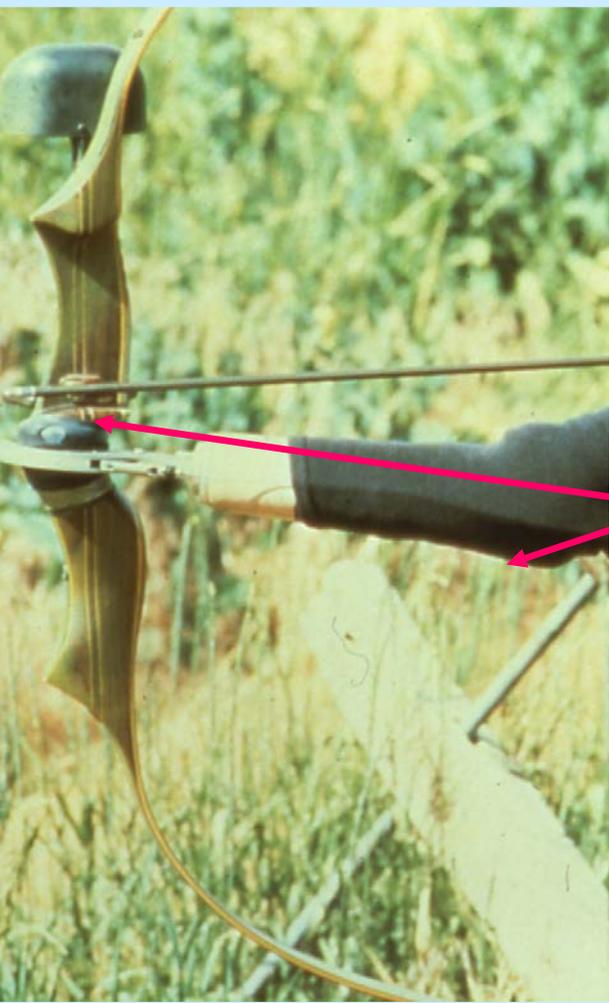
3S Variable Suspension

Wide Brim

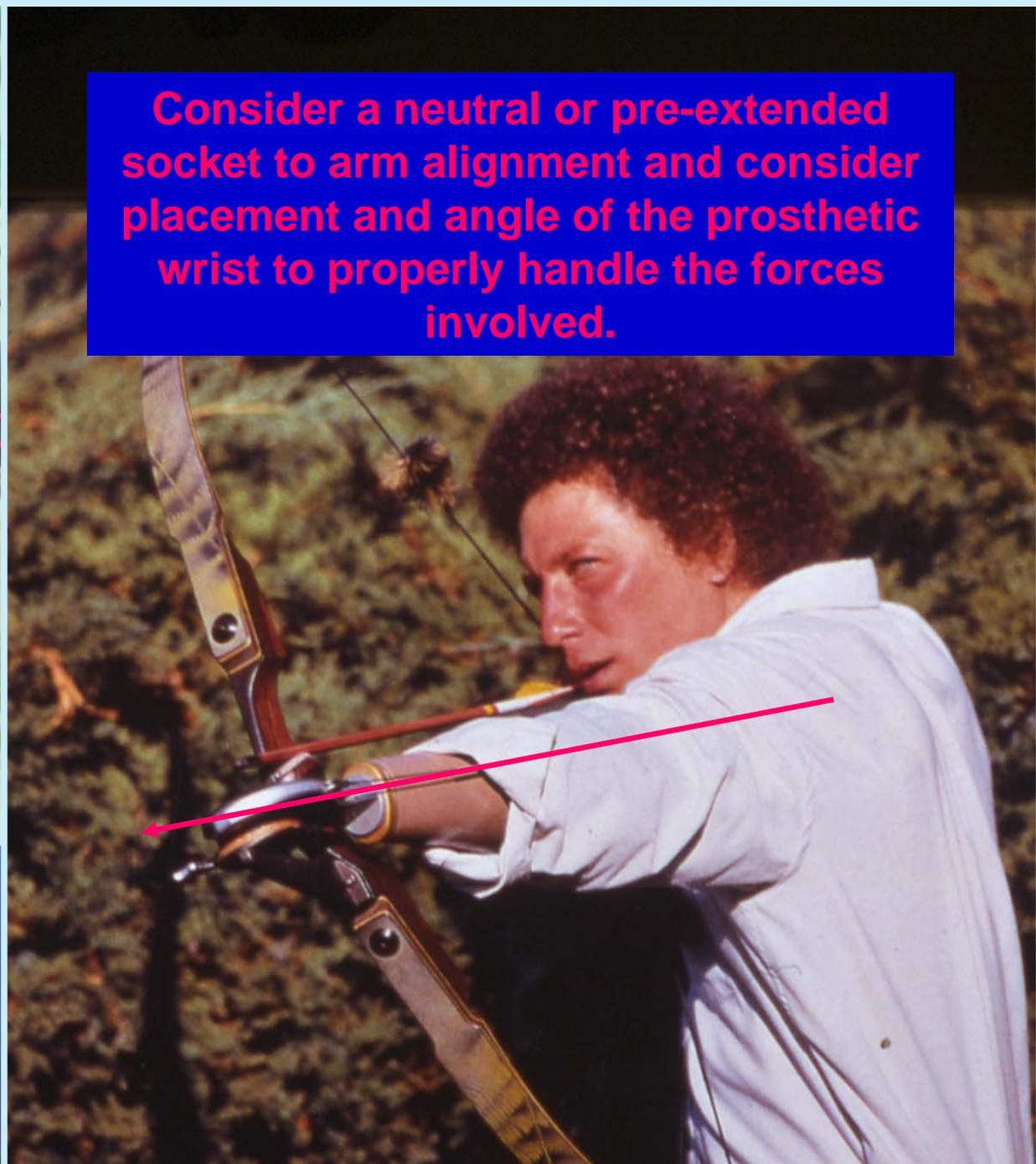


Swimming Prosthesis





Consider a neutral or pre-extended socket to arm alignment and consider placement and angle of the prosthetic wrist to properly handle the forces involved.



Bio-mechanical Considerations

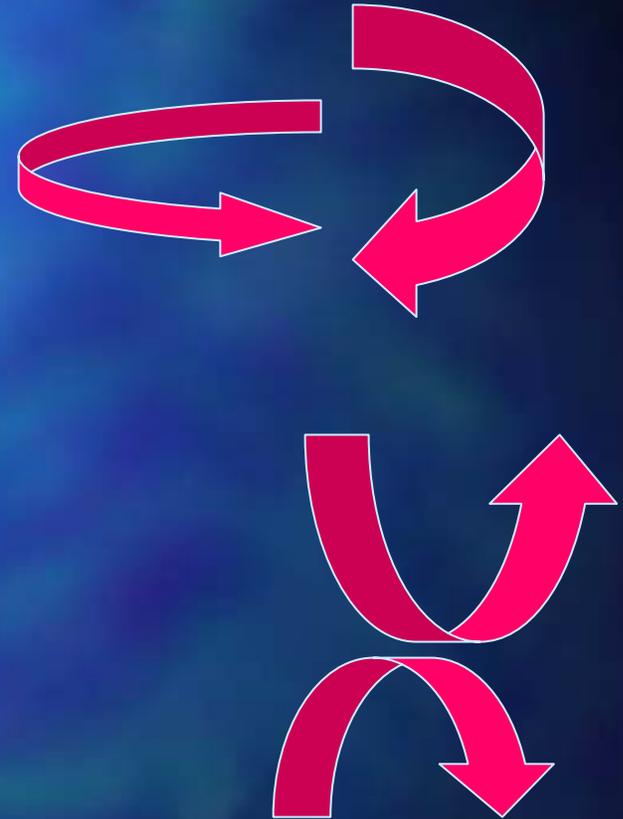
Why ?

“To achieve performance with a prosthesis in a particular sport or recreation , the bio-mechanical elements and demands of the activity must be understood and duplicated.”

