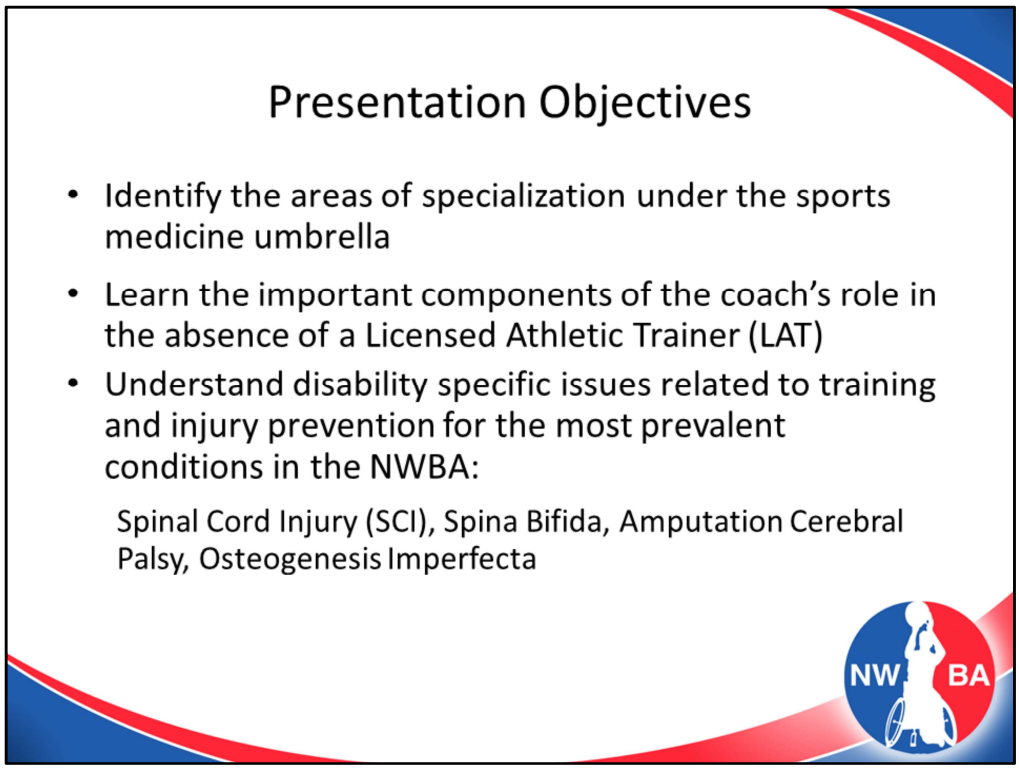
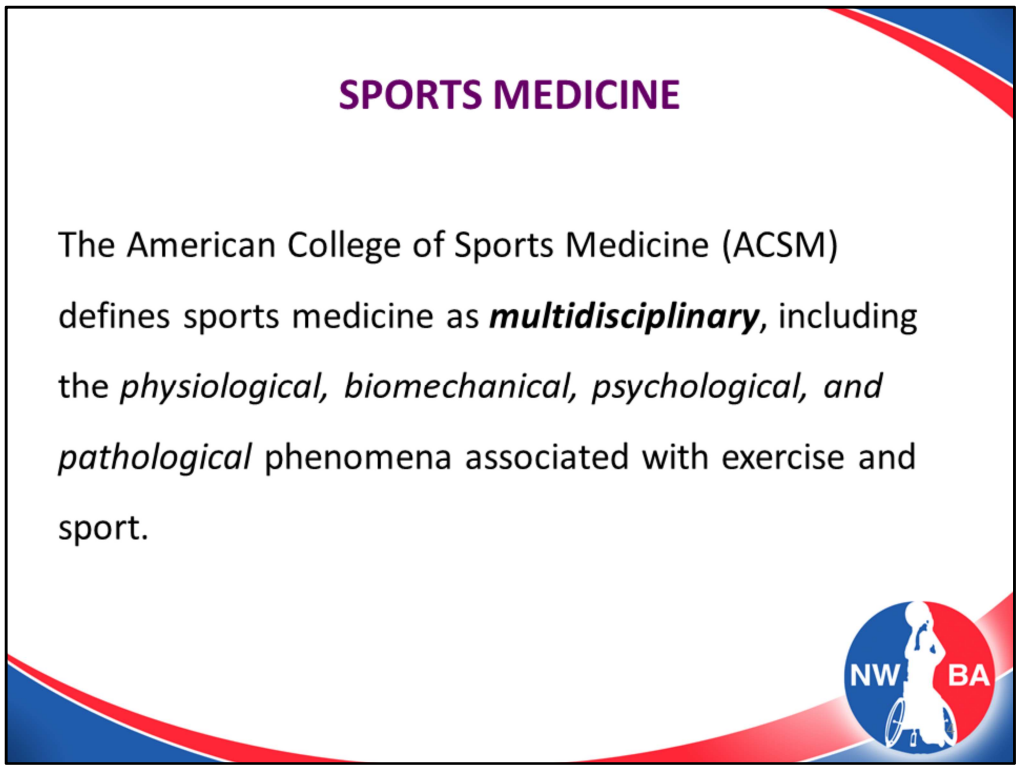

NW BA
Disability Specific Considerations
Level I
Coaching Education and Training Program

This program is made possible through a generous grant from the Craig H. Neilsen Foundation

Established in 2002, the Craig H. Neilsen Foundation is the largest private foundation dedicated to improving the quality of life for those living with spinal cord injury (SCI), by supporting innovative program services, specialty training and research on effective therapies, interventions and treatments, leading to a cure. Today, the Foundation funds SCI scientific research (basic, translational, clinical and psychosocial research); quality of life programs; postdoctoral and SCI medicine fellowships; and other projects to support the SCI community throughout the United States and Canada.



We always have challenges with how much general information to include in these presentations. Hopefully some of this will be review and we will introduce some new topics to consider and to apply the general information to.



In application, this means that the sports medicine team works together to improve and maintain a person's functional capacity to engage in sport and physical activity.

But what/who is the sports medicine team?

Two sides of the same coin: Performance Enhancement and Injury Care and Management.

Ideally you would have a number of these people available from both groups. However, as is often the case in disability sport, the coach is the sole representative from the performance enhancement side and the professionals on the injury care and management side are typically engaged only ***after*** and injury occurs.

Even if you have a certified athletic trainer available on a daily basis, the coach needs to understand their responsibilities because in the absence of an ATC, the coach must assume much of the responsibility for injury prevention. Additionally, the coach must understand the limits of their ability and the processes associated with return to play after an injury is sustained.

A coach should never provide care that they are not trained to perform. Every coach should be certified in CPR and First Aid at a minimum and act within the limits of their knowledge. Just because you have seen 100 tracheotomies performed on TV does not mean you can do one, even if you did sleep at a Holiday Inn last night!

