Managing the Physically Challenged Athlete Across the Age Continuum

Course Description
The rate of involvement in adaptive sports continues to rise, with individuals with disabilities surpassing previous life expectancy expectations. Individuals with disabilities are among the highest rate of inactivity in the nation due to socioeconomic, transportation, and opportunity limitations. As these individuals age, there is increased risk of chronic injuries including metabolic disorders and cardiac diseases. It is important to get individuals with disabilities involved in sports and recreational activities and keep them involved as they age. This two-hour session will describe the role of physical therapists in getting individuals with disabilities involved in sports and recreational activities and assisting the athletes in achieving in their sports and recreational goals.

Disclosures
• No relevant financial relationships exist

Course Objectives
Upon the conclusion of this course, participants will be able to:
1. Identify risk factors for inactivity in individuals with physical challenges
2. Understand tools and community resources available to assist physical therapists in promoting physical activity
3. Analyze opportunities individuals with disabilities have to be involved in sports and recreational activities as a youth, young adult, and older adult
4. Implement sport specific screening in order to assist an athlete’s ability to participate in a sport safely
5. Review screening techniques appropriate to evaluate athletes with physical challenges, including cardiovascular, integumentary, and musculoskeletal testing

Outline

<table>
<thead>
<tr>
<th>Topic</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction: An Overview of Physical Fitness for Individuals with Physical Challenges</td>
<td>10 minutes</td>
</tr>
<tr>
<td>Katie Lucas</td>
<td></td>
</tr>
<tr>
<td>Treating the Young Athlete with a Physical Challenge</td>
<td>25 minutes</td>
</tr>
<tr>
<td>Josh Williams</td>
<td></td>
</tr>
<tr>
<td>Treating the Adolescent/Young Adult Athlete with a Physical Challenge</td>
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<td>25 minutes</td>
</tr>
<tr>
<td>Teresa Schuemann</td>
<td></td>
</tr>
<tr>
<td>Treating the Masters Athlete with a Physical Challenge</td>
<td>25 minutes</td>
</tr>
<tr>
<td>Anne Hart</td>
<td></td>
</tr>
<tr>
<td>Question &amp; Answer</td>
<td>10 minutes</td>
</tr>
</tbody>
</table>

Keywords: athletes with disabilities, wellness, physically challenged athlete, young athletes, geriatric athlete, health promotion
Introduction: An Overview of Physical Fitness for Individuals with Physical Challenges

“Health” & The Health Triangle

“Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” - World Health Organization

- Social Health: Conditions in which people are born, grow, live, work & age. Spending time with friends and family.
- Mental Health: A state of well-being including realizing one’s own potential, coping with the normal stresses of life, working productively/ fruitfully, and contributing to one’s community
- Physical Health: Any bodily movement produced by skeletal muscles (chores, work, play, travel, exercise)

How Does This Relate to Sports?

- Social Health: Leadership skills, ability to contribute to society, and skills that continue to apply despite age, location of residence, or socioeconomic environment
- Physical Health: Strength, cardiovascular fitness, endurance, balance, control, range of motion, flexibility
- Mental Health: Problem-solving, dealing with successes & failures, teamwork, working towards a common goal, contributing to something beyond yourself

What Does the Evidence Say?

<table>
<thead>
<tr>
<th>Physical Health</th>
<th>Mental Health</th>
<th>Social Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Cardiovascular fitness</td>
<td>• Improved social acceptance</td>
<td></td>
</tr>
<tr>
<td>• Improved ability to perform ADL’s</td>
<td>• Enjoyment of participation in physical activities</td>
<td></td>
</tr>
<tr>
<td>• Mobility throughout the aging process</td>
<td>• Self-concept, self-esteem, and self-acceptance</td>
<td></td>
</tr>
<tr>
<td>• Bone health</td>
<td>• Social interactions</td>
<td></td>
</tr>
<tr>
<td>• Muscle strength</td>
<td>• Improved confidence, identity, competence, self-worth, life satisfaction, and community integration</td>
<td></td>
</tr>
<tr>
<td>• Decreased risk of ailments of inactivity such as hypertension, diabetes, and fatigue</td>
<td>• Cognitive function</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Skill acquisition</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Exercise can also help individuals with intellectual disabilities limit challenging behaviors associated with their cognitive impairments</td>
<td></td>
</tr>
</tbody>
</table>

