

Bridging the Gap between Consumers and Products in Rehabilitation Medicine

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How is assistive technology used?

- Mental and / or Physical Activities
 - Improve functioning
 - Overcome disorder or impairment
 - Prevent worsening of a condition
 - Strengthen a weakness

❖ Goal: Increased Independence

The Transdisciplinary Rehabilitation Team

MD

Computer Engineer
Family / Tutor / Caregiver
Rehabilitation Counselor
Assistive Technology Specialist
Service Coordinator
Fabrication / Adaptation Tech
Training Coordinator
Audiologists
Nurse Practitioners
Psychologist



Social Workers
Occupational Therapist
Speech-Language Pathologist
Prosthetist
Medical Consultants
Teachers / Special Educators
AT Equipment Vendors
Hearing Device Specialists
Physical Therapists

Patient



What is Occupational Therapy?

Occupational therapists and **occupational therapy assistants** help people of all ages do the things they want and need to do through the use of everyday activities (occupations).

Occupational therapy practitioners ask:

"What matters to you?"

not, "What's the matter with you?"

ADLs

- Self Care
 - Mobility



ADLs

- Self Care
 - Dressing



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ADLs

- Self Care
 - Eating and Meal Preparation



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ADLs

- Self Care
 - Hygiene



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ADLs

- Communication



ADLs

- Leisure
 - Hobbies, sports, travel, etc.



ADLs

- Vocational and Educational



Steps to Successfully Issue an Assistive Device

- Patient evaluation
 - Home Evaluation
 - Survey/Interview
 - Functional Evaluation

Steps to Successfully Issue an Assistive Device

Framework for Patient Evaluation:

- Health Status
- Cognitive Status
- Economic
- Physical Environment
- Social Aspects
- Personal Preferences

Expectations!!!!

Disability ≠ Inability



Steps to Successfully Issue an Assistive Device

- Introduction of device
 - In-Patient / Out-Patient / Home
- Site and method of instruction / training

Different Levels of Assistive Technology Require Different Amounts of Training

Low Technology Adaptation

- Easy to use and does not require electrical power. May require a short training period.

Elementary Technology Devices

- Includes most battery-operated devices. User requires a moderate training period. Usually off-the-shelf or inexpensive.

High Technology Devices

- Includes complex and programmable equipment. User requires specific training in order for the user to take full advantage of their capabilities. **Expensive.**

High Versus Low Tech Quadraplegic Feeding Aids



\$149

\$6000



Issuing Assistive Devices

The final step?

Write justification to insurance company

Ordering/Buying equipment

High tech equipment (typically) – care team/insurance

Low tech or not covered by insurance – patient/caregiver

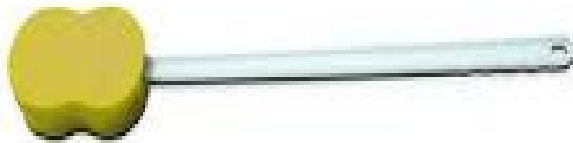
Steps to Successfully Issue an Assistive Device

Assessing the Outcomes:

- Effectiveness
- Psychological Functioning
- Efficiency
- Subjective Well-Being
- Device Satisfaction

Assistive Technology: One Size Doesn't Fit All

Total Hip
Replacement
- precautions



Long Handled Sponge

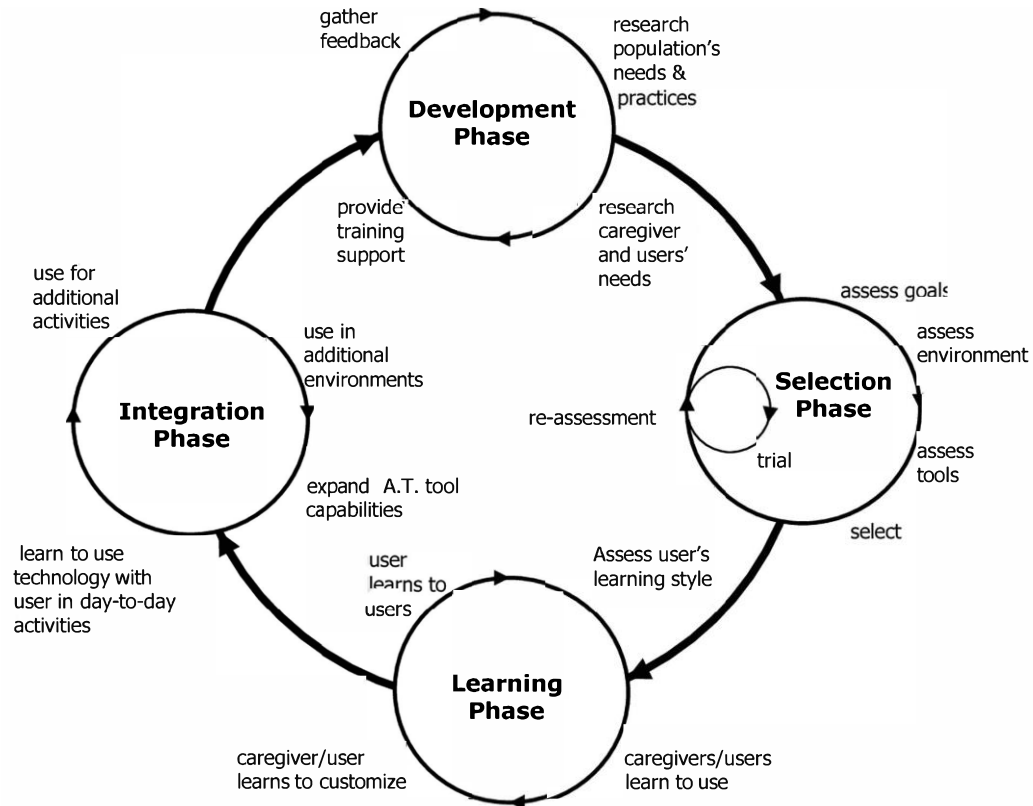
At 2 months, 30%
of patients aren't
using the device