Even if an athlete has medical clearance to participate in an activity, it does not mean that they are physically ready to withstand the demands of an intense practice or competition. Part of getting to know your athletes is understanding where they currently are in terms of strength, endurance, flexibility, aerobic capacity and skill development. It is the job of the coach to ensure that every athlete meets a minimum level prior to full participation and that they develop a plan to get the athlete to that minimum level.

Continued professional development will help the coach ensure that they have the knowledge and skills to provide a safe and fun experience for each athlete.

There are many additional field of play considerations when dealing with athletes with disabilities. What would you need to consider for an athlete with a visual impairment? An ambulatory athlete with cerebral palsy? An athlete using crutches or a walker? An athlete who is using a wheelchair?

What are some environmental conditions we need to be concerned with?

What are some equipment concerns specific to disability sport?

What are resistance exercises that can help produce a balanced shoulder joint?

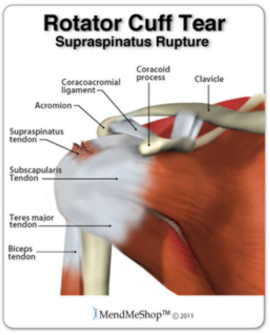
*http://www.ncpad.org/96/707/Overuse~Injuries~in~Wheelchair~Users

Upper Extremity Muscular Injuries

- The shoulder (glenohumeral) joint is the primary joint utilized by wheelchair users for propulsion and transfer
- Shoulder joint is highly susceptible to overuse injuries such as:
  - Rotator Cuff Strain
  - Shoulder Impingement

Care and Prevention of Rotator Cuff Strain/Tear

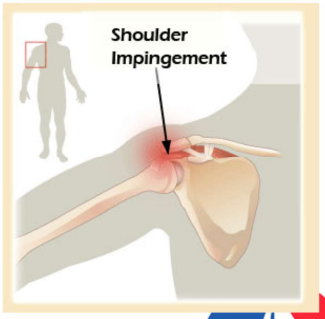
- **Origin/Mechanism of Injury**
  - Overuse (wheelchair propulsion, transfers, ADLs)
  - Forceful muscle contractions
- **Signs and Symptoms**
  - Pain
  - Point tenderness
  - Possible redness and bruising
  - Loss of function
- **Prevention**
  - Dynamic stretching before and static stretching after activity
- **Treatment**
  - RICE (Rest, Ice, Compression with an ACE bandage, Elevation)
  - Surgical repair if torn



*Pic: http://www.google.com/imgres?q=rotator+cuff+strain&hl=en&biw=1280&bih=603&tbm=isch&tbnid=9hUMAhSOM5bcDM:&imgrefurl=http://www.aidmyrotatorcuff.com/rotator-cuff-information/common-rotator-cuff-shoulder-injuries.php&docid=pCHZgn1XFwgW_M&imgurl=http://www.aidmyrotatorcuff.com/_img/rotator-cuff-supraspinatus-tendon-tear.jpg&w=400&h=490&ei=fJivUd3yJcux0AGCoIHQAQ&zoom=1&iact=hc&vpx=871&vpy=28&dur=5453&hovh=249&hovw=203&tx=121&ty=139&page=1&tbnh=137&tbnw=112&start=0&ndsp=22&ved=1t:429,r:5,s:0,i:138

Care and Prevention of Shoulder Impingement

- **Origin/Mechanism of Injury**
  - Muscular strength imbalances in the shoulder
  - Overhead activities that create pressure in the subacromial space
    - The sitting position requires perpetual overhead reaching for ADLs
- **Signs and Symptoms**
  - Pain
  - Point tenderness
  - Loss of function when attempting to raise arm
- **Prevention**
  - Proper biomechanics for wheelchair use
  - Strengthen adductor and internal/external rotator muscle groups
- **Treatment**
  - Ice
  - Correct biomechanics
  - Correct muscular strength imbalances



Overuse Injuries of Upper Extremity

- Common in individuals who utilize wheelchairs since the upper extremity is used for propulsion, transfers, and activities of daily living (ADLs)
- Prevention of pain or displacement of the upper extremities is critical
- Common upper extremity overuse injuries for athletes who use wheelchairs include:
  - Blisters, Abrasions, and Lacerations
  - Carpal tunnel syndrome and chronic shoulder pain

Care and Prevention of Blisters

- **Origin/Mechanism of Injury**
  - Form with repeated contact/rubbing of skin on wheelchair parts
  - The body's response is to form a layer of fluid beneath the epidermal layer of skin to cushion the irritating force
- **Signs and Symptoms**
  - Area feels hot
  - Pain
  - Burning sensation
  - Fluid within the blister may be clear (superficial) or contain blood (deeper tissue disruption)

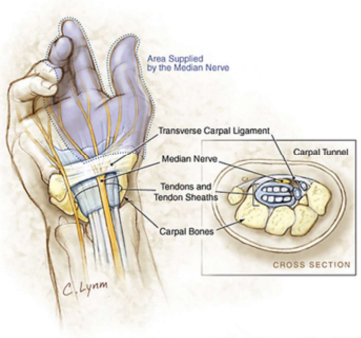
- **Prevention**
  - Talcum powder or petroleum jelly to protect the skin from
  - Wearing gloves
- **Treatment**
  - Do not pop the blister
  - If painful, the blister may be drained by an athletic trainer using a scalpel, and packed with antibacterial cream
  - Keep the blister covered and pad the area to reduce further irritation

Care and Prevention of Abrasions and Lacerations

- **Origin/Mechanism of Injury**
  - Abrasions result when the skin is scraped across a rough surface producing capillary disruption
  - Lacerations are deeper wounds that penetrate veins and can be irregularly torn
- **Prevention**
  - Wearing gloves
  - Plastic wheel guard covers on wheelchairs
  - Use of armrests on wheelchairs
  - Changing the camber of the wheels to prevent fingers from getting caught in wheel spokes
- **Treatment**
  - Control bleeding with direct application pressure using gauze (Glove up before contacting an open wound)
  - Elevate the wound (i.e., raise arm overhead while maintaining direct pressure)
  - Clean the wound (Hybiclens)
  - Apply antibacterial ointment
  - Apply sterile gauze and dressing
  - If the bleeding persists and cannot be controlled, seek further medical attention
  - Monitor the healing process for signs of infection
  - Keep the injury clean and dry

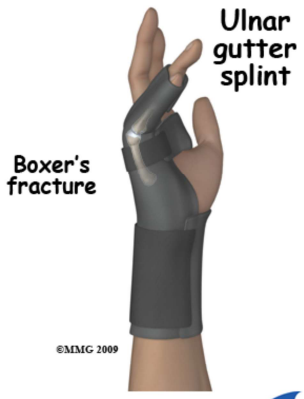
Care and Prevention of Carpal Tunnel Syndrome

