ASSISTIVE TECHNOLOGY ASSESSMENT: SEATING AND POSITIONING FOR ACCESS
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LEARNING OBJECTIVES

• Describe the principles related to assessment and intervention in assistive technology (AT) service delivery.
• Identify and describe key areas to target in the assessment phase of the service delivery process.
• Recognize appropriate seating and positioning and how it impacts a person’s ability to access and functionally participate in desired activities.
• Reflect on team contributions and collaborations, your own professional boundaries, and when to make referrals.

AT ASSESSMENT: SKILLS EVALUATION OVERVIEW

- Sensory
- Physical
- Cognitive
- Language
AT ASSESSMENT: SENSORY

• Many AT devices rely on vision and/or hearing as the user interface. If the primary disability is sensory this consideration must come first.
• Often there is a “secondary” vision or hearing deficit. In this case we acknowledge the issue but consider it in context with the other factors.

AT ASSESSMENT: PHYSICAL

• The overall goal of the physical skills evaluation is:
  – To determine the physical capacity of an individual to perform an activity
  – The most functional position or positions in which to conduct that activity related to gross motor function and manipulation and device access related to fine motor function.

AT ASSESSMENT: PHYSICAL

– At a very basic level, physical skills include range of motion, muscle strength, and muscle tone and the presence of obligatory [reflex] movements
AT ASSESSMENT: PHYSICAL

Things to consider:
• The ability to right the head when moved out of a vertical alignment
• The ability to maintain the trunk in a vertical alignment.
• Sitting and standing balance
• Freedom with which arms can be moved in sitting and standing
• Ability to control speed and activation of movements

PHYSICAL ASSESSMENT

• Many AT users have severe neuromotor or neuromuscular challenges

• Motor abilities, endurance, and attention to task can be greatly influenced by position

THE BEST POSITION MAY NOT BE SITTING!
MUSCLE FUNCTION TERMINOLOGY

- Muscle Tone
- Tone
- Hypotone
- Hypertone

SITTING AS A FUNCTIONAL POSITION FOR AT USE
STABILITY ZONE

- How far the center of mass can move in any direction without loss of balance.
- Stability limits = Edge of the cone of stability

STABILITY IN SITTING

Extrinsic limits to stability zone
- Seat Back
- Arm rests
- Soft seat cushion
- Foot rests

LEVELS OF POSTURAL CONTROL IN SITTING

1. The propped sitter
   - Lacks any ability to support self in sitting
   - Seating system provides total body support
   - Typically seen around 3-4 months developmentally
THE PROPPED SITTER

LEVELS OF POSTURAL CONTROL IN SITTING

2. The hands-dependent sitter
   - One or both hands are used to maintain support
   - Typically seen around 4-5 months of age

THE HANDS DEPENDENT SITTER
LEVELS OF POSTURAL CONTROL IN SITTING

• The hands-free sitter
  – Sits for prolonged periods without using the hands for support
• Developmentally 7+ months

THE HANDS FREE SITTER

SEATING AND POSITIONING-
WHAT ARE THE AT GOALS?
WHAT ARE THE GOALS

For all
• Provide comfort
• Provide safety and stability
• Increase functional skills
• Decreased fatigue

For a few
• Prevent deformity
• Accommodate deformity or medical needs

“FUNCTIONAL” POSITIONING OUTCOMES

1. Improved ability to interact with others
2. Maximize comfort and stability for increased attention and participation
3. Improved visual-motor control
4. Improved upper limb control
5. Improved coordination of eye-hand responses
6. Improved ability to vocalize

WHAT HAPPENS WITHOUT GOOD POSITIONING?

• Pain
• Skin breakdown
• Discomfort
• Poor attention
• Poor motivation
• Poor control of movements
• Poor respiration
• Poor control vision (eye and head movement)
POSITIONING AS AN ENABLER

• A pre-requisite to any interaction or activity is a physical position that is comfortable and promotes function.
• Seating devices (for positioning) should maximize a person’s ability to function in activities across all performance areas.
• A general purpose Extrinsic Enabler.

THE BEGINNING....

Proximal stability equals distal mobility.
• This starts with a stable/supported pelvis/trunk.
BASIC SEATING GUIDELINES

Proximal stabilization assists:
• Head control
• Trunk control
• Arm use
• Leg use

BASIC SEATING GUIDELINES

• Provide lower body stability
  – Firm seating surface with pelvis in the middle of the seat
  – Tailbone against the back of the seat, without forward slippage
  – Seat belts in place
• Postural control should enable movement rather than restrict it

BASIC SEATING GUIDELINES

• The pelvis is a key point of control
• The legs should be in a neutral position
• The trunk should be upright and in a midline position
• The head should be in midline with a neutral neck position
• Shoulders should be down and forward
• Elbows should be supported at 90 degree angle
PELVIC CONTROL

- Most important with persons who need the support of their hands or external devices to maintain their posture
  - Pelvic support and positioning can be achieved using a pelvic belt, lap belt, subasis bar, or anti-thrust cushion

PELVIC CONTROL DEVICES

QUICK FIXES

- If the person has a tilt-in-space chair, tilt it back slightly
- Add a wedge shape cushion or place a soft roll under the distal thighs
- Sometimes a forward tilt works better, but you need a special chair
QUICK FIXES

• Solid seating (rather than cushions or soft seating)
• Seat with arms
• Roll up towels (or washcloths, or use pipe insulation tubes) and place on either side of hips in seat to increase stability
• Seat belts

LEGGS IN NEUTRAL

TRUNK ALIGNED AT MIDLINE

• Not falling forward or to the side
• Should allows for regular deep respiration
• Any harnesses or lateral supports should not be causing pressure redness when the person has been sitting for 20-30 minutes
CHEST SUPPORTS

- H-strap systems
- Headrests with Shoulder bars
- Thoracic vests

- These systems must be closely monitored and are not usually used all the time

HEAD ALIGNED, UPRIGHT AND AT MIDLINE

HEAD ALIGNED, UPRIGHT AND AT MIDLINE
HEAD SUPPORTS

1. Headpod
2. Hensinger Head support
3. Heads up flexible support system
4. Nodstop

HEAD SUPPORTS

SHOULDERS SHOULD BE DOWN AND FORWARD
ELBOWS SUPPORTED AT 90 DEGREES

ARM STABILIZERS

- Arm movement greatly influences postural stability and visual fixation

QUICK FIXES

- Keep chair upright (not tilted or reclined)
- Roll up towels (or washcloths, or use pipe insulation tubes) and place on either side of laptray to help contain arms
- Provide pegs or handles for child to hold onto to add stability
- Head position will be key place visual stimulus at midline whenever possible
- Use head rest with head control device when possible
MAKING IT FUNCTIONAL

- Always check for stability and comfort
- Listen for deep relaxed respirations
- Look at functional line of sight
- Midline is not always best, look for the “sweet spot”
ADAPT-A-TRAY

• $685, plus
• [Website link]
• The Adapt-a-Tray is an upper body positioning system to assist individuals with physical disabilities to access equipment in their work and learning environment.

THE 3 R’S!

• Recognition
  – Of appropriate/inappropriate seating
  – Of the abilities of the individual
  – Of professional abilities/boundaries
• Resources
  – Know where to look, who to call for help
• Referrals
  – Take steps to get help when needed

PROFESSIONAL COLLABORATIONS

• Teach and share with other professionals
• Complex clients require complex, often dynamic solutions
• As language development is complex and hierarchical in development, so is motor control; the best solutions respect this
• Maybe working in a wheelchair is NOT the best choice
QUESTIONS?