

The background is a dark blue gradient. There are three large, semi-transparent blue circles: one in the top left, one in the top right, and one in the bottom left. The title text is centered in the middle of the slide.

Pre-Operative Physical Therapy for Tethered Cord Release Surgery

Presented Danielle Jolliff, MSPT

What Is “Prehabilitation”?

- **Definition:** Pre-operative physical therapy — often called “prehabilitation” or “prehab” — is physical therapy delivered before surgery to help the body prepare for an upcoming surgery and recovery.
- **Goal:** For tethered cord patients, a key goal is making sure exercises and movements don’t add extra tension to a nervous system that’s already under strain from the tethered spinal cord.
- **Evidence:** Recent research supports personalized prehabilitation programs before major surgery, demonstrating they can enhance recovery.¹⁻⁴

How Prehab Works



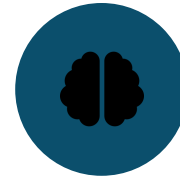
Optimizing Function

Improving baseline core engagement, stability, and mobility can make post-op rehab is more effective.



Enhancing Body Awareness

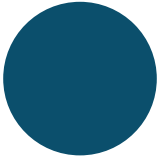
Learning proper alignment and movement patterns before surgery makes post-op precautions easier to follow.



Reducing Anxiety

Pain-science education, CBT strategies, and mindfulness lower nervous-system sensitization and pre-surgical stress.

Benefit 1: Building Core Engagement & Stability



Gentle exercises prepare the abdominal and back muscles to support the spine while it heals. Working on proper muscle activation before surgery reduces stress and strain on healing surgical tissue.

What this looks like in practice:

- Gentle, low-load exercises for the abdominals and back
- Isometric muscle activation that avoids added spinal stress
- Programs adapted to each patient's baseline abilities and goals

Benefit 2: Learning Post-Operative Techniques



Log Rolling

A safe way to get in and out of bed that decreases pain and stress through the spine. Practicing it repeatedly, before surgery, in a comfortable setting builds real muscle memory.

- Demonstrate proper technique
- Allow repeated, low-pressure practice
- Answer questions about the movement
- Build muscle memory before it's needed

Other things patients & families ask us to plan for:

Getting shoes on & off

Modifying tooth-brushing to avoid leaning forward

Sleeping & lounging positions

Any other personal comfort questions unique to your situation

Benefit 3: Establishing Baseline Measurements

Before surgery, we objectively measure where you're starting from — so after surgery, we know what's changed.



Strength



Gait Mechanics



Range of Motion



**Neurological Symptoms
& Neural Mobility**



Functional Abilities

These baselines let your care team track recovery and any neurological changes.

Benefits 4 & 5: Confidence, Anxiety & Continuity of Care



Improving Confidence, Reducing Anxiety

Surgery is stressful for the whole support system. Pre-op PT sessions give patients, families, and caregivers a structured space to ask questions, voice concerns, and build a shared plan.

Every plan is collaborative — you and your provider work together to shape the approach around your circumstances, your support system, and your recovery.



Creating Continuity of Care

By the time post-operative PT begins, you've already built a relationship with your therapist. They already know your baseline abilities, personality, and learning style.

That familiarity means recovery care can be more personalized and effective from the very first post-op session.

What Does a Prehab Program Include?

Guiding principle: avoid extra strain on an already-tensioned nervous system



Gentle Core Engagement

Isometric muscle activation, neutral-spine positioning, supported movements



Neural Health

Pain-science education, pain-free neural mobility (“nerve flossing”), reducing sensitization



Functional Movement Training

Safe transfers, getting in/out of bed, proper positioning



Education Sessions

Post-op precautions, recovery timeline, managing limitations



Breathing Exercises

Diaphragmatic breathing techniques important during recovery



Activity Pacing

Balancing activity with rest — essential during recovery

Practical Tips to Maximize the Benefit

01

Start Early

Begin prehab as soon as surgery is scheduled — ideally several weeks ahead.

02

Practice at Home

Reinforce what's learned in sessions by practicing techniques at home.

03

Ask Questions

Use sessions to raise concerns — especially anything unique to your own situation.

04

Create Reference Documents

Take notes or videos (with therapist permission) to reference during recovery.

The Role of Personalized Programs

Every prehab plan is built around the individual

	Adapted to You	Exercises, pacing, and teaching style matched to your age, abilities, and how you learn best.
	Creative & Individualized	Programs are designed around each person's individual needs
	Family & Caregivers Included	Anyone supporting your recovery is welcomed into the planning process when helpful.
	Existing Limitations Addressed	Any current mobility limits or symptoms are factored directly into your program.
	Your Circumstances Considered	Home environment, daily routine, and personal comfort all shape the final plan.

References



1. Cambriel A, Tsai A, Choisy B, et al. Immune modulation by personalized vs standard prehabilitation before major surgery: a randomized controlled trial. JAMA Surg. Published online November 12, 2025.
2. Gohel P, Lavadi RS, Jawad-Makki MAH, et al. Comprehensive guidelines for prehabilitation in spine surgery. J Craniovertebr Junction Spine. 2025;16(1):5-15.
3. Eubanks JE, Carlesso C, Sundaram M, et al. Prehabilitation for spine surgery: a scoping review. PM&R. 2023;15(10):1335-1350.
4. Pester BD, Yoon J, Yamin JB, et al. Let's get physical! A comprehensive review of pre- and post-surgical interventions targeting physical activity to improve pain and functional outcomes in spine surgery patients. J Clin Med. 2023;12(7):2608.