“Duplicating the bio-mechanics provides for the control and transfer of energy from the body through the limbs (anatomical & prosthetic), resulting in or facilitating some predetermined action.”

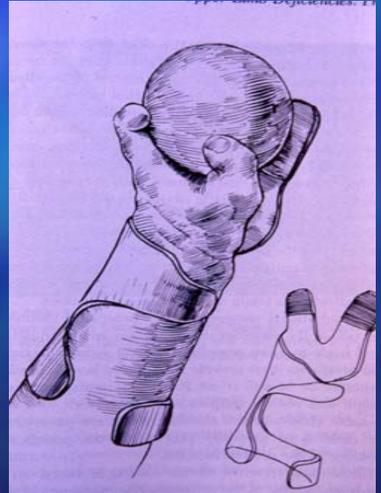
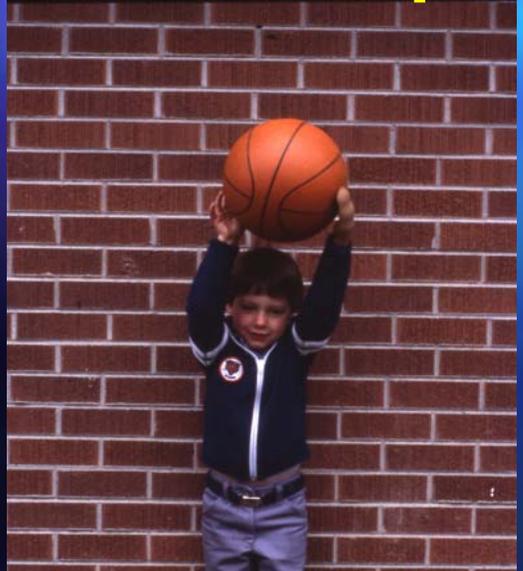
Bio-mechanical Considerations

- Basic Prehension
- Wrist Flexion/Extension
- Pronation/Supination
- Elbow Flexion
- Humeral Flexion/Extension
- Humeral Ab & Adduction





