



Working Together to Create a Therapeutic Foundation

*Conservative Physical Therapy
Management of Children
with Myotonic Dystrophy*

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Are we having fun yet?



Today's Overview

1

- Assessment

2

- Working with Alignment

3

- Core Strengthening

Observing Early Movement



- Observation of age appropriate motor skills
- Quality of movement
- Sensory/motor issues
- Look for patterns
- Can be helpful with early diagnosis

Sensory-motor Organization

- Integrated flexion and extension
- Ability to sustain posture against gravity
- Well-controlled, modulated movement
- Adaptability of muscle tone
- Good body awareness
- Mid-range control



Distinct motor profiles associated with Myotonic Dystrophy

- Drop foot, unusual gait
- Slow acquisition of symptoms
- Difficulty maintaining posture against gravity
- Difficulty with balance, selective motor control and coordination
- Inability to function within the “grey-zone” of movement

Posture and Alignment in Myotonic Dystrophy

Biomechanical Alignment



- Postural assessment
- Head position
- Kyphosis/Scoliosis
- Rounded shoulders
- Lumbar curve
- Abdominal protrusion
- Leg alignment
- Knee hyperextension
- Foot and ankle alignment

Foot and Ankle Alignment



- Wide base of support
- Ankle pronation
- Genu valgum (knock-knees)



- COG over BOS
- Knees in alignment
- Rear foot control

LE Evaluation



- Objective measurement of foot and ankle mobility, deformity and function



- Leg length discrepancy
- Contributes to postural asymmetry

Foot and Ankle Management



Ankle Stretching



- Board used at home for daily program of dynamic stretching to increase or maintain ROM

10 to 15 minutes daily to maintain ROM



Biofeedback



- Bio 1



- Bio 2

Kinesiotaping



- Foot 1



- Foot vid 2

Problem Solving



Why use equipment?



- Disorders of muscle balance
- Inability to maintain postures vs. gravity
- Prevent compensations!!!!
- Prevent deformity
- Facilitate body awareness
- Correct alignment
- Reinforce therapy goals
- Compression for co-contraction

Influencing Compensatory Leg Posture



- Intoeing most often comes from the hips
- Internal rotation at the hip joint
- Knock knees



- Stabilize the foot and ankle
- Create rotary force using strapping to influence hip and knee position
- Recreating hands-on therapy

Hypotonia~ Low Muscle Tone

Hypotonia-low muscle tone



- Amount of tension or resistance to movement in a muscle
- Recognizable in infancy
- Can have long-term effects on development and posture
- Underlying cause of scoliosis
- Leads to compensatory postures and movement

Joint Hypermobility



- Decreased proprioception
- Lack of congruency of joint surfaces = Decreased input at joint receptors
- Poor postural control and lack of postural awareness
- Too much movement
- Need increased stabilization
- Central control/postural alignment must be maintained so that the limbs can have greater control

Joint Hypermobility



- Too much movement
- Poor distal stabilization
- Creates unstable base of support/ foundation for the body to align on top of
- Control the rear-foot to allow efficient muscle control
- Create balance around the joint

Foot Orthotics



- Postural evaluation
- Creating a balanced base of support
- Bony modeling
- Decreasing postural compensations

Toe Walking



- Never normal
- Sensory-seeking
- Poor modulation of movement
- Becomes habitual
- Should be treated at the onset
- Gets harder to treat as child gets older

Compression Garments:

How do they work?

- By providing compression, body awareness is improved
- Body awareness = Postural awareness
- Compression causes co-contraction of muscles around a joint
- This directly improves low muscle tone
- Allows for neuromotor re-education
- Different types: SPIO, Theratogs, Underarmor...
- Used for different purposes

Neuromotor Re-education



- Requires hundreds and thousands of repetitions
- Dynamic stabilization
- Allows the wearer to experience and use new movement and/or muscle recruitment throughout the day

Compression Garments



- Difficult or impossible for a child to maintain posture while engaged in other activities



- Provides sensory input and applies forces to allow for consistent postural support throughout the day

Scapular Stabilization



- Part of core stability
- Muscular attachments of UE to trunk
- Synergists with oblique abdominals



- Shorten lengthened muscles
- Perform just-right challenge
- Sensory cueing to maintain postural control

Importance of Core Strength

- Postural support is the basis for all controlled movement of the extremities
- Core consists of : transverse abdominus, internal and external obliques and rectus abdominus, hip flexors, adductors and abductors, Lumbar spine and diaphragm
- Effects all areas of control
- Creating a postural “set” for movement

Core Strengthening Program

Bridging



- Start with both feet on the floor
- Slowly raise and lower hips off the floor 10x
- No wiggling

One-legged Bridging



- Starting position as above
- Then cross one leg so that the ankle rests on the opposite knee
- Push down into the floor with both hands and raise the hips off the floor.
- Hold for a slow count of 5.
- Keep pelvis stable.
- This is difficult and may require adult assistance.

Sit-ups/ Crane Arms



- Feet flat, knees bent-reach both hands forward and tuck chin to reach for a ball or toy held on the knees.
- Reach for the ball and slowly lower trunk to the floor.
- Keep head in chin tuck position.

Meatball



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- Reach for the ball and slowly lower trunk to the floor.
- Keep head in chin tuck position.

Quadruped Reaching



- On hands and knees, reach one arm forward,
- Hold for a count of 10
- Alternate reaching with each limb individually.



- Then lift opposite arm and leg, i.e. right arm /left leg and
- Hold for a count of 10 on each side.

Goal post arms



- Lying prone on the floor with a small pillow under the forehead.
- Bend elbows to 90 degrees and hold arms out at shoulder height, making the shape of a goal post with your arms.
- Squeeze the shoulder blades together and lift the arms up off the floor.
- Hold for a count of 10

Push ups



- Start with hands under the shoulders.
- Bend elbows as much as possible while maintaining good form in the trunk.
- Can be done with the knees bent, legs squeezing together if the buttocks tends to rise or arms are weak.
- Hold for a count of 5
- Plank position is a great precursor
- Forearm plank is a great starting position

Swimming on the floor



- Lying prone with arms and legs stretched out.
- Palms face each other, thumbs up, lift one arm and then the other.
- Try NOT to rotate the body, just lift from the shoulder.
- When you have a controlled alternating pattern, add alternating legs, moving from the hips into extension.

Daily stretching program



- Stand in a doorway with arms in the goal post position. Keep feet stable and lean through the door creating a forward motion of the body over the feet. You should feel a stretch through the whole chest.



- Standing at a staircase place hands on lowest comfortable step. Keep legs straight, bend elbows and lower torso to maximum stretch. Keep head down.

Summary

1. Observation of movement
2. Postural alignment of the skeleton
3. Improved sensory/body awareness
4. Strengthen in the aligned position
5. Perform exercises consistently
6. Modify exercise to create “just right challenge”
7. Be consistent and participate
8. Goal always focused on improving ease and efficiency

Thank You!



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