Why might this AT end up in the closet?



\$599

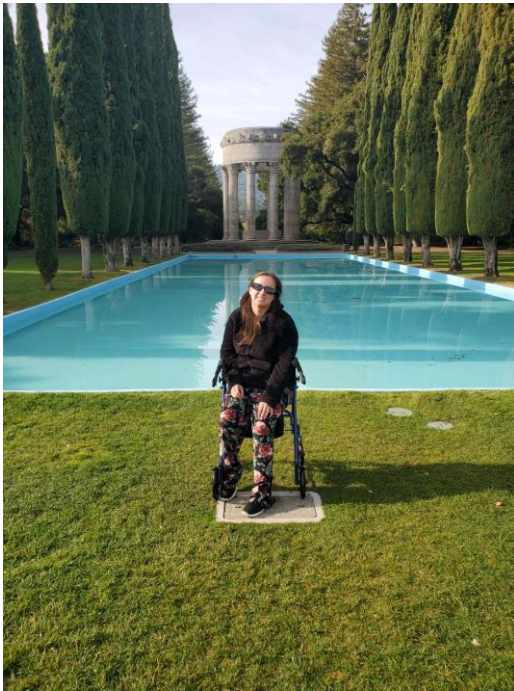
Successful Design and Implementation of Assistive Technology



How this all Relates to Product Development

- Involve all stakeholders early on and throughout the design process:
 - ❖ End users
 - ❖ Rehab team / therapist
 - ❖ Family members

Case Study



Emma

30 y.o.

Reading

Cooking

Animals / Pets

Watching TV

Hiking / Backpacking / Traveling

Case Study



Acquired Brain Injury:
Cortical Blindness
Sensory and Motor deficits
Memory deficits
Executive Functioning deficits