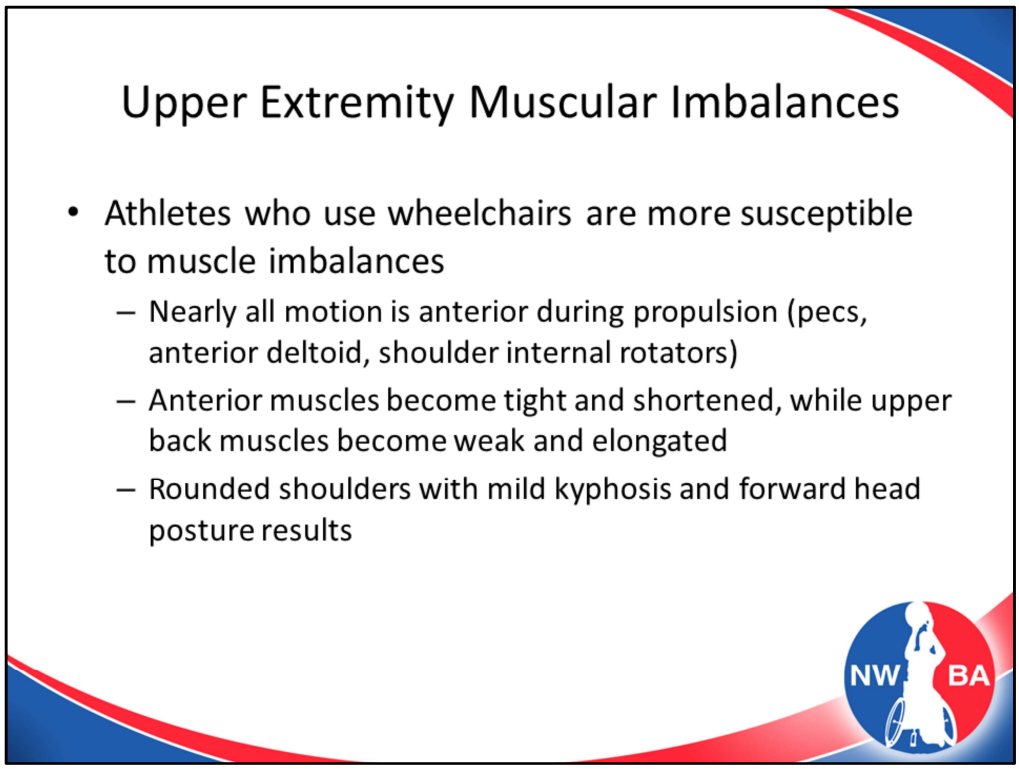
- **Origin/Mechanism of Injury**
  - Propelling a wheelchair, transferring, and unloading pressure on the sacrum (weight shifts)
  - The carpal tunnel is located on the palmar side (anterior) of the wrist and constructs the pathway for the median nerve that innervates the first three fingers of the hand (thumb, index, and middle)
  - Even a small amount of swelling within the carpal tunnel can create a loss of sensation in the hand
- **Signs and Symptoms**
  - Numbness and tingling
  - Loss of grip strength
  - Pain at night
- **Prevention**
  - Apply ice to the wrist for 20 minutes at the end of each day
  - Wrist flexibility and strengthening program
  - Wearing padded gloves
  - Correcting biomechanics
- **Treatment**
  - Immobilization
  - Non-steroidal anti-inflammatory drugs (NSAIDs)
  - Possible surgery



Management of Hand Fractures

- Hand fractures should be immobilized in a splint in the position they are found
- Splint above and below the fracture
- Do not attempt to reposition the hand
- Seek further medical attention





Muscle Imbalances: Most rotator cuff injuries are due to muscle imbalances of the shoulder. Shoulder strength and muscular length/ROM imbalance can cause impingement of the soft tissue structures of the acromiohumeral space. Wheelchair users are even more susceptible to muscle imbalances. Nearly every motion and all repetitive motions are anterior working the pecs, shoulder internal rotators, anterior deltoid, etc. These anterior muscles become tight and shortened while the upper back muscles become weak and elongated. You can see these imbalances in the postures of chronic wheelchair users. A typical posture is rounded shoulders with mild thoracic kyphosis and forward head. This posture is even more accentuated by non-supportive wheelchair back that is stretched out accommodating this poor posture.

Upper Extremity Muscular Imbalances

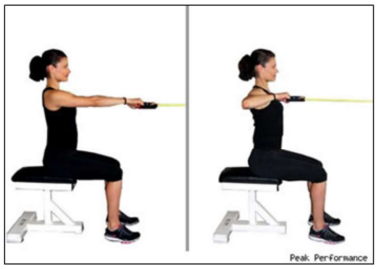
- Prevention and management
  - Supportive wheelchair backs
  - Stretch anterior musculature, while strengthening upper back, posterior shoulder, and scapular muscles
    - Perform strengthening exercises on stomach or while leaning forward in wheelchair (see following slide)
  - Push-Pull Routine to promote muscular strength symmetry
    - Example: After preforming bench press, follow with seated rows (after forward push, backward push)
    - Strengthens both agonist and antagonist muscle groups
    - Assures anterior muscle groups are not overworked
    - Will increase strength in all movement planes of the shoulder girdle

Upper Extremity Muscular Imbalances

- Posterior Strengthening Exercises in a Seated Position

Seated Rows with Band

- Strengthens Lats/Lower Traps
- Perform with elbows down



Seated Rows with Band

- Strengthens Rhomboids
- Perform with elbows up and out

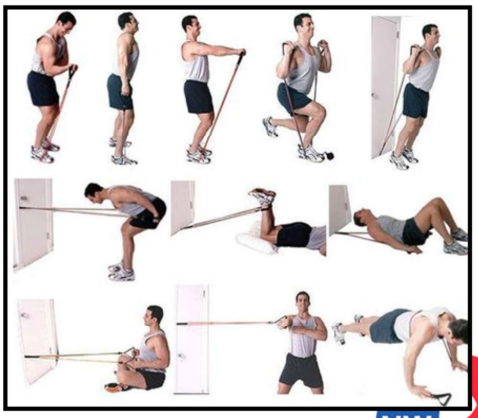
Seated Lat Pull Downs

- Strengthens Lats/Triceps

*__Shrugs__ may also be preformed by tying band under wheelchair. Shrugs strengthen upper traps; levator scapulae can be strengthened by rolling shoulders back with shrug.

Upper Extremity Muscular Imbalances

- Home Strengthening Exercise Programs using Bands
  - Theraband Door Anchors can turn a regular door into a highly versatile cable resistance machine



AUTONOMIC DISREFLEXIA

Can be life threatening!