Ball Sports



Duplicating "Volar" or "Palmer" Function and Control

Ball Sports



Protective Neoprene Sleeve



Baseball & Softball Bat



Swinging





Golf

Fragment — Winter, 1983

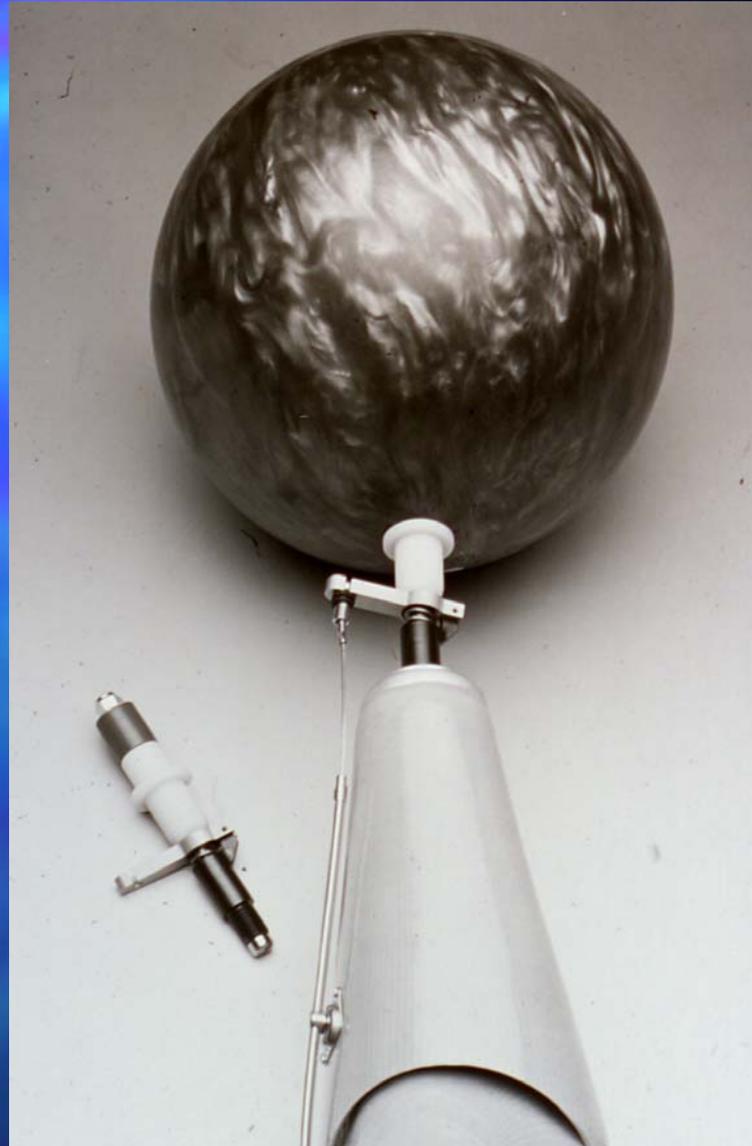


Innovative Activity Specific Designs

Short, Trans-Humeral Golf/Sports Prosthesis



Bowling





Steering



Driving

Riding



Driving /Steering



