

Assistive Technology for Sports & Recreation



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Acknowledgments

- With many thanks to the athletes for serving as “roll” models, sharing their experiences, and teaching me most of what I know.
- Several photos were provided by:
 - The athletes pictured
 - The Challenged Athletes Foundation
 - US Paralympics
 - Manufacturers

Learning Objectives

- Following this session, participants will be able to:
- Identify at least 5 new sports and recreation opportunities available to participants with disabilities.
 - Discuss 3 components of the interdisciplinary client evaluation necessary to determine adaptive sports equipment needs.
 - Highlight 2 aspects of their everyday work that contribute toward positive outcomes associated with adaptive sports and recreation participation.
 - Locate at least 3 additional resources for adaptive sports equipment support.

With adaptive sports, there's something for everyone.

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So many choices . . .



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How does someone in a wheelchair Cross-Country Ski?



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PARALYMPICS clarified

- PARA = “parallel” or “alongside” the Olympics
- Same venues as Olympics Games
- International Paralympic Committee (IPC) is governing body www.paralympic.org
- US Paralympics is division of USOC www.uparalympics.org
- 2014 in Sochi for Winter Paralympics
- 2016 in Rio for Summer Paralympics

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Summer Paralympic Sports



- Archery
- Basketball
- Boccia
- Cycling
- Equestrian
- Fencing
- Goalball
- Judo
- Power Lifting
- Rugby
- Sailing
- Shooting
- Soccer
- Swimming
- Table Tennis
- Track & Field
- Volleyball

Boccia



Visual Impairment



Winter Paralympic Sports



- Alpine Skiing
- Curling
- Nordic Skiing
- Biathlon
- Sled Hockey
- Snowboarding*



In addition to "Paralympic" events . . .

. . . endless options exist.

SkateBoarding

Power Soccer



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Adaptive sports equipment is
Assistive Technology.

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What is Assistive Technology (AT)?

Assistive Technology is any item, piece of equipment or product system whether acquired commercially off the shelf, modified, or customized that is used to increase or improve functional capabilities of individuals with disabilities.

(Assistive Technology Act, 1998, PL 105-394, S.2432)

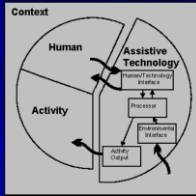
- Supports function in a varied of environments
 - (home, work, school, community,)
- Engage in meaningful activities
 - (ADLs, play, learn, communicate, work, travel...)
- Optimize independence



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Where to start?

- HAAT Model
 - Human
 - Activity
 - Assistive technology
 - Context



- Functional task analysis
 - i.e. the SPORT
- Hierarchy of AT
 - No tech → low tech → high tech
 - Commercially available → custom medical devices

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Understand the “human” participant *In this case, the athlete.*

Complete a comprehensive interdisciplinary evaluation, assessment & treatment plan.

EVALUATION

- Interview
- Medical background
- Physical assessment
- Social profile
- Functional evaluation
- Environmental profile
- Client goals



Perform a Clinical Evaluation



AT and Clinical Care

The assessment & treatment plan . . .

- Both are based on an interdisciplinary evaluation
- Client centered goals are identified
 - Long term for end result
 - Short term for interim progress measures
- Assessment requires awareness of options
- Plan is individualized to the person
- Outcome measures must be incorporated

Understand activity requirements

In this case, the “sport” or recreation activity.

- Client considerations
 - Diagnosis & prognosis
 - Functional capabilities
 - Interests & preferences (theirs, not yours ☺)
- Equipment specific considerations
 - Options available
 - For the individual
 - For the specific sport
 - For the level of participation

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Sport Specific Considerations

Include athlete classification for team & individual competitive sports

- Classification varies for each sport
 - Tests based on sport specific demands
 - Class descriptions specific to each sport
- Clinical bench testing
- Functional evaluation during activity

Client Specific Consideration

CLASSIFICATION

- Comprehensive evaluation
 - BENCH TESTING
 - OBSERVATION
- "levels the playing field"
- Impacts technology



Functional Observation



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Be Aware of the Options



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Be Aware of the Trends

2002



2012



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Incorporate Participation Goals

Recreation



Competition



Options: AT for Hand Function



Hand Support for Paddling



Joystick Control



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Sailing with SCI



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CNN August 23, 2012 on Paul and his SCI:

[after his SCI] . . .

Callahan spent the next five years traveling to rehabilitation centers across the United States in search of a way to walk again. When a doctor finally suggested it was time to concentrate on living instead of walking, Paul did exactly that.

