Physical Therapy throughout the Life Span

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Lifetime Goals for Physical Therapy

• Maximize Participation in school, work, community
• Maintain Flexibility and Comfort
• Encourage Motor Skills and Activity
• Assist with Mobility
• Promote independence
• Promote self advocacy
• Decrease caregiver burden
• Family Education
Impact of Physical Therapy Interventions

• Flexibility and muscle health
• Assistive technology or adaptive devices
• Adapt environment: School, work
Why DMD muscles become tight

• Growing bone
• Fibrosis within muscle tissue
• Standing and Gait postures
• Prolonged Wheelchair sitting
• Decreased joint movement
Why is flexibility important?

• Maintains symmetry
• Prolongs walking and standing transfers
• Improves positioning in wheelchair
• Improves ability to move
  – Benefits from new drugs
    • Musculoskeletal Health
  – Increased ability to access technology
• Improves comfort
### Which muscles are at risk?

<table>
<thead>
<tr>
<th>Ambulatory Phase</th>
<th>Transitional Phase</th>
<th>Wheelchair Phase</th>
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</thead>
<tbody>
<tr>
<td>Hamstrings</td>
<td>Hip flexors</td>
<td>Elbow flexors</td>
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<tr>
<td>Gastro soleus</td>
<td>Hip abductors</td>
<td>Shoulder muscles</td>
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<td></td>
<td>Posterior tibialis</td>
<td>Wrist flexors</td>
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<td></td>
<td>Forearm supinators</td>
<td>Finger flexors</td>
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<td></td>
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<td>Neck extensors</td>
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We can’t prevent all contractures... Can we slow the process?

- Splinting
- Stretching
- Positioning
Benefits of Stretching

• Stretching improves circulation to muscles
• Moves joints through entire range of motion
• Decrease tightness associated with lack of movement
• Decrease pain
Approaches to Manage Contractures

**Conservative**
- Short Duration Stretches <30min
  - Manual Stretches
  - Standing frames: Depends on tolerance
- Long Duration Stretching
  - Splinting
    - Static/dynamic splints
  - Positioning
  - Serial Casting

**Surgical**
- Tendon lengthening and transfers
Ankle Splints

• Initially worn at night
  – 6 to 8 hours per night
  – 6 to 7 nights per week
• Solid or articulated
• Work with your therapist
  – Maximize Sleep
  – Maximize Comfort
Non-ambulatory phase

- May be worn during the day in wheelchair
  - $> 6$ hours per day/night
    - $6$ to $7$ days per week
- Limits feet from turning in
- Choose style to maximize comfort
- Initiate hand splinting
Gentle Stretches

• Gentle Stretches
  – Hold 30 seconds
  – Repeat 2-3 times

• Ambulatory → Legs
• Transitional → Legs/Forearm
• Non-Ambulatory → Arms/Legs

Parent vs. Self Stretches
Positioning

- Long sitting postures
- Standing wedges
- Prone Lying
- Yoga activities
Standing Frames

Need to tolerate for 90 minutes
Activity & Exercise:
What we know about exercise

• No exercise leads to muscle atrophy
• Too much exercise hastens muscle breakdown
• Eccentric contractions are more damaging to the muscle cell
• Younger boys benefit more than older boys
• Boys with DMD are 40% less active than their same aged peers (McDonald, 2000).
Exercise Recommendations

• Mild to moderate exercise intensity
• Balance activity with rest
  • Avoid generalized fatigue
  • Avoid muscle soreness
• Concentric versus eccentric
• Low load/intensity versus High load/intensity
• Incorporate balance and coordination
• Make activities fun and social!!!
Aquatic Activities

• Safest form of exercise
• Non weight bearing
• No load
• Full Range of Motion
• Improves aerobic function
• Increased movement
• FUN!!!
Your Questions ????

Regarding............

• Splinting
• Stretching
• Positioning
• Contractures
• Exercise

PPMD: Helen Posselt PT
Early Mobility Devices

Go-Go® Elite Traveler Plus

EZ Lite Cruiser

evrider.com
Purchasing a Power Wheelchair

• Do some homework
  – Look at various websites
  – Talk to other parents
• Work with an experienced therapist
• Choose a vendor wisely
  – You will need to work with this vendor for repairs
• Know what your insurance will pay for
  – Can you pay out of pocket for an upgrade
• Expect to wait…. it takes several months
• Make sure the chair fits properly on delivery
Power Wheelchairs

- Drive Mechanism
  - Front Wheel
  - Mid Wheel
  - Rear Wheel

- Power Options
  - Power stand feature
  - Power tilt
  - Power recline
  - Power seat elevation
  - Power elevating leg rests
Seating for postural alignment

- Appropriate cushion on solid base
- Solid planar or contoured backrest
- Supportive head rest
- Lateral trunk supports
- Lateral hip guides and/or adductor pads
- Hip belt and chest strap
- Swing away or center mounted foot plates
Seating for young adults

- Emphasis on comfort
- Pressure relieving cushion
- Larger head rest
- Wider arm rests with elbow blocks
- Padded footrests
- Joystick modifications
- Ability to attach ventilator
Transfers

• Stand pivot with maximum assist
• Sliding board across level surfaces
• Maximum lift of caretaker
• Use of mechanical transfer lift
  – Hoyer lift
  – Ceiling lifts
• Minimize transfers with rolling bath chair
Transfer Options

Rifton-Tram

Joerns Voyager Track
Bathroom Transfers

RAZ-AT (Attendant Tilt)
Mobile arm supports

WREX: jaecoorthopedic.com

www.neater.co.uk
Assistive Technology

• Blue tooth devices
• Siri/Dragon Speak
• Environmental controls
  – Amazon echo & Google home
• Tablets & Smart phones
• Voice amplifiers
• TouchTapSwipe Guide (dmdpathfinders.org.uk)
Accommodations in the Classroom

- Copies of power points or notes
- Extra set of books for home
- Use of laptop/tablet or scribe
- Modified homework to limit fatigue
- Extra time for tests
- Oral tests if writing is difficult
- One-on-one aide
- Individualized seating or desks
Accommodations for Campus

- Extra time to get to class
- Individualized PE modifications
- Use of accessible bathroom
- Staff trained in transfers (using a lift)
- Assistance for lunch set up
- Safety evacuation plan
- Service Dog
School Therapy Services

- Educational rather than Medical model
- Direct Services (IEP) vs Consultative (504)
- Setting meaningful functional goals
- Availability of aquatic services
- Equipment needs at school
- Consultation for PE activities
- Consultation for Safety Plan & Transfers
Your Questions ????

Regarding.............

• Wheelchairs
• Seating
• Transfers
• Assistive devices
• School modifications