The Roles of Medical Rehabilitation Professionals

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AT-Service Delivery Model

– Center For Assistive Technology
  • Mission
  • Services
  • Service Delivery Model (Medical Home)
  • Clinician Task Force (Team Approach)
  • Outcome Measures
  • Research (Virtual Coach)

– Assistive Technology Centers of Excellence
Center For Assistive Technology

Mission

The mission of CAT is to enhance the ability of people with disabilities to fulfill life goals through the coordination and provision of appropriate assistive technology services.
Center For Assistive Technology Services

wheelchair seating and positioning
personal mobility systems
augmentative communication devices (speech output devices)
audiology services, aural rehabilitation, assistive listening and alerting devices, and hearing aid dispensing
specialized computer equipment and software, such as adaptive keyboards, monitors, and voice programs
ergonomic workstation design
environmental control units for work, school, or home
recreational devices, such as cycles and skis
consultation on vehicle modifications and related adaptive equipment
adaptive driving evaluation and training
environmental accessibility and recommendations for home modifications
AT Takes a Team Effort!

- Physical Medicine & Rehabilitation
- Rehabilitation Nursing
- Speech Language Pathology
- Occupational Therapy
- Physical Therapy
- Recreation Therapy
- Rehabilitation Engineering
- Blind Rehabilitation Specialist
- Counseling Psychology
- Neuropsychology
- Social Work/Case Manager
- Prosthetist/Orthotist
- Prosthetic Purchasing
The chief team member is ....

The client

The design and application of the AT Service Delivery starts out with the introduction of the client to the AT Assessment team and empowering the client to be an active decision-making member of that team.

“One –stop visit”

“AT Service Home”
AT - Service Delivery Process
(Good Practices)

• Screening
• In-depth evaluation and client education
• Final specifications
• Documentation
• Fittings
• Delivery
• Training
• Follow-up/Outcomes
AT- Service Delivery Process

(Good Practices)

- Assessment by a knowledgeable & trained clinician
- Face-to-face evaluation
- The individual’s medical history;
- Physical abilities and needs;
- Functional abilities and needs;
- Seating and positioning abilities and needs;
- Home accessibility;
- Currently used assistive devices; and
- Environmental considerations
AT- Service Delivery Process

• Trial of Demonstration Equipment
• Client education
• Discussion of options
• Review of goals
• Compromises/Optimization
• Home trials
• Consensus and final decisions
Physical therapists provide services that help restore function, improve mobility, relieve pain, and prevent or limit permanent physical disabilities of patients suffering from injuries or disease.

Occupational therapists (OTs) evaluate people’s abilities to perform the everyday tasks they need to do (toileting, dressing); are required to do (data entry, tool and die machine repair, change diapers); or want to do (play cards).

When task performance is too difficult, painful, or cannot be accomplished at all, occupational therapists modify or simplify the tasks; adapt tools, objects, or environments; or match technologies to people’s needs and preferences—enabling more independent, safe, and adequate task performance.
AT Team

- **Physiatrists** are the team leaders of care during rehabilitation, directing a rehabilitation care plan that includes several other team members.
- Some of the types of problems that a physiatrist may treat are skin breakdown, obesity, bowel and bladder problems, musculoskeletal, back, and nerve injuries, chronic pain, and spasticity.
- Physiatrists also guide prescriptions for orthotics, prosthetics, mobility devices and assistive technology.
A speech language pathologist deals with the prevention, diagnosis, and treatment of a wide range of primarily expressive communication disorders, including the identification, diagnosis, and rehabilitation of speech, language, and swallowing dysfunction.

The goal of augmentative and alternative communication (AAC) intervention is to optimize the communication of individuals with significant communication disorders. AAC assistive technology provides a viable rehabilitation solution to assist individuals who cannot speak to achieve maximum potential.
An **audiologist** deals primarily with receptive communication disorders, especially the prevention, identification, and measurement of hearing loss and the rehabilitation of individuals with hearing impairments, as well as the assessment of balance disorders.