Conditions, below the level of injury, that may lead to autonomic hyperreflexia include:

- Full Bladder
- Constipation or a full bowel
- Pain
- Infection
- Skin breakdown
- Ingrown toenail
- Sudden temperature changes in the surrounding environment
- Fractures
- Tight Clothing

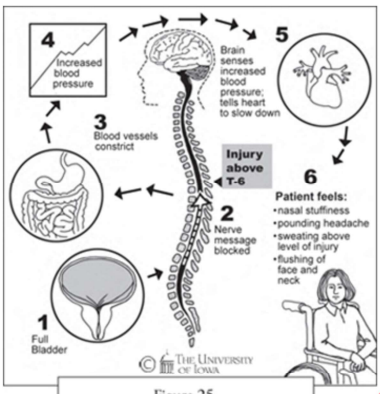
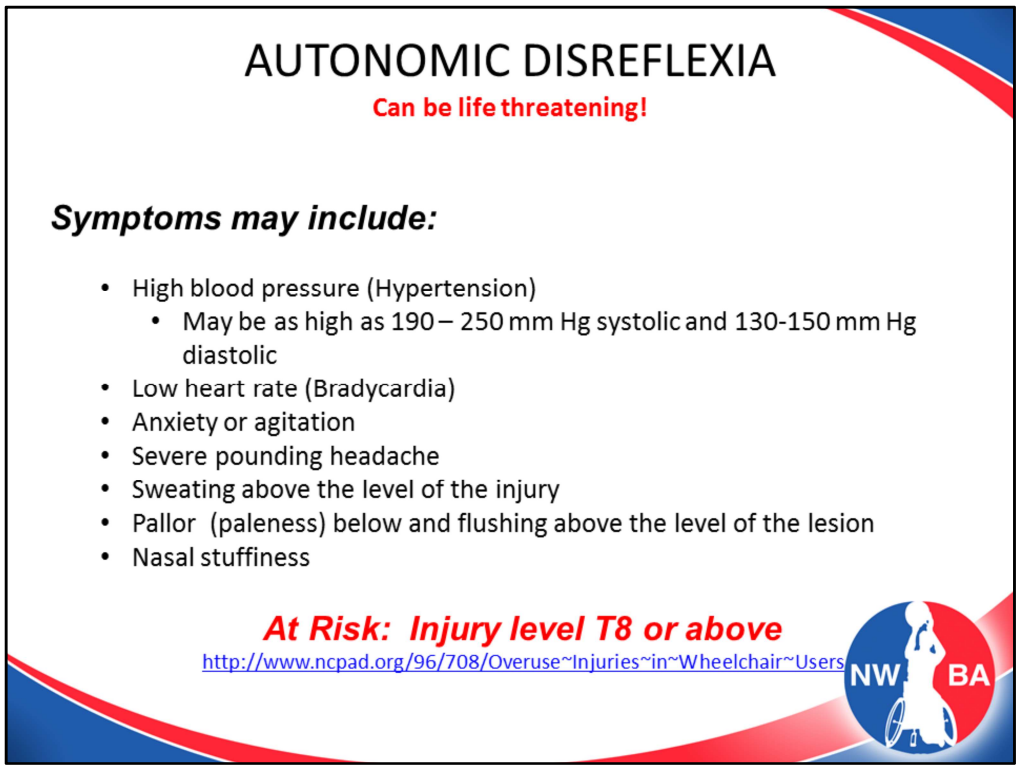


Figure 25.
Cycle of autonomic hyperreflexia caused by full bladder



At risk are people with injury level at T6 and above, but cases have been reported by people with injury level as low as T8.

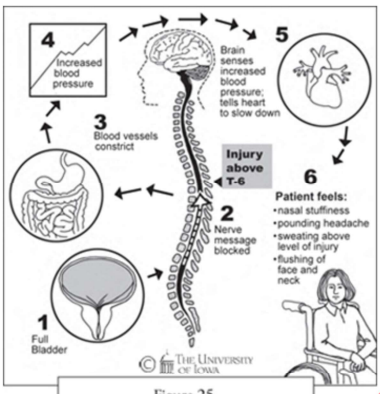
*http://www.ncpad.org/96/708/Overuse~Injuries~in~Wheelchair~Users

AUTONOMIC DISREFLEXIA

Can be life threatening!

- Treatment
  - Sit athlete up/dangle legs down
  - Removal of Stimuli
  - Catheterization
  - Loosen tight clothes
  - Anti-hypertensive medication

- Complications
  - Seizures
  - Pulmonary edema
  - Myocardial infarction
  - Cerebral hemorrhage