Bike/Trike

Hand Brakes



Foot Brakes

Hydraulic Bike Brakes & Gear Shifting Controls



Canoeing/Kayaking

Windsurfing

Water Skiing

Mountaineering

Fishing

Hockey



Canoeing & Kayaking



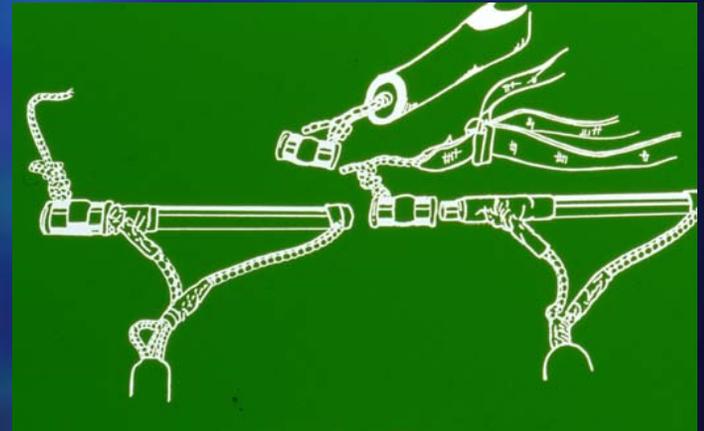
KAYAKING



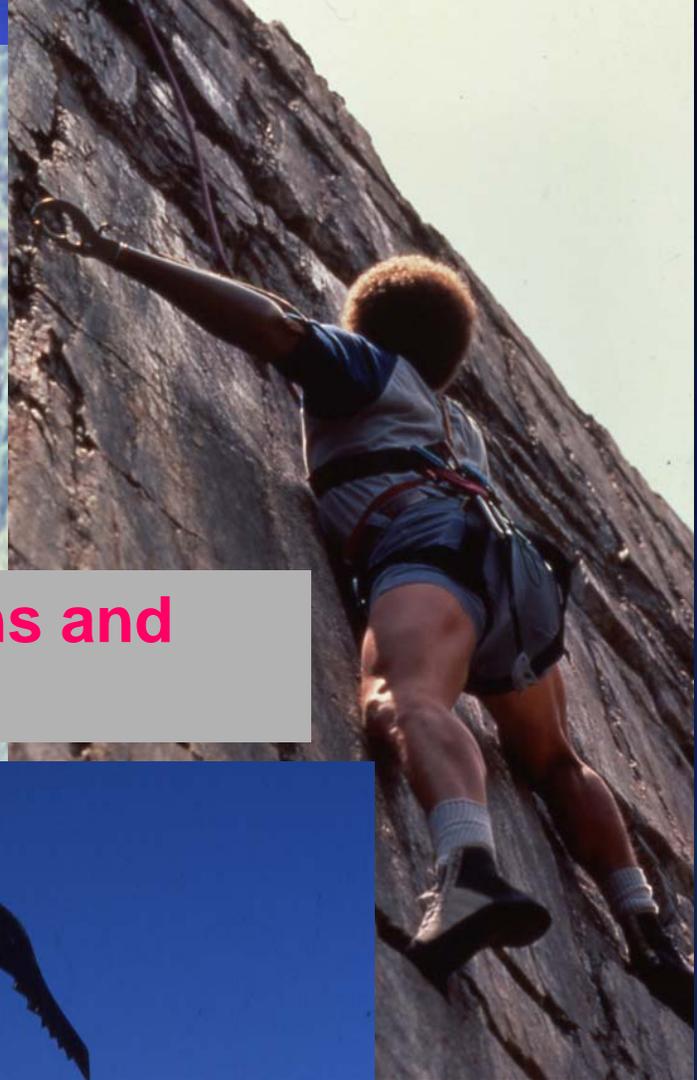


Windsurfing

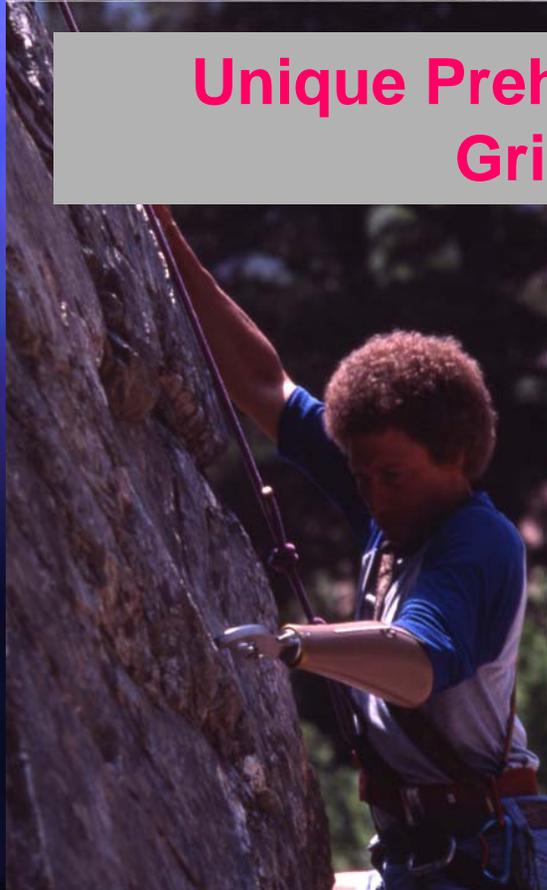
Water Skiing



Mountaineering

