Wednesday, 12:30 – 2:00, E8

# Biomechanical Issues in the Wheelchair Athlete

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Objectives:

1. Identify advances in clinical assessment and management of selected healthcare issues related to persons with developmental disabilities
2. Identify and emphasize attitudes that enhance the opportunities for persons with DD to achieve their optimal potential

Notes:

# BIOMECHANICAL ISSUES AND THE WHEELCHAIR ATHLETE

## Shoulder Focus

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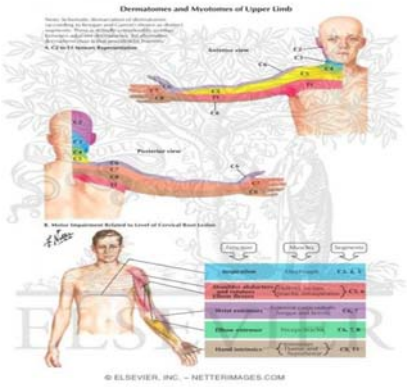
## Athlete

- Trained or acquired skills
- Practiced/repeated activity leading to proficiency
- Equipment specialized and fit for the athlete
- Concern for injury prevention
- Support

## Considerations in enhancing wheelchair mechanics

- Level of injury and ability
- Stroke pattern
- Equipment support
  - o seating
  - o camber
  - o backrest height
  - o seat angle

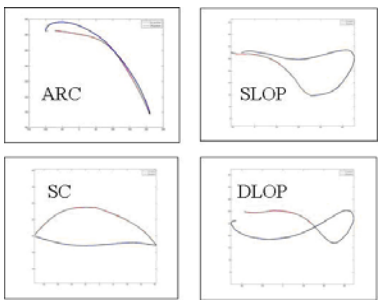
## Anatomy overview




## Considerations in enhancing wheelchair mechanics: Stroke pattern

http://v.coachseye.com/BjhQ

## Considerations in enhancing wheelchair mechanics: Stroke pattern



## Considerations in enhancing wheelchair mechanics

Angle of wheel- camber

Seat height

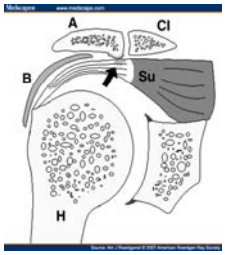
## Train to perform

## Common injury in wheelchair athletes

- Impingement
- Carpal tunnel
- Neck and back pain
- Tendinitis

## Common injury: Impingement

Lateral view of Humeral head




Maximum internal rotation, scapular downward rotation and protraction

## Common Injury: Tendinitis

- Overuse of muscle leading to inflammation and pain at tendon insertion
- Bicipital
- Rotator cuff
- Medial/lateral epicondylitis

## Injury prevention in wheelchair athletes

**Maintain ROM (Range of Motion)**
- Stretching

**Rest**
- Electric chair when able to do so
- RICE

Examine stroke pattern for efficiency and pattern

Joint Distraction

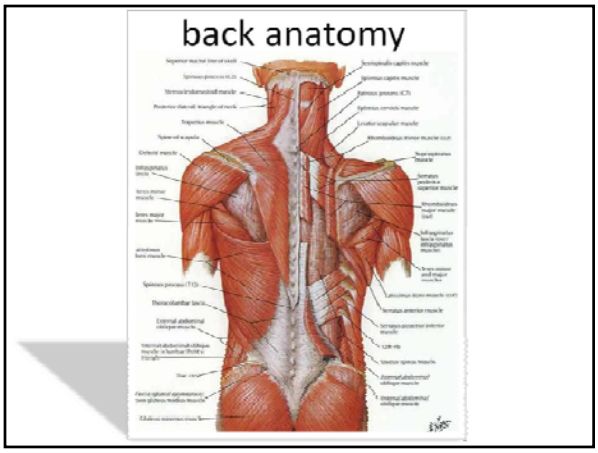
**Strengthen stabilizers and lengtheners**
- Posterior deltoid, triceps, lats, rhomboids, lower trapezius

## The role of scapular stabilizers

- http://www.kideos.com/video/construction-equipment-video

## Load Outweighs Base

http://www.youtube.com/watch?feature=player_detailpage&v=fZvtNz8-6Sc



## Neck Stretches

- Levator scapula
- Upper trapezius


## Basic Exercises

- Chin Tucks and Scapular Sets



## Shoulder circle





**Conclusion**

Most wheelchair users are athletes at some definition due to the specialized equipment needed, the prolonged positioning and repetitive nature of the motion, and the need to train to perform efficiently and effectively to enhance participation in life

There is need to increase accessibility for training in order to reduce joint compression forces, increase muscle strength and flexibility for these athletes of all abilities prior to injury occuring

Improved equipment and varied equipment could better prepare individuals for a wider variety of activities allowing for change in position, posture, and support increasing participation and visibility.

# Bibliography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