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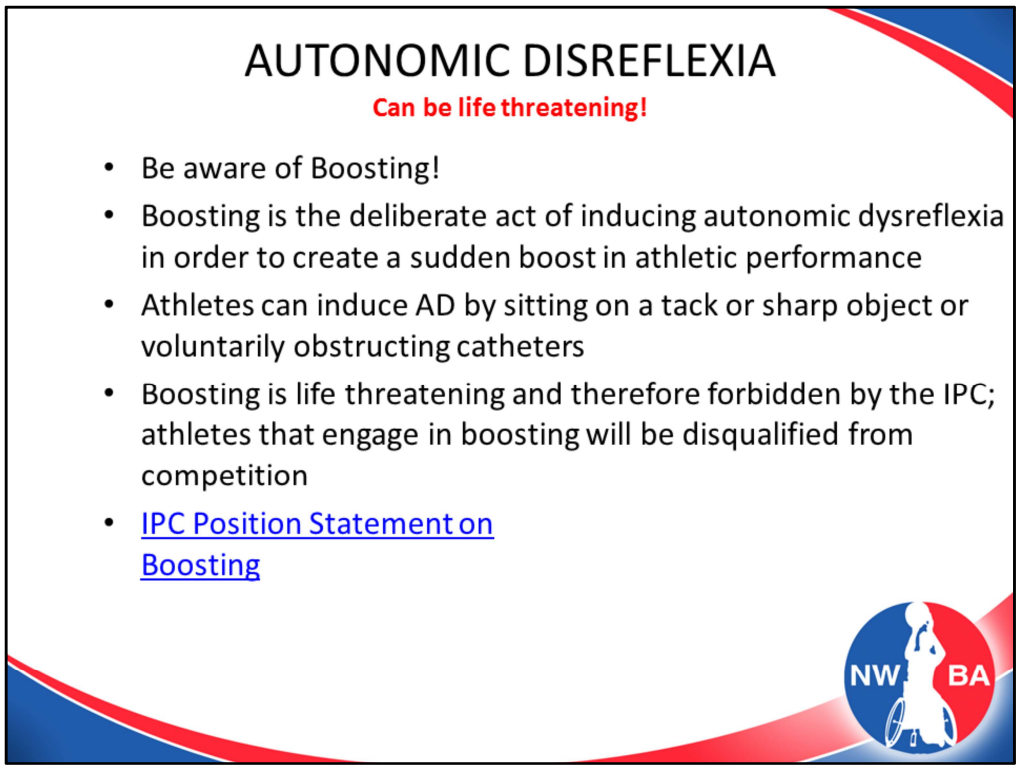
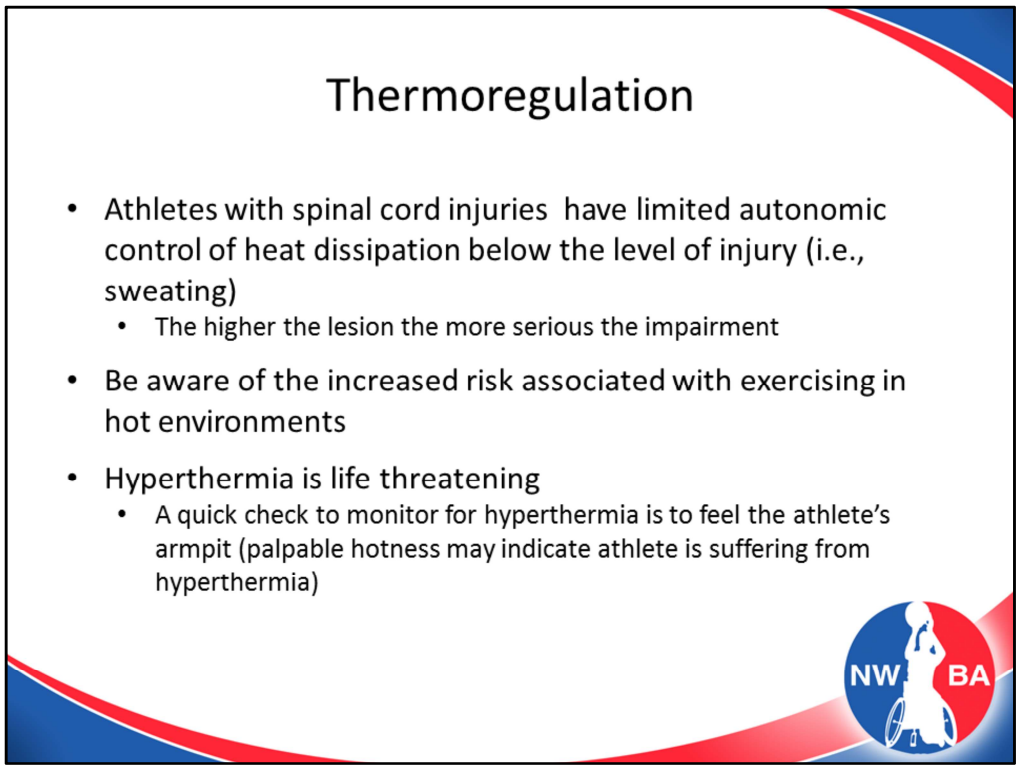
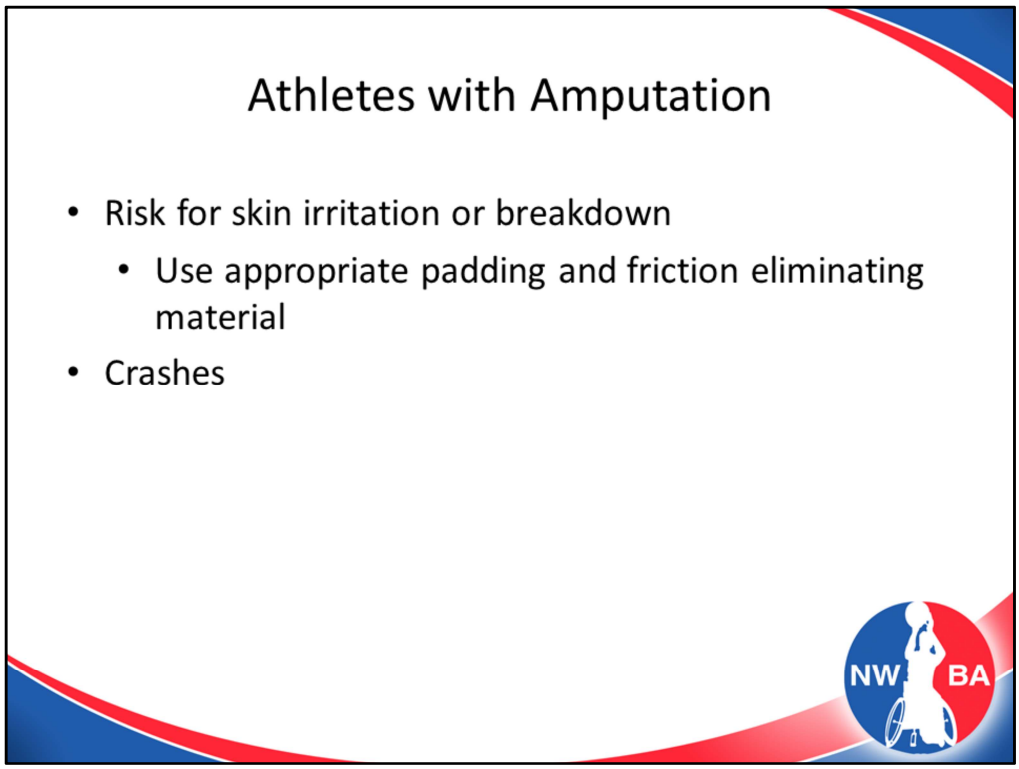


*http://www.paralympic.org/sites/default/files/document/120203171154502_Sec_ii_chapter_4.3_Position_Statement_on_Autonomic_Dysreflexia_and_Boosting.pdf