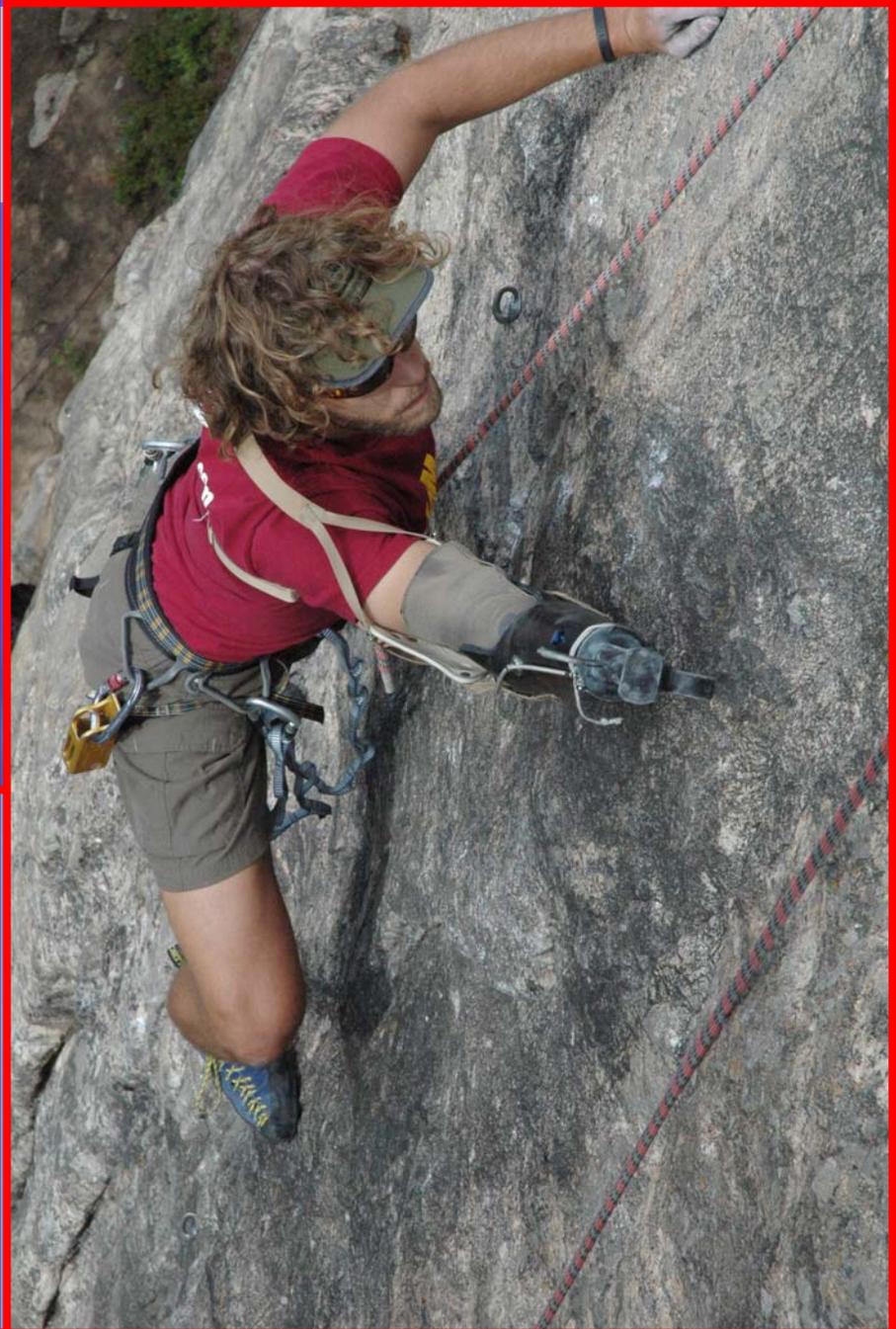


Unique Prehension Patterns and Gripping Force

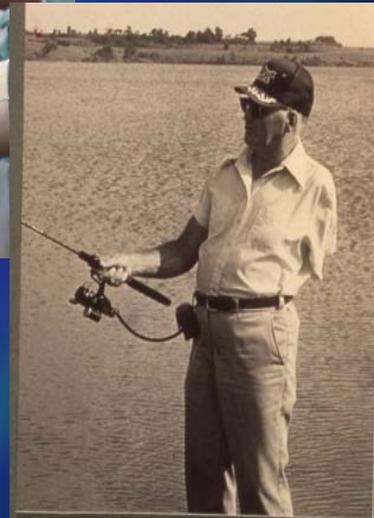
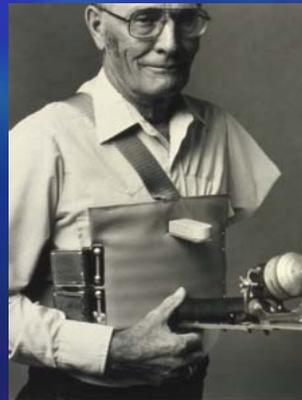


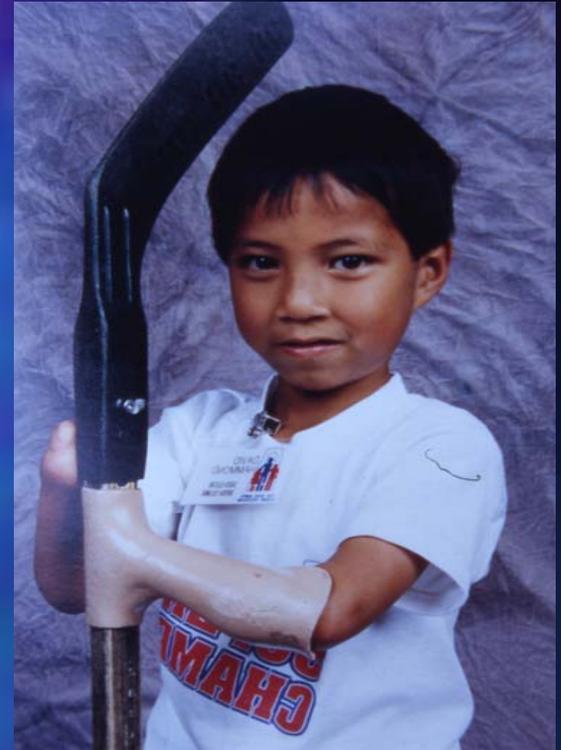
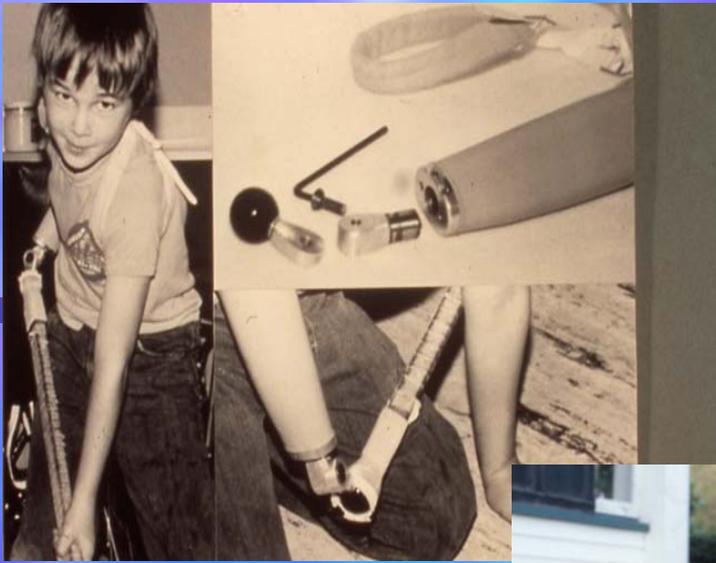


Aron Ralston Photos by Lauren Discipio



Fishing





HOCKEY

Kids



Hockey

Adults

POWER PLAY HOCKEY TD.

