Applications of Textiles in Occupational Therapy

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1pm

Notes: Deb Wang

Per 2010 U.S. Census, 56.7M people in the U.S. (1 in 5, or 19%) are living with a disability

* 54% mobility challenges
* 35% lifting and grasping challenges
* Other challenges include fatigue/exhaustion and sensation (hearing, vision, etc.)

Textiles can support social participation for people living with disabilities (PWDs), increasing quality of life, enabling them to meet work/home obligations, and preventing depression. Increase mobility, dexterity, daily function. Blue tooth sensors which gather and send personal health data to health providers can also decrease office visits, which in turn could decrease health care costs.

Optimizing Fabrics – Factors to Consider

* Air permeability
* Moisture properties – absorption vs. wicking
* Weight
* Surface characteristics – rough vs. smooth
* Ease of care
* Antimicrobial – odor prevention v. infection prevention
* Abrasion & wear – withstand high volume of physical activity?
* Bio-reactive? – bio-absorbable, bio-degradable, or non-reactive
  + For example, could impregnate fabric with a drug, then have fabric absorbed into skin
* Conformability
* Strength

Examples

* “Crutch Clutch” – pocket for personal items attached to crutch
* “Ratchet-to-Reach” – mechanism which allows for opening laptop with one finger
* Cooling vests for MS patients who overheat easily, especially when participating in sports
* “Maximus V Rehab Shirt” – a company called Maximus V has developed a stylish, non-medical-looking shirt for stroke patients. The shirt is weighted by gel, allowing the patient to do rehab “all the time” and decreasing their recovery period.
* Mobility vests to help caregivers move patients
* Childhood allergic reaction vest with pockets for EPI pens
  + *Can this be made more stylish, less bulky?*
* Cystic fibrosis vest: a cumbersome vibrating vest that breaks up mucus
  + *Can this be made more comfortable, more stylish/less conspicuous?*

Ideas

* Garment that can sense developing pressure sores and wirelessly alert health providers?
* Office chairs that correct posture or remind sitter to get up?

Recent Developments

* **Temperature-sensing fabric** that has sensing wires embedded into knitted fabric
* **Phase-change materials:** polymer embedded into fibers that changes from liquid to solid. Also for temperature regulation: as body heats, polymer absorbs energy and becomes liquid. As body cools, polymer releases energy back to body and solidifies.

Fun fact: body can be rapidly cooled at **pulse points** – around neck, temples, inner wrists, etc. Google for full list.