Opportunities for Individuals with Disabilities

- School Teams
- Club Sports
- Special Olympic Sports
- Paralympic Sports

School Teams & Local Clubs

- Athletes with physical challenges should be coached, trained, and scored similar to their peers
- Local clubs can be found at:
  - http://www.disabledsportsusa.org/
  - https://adaptivesportsusa.org/
  - http://www.specialolympics.org/program_locator.aspx

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Local park/recreation programs
Special Olympics and Paralympics

Special Olympics
- Mission: “to provide year-round sports training and athletic competitions in a variety of Olympic-type sports for children and adults with intellectual disabilities”
- For Athletes with Intellectual Impairments
- Goal of Participation
  - Sport Assessment is Skill-Based
  - Each Team has an Equal Overall Skill Level
- Available Sports
  - Alpine skiing
  - Cross country skiing
  - Floorball
  - Powerlifting
  - Swimming
  - Aquatics
  - Cycling
  - Golf
  - Roller-skating
  - Table Tennis
  - Track & Field
  - Equestrian
  - Gymnastics
  - Sailing
  - Tennis
  - Badminton
  - Figure skating
  - Handball
  - Snowboarding
  - Volleyball
  - Basketball
  - Floor Hockey
  - Judo
  - Snowshoeing
  - Bocce
  - Soccer
  - Kayaking
  - Softball
  - Bowling
  - Netball
  - Speed Skating
  - Cricket

Paralympics
- Mission: “to promote and contribute to the development of sport opportunities and competitions, from initiation to elite level, for Paralympic athletes as the foundation of elite Paralympic sport”
- Values: determination, equality, inspiration, courage
- “Parallel to the Olympics”
- For Athletes with Physical or Intellectual Impairments
- Goal of Participation
  - Sport Assessment is Impairment-Based
  - Each Athlete Competes to His or Her Highest Level
- Available Sports
  - Archery
  - Curling
  - Power Lifting
  - Table Tennis
  - Alpine Skiing
  - Rowing
  - Cycling
  - Track & Field
  - Biathlon
  - Equestrian
  - Sailing
  - Boccia
  - Fencing
  - Shooting
  - Canoeing
  - Paratriathlon
  - Sled Hockey
  - Swimming
  - Cross Country Skiing

Where to Start?
- Identify local opportunities
  - Clubs, programs, school teams, community events
- Screen cardiovascular fitness
  - Resting blood pressure, heart rate, typically activity level

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• Educate
  – Nutrition, hydration, sleep hygiene
  – **Age-Appropriate Treatment and Training of Athletes**

In Conclusion
• We have the tools to treat, train, and advocate for the involvement of our patients
• Sports and recreational activities provide athletes tools besides physical fitness which can benefit them throughout life

References
11. EDUCATION PIP. Creating Equal Opportunities for Children and Youth with Disabilities to Participate in Physical Education and Extracurricular Athletics. *Director*. 2011;

**Treating the Young Athlete with a Physical Challenge**

Benefits of Sports/Activity
- Physical Impact
- Psychological Impact
- Social Impact

How to Get There?
- Know the guidelines
- Assess current status
- Ensure safe participation
- Provide tools & resources

Know the Guidelines
- Able bodied vs physically challenged
  - General considerations
  - Aerobic
  - Muscle
  - Bone

Assess Current Status
- Current activity level/participation
- Beliefs, attitudes, interests
- Barriers
- Facilitators

Barriers
- Physical
- Environmental
- Financial
- Social

Facilitators
- ‘FUN!
- Relaxation
- Social Interaction

Ensure Safe Participation
- Pre-participation screening
  - Epidemiology of injuries for athletes with physical challenges
  - Disability specific considerations
  - Educate/Advise

