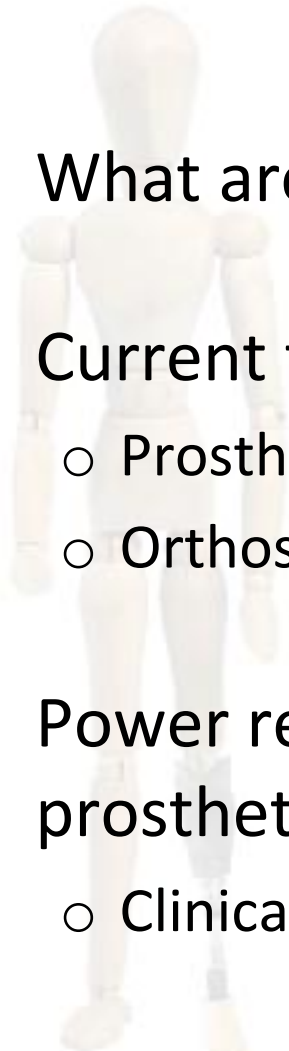




Energy Requirements for Prosthetic and Orthotic Devices in Research and Clinical Applications

Arjan Buis

Overview

- 
- What are prosthetics and orthotics?
 - Current features of existing
 - Prosthesis
 - Orthosis
 - Power requirements for prosthetics/orthotics
 - Clinical/research

What are prosthetics and orthotics?

- 
- **Prosthetics** are interventions designed to REPLACE a part of the body that is absent, usually due to amputation, trauma or congenital deformity.
 - **Orthotics** are interventions that are designed to RESTORE function to a part of the body that is not able through illness, trauma or congenital deformity to function properly.