Part of complete coverage on
MainSail

MainSail

Paralympics sailor: 'My disability is a gift'

By **Sheena McKenzie** for CNN
August 23, 2012 - Updated 1440 GMT (2240 HKT)



Paralympian Paul left his Wall Street job to take over Sail to Prevail - an organization which teaches disabled children to sail. From eight children a year, the charity, based in Newport, Rhode Island, now helps around 1,000 youngsters annually.

Paralympics 2012

HIDE CAPTION



Hierarchy of AT Applied to Sports

- No tech, low tech, high tech



Swimming
No Tech



3-Track Skiing
Low Tech



Off Road Cycling
High Tech

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Sit Down Volleyball



You can apply what you
already know about AT to
adaptive sports equipment.

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It Starts with a Disability . . .

- Rehabilitation Skills
 - Self Care / ADLs
 - Bed Mobility
 - Transfers
 - Wheeled Mobility Skills
 - Power
 - Manual
 - Gait Training *
 - Environmental Management
 - Driving / Transportation



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Rehabilitation Professionals

Education / Training / Support

- Self management
- Mobility skills training
- Assistive technologies
- Psychosocial adjustment
- Community reintegration
- COLLABORATION



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Education & Training

Associated Mobility Skills

- Transfers
- Wheelchair skills
- Sport specific techniques and skills
- Equipment management
- Training techniques / cross training
- Realistic Expectations



Mobility Skills: Transfers



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Wheelchair Skills



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Wheelchair Skills



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Advanced wheelchair skills



Equipment Management



Travel



Education for Realistic Expectations

Recreation vs. Competition

- Commitment
- Time
- Equipment
- Expense
- Sacrifice
- **BALANCE**



Seating for Sports

Provide clinical expertise for athlete support . . .

- Comfort
- Postural stability
- Skin Protection
- Injury Prevention
- Performance



GOT RANGE?



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Why Seating for Sports?

Photos coming

Sitting Surface

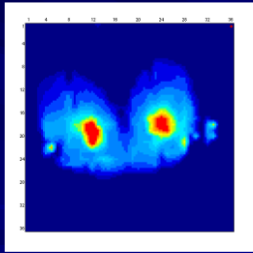


Trunk & Extremities

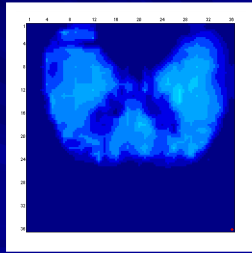
Do NOT try this at home . . .



Handcycle Custom Seat



Standard foam cushion



Prototype

Seating for Sports



Seating for Sports



Positioned for stability, mobility, action, performance



Positioned for stability

Does one of these people have a disability?



With an appropriate seating system, you just may not be able to tell the difference.

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Seating for Kayak / Canoe



Prosthetic Limbs & Sports



PROSTHESIS OR NOT?

Depends on . . .

- Nature of amputation(s)
- Health of residual limb(s)
- Co-morbidities
- Athlete's age
- Time with amputation
- Functional abilities/skills
- Sport specific requirements
- Participation goals
- Personal preferences

Prosthetic Limbs & Sports



"It's Just Like Riding a Bike . . ."



Snowboarding



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The Power of "AND" . . .



- 1) Handcycling
- 2) track
- 3) swimming,
- 4) skiing
- 5) tennis
- 6) basketball . . .



Right above knee prosthetic limb,
left ankle foot orthosis, custom
wheelchair AND sports equipment.

It's impossible to learn adaptive sports in the clinic or from a desk.

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GET OUT THERE!



Recreation & Sports

Never too old . . .



Nor too young

GET OUT THERE

*“Rehab allows you to exist.
Sports allow you to live.”*

Sean Halsted
Air Force Veteran with L1 Paraplegia
March 2007



*“I was 7 years old
before I realized I was disabled”*



Sled hockey



Sled hockey



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USA GOLD



Resources

- Challenged Athletes Foundation
 - Operation Rebound for Veterans, Active Duty Service Members and First Responders
- Military Support Organizations
 - Such as Team Semper Fi Fund for injured Marines
- Veterans Service Organizations
 - i.e. PVA, Wounded Warriors, BVA, DAV, VFW, etc.
- Disability Specific and Regional Support Programs
 - i.e. Christopher Reeves Foundation, MS Society, ALS Foundation, Operation Comfort, High Fives

To love what you do and feel that it matters,
how could anything be more fun?

~ Catherine Graham



Thank You!

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