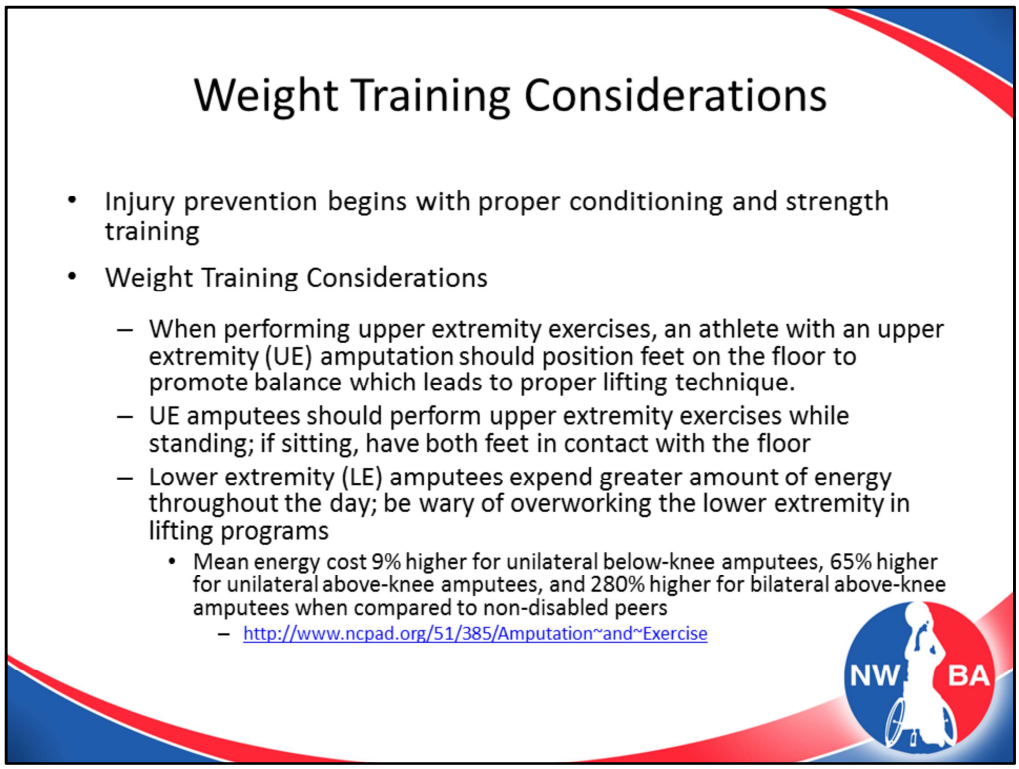


To prevent hyperthermia, stay well hydrated, wear lightweight clothing, use fans and air conditioning, and remain indoor in extreme heat and humidity. If hyperthermia does occur, move to a cooler climate, e.g., shade, indoors, drink fluids, and sponge the skin with cool water. If the hyperthermia is severe, e.g., person is unable to drink, loses consciousness, or is incoherent, then emergency medical treatment is necessary.

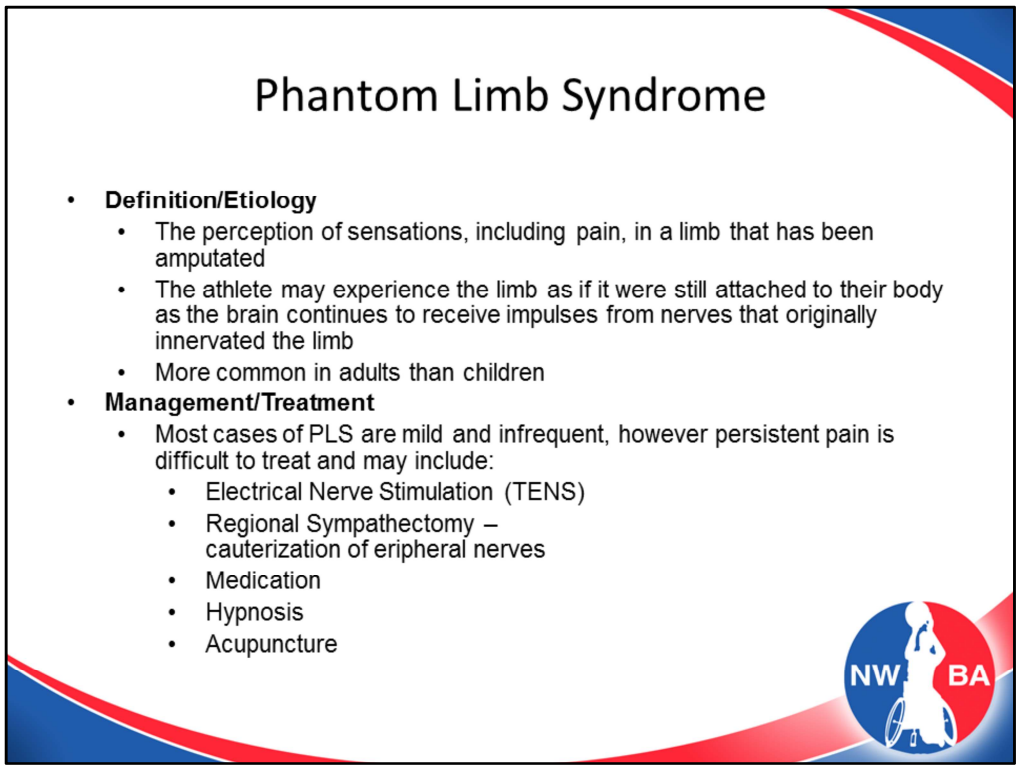


What else needs to be taken into consideration relative to injury potential for athletes with amputation?

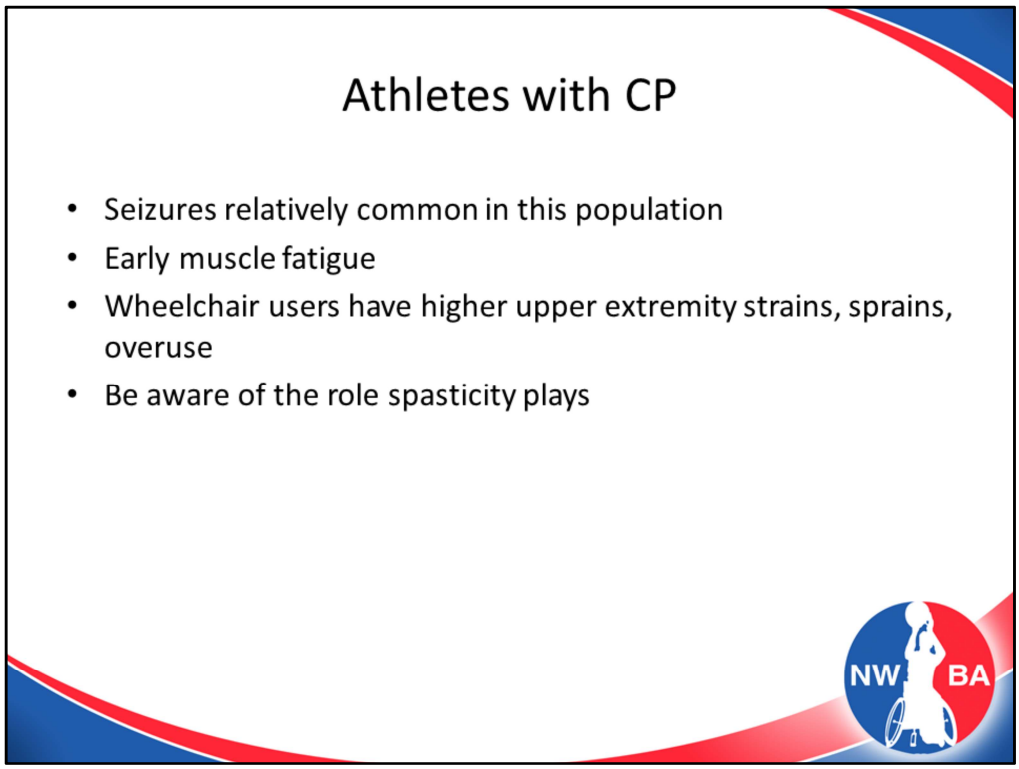
Prosthetic failure, balance issues, falls/crashes.