Provide Tools & Resources
- Local
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• Regional
• National/International

Tools & Resources
• Endeavor Series
• Disabled Sports USA
• SportForward
• Rise Sports
• NCHPAD

Resources
• http://www.nchpad.org/
• http://www.disabledsportsusa.org
• http://www.endeavorgames.com/
• http://www.riseadaptaivesports.org
• http://www.sportforward.org

References

Treating the Adolescent/Young Adult Athlete with a Physical Challenge

Adolescence: A Time of Growth
• Physical Growth
  – On average, between the ages of 13 and 19, typically developing females grow 3 inches and gain 25# and males grow 8 inches and gain 53#
    • Individuals with Chromosomal or Genetic Disorders often have altered growth curves
    • Neurological Conditions such as Cerebral Palsy or Spina Bifida can also alter growth of the individual (especially if the individual is not ambulatory)
• Social Growth
  – Decreased reliance on parents/family with increased influence from peers

With Growth Comes Changes
• Balance
• Flexibility
• Strength

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• Coordination
• Social Acceptance
• BMI
• Cognition
• Independence

The Influence of Physical Fitness
• Similar to able-bodied peers, physical activity improves strength, balance, neuromuscular control, coordination, agility, cardiovascular fitness
• It also improves social acceptance of their diagnosis and improves self-esteem, cognition, and provides a positive social environment for the individual

Strength, Balance & Neuromuscular Control
• Jeng 2013: 16 years old individuals with CP improved single leg balance time, 6-minute walk, knee extensor strength, & 10 meter shuttle run time with a 12-week fitness program compared to age & impairment-based controls
• Runciman 2015: Similar EMG and Power Output in highly trained individuals with CP (22-year-old athletes)

Cardiovascular Fitness
• Shkedy Rabani 2014: 16 yo’s with CP are less active than typically developing peers
  — Those with higher GMFCS are more sedentary than lower GMFCS
• Nsenga 2013 & Lauglo 2016: Improvements in VO₂max and HR improved with ergometer & treadmill training for individuals with CP (10-17yo)

Fitness & Anthropometric Changes
• Siaman 2014: Increased physical activity in 16-24 yo’s with CP improved VO₂max, HR, and waist circumference
• Bragaru 2011: Individuals s/p limb amputation had worse physical fitness than able-body peers, but this improves with training

Social Benefits
• Baran 2013: SO Unified Program improved physical fitness and skills for all participants (with and without ID)

Risk Factors of Inactivity
• Limited spots on a sporting team
  — Some schools have “Pay to Play” policy
• Lack of confidence in participating in sports

Barriers & Facilitators to Physical Activity

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Facilitators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Influence</td>
<td>Social Influences</td>
</tr>
<tr>
<td>-Feel they’re not an “athlete”</td>
<td>-Becoming part of a team</td>
</tr>
<tr>
<td>Health Conditions</td>
<td>Health Conditions</td>
</tr>
<tr>
<td>-Cognitive impairment, poor health</td>
<td>-Improves strength, endurance, etc</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>Self-Efficacy</td>
</tr>
<tr>
<td>-Lack confidence in participation</td>
<td>-Improves independence and self-confidence</td>
</tr>
<tr>
<td>Attitude of Individual Towards Sport</td>
<td>-Desire to be healthy/have a healthy body</td>
</tr>
<tr>
<td>-Fear of injury/safety playing</td>
<td>Influences of Family/Friends</td>
</tr>
<tr>
<td>Fitness</td>
<td>Environment</td>
</tr>
<tr>
<td>-Lack of skill</td>
<td>-Encouragement to join a team</td>
</tr>
<tr>
<td>Age</td>
<td>-Access to sporting facilities</td>
</tr>
<tr>
<td>-Less likely to become more active with age</td>
<td></td>
</tr>
</tbody>
</table>

Bloemen et al 2015

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**Treating the Adult Athlete with a Physical Challenge**