**Assistive Devices:**

*Devices to Enhance Hearing Ability*

*Signaling and Alerting Devices*
AT Team

• **Rehabilitation counseling** is a process whereby the counselor works collaboratively with an individual with a disability to understand existing problems, barriers, and potentials in order to facilitate the client’s effective use of personal and environmental resources for personal, social, career, and community adjustment.

• OVR
AT Team

Rehabilitation Engineering:
Rehabilitation technology means the systematic application of technologies, engineering methodologies, or scientific principles to meet the needs of, and address the barriers confronted by, individuals with disabilities in areas that include education, rehabilitation, employment, transportation, independent living, and recreation. The term includes rehabilitation engineering, assistive technology devices, and assistive technology services.

Assistive Technology Supplier (ATP Credentialed)
Implementation of Outcome Measures

• The Need
• Locating the appropriate tool
• Integration into assessment
• Acceptance by clinicians
The SmartWheel is a Quantitative Tool

- The SmartWheel provides data such as:
  - Average force it takes to propel a wheelchair
  - Length of each push on the handrim
  - How often the person is pushing
  - How smooth the person is pushing
The Importance of Quantitative Data

- Bolsters funding justification:
  - Medical Insurance and Vocational Rehab
- Provides data to support equipment decisions
- Client education
  - Feedback to promote training (e.g., push technique)
- Provides visit-to-visit data to track client outcomes
- Database and “knowledge base” creation
Functioning Everyday with a Wheelchair (FEW) (Mills, et al, 2007) www. few.pitt.edu

1. Durability, Reliability
2. Comfort
3. Health Needs
4. Operate
5. Reach
6. Transfers
7. Personal Care
8. Indoor Mobility
9. Outdoor Mobility
10. Transport
**Powered Wheelchair Driving Skill Test, Center of Assistive Technology, UPMC**

Participant: ___________________  Investigator: ___________________

Date: _________________________

Wheelchair: ___________________  Joystick: _______________________

Powered seat function: __________

Time duration to complete the test: __________

<table>
<thead>
<tr>
<th>Task</th>
<th>Score</th>
<th>Comment</th>
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<tbody>
<tr>
<td>1. Fasten the seat belt</td>
<td></td>
<td></td>
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<tr>
<td>2. Turn on/off the wheelchair</td>
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<td></td>
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<td>3. Change speed setting on the controller</td>
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<tr>
<td>4. Drive straight forward in the hallway</td>
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<tr>
<td>5. Change speed under command (showing proportionality of the joystick)</td>
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<tr>
<td>6. Turn around a 90° left hand corner (90° left turn)</td>
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<tr>
<td>7. Drive straight backward (10 ft) in an open area</td>
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<tr>
<td>8. Drive into the elevator, turn around (check turn on/off wheelchair)</td>
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<tr>
<td>9. Avoid unexpected obstacles (person entering hallway)</td>
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<tr>
<td>10. Drive uphill on the ramp with controlled speed</td>
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<tr>
<td>11. Turn 180° on the platform</td>
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<tr>
<td>12. Drive downhill on the ramp with controlled speed</td>
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<tr>
<td>13. Drive into the elevator, and stop (check turn on/off wheelchair)</td>
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<td></td>
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<tr>
<td>14. Drive backward out of the elevator</td>
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<tr>
<td>15. Turn around a 90° right hand corner (90° right turn)</td>
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<tr>
<td>16. Drive into the bathroom</td>
<td></td>
<td></td>
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<tr>
<td>17. Parallel park to get to the sink close enough to use the faucet</td>
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<td></td>
</tr>
<tr>
<td>18. Turn off the wheelchair whenever doing tasks other than driving the wheelchair</td>
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**Scoring Criteria:**
4: Completely independent: optimal performance; able to perform task in one attempt smoothly and safely
3: Complete task hesitantly, require several tries, require speed restriction, and/or bumps wall, objects lightly without causing harm
2: Bumps objects and people in a way that causes harm or could cause harm to driver, other persons or objects
1: Unable to complete the task. Provide reasons in the comments column.
Timed Up & Go (TUG) Test

