TLIF/POSTERIOR LUMBAR FUSION POST-OPERATIVE REHABILITATION GUIDELINE

- No NSAIDs for 6 months
- No driving while on narcotics
- No scar mobilization for 3 months
- No jog/run/horseback riding for 6 months
- Education booklet to patient before surgery (smoking cessation)
- All patients progress at different rates...progress as appropriate, with goal completion

Phase 1 (POD 1 - 6 weeks)

- Brace, if needed, is patient specific
    - Typically needed for those with poor bone quality, smokers, sustained spinal fractures
    - Multi-level fusion may require longer wear

Focus:

- Mobilization, correctly performing ADLs
    - Putting shoes on, correctly picking items off ground, etc
- Ambulation, endurance, posture
    - Begin progressive walking program
- Correct usage of assistive device

Phase 2 (6 weeks - 3 months)

- Begin regimented OP PT (2-3x/week) for 6-8 weeks (12-24 visits)
- Give ODI, FABQ at initial evaluation
    - FABQ at 6th visit as well

Goals:

- ↓ pain, 0-2/10 pain at rest
- Improve scar mobility
- Maintain erect posture throughout 80% of the day
- Reestablish neuromuscular control of the lumbar stabilizers
- Volitional contraction of TA and lumbar multifidi for 5 x 5 sec
- Improve LE strength & mobility
- Demonstrate appropriate functional movement within precautions
- Continue progressive walking program
- Independent with HEP
- Progress exercises once patient demonstrates proper form/technique and control of neutral spine with each repetition
- D/C brace at 12 weeks or surgeon's orders

Focus:

- Initiate aerobic conditioning (gentle, progressive)
    - Ambulation, endurance
        - Progress toward discontinuing assisted devices

        - Treadmill, track, recumbent bike
        - Continue to walk within tolerance with progressive walking program
- Strengthening (legs core back)
    - Can use light weights, pulley system, resistance bands
    - Isometric lumbar stabilization exercises with trunk ext/flex/lateral flexion
        - 15s → 45s x 3
    - Lumbar stabilization exercises (with trunk co-contraction) – 2 x 10,15,20
        - 1. Hook-lying pelvic neutral (hip at 45°): marches → SL heel slide → leg lift c knee ext.
        - 2. dying bug: alt. UE → alt. LE → alt. opposite UE/LE
        - 3. Bridges
        - 4. birddog: alt. UE → alt. LE → alt. opposite UE/LE
        - 5. pelvic tilts (all directions)
    - LE strengthening exercises (maintain neutral spine) – 2 x 10,15,20 (progress c resistance):
        - 1. wall squats
        - 2. supine abdominal crunch (not a sit-up)
        - 3. Hook-lying bent knee fall outs
        - 4. Side-lying hip abduction/clamshells
        - 5. standing hip extension
- Stretching, LE flexibility
    - Bilateral LE stretching 3 x 30s (gastoc/soleus, hamstrings, hip flexor)
    - Nerve glides 2 x 10...15...20
- Balance, POSTURE, Gait training
    - Neuromuscular activation of lumbar stabilizers (multifidi, TA)
        - Diaphragmatic breathing
        - Abdominal isometrics, hollowing of TA and lumbar multifidi
        - Drawing in maneuver and VC for volitional lumbar multifidi contraction
    - Maintain neutral spine, initiate pelvic tilts in all directions
    - Appropriate lumbar lordosis
- + / - pool therapy
    - Swimming within tolerance
- Functional movement for home/work
    - Proper body mechanics
        - Bend with knees when reaching toward floor
        - Shift weight, don't twist body
        - Lift slowly, close to body
        - Bring feet/leg up to self when donning/doffing shoes, socks
        - Scoot to front of chair when standing
- Education/review on precautions, anatomy/biomechanics, surgical procedure, prognosis
- Control pain/inflammation
    - ice/modalities
    - Manual
        - Grade I-II joint mobilizations above/below surgical site for pain modulation
        - Soft tissue mobilization for hypertonic paraspinal muscles
- Facilitate healing of incision (watch for increased redness/drainage/swelling)

Suggested Components for Daily HEP:

- Pain management PRN
- Appropriate stretches
- LE strengthening with neutral spine

- Postural awareness, pelvic tilts
- Abdominal hollowing in isolation and with extremity movement
- Progressive walking program as tolerated, monitoring steps
    - See end of protocol

Avoid:

- Lifting, bending, twisting > 20 lbs until 3 months post-op (BLTs)
    - Includes yardwork, pushing/pulling
- Sitting prolonged periods - encourage position changes 30-45 minutes
    - Sit with back support, feet flat on floor, knees level with hips
- Lotions/creams, submerging incision underwater until fully healed

Other considerations/precautions:

- Brace wear as indicated by surgeon
- Consult doctor for return to driving, return to work
    - May be shorter return for sedentary jobs
- Sleeping
    - Supine with pillow under knees
    - S/L with pillow between knees

Phase 3 (3 - 6+ months)