*http://www.ncpad.org/51/385/Amputation~and~Exercise



*http://www.med.nyu.edu/content?ChunkIID=96857



Proper warm up, consistent flexibility program to increase ROM, adapt technique for each individual

Athletes with CP

- Flexibility training is KEY for athletes with spasticity – emphasis ROM training. PNF Stretching very useful.
- Athletes with spastic CP tend to have tight hip adductors; take time to strengthen the hip abductors to promote muscular symmetry.
- Be aware that balance is often impaired in ambulatory athletes with CP. Protect the athlete by providing assistance if necessary for standing resistance exercises or having the athlete perform seated exercises.

NW BA

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http://www.ncpad.org/94/705/Resistance~Training~for~Persons~with~Physical~Disabilities

Athletes with CP

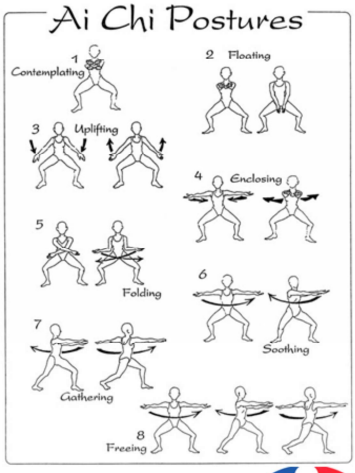
- Athletes with spastic CP often have a hyperactive stretch reflex that overacts to stretching by producing a forceful contraction producing jerky movement patterns. Emphasis should be placed on concentrating on smooth, fluid movement patterns during resistance training and ROM.
- Athletes with athetosis (involuntary movements) may find the most success utilizing cuff weights and machines instead of free weights and bands.

*
http://www.ncpad.org/94/705/Resistance~Training~for~Persons~with~Physical~Disabilities

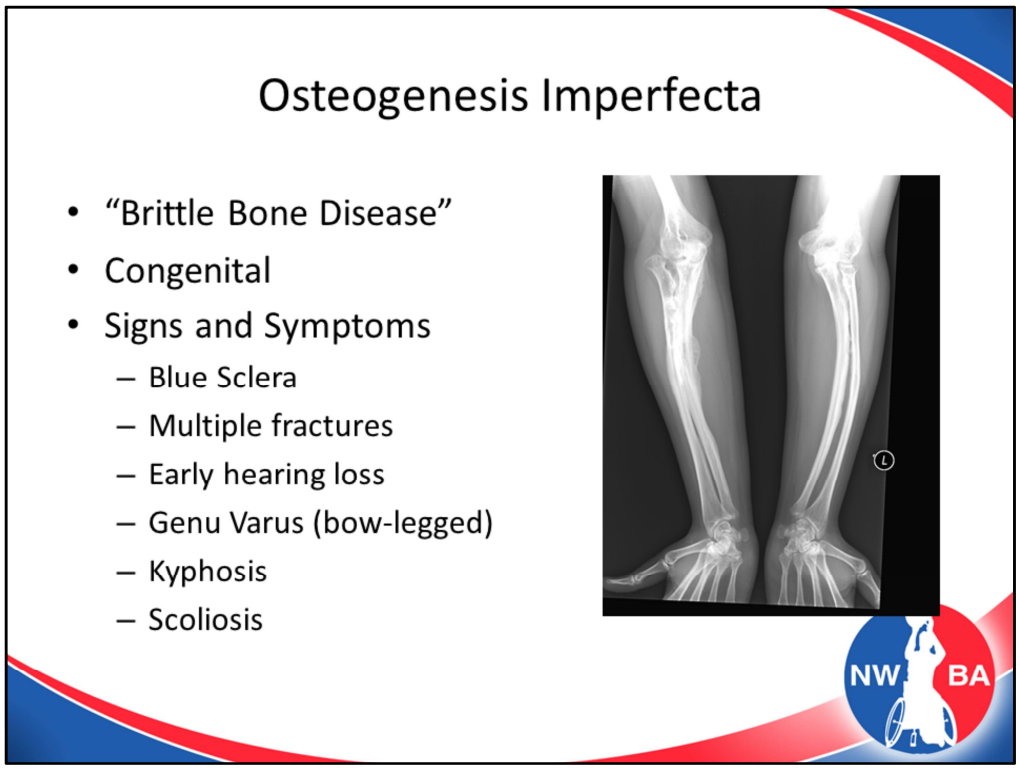
AI CHI FOR ATHLETES WITH CP

- Ai Chi is a water-based total body strengthening and relaxation progression that incorporates Watsu movements
- Progresses from simple breathing, to incorporation of upper-extremity, trunk, lower-extremity, and finally total body involvement
- Ideal as a relaxation technique to improve ROM and mobility

- Watsu: http://www.youtube.com/watch?v=58ya3qtSyMY
- Ai Chi: http://www.youtube.com/watch?v=Wje4Y4E1CXA