**Adult Athletes with Physical Challenges**

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athletes in Wheelchairs</td>
<td>SCI or disease with at least 10% loss of LE function (quad, para, polio, + amputation, CP)</td>
</tr>
<tr>
<td>Athletes with Cerebral Palsy</td>
<td>Disorders of movement / posture due to damage to part of the brain controlling muscle tone, reflexes, posture (CVA, cerebral trauma, quadriplegia / paraplegia with spasticity, ataxia, or athetosis)</td>
</tr>
<tr>
<td>Athletes with amputation</td>
<td>Missing at least one major joint in a limb (missing, congenital, traumatic)</td>
</tr>
<tr>
<td>Athletes with visual impairment</td>
<td>Visual loss &gt; 20 / 200</td>
</tr>
<tr>
<td>Les autres (the others)</td>
<td>Athletes who do not fit into other categories (athletes with: dwarfism, OI, MD, arthrogryposis, etc)</td>
</tr>
<tr>
<td>Athletes with intellectual disability</td>
<td>Substantial limits in intellectual functioning in two or more areas (communication, self care, home living, community use, self-direction, health and safety, functional academics, leisure, or work)</td>
</tr>
</tbody>
</table>
Spectrum of Care

<table>
<thead>
<tr>
<th>Injuries</th>
<th>Ambulatory Athletes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Injuries</td>
<td>Sprains, Strains, Contusions, Abrasions, Blisters</td>
</tr>
<tr>
<td>Chronic Injuries</td>
<td>LE Injury, PF dysfunction, Plantar fasciitis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Injuries</th>
<th>Non-ambulatory Athletes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Injuries</td>
<td>Residual limb injuries, Abrasions, Pressure sores, Blisters</td>
</tr>
</tbody>
</table>

Benefit of Exercise for individuals with physical challenges
- Improved physical health and functioning
- Increased Self Esteem
- Less anxiety
- Decreased depression
- Decreased loneliness
- Increased Resilience
- Increased Sense of purpose

Injury Prevalence for Athletes with Physical Challenges
- Athletes with disability experience injury rates similar to able-bodied athletes
- IR = 7.23 per 1000 athlete exposures
- Elite athletes IR = 9.45 per 1000 athlete exposures

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• Rash

Chronic Injury: Athletes with LE Amputation
• **Prosthetic side:** L/S Pain
• **Residual limb:** Plantar fasciitis, Achilles tendinitis, Stress reactions/fractures

Chronic Injury: Athletes with UE Amputation
• Increased cervical and T/S Pain

Acute Injury: Contact/Collision Sports
• Contusions
• Abrasions
• Fractures
• Dislocations

Injury: Athletes with Cerebral Palsy
• Dehydration
• PF pain
• Metatarsalgia
• Ankle instability
• Callus formation
• Pressure sores

Injury: Athletes with Impaired Vision
• Decreased proprioception
• LE > UE injury
  o Ankle sprains
  o Lower leg contusions
  o Wrist sprain/fracture

Injury Prevention
• Proper Fluid Status & Replacement
• Proper Fueling
  – Nutritional needs
• Environmental Injury Prevention
  – Hyperthermia
  – Hypothermia
• Specific Conditions

Fluid Replacement

<table>
<thead>
<tr>
<th>All exercise sessions should be started Well-hydrated!</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre – Exercise (2 hours before exercise)</strong></td>
</tr>
<tr>
<td>Drink approximately 5–10 mL/kg body weight of water in order to start exercise well hydrated</td>
</tr>
<tr>
<td>Thirst sensation should be low and urine a pale color</td>
</tr>
</tbody>
</table>