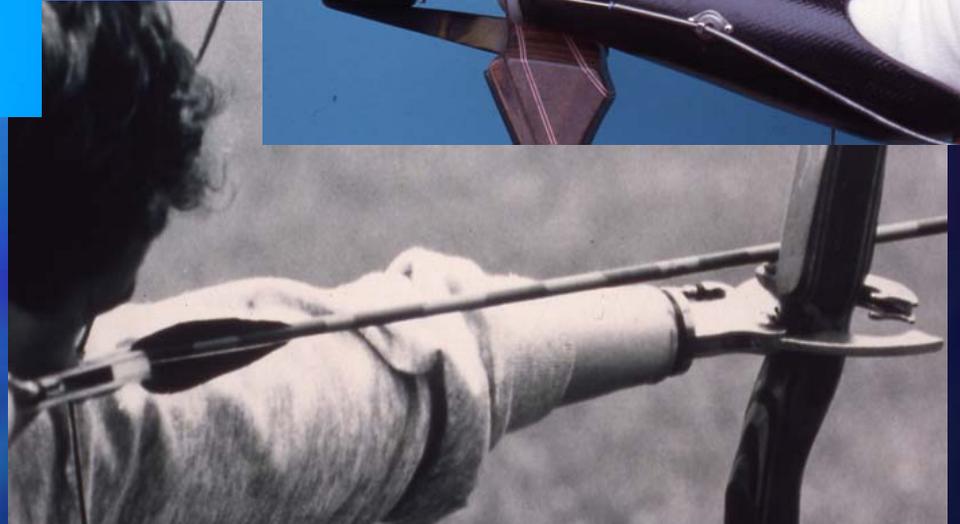
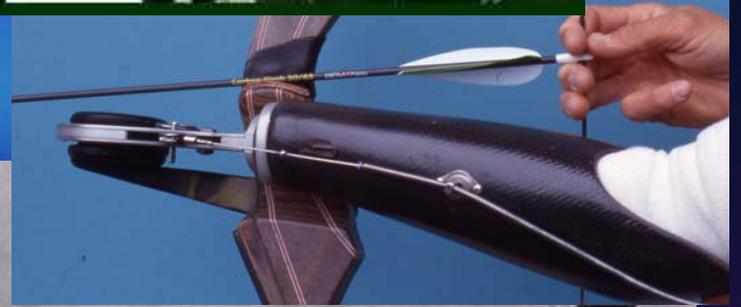


Archery

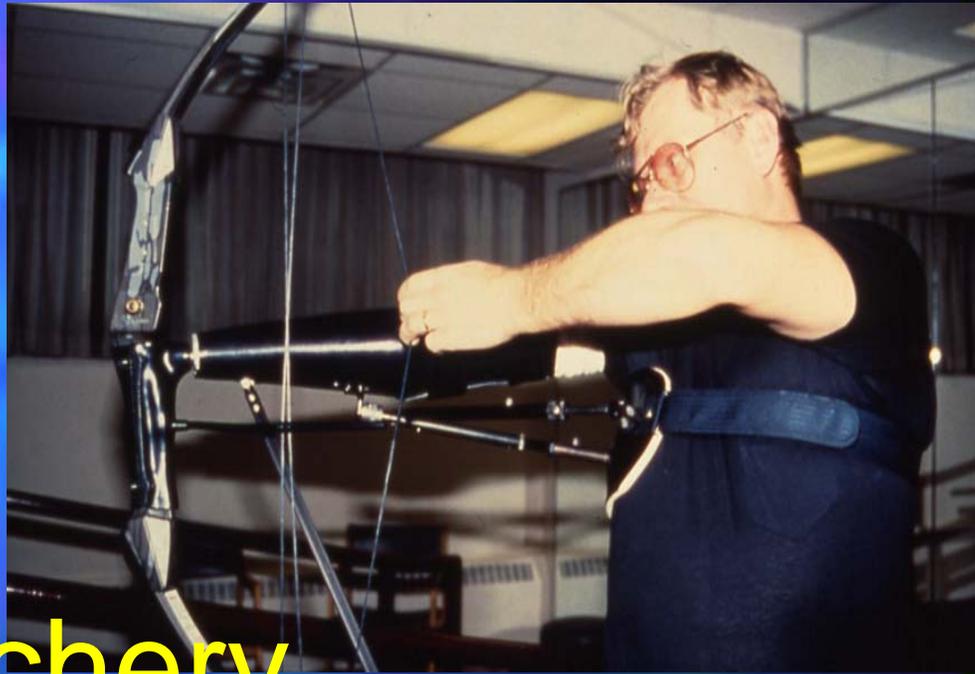
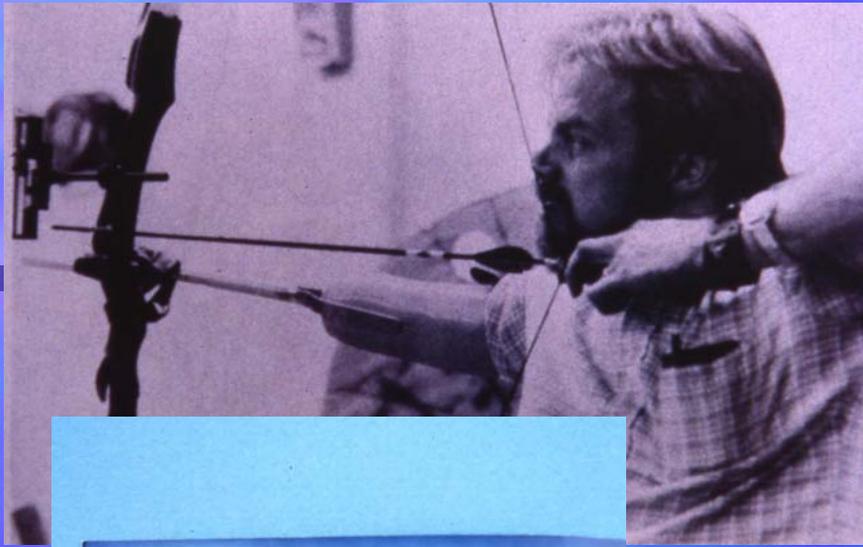