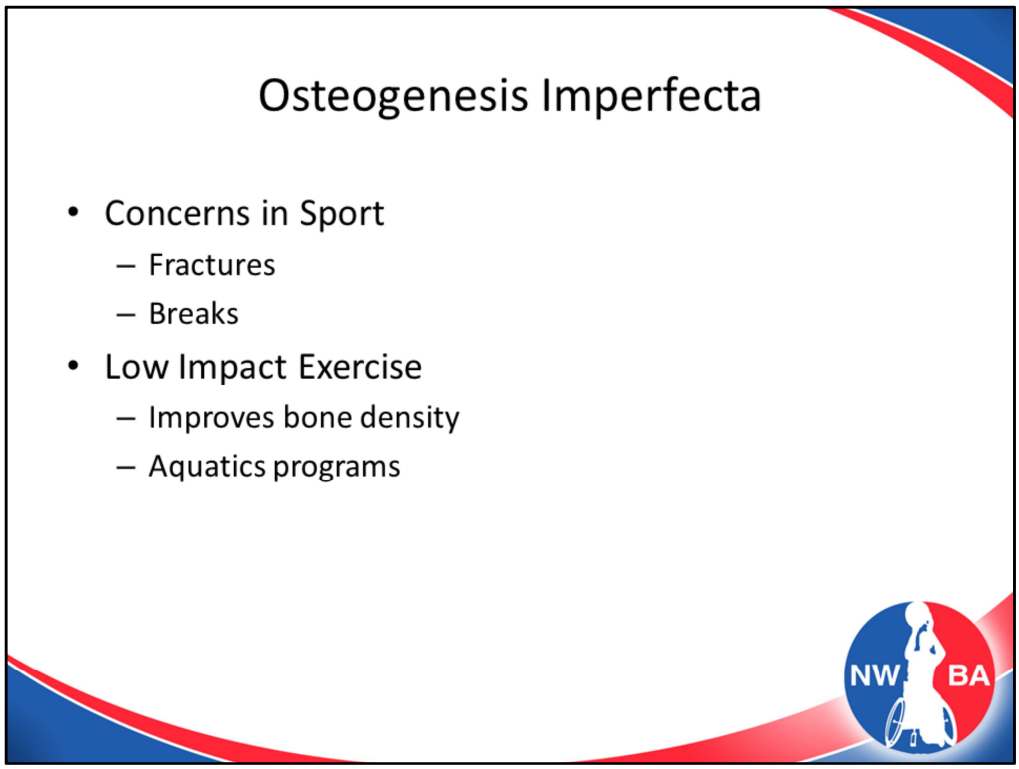


*http://www.nchpad.org/373/2078/Ai~Chi



Osteogenesis Imperfecta is the medical term for the disease commonly known as brittle bone disease. Osteogensis Imperfecta -- OI -- is a genetic disorder in which an individual is born with fragile bones, according to the Osteogenesis Imperfecta Foundation. OI will affect you throughout your entire life and lead to easy fractures. Osteoporosis is also classified as a brittle bone disease. Low impact exercise can help improve overall health and maximize bone density in OI and osteoporosis patients. You should always consult your doctor before beginning an exercise program for Osteogenesis Imperfecta.Read more:

http://www.livestrong.com/article/329081-brittle-bone-disease-exercises/#ixzz1ffxH9pVq



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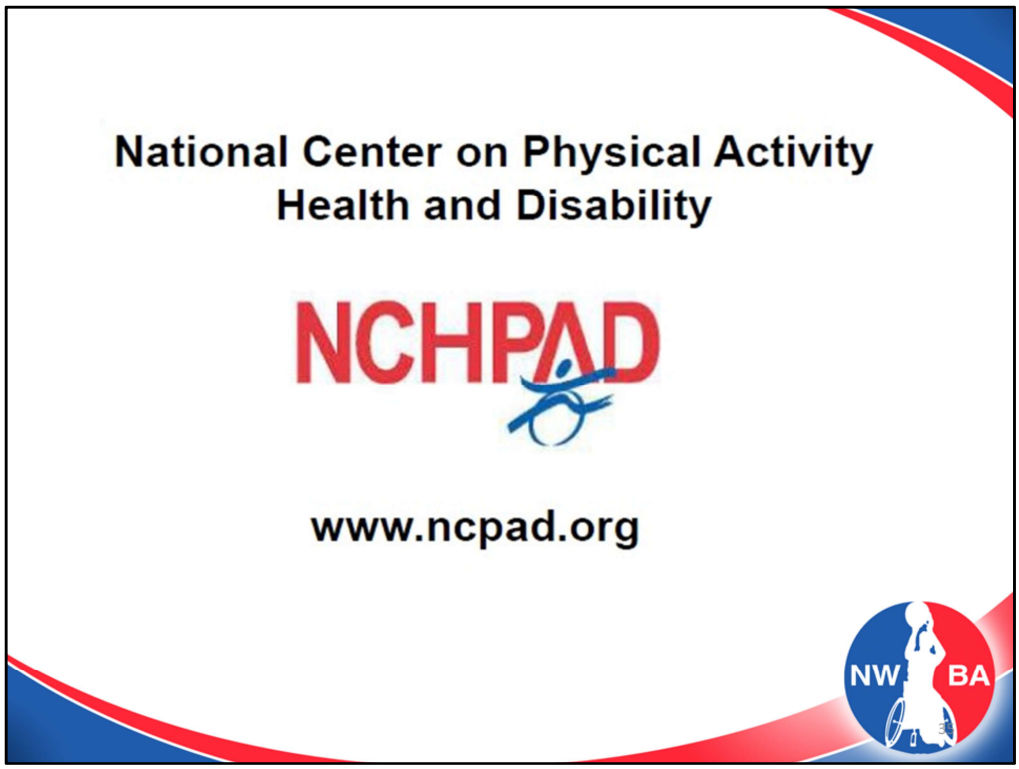
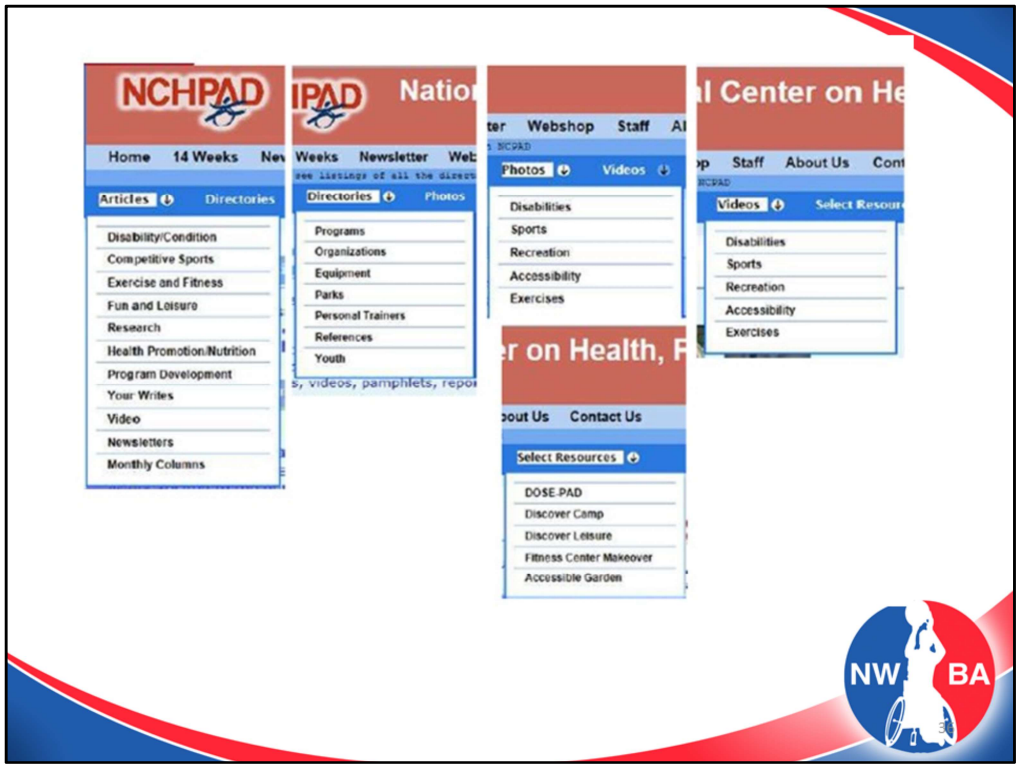


NCHPAD is a suggested resource for additional staff and volunteer training on disabilities.



NCHPAD is an extensive resource of articles, fact sheets, research, videos and program directories on topics related to physical activity and disability.

Summary

- Each type of disability offers its own challenges relative to participation and possible athletic injury.
- Understand the potential injuries, methods of prevention and care for each disability group.
- Use disability-specific resources for additional information for staff and volunteer training opportunities.
- Understand the role of a coach as part of the Sports Medicine team.