<p>| <strong>During Exercise &lt; 1 hour duration</strong>                 |
| No specific guidelines as dehydration does not effect endurance performance. Drink according to thirst sensation and some sources recommend a mouth rinse with an electrolyte drink. |</p>
<table>
<thead>
<tr>
<th>Purpose</th>
<th>How to . . .</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-event</strong></td>
<td>Avoid extracellular fluid loss due to dehydration. Drink approximately 5–10 mL/kg body weight. Drink water or sports drink 2–3 hours before exercise. Approx. 17–20 fl oz (500–600 mL) of water or sports drink 10–20 minutes before exercise.</td>
</tr>
<tr>
<td><strong>During event</strong></td>
<td>Monitor approximate sweat and urine losses. Maintain hydration at less than 2% body weight reduction. Drink 7–10 fl oz. (200–300 mL) of water or sports drink every 10–20 min.</td>
</tr>
<tr>
<td><strong>Post event</strong></td>
<td>Correct any fluid loss accumulated during practice and/or event. Should be completed within 2 hours of exertion if bladder tolerates bolus. Water to restore hydration status to return athlete to proper body weight – replenishing lost water weight. Electrolytes to speed rehydration per athlete tolerance.</td>
</tr>
</tbody>
</table>
Proper Fueling

**Athletes with Minimal to Moderate levels of Intense training**
- Exercising 1 – 2 hours/day, 3 – 5 X/week
- Normal diet
  - 2000 – 3500 kcals/day
  - 25 - 30 kcals/kg/day for a 50 - 100 kg athlete

**Athletes with Moderate - High levels of Intense training**
- Exercising 2-3 hours/day, 5-6X/week OR
- High volume 3 – 6 hours/day in 1 – 2 workouts, 5 – 6 days/week, 600 – 1200 kcal/hr
- Normal diet
  - 2,500 - 8,000 kcals/day
  - 50 - 80 kcals/kg/day for a 50 - 100 kg athlete

### Fueling Specifics

<table>
<thead>
<tr>
<th></th>
<th>Amount (g/kg body weight)</th>
<th>Total Amount (g)</th>
<th>% of Daily Calories</th>
<th>Calories/g</th>
<th>Calories/day (kcal)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Protein</strong></td>
<td>1.2 – 1.6</td>
<td>76 - 102</td>
<td>10 - 35</td>
<td>4</td>
<td>304 - 408</td>
</tr>
<tr>
<td><strong>Carbohydrates</strong></td>
<td>3 - 10</td>
<td>191 - 636</td>
<td>45-65</td>
<td>4</td>
<td>764 - 2544</td>
</tr>
<tr>
<td><strong>Fats</strong></td>
<td>1</td>
<td>63</td>
<td>25 - 35</td>
<td>9</td>
<td>567</td>
</tr>
<tr>
<td><strong>Total Fats</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Saturated Fats

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>&lt; 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber</td>
<td>0.6 - 1</td>
<td>25</td>
</tr>
</tbody>
</table>

**TOTAL DAILY INTAKE**

|                |               | 1635 - 3519 |

**Proper Fueling**

<table>
<thead>
<tr>
<th></th>
<th>Purpose</th>
<th>How to . . . .</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-event</td>
<td>Ensure Proper Pre-event fueling</td>
<td>3 hours prior: 150-200g carbohydrates&lt;br&gt;90 minutes prior – 60-100g carbohydrates&lt;br&gt;Within one hour of race start – 25-50g carbohydrates</td>
</tr>
<tr>
<td>During event</td>
<td>Ensure proper fueling for performance maintenance</td>
<td>Emphasis on fluid replacement although some studies advocate a CHO/Protein replacement drink to supplement 15 – 20% of calories burned per gut tolerance</td>
</tr>
<tr>
<td>Post event</td>
<td>Replenish glycogen stores, 300-400 total calories for events that last about one hour and increase with longer events&lt;br&gt;Should be completed within 30 – 60 minutes of exertion if gut tolerates bolus</td>
<td>Carbohydrates in a tolerable form&lt;br&gt;Electrolytes to speed rehydration</td>
</tr>
</tbody>
</table>

**Pre-Event Nutrition Plan**

**Dependent upon Type of Event**

- **Low Volume (events under 30 - 50 minutes)**
  - No need to increase CHO or glycogen load the night before the competition.