- Sit in Arm Chair
- Get up & walk 3 meters
- Turn around, come back & sit down
  - <10 seconds = normal
  - <20 seconds = good mobility, can go out alone, mobile without a gait aid
  - <30 seconds = problems, cannot go outside alone, requires a gait aid

- Podsiadio & Richardson, 1991
- ≤ 14 seconds = high risk for falling

- Shumway-Cook, Brauer & Woolcott, 2000
Research
Example: Virtual Coach

• Collaboration between the University of Pittsburgh and Carnegie Mellon University:
  – Started from a CMU-computer engineering class project:
  – U-Pitt Clinician gave lectures about:
    • Introduction to Power Seat Functions (PSFs)
    • Concerns and considerations from clinical observation
Development of Virtual Coach

• Technologists to observe clinician-client relationship
• More specific questions were developed:
  – How can we enhance the use of PSFs and provide appropriate feedback?
  – How can we verify whether the user understand clinical recommendations and comply with them?
  – Are there any technologies currently on the market that could be applied?
Virtual Seating Coach (VSC)

• Functions:
  – Monitor and Record
    • Power seat function and wheelchair usage
    • Interaction with VSC
  – Remind
    • Pressure relief
    • Usage safety
  – Report
    • For clinicians
• Conventional power wheelchair
  – Current: instrumented system
  – Future: add-on system
Virtual Seating Coach (VSC)

• User can personalize display effects
Assistive Technology Centers of Excellence

• Partnership between the VHA and Academic community (University of Pittsburgh)
• Established 4 COE across VA
  – In-person evaluation and training
  – Telemedicine evaluation and consultation
  – Teleconference and in-person training of staff
• Assist with establishing AT expertise in each of 22 VISNs
  – In-person evaluation and training
• AT resources available to all Veterans
Integrated System

Polytrauma Centers (now 5!)
  - Regional referral centers

Polytrauma Network Sites (22)
  - VISN level referral sites

Polytrauma Support Clinics (85)
  - Facility level teams

Polytrauma Points of Contact (43)
  - Referral and care coordination
Polytrauma Rehabilitation Centers

- Regional referral centers for veterans and active duty service members with TBI and polytrauma
- Patients with high degree of medical complexity and varied patterns of disabling injuries
- Full range of acute comprehensive medical and rehabilitative services
Polytrauma Rehabilitation Centers

Tampa, FL

Richmond, VA

Minneapolis, MN

Palo Alto, CA
Polytrauma Patient

- Traumatic Brain Injury
- Blindness or low vision impairment
- Amputation
- Burns
- Hearing Loss
- Infections
- Wounds/pressure ulcers
- Paresis
- Spinal Cord Injury
- PTSD
Military Culture

- Dealing with the loss of brothers in combat
- Transferred to the PRCs, which limits communicating with and support of their comrades
- Wish to return to combat with their comrades
- Young and technologically savvy
- Incorporation of military culture as a motivational tool and effects on rehab
Family Support

• Integral member of the rehab team for goal formation and patient support/motivation
• Families have high expectations and understandably want the latest advances and state of the art technology for their loved one
• Families live together on campus. They are very aware of everybody’s care, therapy and receipt of technology
• Family involvement facilitates improved education and carryover of newly learned skills
Teams

- Involve more people, thus affording more resources, ideas, and energy than would an individual.
- Provide multiple perspectives on how to meet a need or reach a goal, thus devising several alternatives for each situation.

‘Deep Dive’ Assistive Technology Institute for VA Clinicians
Pittsburgh, PA 2010 & 2011
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Pittsburgh, PA 2010 & 2011
Any Questions????
Thank You

References to support wheelchair prescription: www.herlpitt.org