

**Rehabilitation Protocol:**  
**Post-Operative Lumbar Spinal Fusion**

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## Phase 1 Weeks 1 – 6 Post-Op

### Goals:

- Decrease pain and inflammation
- Encourage activity tolerance
- Increase aerobic tolerance (HEP 20 min tolerance to exercise)
- Educate on body mechanics and posture for bed mobility

### Precautions:

- Prevent excessive initial mobility or stress on the tissues
- Avoid all exercises that reproduce or increase the pain
- Avoid excessive lifting, twisting, or bending the lumbar spine for 6 weeks
- Avoid preloading the spine in a posterior pelvic tilt
- Avoid prone upper body extensions, or prone leg extensions until 8 weeks

## Rehab Program 1- 6 weeks Post-Op

### Therapeutic Exercise:

- Reinforce basic post-op home exercise program
  - Ankle pumps
  - Long arc and short arc quadriceps
  - Diaphragmatic Breathing
  - Relaxation exercises
  - Abdominal isometric exercises
- Increase tolerance to walking to ½ mile daily (15-30 min cardiovascular activity)
- All exercises are fully supported and neutral spine is strictly maintained
- Gentle neural mobilization is included for the lower extremity
- Focus on low load high repetitions to improve endurance rather than high loads

### Functional activities:

- Reinforce precautions
- Reinforce use of brace or corset if one is required
- Education on Bed Mobility
- Reinforce sitting, standing and ADL modifications with neutral spine and proper body mechanics
- **Modalities for symptom modulation if indicated**

### Criteria for progression to next phase:

- **Formal Therapy may begin 7-12 weeks post fusion according to patient clinical progress**
  - Pain and swelling within tolerance
  - Independent with HEP
  - Tolerates 15 min of exercise and 15-30 min of cardiovascular exercise
  - Functional ADL for self care with neutral spine position

## Phase 2: Weeks 7 to 12 Post-Op

### Goals:

- Patient Education/Back School
- Reestablish neuromuscular recruitment of the multifidus (emphasizing correct muscle recruitment or Functional dynamic Lumbar stability)
- Correct flexibility deficits in extremities
- Normalize gait deviations
- 30 min of cardiovascular exercise daily
- Add stabilization exercises for the lumbar paraspinals and upper back
- Reinforce proper posture and body mechanics for all ADL's
- Improve positional tolerances for return to work
- Prepare to wean from the brace, if applicable

### Precautions

- Begin light weight training
- Avoid exercises that load the lumbar spine
- Avoid excessive twisting or bending of the lumbar spine
- Limit Lumbar extension
- No lifting greater than 20 pounds and no overhead lifting
- No standing ROM testing until 8 weeks

### Treatment Summary:

- Back School:
  - Consisting of Anatomy and Biomechanics in order to reinforce neutral spine positioning
  - Body mechanics training: performing functional activities with protective and neutral spine positions.
- Manual therapy:
  - Grade 1-2 joint mobilization for neuro-modulation of pain (primarily thoracic region)
  - Scar soft tissue mobilization after incision is closed.
  - Teach Patient self-massage
  - Soft tissue mobilization of soft tissue restrictions.
- Exercises:
  - Train neutral Lumbar position
  - Diaphragmatic Breathing instruction
  - Neural mobilization exercises.
  - Do not reproduce symptoms.
  - Lumbopelvic stabilization exercises emphasizing transverse abdominis and multifidus
  - Neuromuscular control of the lumbar spine in a neutral position (abdominal drawing in).
  - Pressure Biofeedback (prone start at 70 mmHG contract to 6-10 mmHG decrease in pressure for 10 seconds hold) (supine 40 mmHG abdominal drawing in monitor to avoid erector spinae recruitment.)
  - Co-Contract multifidus with transverse abdominals

- **Week 8:**
  - Abdominal bracing with gentle arm and leg ex's
  - Supine heel slides
  - supine marches
  - Supine hip abduction slides
  - Clam shells
- **Week 9-10:**
  - Progress to rotary stability of the spine
  - Lumbo-pelvic control during sitting on an unstable base exercises (physioball).with arm movements, knee movement, (knee extension)
  - Mini squats
  - Balance progression,
  - T-band ex's (rows, lat pulls)
  - Pushup progression (wall, table, floor)
  - Co-contraction during normal speed walking
- **Week 10-12:**
  - Isometric co-contractions with increasing load
  - Bridging
  - Hook lying Alt arm/leg lifts
  - Leg extensions in quadruped progress to bird dog
  - Unloaded Pelvic and Lumbar ROM (supported): pelvic rocks, pelvic clocks in neutral and protected positions
  - Hip and Knee flexibility exercises, to decrease stress on the lumbar spine (hamstrings, piriformis, glutes, quads, hip flexors, gastroc, soleus)
  - Initiate aquatics if available and indicated
  - Cardiovascular training, treadmill, UBE, stationary bike if patient has good lumbo-pelvic control
  - Initiate balance exercises
  - **Modalities for symptom modulation if indicated**

**Functional activities:**

- Focus on pain relief with Oswestry scores of 40-60
- Focus on decreasing pain with Oswestry scores of 20-40
  - Muscle reeducation
  - Gradual strengthening
  - Flexibility and increasing cardiovascular endurance
- Focus on progressive strengthening and work simulation with Oswestry score of less than 20
- **Modalities for symptom modulation if indicated**

**Phase 3 13 - 18 weeks post op:**

**Goals:**

- Progress with flexibility and strengthening exercises
- Progress stabilization and trunk control with lifting and postural corrections

**Treatment summary:**

- Manual therapy
- Joint mobilizations of restrictions within the hips/thoracic spine
- Soft tissue mobilization of noted restrictions
- Exercises:
  - Continue with ROM of the lumbar spine
  - Advance balance exercises
  - Neural mobilization exercises
  - Progress stabilization exercises.
- **Week 13-15**
  - Multiplanar mobility onto stability exercises
  - Bridge on unsteady surface
  - Alternate opposite arm/leg lifts in quadruped
  - Prone on the physioball arm and leg lifts
  - Bracing with kneeling
  - Squatting
  - Walking and stairs
  - Planks
- **Week 16-18**
  - Coordination exercises progress exercises on the physioball
  - Side bridges
  - Single leg bridges

**Functional activities:**

- Advance Hip/core strengthening exercises: functional exercises coping/lifting with pulleys
- Squatting and lunges
- Training in proper lifting techniques
- D/C when patient is independent with a gym program, ROM and strength are within functional limits.