- **Moderate Volume (events 50 – 120 minutes)**
  - Top off fluid and glycogen stores by eating an additional serving of CHO the night before the race.

- **High Volume (120+ minutes)**
  - Start the week before event with decreasing alcoholic intake and increasing CHO and glycogen stores<br>3 days before event – decrease fiber and spice to reduce GI distress<br>If “heavy” sweater – Sodium load 12 – 15 hours before race

**Environmental Injury Prevention**

**Hyperthermia**

- **Proper hydration**
- Appropriate sun protection
- Layering of clothing
- Appropriate Training

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— Race effort level
• Appropriate BMI
• Pre-cooling
  — CAREFUL!
• Acclimatization

Hypothermia
• Biggest risk is Wet & Windy Conditions
• Appropriate layering
  — Warming/Wicking layer
  — Insulation layering as needed
  — Protective layering
    • Wind resistant
    • Waterproof/resistant
• Extra layering including HAT and gloves
• Acclimatization

Clothing Layers
• Base
  — Temperature control/Wicking
• Insulating - prn
• Shell layer (Environmental Protection)
  — Wind
  — Rain
  — Temperature
• “Sponsorship”
  — Modesty
  — Identification

Environmental Injury Prevention
• SUN protection
  — Shading
    • Shelter
    • Hats
    • Glasses
  — Skin protection
    • Sunblock
    • Sunscreen
    • Clothing

Specific Injuries: Autonomic Dysreflexia
• Syndrome that results in a sudden onset of severe hypertension as a result of exposure to a noxious stimuli.
• Powerful sympathetic sympathetic reflex
• Triggers a massive release of noradrenalin
  • BP 20 – 30 mm Hg above normal
  • Sweating
  • Pounding Headache
  • Flushed
  • Tight Chest & Stuffy nose
  • Blurred Vision

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Autonomic Dysreflexia: Causes
- Bladder
- Bowel
- Skin
- Boosting
- Other

Autonomic Dysreflexia: Management
  - Prevention: Avoidance of noxious stimuli
  - Boosting – AVOIDANCE!
  - Management
    - Recognition & Call
    - Positioning of athlete
    - Removal of noxious stimuli
    - Medication

Neurogenic Bladder
  - Prevention
    - Regular bladder routine
    - Proper hydration
  - Management
    - Bladder emptying, antiseptic catherization
    - Proper hydration

Skin Conditions

Pressure Sores
  - Prevention
  - Regular plan for prevention
    - Positional changes & W/C presses
    - Skin observation
    - Appropriate fit of prosthesis
    - Appropriate “socking”/layering of prosthesis
    - Padding/covering
    - Non-abrasive materials
    - Moisture absorbing materials
  - Management
    - Wound care with bio-occlusive dressings
    - Possible electrical stimulation for healing

Blisters
  - Prevention
    - Appropriate clothing
      - Absorptive materials
      - CLEAN!
    - Care for highly abrasive areas
      - Skin glide or other tolerated ointment
  - Management
    - Blister care
    - Leave intact with clean dressing
    - If disrupted, clean dressing with bio-occlusive dressings
Seizures

Prevention
- Thermoregulation
- Proper Hydration
  - Electrolyte management
- Proper Fueling
- Proper Stress Management
  - Planning
  - Relaxation techniques
- Appropriate Medication
  - Dosage
  - Timing of administration

Management
- Airway, Breathing & Signs of Life
- Resolution of event
- Removal of precipitating factor
  - Thermal regulate
  - Fluid replacement
  - Medication
- Supervision for Return to Sport

Hydrocephalus

Prevalence
- 90% of incidents are athletes with spina bifida
- Shunt malfunction causing
  - Headache
  - Blurred Vision
  - Vomiting

Management
- MEDICAL EMERGENCY!
- Recognition and CALL
- Airway, Breathing & Signs of Life
- Support until transport
- Surgical revision/replacement
- Supervision for Return to Sport

Overuse Injuries: UE
- Lowering w/c seat height
- Stroke technique – rim contact +270°
- Scapulohumeral rhythm balance
- R/O cervical / thoracic dysfunction

References
11. Food & Nutrition Board, Institute of Medicine: Dietary Reference Intake (DRI) http://www.iom.edu/Activities/Nutrition/SummaryDRIs/~/media/Files/Activity%20Files/Nutrition/DRI
s/1_%20EARs.pdf

**Treat the Masters Athlete with a Physical Challenge**

The First Truth About Aging is That Everybody Does It. The Second Truth is That Everybody Does It Differently.