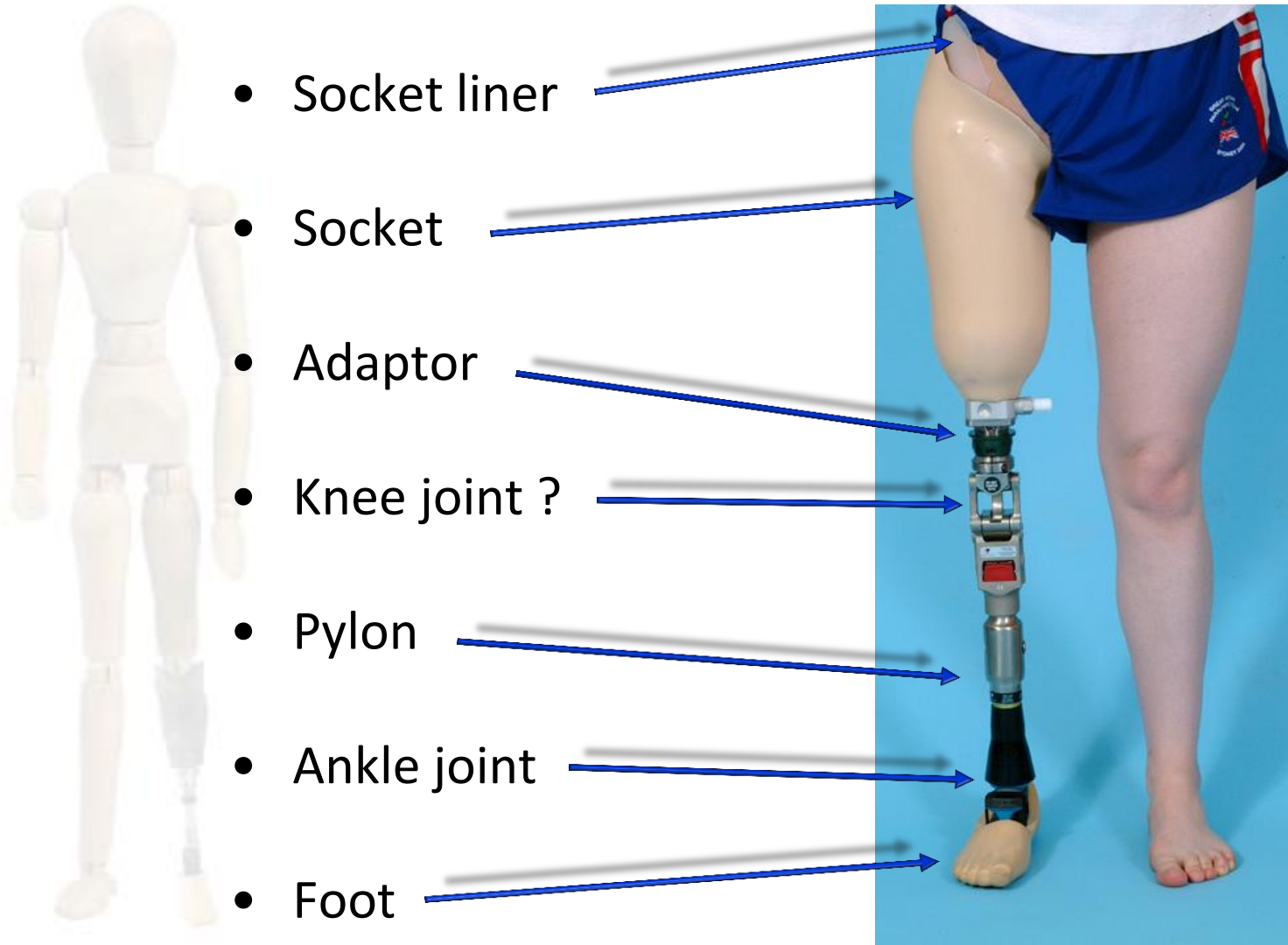
Some common prostheses



Some common orthoses



Prostheses components

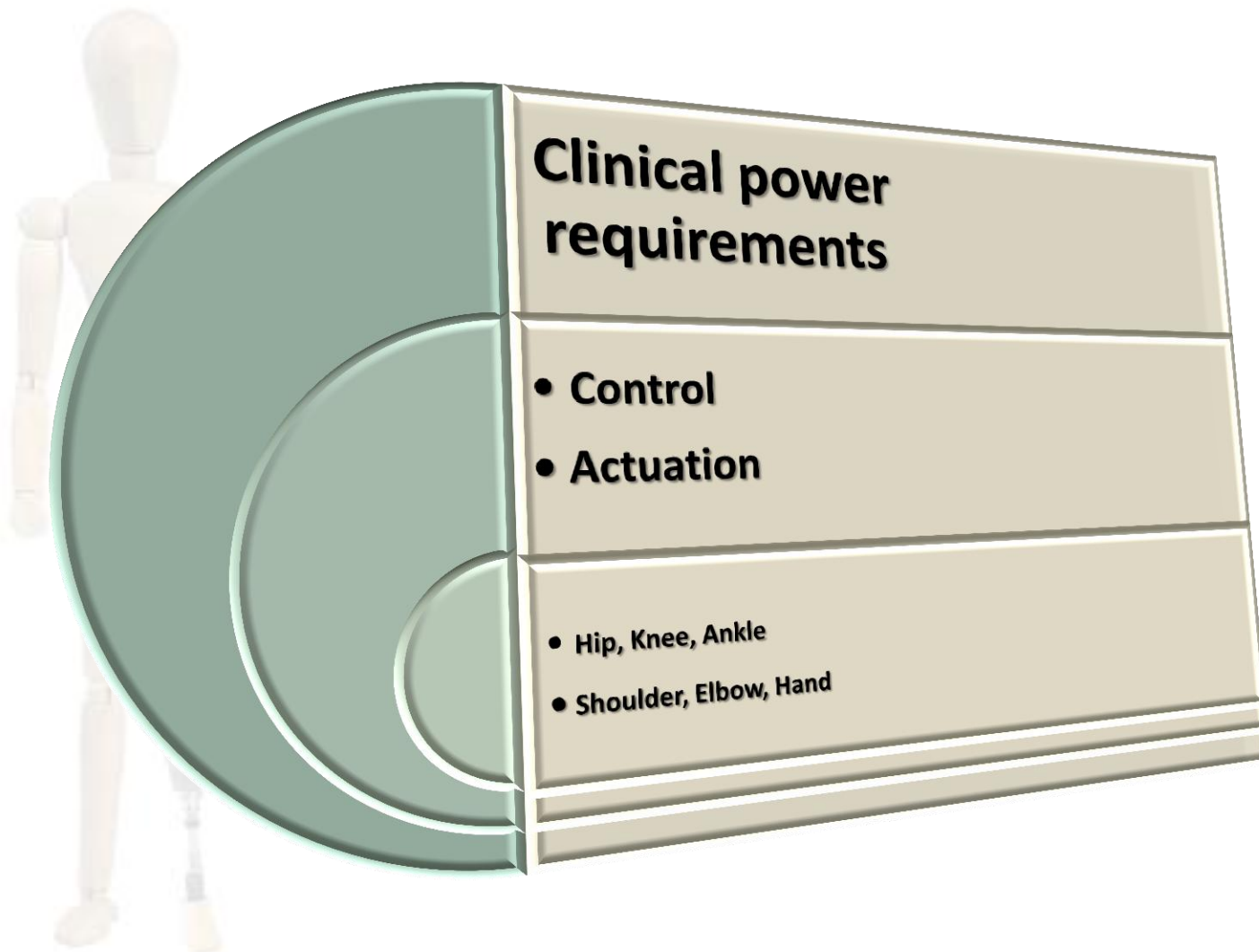


Limb orthoses

- Moulded interventions from a variety of materials.
- Usually patient specific, but can be generic.
- Can be used to aid daily life or for exercising.
- Function of orthoses
 - augmentation
 - training
 - dynamic correctional devices

