

Fundamentals in Assistive Technology

Mobility



Mobility Technology



Learning Outcomes

- Identify the impairments that cause a person to need mobility technology
- Identify the steps in assessing clients for mobility technology
- Identify the major characteristics and features of different mobility technologies



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Mobility

Mobility

- Goals of mobility
- Assessment
- Mobility Options
- Related factors



Mobility Goals

- Independence in moving throughout the environment and completing functional tasks
- Safety
- Efficiency



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Mobility Assessment

- Determine the optimal category of mobility options
- More than one mobility option may be needed



Mobility Assessment

- Motor skills
- Vision and visual perceptual skills
- Cognition
 - Mobility concepts
 - Judgment



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Mobility Options

- Assisted Ambulation
- Dependent Mobility Bases
- Manual Wheelchairs
- Power Assist Wheels
- Power Operated Vehicles
- Power Wheelchairs



Assisted Ambulation

- Canes
- Crutches
- Walkers
- Gait Trainers



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Dependent Mobility Systems

- Not designed for self-propulsion
- Aka Strollers
- Transport chairs



Dependent Mobility Bases

Clinical indications:

- For the very small child
- Caregiver preference
- Ease of transport (folding and lightweight)
- As a back-up to a manual wheelchair



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Manual Wheelchairs

- Pediatric
- Lightweight
- Ultralightweights
- Sports Chairs
- Tilt
- Recline



Pediatric Manual Wheelchairs

- Accommodates smaller dimensions
- Growth varies frame to frame
- Low seat to floor height



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Self-Propulsion Considerations

- Weight
- Rear wheel placement
- Camber
- Front caster
 - Size
 - Loading
- Optimize efficiency
- Stability vs. maneuverability and turning radius



Alternative Propulsion Patterns

- One hand
- One hand, one foot
- Both feet



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Tilt, Recline and Standing



Power Assist Wheels

- Improves efficiency
- Increases weight and cost
- May preserve shoulder function



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Power Operated Vehicles

- POVs: aka Scooters
- Features vs. power wheelchairs
 - Consumer Preference
 - Transport
 - Maneuverability
 - Stability
 - Distance, power and speed
 - Motoric requirements



Power Wheelchairs: Clinical Indicators

To provide independent mobility if other forms of mobility technology cannot be used at all or efficiently



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Power Wheelchairs

- Drive wheel configuration
- Power actuators
- Access methods
- Programming
- Built-in features
- Interfacing



Drive Wheel Configuration

- Front
- Mid
- Rear



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Power Actuators

- Tilt
- Recline
- Seat Elevator
- Elevating Legrests
- Standing
- Other



Access Methods

- Proportional
- Digital



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Proportional Access

- Joysticks and a few others
- Requires grading of force and distance of movement
- 360 degree control
- Speed control



Digital Access

Basically, using 1-5 switches to control the direction of the chair



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Programming

- Optimizes drive performance and efficiency
- Enables control of other features such as speed, reverse and actuators through the drive control



Built-in Features

Newer electronics offer built-in features:

- IR transmission
- Mouse emulation



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Interfacing

Using the access method to control other assistive technology devices, such as a speech generating device, laptop computer or EADL.



Related Factors

- Environment
- Transportation
- Functional Activities



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Environmental Factors

Can the client use the recommended mobility technology in all required environments?

- Indoors
- Outdoors
- Accessible entrances



Environmental Factors



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Environmental Factors



Transportation Factors

- How will the mobility base be transported?
- Can the client be safely transported in the mobility base?



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Functional Activities

- Can the client reach what is needed?
- Can the client transfer to other surfaces?



Review Questions (feel free to discuss with your neighbors)

1. Clinical indicators for a dependent mobility base include:
 - a. To provide a means of independent mobility
 - b. To provide support for a very young child
 - c. To provide one handed access
 - d. To improve transfers
2. What accessibility factors need to be evaluated before recommending a mobility device:
 - a. Home
 - b. Transportation
 - c. Transfers
 - d. All of the above
3. Proportional control provides the following directional control:
 - a. 4 direction
 - b. 8 direction
 - c. 180 degree control
 - d. 360 degree control



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Review Questions (Here are the answers. How did you do?)

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 - b. To provide support for a very young child**
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Questions?