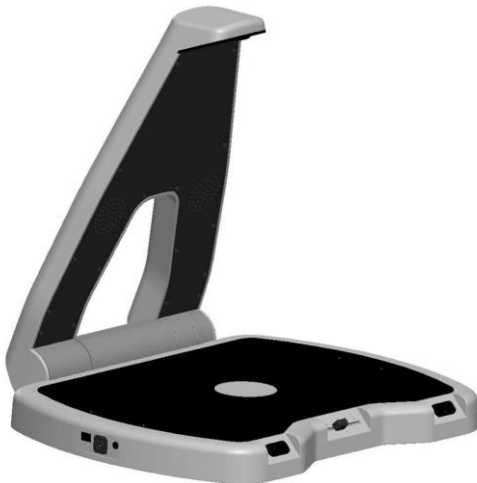
Aids for Reading



Orcam

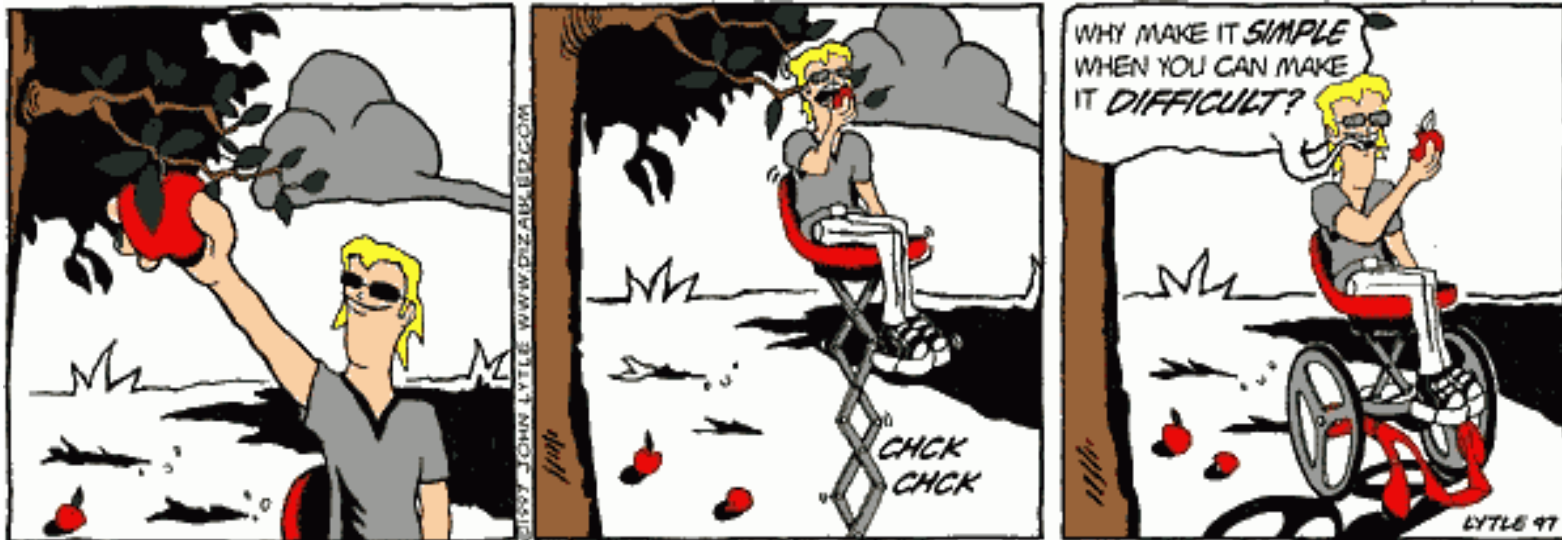


Envision



LyriQ

Whenever possible, keep it simple



Practicing Subject and Caregiver Interviews

Which of the following assistive technologies do these people use?

- ❖ Do they use it
- ❖ Did they own it but no longer use it: Why?

Prompts:

- ❖ Explore social aspects, personal factors, economic and physical environments of the subject
- ❖ Find out what motivates them

Stroke (aka CVA)



Michael

Rt Hand Dominant

Lt CVA with limited
ability to use Rt hand

Stroke (aka CVA)



Albert

Rt Hand Dominant

Lt CVA with limited ability to use
Rt hand

Example of a Low Tech Device: Rocker Knife



\$8.95

\$26.50



ADLs

- Self Care
 - Mobility



Mobility



Example of Medium Tech Saebo Stretch



\$200

Example of High Tech Device Rewalk Exoskeleton



Example of High Tech Device Rewalk Exoskeleton



\$71,600 +

What is it & Who would use it?



What is it & Who would use it?



What is it & Who would use it?



What is it & Who would use it?



What is it & Who would use it?



What is it & Who would use it?



What is it & Who would use it?



What is it & Who would use it?



What is it & Who would use it?



What is it & Who would use it?



ADT Website

- ◆ [Allegro Medical](#)
- ◆ [North Coast Medical](#)
- ◆ [Sunrise Medical](#)
- ◆ [Rehab Mart](#)
- ◆ [Move United](#)

Where to donate used medical equipment

- ◆ [ReCARES](#)
- ◆ Lions Club – [Hearing Aid and Eyeglass Recycling Program](#)
- ◆ [Silicon Valley Independent Living Center](#)
(wheelchairs <5 years old)
- ◆ Ability Tools – [Reuse Programs](#)

Other Resources

- **The Design and Evaluation of Assistive Technology Products and Devices Part 1: Design.** Marion A. Hersh. International Encyclopedia of Rehabilitation.
- <https://www.resna.org/>
- <https://tecnoaccessible.net/en/content/accessible-technology-coalition>

Other Resources

- Gillham, M., Pepper, M., Kelly, S., & Howells, G. (2019). **Stakeholder views addressing the development and uptake of powered wheelchair assistive technology.** *Disability and Rehabilitation: Assistive Technology*, 14(2), 146–160. <https://doi.org/10.1080/17483107.2017.1416186>
- Shah et al (2009) **Developing medical device technologies from users' perspectives.** *Int J Technol Assess Health Care*. 25(4):514-521. [link](#)
- Trish Wielandt et al., **Factors that predict the post-discharge use of recommended assistive technology.** *Disability and Rehabilitation: Assistive Technology*, January-June 2006; 1(1-2)β: 29-40. [link](#)
- Ripat, J., & Booth, A. (2005). Characteristics of assistive technology service delivery models: Stakeholder perspectives and preferences. *Disability and Rehabilitation*, 27(24), 1461–1470. <https://doi.org/10.1080/09638280500264535>