Weight Lifting

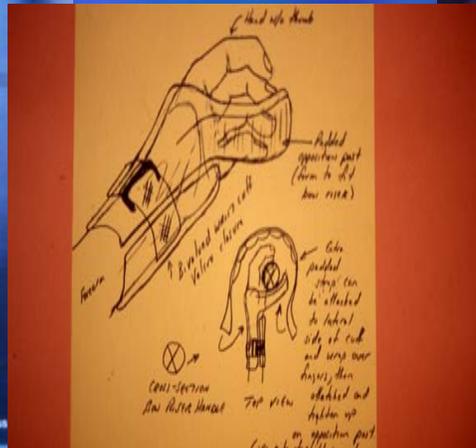
ARCHERY



Prosthetic Stability, Alignment & Control



Archery



Weight Training



High Performance Weight Lifting Prosthetic Components



**Black Iron Master and
Trainer TD's**



Swimming

Fielding & Catching

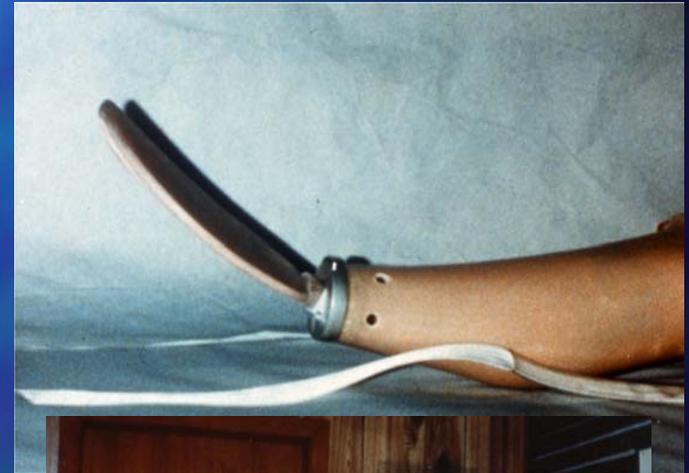




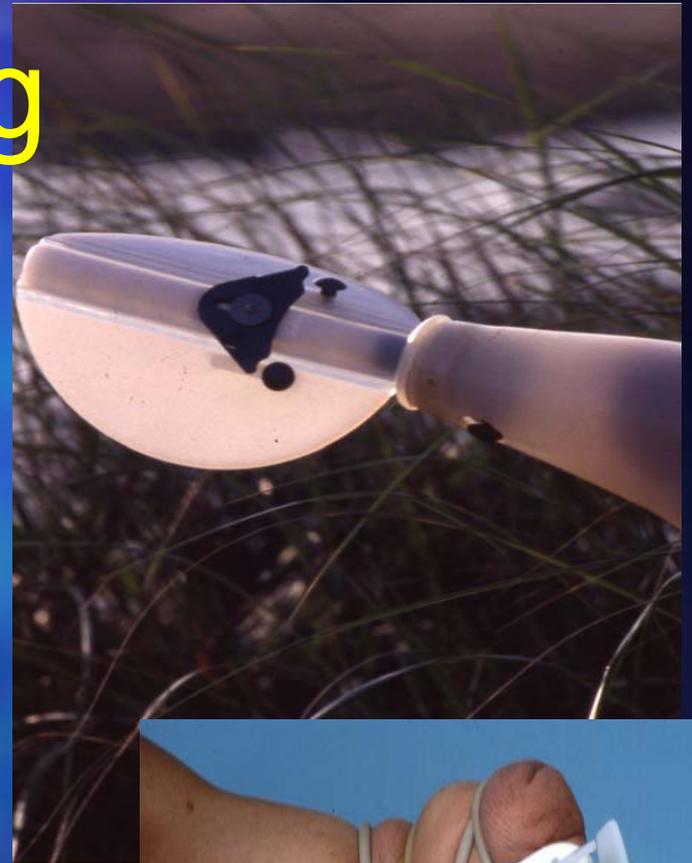
Swimming



ALIGNMENT



Swimming



