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**COMPREHENSIVE ADULT SPINE, ADULT TOTAL HIP AND KNEE RECONSTRUCTION, AND
 ORTHOPAEDIC TRAUMATOLOGY/FRACTURE MANAGEMENT**

Patient Name: _____

Diagnosis: _____

Lumbar Fusion Physical Therapy Prescription

The intent of this protocol is to provide guidelines for rehab. It is not intended to be used as a substitute for clinical decision-making.

If any of the following occur, contact Dr. Anderson and hold off on physical therapy:

- Any signs of infection
- Worsening of radicular symptoms, including progressive weakness
- Unexpected high self-reports of pain in comparison to presurgical state

Progress patients with multilevel fusions slower and more cautiously.

Phase I (0-12 Weeks): Protective Phase

Therapy

- First visit at 1-2 weeks postoperatively as an outpatient.
- 2-4 visits during first 12 weeks postoperatively.
- Review brace wear with patient.
- Evaluate gait, and walking aid progression.
- Review Indications for Initiation of Bone Growth Stimulation Therapy.
 - If Indicated, Confirm Patient's receipt of/order placed for therapy

Indication of External Bone Growth Stimulator:

- | | |
|---|--|
| <input type="checkbox"/> Multilevel spinal Fusion | <input type="checkbox"/> Failed Fusion/Non-Union |
| <input type="checkbox"/> EtOH Abuse/Alcoholism | <input type="checkbox"/> History of Chemotherapy |
| <input type="checkbox"/> Diabetes | <input type="checkbox"/> Obesity |
| <input type="checkbox"/> Osteoporosis | <input type="checkbox"/> Renal Disease |
| <input type="checkbox"/> Tobacco use - Current | <input type="checkbox"/> Steroid use |
| <input type="checkbox"/> Bone Depleting Medications | <input type="checkbox"/> Spondylolisthesis Gr II |

- **Schedule Phase II outpatient therapy to begin at week 12 postoperatively.**

Precautions

- Avoid bending, lifting, and twisting (**No BLT**). No pushing and pulling. Nothing heavier than 5 lbs until 6 weeks postoperatively.
 - After 6 weeks postoperatively, continued avoidance of bending, lifting, and twisting (**No BLT**). No pushing and pulling. Nothing heavier than 15 lbs until after 12 weeks postoperatively.
 - Limit sitting, including in the car, to no more than 30 minutes at a time (standing/walking breaks - at least 50-100 feet at a time).
- **Driving:** When off narcotic pain medications, and patient feels that they are safe enough to drive, able to react to avoid accidents/drive defensively without hesitation. Dr. Anderson does not clear patients to drive, this is an individual decision for each patient.

Goals:

- Diminish pain/inflammation and minimize lower extremity radiating symptoms (ice, modalities as needed).
- Learn correct posture, body mechanics, transfers, and positioning.
- Achieve proper muscle firing for transversus abdominis, multifidus, and gluteal motor groups
- Focus on walking program, increasing tolerance to 10 minutes, 2 times a day.

Education

- **Posture Education:** Upright sitting posture with Lumbar Roll at all times; Frequent changes in positions, and sleeping positions. Teach how different body positions and postures affect the spine.
- **Body Mechanics:** Light lifting, transfers (include logrolling), positioning, etc.

Exercises

- **Walking Program:** Begin 1-2 times a day for 10 minutes, progress as tolerated
- **Transversus Abdominis Bracing:** 10 second isometrics with normal breathing (without pelvic tilt) in supine position.
- **Multifidus:** 10 second isometrics with normal breathing in prone position (if able).
- **Glute sets:** 10 second isometrics with emphasis on proper gluteal muscle group firing in prone position (bilateral and unilateral).
- **Light stretching:** Hip flexors, quadriceps, hamstrings, and gastrocsoleus.
- **Neural mobilization:** Performed as needed, gentle with caution not to flareup nerve roots.

Phase II (12+ Weeks): Initial Strengthening Phase

Therapy

- Starting at week 12, 2-3 times per week, 4-6+ weeks

Precautions

- Keep spine in neutral and good posture for strengthening with focus on proper neuromuscular control, do not progress without good neuromuscular control.
- **Lifting Restrictions:** Lifting, pushing and pulling gradually progressing from 15lbs up to 40 lbs through 24 weeks.

- Minimize rotation exercises long-term (even after fully healed).
- Full healing may take 6 to 12 months. Patients are cautioned not to overdo their activities prior to being cleared by Dr. Anderson.