**Outline - Treating the Master’s Athlete**
- Aging is not a Disease
- The Norm of Aging + The Norm of Impairment = Idiosyncrasy x 2
- Aging with Impairment
- Who is a Masters Athlete?
- Where to Masters Athletes Compete?
- Impairment Acquired with Age
- Impairment Acquired at birth or Trauma + aging
- Frequent Injuries in Para Athletes
- Athlete + Impairments + Aging considerations in treatment
- Be the Champions' Champion!

Idiosyncrasy is the Aging Norm

Aging is Not a Disease
- Age Related Changes
  - Muscle fiber decrease
  - Connective tissue elasticity decrease
  - Exercise responses
  - Reaction Time
  - Vision/Hearing
  - Sensory Changes
- Predisposition with Age

**Managing the Physically Challenged Athlete Across the Age Continuum**

APTA’s CSM, February 16, 2017, 8-10 am, San Antonio, TX

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• Atherosclerosis
• Myocardial degeneration
• Hypertension
• Respiratory Infections
  – Cancer

Age Related Pathology
• Cardiopulmonary
• Musculoskeletal
• Neuromuscular
• Neurosensory
• Integumentary
• Osteoporosis/Osteopenia
• DJD/OA
• CVA/PD
• Cataracts, MD, SNHL
• Herpes Zoster, Pressure Ulcers

Eligible Impairments + Aging
• Physical
  – Motor power, PROM, leg length, limb deficiency
• Coordination
  – Ataxia, athetosis, hypertonia
• Vision
• Intellectual
  – Slowness of movement
  – Slowed postural reflexes may disrupt coordination
  – Decreases strength, flexibility, sensation
  – Increased reaction time
  – Decreased balance

Definition of a Masters Athlete?

Competitive Opportunities
• National Senior Games
• Qualifications
• +20 yr professional rule
• Athletes with Impairment @ discretion of NSGA

World Masters Games: 2017 1st time for Para Athletes
• 11 Para sports
• No qualification
  – Minimum age criteria by sport
  – Eligible impairment (IPC)
  – Minimum impairment criteria (MIC - sport)
  – Athlete Classification
• Archery, Athletics, Badminton, Canoe (Flat Water and Waka Ama), Cycling, Lawn Bowls, Rowing, Swimming, Table Tennis, Tennis and Triathlon

IPC Paralympic Games

Paralympic Games Injury & Illness Survey
4,000 Para athletes 2012 London Paralympic Games
IPC’s London 2012 study is largest to date with a prospective cohort study involving 49,910 athlete-days
Participants 3,565 athletes (85%) that participated in any of the 20 sports of the London 2012 Paralympic Games

- Most injuries are acute injuries and mostly related to upper limb regions (shoulder, wrist, hand, elbow, knee) – sprains, strains
- Sports with highest incidence rates - football 5-a-side, powerlifting, goalball, wheelchair fencing and wheelchair rugby. Safest sports are shooting, rowing and sailing.
- Higher injury rates were found in older athletes
- Illness of respiratory, skin, digestive, nervous, genitourinary systems
- To inform injury prevention & intervention strategies.

**Evaluation + Goal Setting & Treatment**

- Stable/fluctuating HC
- Impairments
  - Permanent muscle imbalance
  - Compensatory “normals”
  - Autonomic system
  - Integumentary system
  - Urinary & GI systems
  - Activities of sport & training

**References**