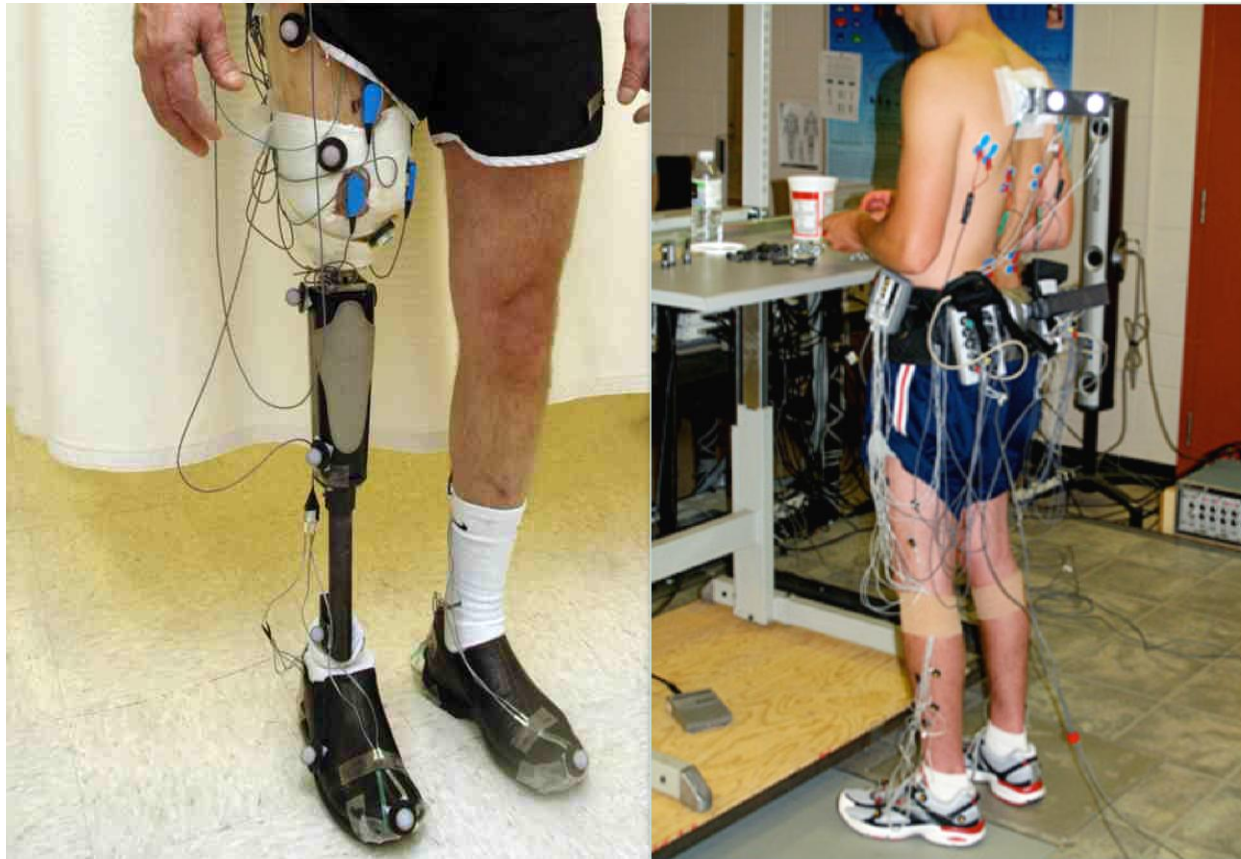


Clinical power requirements for P&O





Research requirements



- Oxygenation
 - Dynamic interface pressure & shear.
 - Motion tracking
 - Activity monitoring
 - Bone movement
 - Temperature
 - Foot pressure
-
- Tele-Health (monitoring of intervention status)

Harvesting opportunities

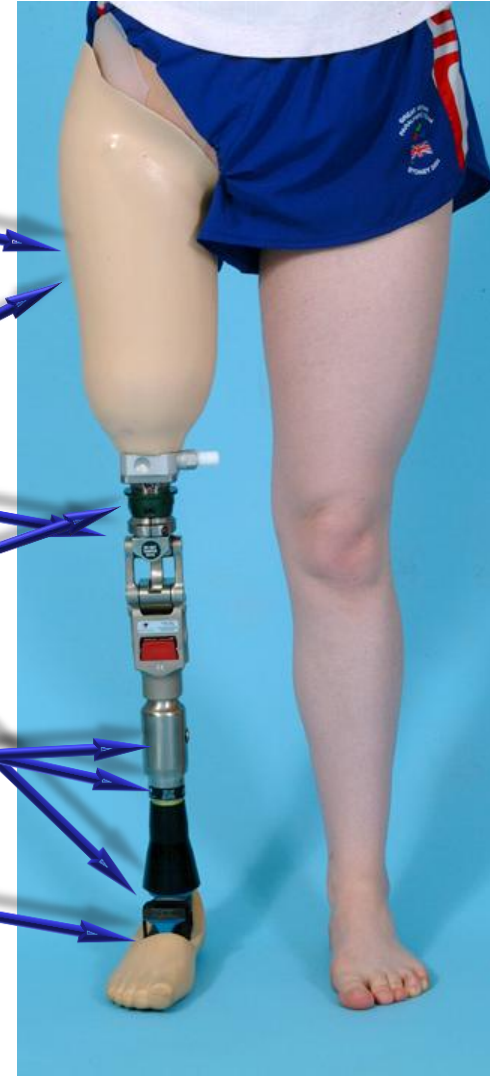
Thermal energy (i.e. body device interface thermal differential)

Motion energy:

Flexion & extension of components.
(Hydraulic control units).

Structural deformation

Shock absorption/
dissipation



Thank you