Goals

- Patient to have proper neuromuscular control and posture with stabilization and strength exercises
- Complete light strengthening, with a neutral spine and correct firing of stabilizers.
- Release soft tissue restriction/muscle spasm/scar
- Independent with body and lifting mechanics - review
- Increase aerobic endurance to more than 30 minutes

Cardiovascular (as long as it does not aggravate or increase symptoms, let pain be your guide)

- Walking Progression: Gradually progress to 30 minutes a day.
- Biking – Recumbent Stationary Bike (avoid road bikes) initiate at 2 weeks postop
- Stationary Bike Upright - Can initiate at 4 weeks (no resistance), 6 weeks (resistance)
- Swimming
- Elliptical
- Hiking
- Pilates
- Emphasize correct form and equipment set up (example: Elliptical, bike, walking training, etc.)
- Preference of Pilates or yoga, if returning to yoga, and sure it is with an experienced instructor. Same goes for Pilates.
- When initiating running and sports below, slowly increase in the 8 to 12-week timeframe.
- Time frames may vary per patient, and based upon the sport/activity, consult with Dr. Anderson if you have questions.

No Earlier Than:

Walking Progression	At least 30 mins/day, continue progress
Stationary Bike	Gradual increase in resistance at 4 weeks
Pilates (neutral spine)	3 months, minimize rotation exercises
Outdoor Biking	2 to 3 months
Hiking	3 to 4 months
Elliptical	3 months
Skiing	1 year

No Earlier Than:

Yoga	4 months
Swimming	2 months
Running	4 months
Soccer	6 months
Basketball	6 months
Golf	6 months

Strength

Only initiate Phase II strength conditioning once patient can complete Phase I exercises. Then begin light resistance and slowly progress. Emphasize achieving proper neuromuscular control of the transversus abdominis and multifidus muscle groups without compensation (use stabilizer biofeedback cuff if available).

- **Transversus Abdominis/Multifidus Progression:** 10-20 second isometrics with normal breathing (without pelvic tilt) in supine, quadruped and prone. Must maintain neutral spine.
 - Progress with upper extremity/lower extremity movements (example marches, straight leg raises, upper extremity lift and lowers, planks, etc.)

- **Supine:** Add upper extremity/lower extremity movements (example: Marches, straight leg raises, upper extremity lift and lowers, etc.)
- **Quadruped:** Alternating upper extremity, alternating lower extremity, alternating upper extremity/lower extremity (bird-dog)
- **Bridging:** Bridges, Side Leg Bridges, on Swiss ball, etc.
- **Balance:** Static (example: Single-Leg Stance, Tandem, etc.)
- **Swiss ball:** No Sit Ups, No Twisting (example wall squats, seated exercises, bridges, bird-dog, etc.)
- **Multifidus:** 10-20 second isometrics with normal breathing in prone position.
- **Glute Activation Exercises:** 10-20 second isometrics with emphasis on proper gluteal muscle group firing in prone position (bilateral and unilateral).
 - **Prone:** Hip extensions, alternating upper extremity/lower extremity lifts (avoid hyperextension)
 - **Side-lying:** Clams, hip abduction, etc
 - 90/90 leg lifts, side-lying abduction, quadruped hip extension, bird-dog
 - **Bridging:** Bridges, Side Leg Bridges, on Swiss ball, etc.
- **Upper Extremity/Lower Extremity Strength Training**
 - **Step ups, leg press, wall squats, body weight squats, etc.**
 - **Balance:** With transversus abdominis bracing): Single-leg stance, tandem, foam, etc.
 - **Upper extremity light resistive exercises** (machines, Thera-Band, free weights).

Flexibility

- **Stretching:** Hamstrings, gastroc/soleus, quadriceps, hip flexors, piriformis, etc.
- **Neural mobilization:** Performed as needed, gentle with caution not to flareup nerve roots

Aquatic Physical Therapy (At 4 weeks if available once incision is healed)

- No rotation and transversus abdominis bracing during all exercises
- Walking all directions, balance, upper extremity/lower extremity strengthening

Phase III (16+ weeks): Progression to Advanced Strengthening/Return To Work/Work Conditioning/Return to Sport (If Applicable)

Therapy

- 1-2 times a week (as needed for return to sport or work)
- Functional drills/sport drills/drop drills may begin with supervision
- Advanced Core Strength and Stabilization Exercises:
 - **Highly Recommend Pilates**
 - Progress to weightbearing, balance, Swiss Ball, reformer, etc.
 - Progressed to multiplanar exercises with upper and lower extremities
- Progress lower extremity/upper extremity strengthening
- Possible referral to Work Hardening/Work Reconditioning program