

Motor/Mobility

Bum Jun (Todd) Park

Outline

- Seating
 - Poster Control
 - Tissue integrity
 - Seating Technologies
- Mobility
 - Components/Assessments
 - Assistive Technology: Wheelchairs
 - On campus example

Posture Control

- Cerebral palsy and Neuromuscular disorders
- Stability
 - Sliding forward in the seat or lateral or anterior trunk flexion
- Spinal Cord Injury (SCI)
 - Individuals with low or absent tone cannot maintain a sitting position b/c of loss of strength and endurance.

Tissue Integrity Pressure Redistribution

- Pressure Ulcer
 - Injury to skin and underlying tissue resulting from prolonged pressure on the skin
 - Approx. 25% of the health care costs of a SCI patient

- Pressure Redistribution

Real-life application



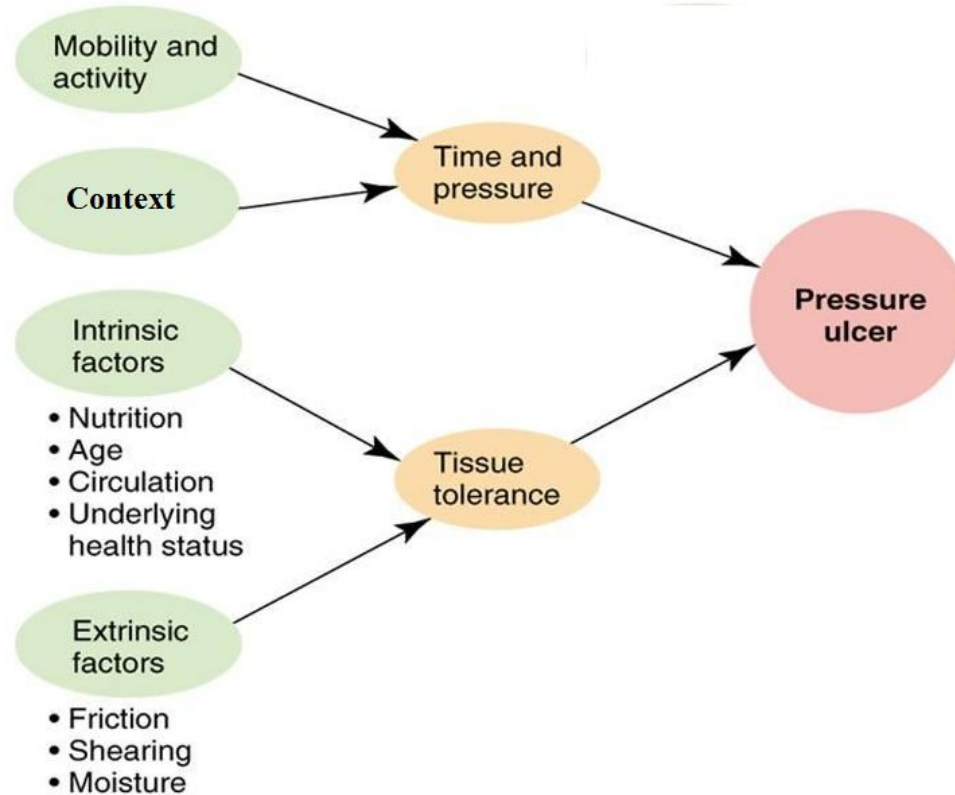
Pressure is more evenly distributed along the foot.
Your foot is less likely to hurt!