Specialized Activities



Amp-u-pod

Special Accessories

Hustler



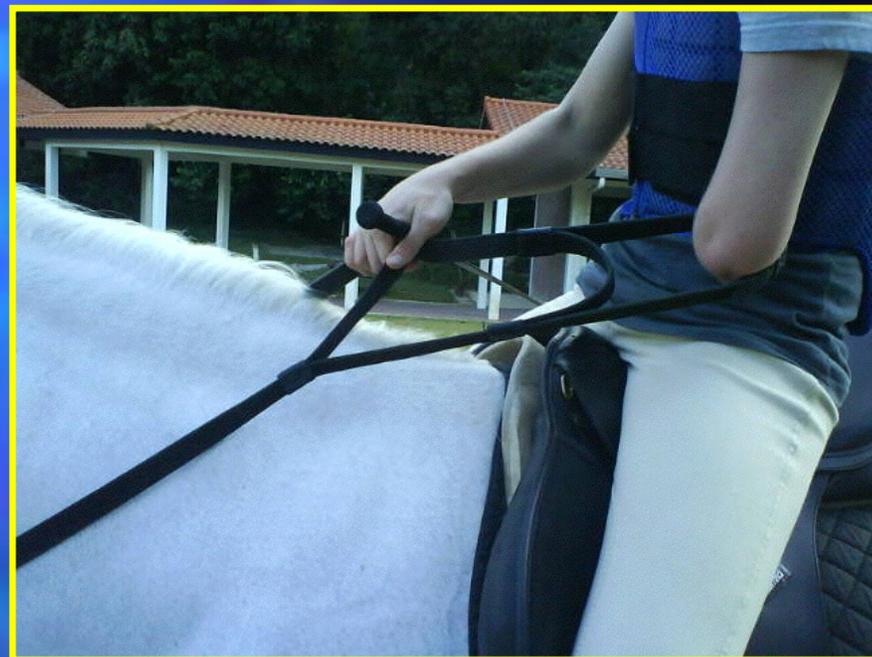
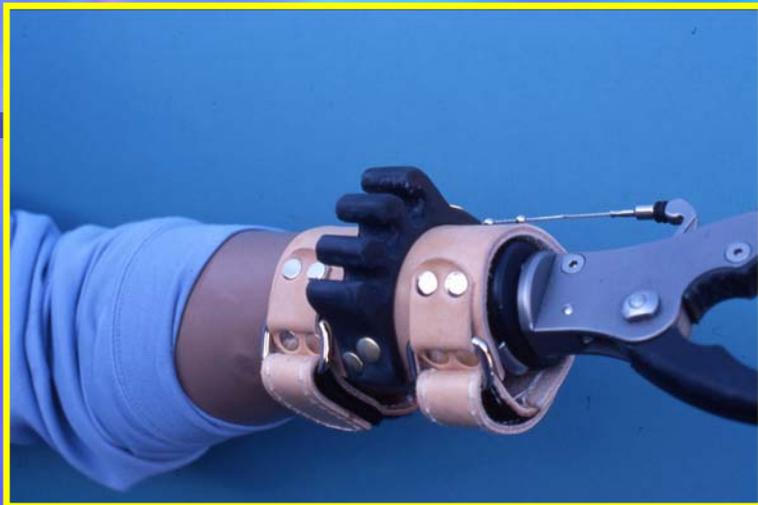
Shroom Tumbler



Musical
Adapters



Equestrian-Riding & Roping

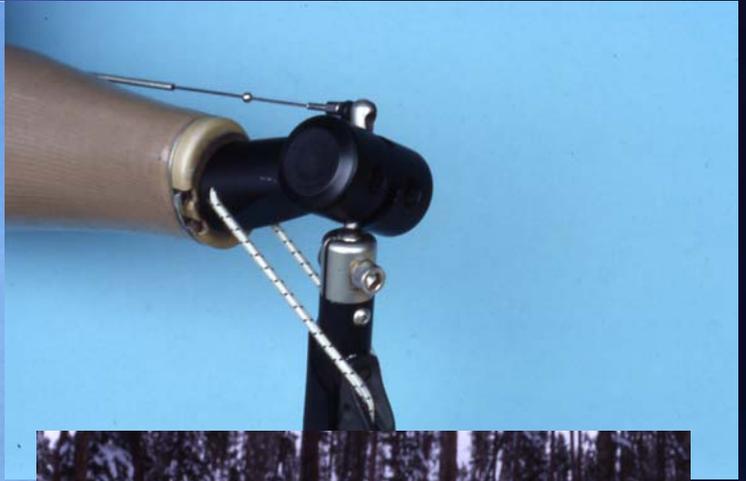


FIREARMS



Lamprey Gun Turret





Skiing

Martial Arts Wrestling & Boxing



DRAGON



Kahuna Surfing TD



The End

Thank You!