

Physical Therapist Reference Sheet

Pre-Operative Tethered Cord Release

Overview

Tethered Cord Syndrome is a rare neurological condition affecting the spinal cord and many important nervous system functions throughout the body. It occurs when a portion of the spinal cord is abnormally attached or "tethered" within the spinal canal. This creates tension on the neural tissue and restricts the cord's normal movement during spinal motion, which can lead to progressive neurological and functional decline. Surgical detethering is a primary treatment, and patients may be referred to physical therapy before surgery.

Clinical Presentation

Patients typically present with symptoms affecting multiple body systems:

- **Neurological symptoms** may include progressive motor weakness or recruitment issues, sensory deficits, pain in the back or legs, and hyperreflexia.
- **Urological and bowel symptoms** can include bladder dysfunction, urinary incontinence or retention, and irregular bowel patterns.
- **Orthopedic symptoms** often involve scoliosis or changes in the curvature of the spine over time, foot deformities, gait abnormalities, limited mobility, and pain or weakness in the back and legs.

Pre-Operative Treatment Considerations

Neutral Spine Positioning

The spinal cord is already under tension; pre-op PT should minimize additional stress:

- Keep the spine in neutral alignment during activities
- Avoid or limit trunk flexion, which increases tension inside the spinal canal and can worsen symptoms
- Promote hip hinging and proper sacral positioning with functional movement
- Consider gentle isometric strengthening and neuromuscular activation exercises in neutral positions instead of dynamic movements that require extensive spinal motion
- Provide supportive props and positioning aids to reduce mechanical strain during exercise

Flexibility and Stretching Precautions

Take a conservative approach:

- Avoid aggressive lower extremity stretching, as this can stress the already-tensioned nervous system and provoke symptoms
- If stretching is needed, teach the patient muscle stretching techniques in positions of reduced neural tension

- If tolerated consider creating a safe peripheral neural mobility program starting with flossing before progressing to gliding or tensioning
- Consider manual strategies: this may include advanced training in myofascial, fascial counterstrain, lymphatic, and neuromeningeal manipulation techniques
- Build neuromuscular control to help the nervous system gradually adapt to movement patterns: this may include foot intrinsics, posterior chain engagement, and transverse abdominus if tolerated

Managing Co-Morbidities

Many patients have additional medical concerns:

- Take a thorough history to identify co-morbidities and understand how different body systems are affected including any immune, inflammatory, or mast cell related contributing factors that may need to be monitored during the rehabilitation process
- Monitor neurological status closely during each session, watching for changes in strength, sensation, pain, and autonomic symptoms
- Progress slowly and conservatively, adjusting your approach based on how the patient responds

Goals of Pre-Operative Physical Therapy

Establish Baseline Measurements

Document objective measures:

- Strength testing (within symptom-limited parameters)
- Neurological symptoms (pain levels, sensory mapping, reflex testing)
- Functional limitations (mobility, daily activities, quality of life)

Educate Patient and Caregivers

Prepare patients and families for post-operative recovery:

- Post-operative bed mobility techniques
- Safe transfer strategies
- Teach the patient neural tension positions to avoid
- Proper use of assistive devices if needed
- Warning signs that require immediate medical attention
- Activity modifications to protect surgical outcomes

Key Takeaways

Pre-operative physical therapy for Tethered Cord Syndrome requires specialized knowledge and careful monitoring. The primary goals are to optimize the patient's function within safe limits, establish baseline measurements for tracking post-operative progress, and prepare patients and caregivers for recovery—all while avoiding interventions that could worsen neurological symptoms.