- ODI + FABQ at discharge

Goals:

- Progress to return to baseline standing/walking duration, distance
- Maintenance of trunk co-contraction throughout therapeutic activities
- Volitional contraction of TA and lumbar multifidi for 7 x 7 sec → 10 x 10 sec
- Maintenance of neutral spine during therapy interventions
- Improve trunk and LE strength
- Achieve functional ROM
- Demonstrate proper ergonomics and work simulation
    - Able to tolerate work simulation activities without increase in symptoms
        - Verbally understands return to work progression
- Continue, ultimately complete progressive walking program
- 0-2/10 pain with activity → 0/10 pain with all/most activities
- Independent with HEP
- Achieve ODI MCID

Focus:

- Progress endurance
    - Aerobic conditioning
        - walking/treadmill
        - Progress to elliptical
- Trunk + LE mobility, flexibility
    - Aim for mid-end range ROM by 3-4 months
        - Quadruped rocking, cat/camel, prayer stretch
    - Bilateral LE stretching
- Strengthening
    - Increase weight limit by 5 lbs every other week as tolerable

- Muscle Strength of lumbar stabilizers
    - Dynamic exercises
        - with trunk co-contraction – 2-3 x 10,15,20:
            - 1. Hook-lying pelvic neutral (hip at 90°): marches → SL heel slide → leg lift c knee ext.
            - 2. sitting or standing pelvic neutral: alt. UE → marching → marching c alt. UE
            - 3. SL bridges or DL c marches
            - 4. prone and side-lying planks (on knees: 5-10 sec)
            - 5. standing isometric core resistance c Theraband
            - 6. standing pelvic neutral: shoulder ext, hor. abd., row, D1/D2 c Therband (bil → uni)
        - Further progressions - 2-4 x 10, 15, 20
            - bridges on Dynadisc or BOSU
            - upward/downward chops (cable column)
            - prone and side-lying planks (off knees: 5-10 sec)
            - walkouts/rollouts on stability ball
            - cable column resistance walking (close to body → away from body or OH)
            - prone superman's
    - LE strengthening exercises (maintain neutral spine) – 2-3 x 10,15,20 (progress c resistance)
            - 1. stability ball wall squats
            - 2. standing hip abduction and extension
            - 3. side stepping
            - 4. lunges (SP and FP)
            - 5. SL deadlifts
        - Further progression (2-4x)
            - squats (DL → SL)
            - SL deadlift on Dynadisc or BOSU
            - lateral band walks
            - lunges (add TP)
            - stability ball H/S curl
    - Core strengthening (planks)
- Facilitate neuromuscular re-education
    - Abdominal hollowing of TA, lumbar multifidi
- Balance, progressing as needed
    - DL → SL, EO → EC, no UE mvmt → UE mvmt, stable → unstable surface
    - High level
        - Rebounder toss, medicine ball rotations on stability ball, etc
- Pain/inflammation reduction
    - Joint mobilization (grades I-II) above/below surgical site for pain modulation
    - ice/modalities
- Light work simulation activities → full duty work simulation

Suggested Components for Daily HEP:

- Stretches, ROM (progress to maintenance therapy)
- Trunk, LE strengthening, stabilization (progress to maintenance therapy)
- Proper lifting and functional movement
- Progressive walking program

Recommendations for return to work based on job type:

Work Type:	**Return to Work:**
Sedentary (<10lbs) or Light (frequently 10lbs, occasionally 20lbs)	After 8-14 weeks, with limited sitting duration for 30 min at a time for 6 weeks
Moderate (frequently 20lbs, occasionally 50lbs)	At 10-16 weeks, patient may return to light duty if available – no lifting >10lbs At 14-20 weeks, return to full duty – no lifting >25 lbs
Heavy (frequently 50lbs, occasionally 100lbs)	At 10-16 weeks, patient may return to light duty if available – no lifting >10lbs At 14-20 weeks, moderate duty – no lifting >25lbs At 22-28 weeks, return full duty

Progressive Walking Program, begin POD 1

AIM:	MODEL OF PROGRESSION:
10,000 steps/day, if: age under 65 years, healthy and no restrictions to increase physical activity	1. If baseline level <5,000 (sedentary), number of steps is increased 15% every other months until the target level is reached. 2. If baseline level 5,000–7,499 (”low active”), number of steps is increased 10% every other months until the target level is reached. 3. If baseline level 7,500–9,999 (”somewhat active”), number of steps is increased 5% every other months until the target level is reached. 4. If baseline level >10,000 (active), this level is maintained or number of steps is increased 5% every other months until 12,500/day (”highly active”) is reached.
7,500 steps/day, if: age >65 years and/or chronic diseases and/or some restriction to increase physical activity	1. If baseline level <4,250, number of steps is increased 15% every other months until the target level is reached. In later phase, this level is maintained or a new goal is set. 2. If baseline level >4,250, number of steps is increased 10% every other months until the target level is reached. In later phase, this level is maintained or a new goal is set.

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