Pressure is greater on heel and at front sole



Pressure ulcer risk factors



Seating Technologies

- Planar Cushions

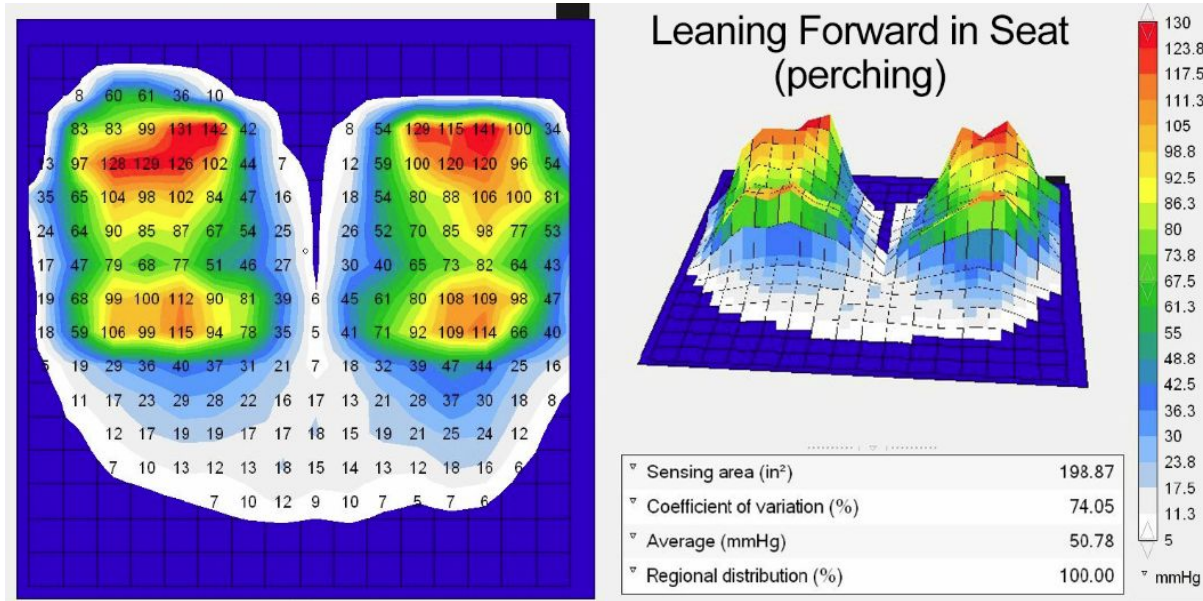


- Contour Cushions



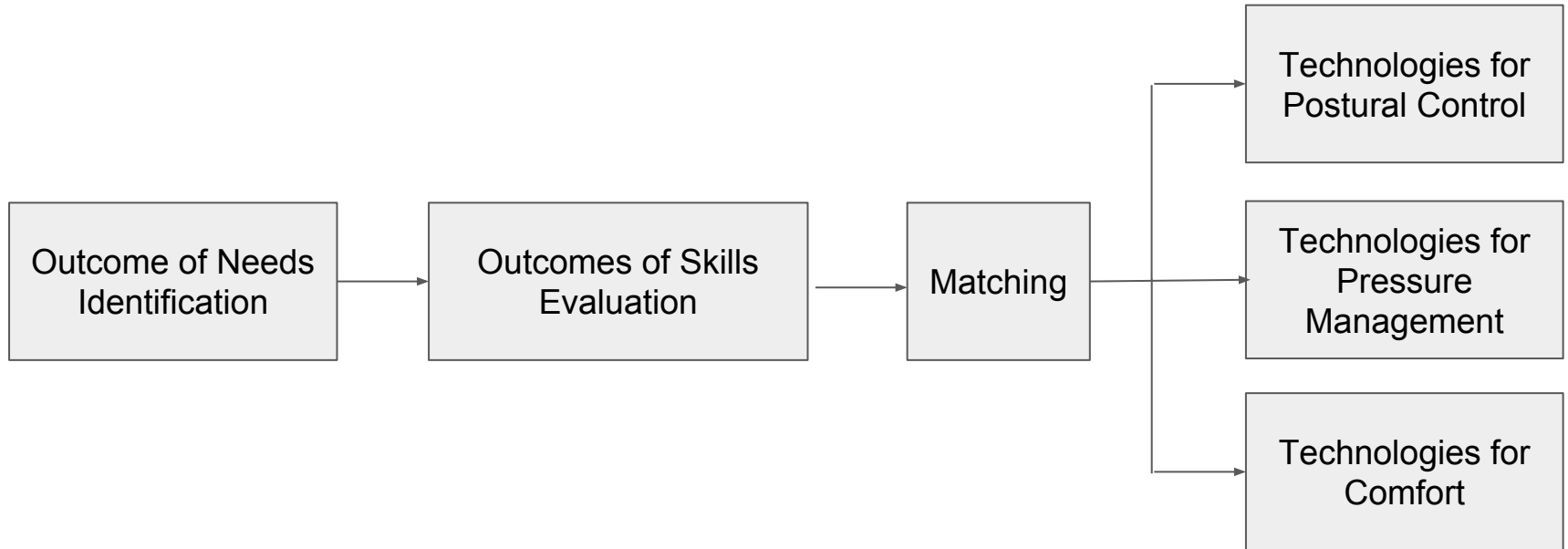
Pressure Measurements

- Pressure mapping



Seating Assessment

- Seating Assessment Framework



Human Factors

- Orthopedic Factors
- Postural Control
- Respiratory and Circulatory Factors
- Sensory and Perceptual Skills
- Cognitive skills
- Psychosocial Factors

Guidelines for Postural Control

- Pelvis and Lower Extremities
 - Pelvic obliquity & Pelvic rotation
- Trunk
 - Scoliosis
- Head and Neck
- Upper Extremities

What do we mean by mobility?



Components

- Activity
 - Identifies the occupations
 - Frequency of use of the wheelchair
- Human
 - Older adults
 - Obesity
 - Accessibility legislation
- Context
 - Physical
 - Social
 - Cultural
 - Institutional

Assessment for Wheeled Mobility

- Needs Assessment
 - The most appropriate wheeled mobility for activities which the individual's wishes to engage.
 - The clinician determines which activities are important and necessary for the users

- Factors to consider when selecting a wheelchair
 - Consumer profile: disability, date of onset, prognosis, size, and weight
 - Consumer needs: activities, contexts of use, preferences, transportation, reliability
 - Physical and sensory skills: range of motion, motor control, strength, vision, perception
 - Functional skills: Transfers and ability to propel

Anatomy of a Wheelchair



Cool Wheelchair videos

Moto+ wheelchair

<https://www.youtube.com/watch?v=3NUjnleAlJg>

Future Wheelchair

<https://www.youtube.com/watch?v=WiJNLhDxmXs>

<https://www.indiegogo.com/projects/hovering-steprover-new#/> Crowdfunding

Types of Wheelchairs

<https://www.karmanhealthcare.com/different-types-of-wheelchairs/>

<http://www.topenswheelchair.com/our-chairs/>

<https://www.youtube.com/watch?v=8N4KCZuOkh8>

Power-Assist Mechanisms

Powered Wheelchairs Safety

- The National Institute for Rehabilitation Engineering (NIRE) report
- **High injury rates** are reported for disabled people using power wheelchairs
- Recommendations
 - Never buy a mobility aid from an advertiser or vendor without first having it recommended by a physician or therapist
 - Have the seller visit the user at his/her residence: to adjust it to fit the user
 - Arrange for a mobility trainer
 - Make it a firm policy to never attempt to drive the mobility aid under conditions that are new to you, such as at the beach or outdoors

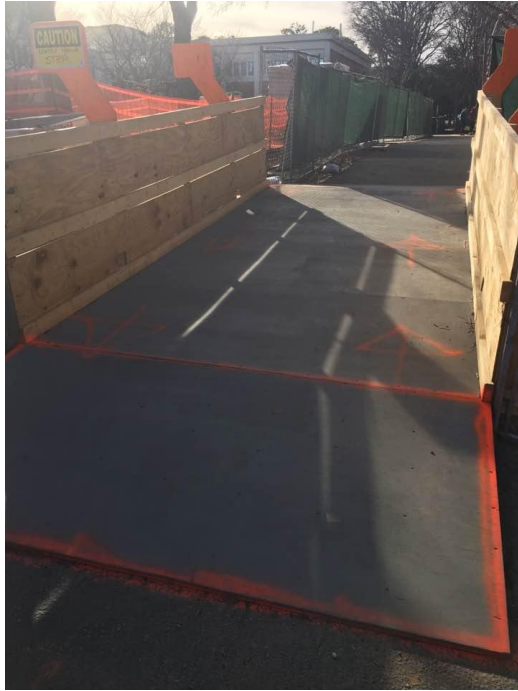
On Campus



On January 24th



On February 10th



On January 24th



On February 10th

Questions?

Cool Powered Wheelchairs

https://www.youtube.com/watch?v=oVs_4dtNERY