Posterior Thoracic-Lumbar Fusion Spinal Deformity Post-Operative Rehabilitation Guidelines

- No NSAIDs for 3-6 months (per surgeon)
- No driving while on narcotics
- No scar mobilization for 3 months
- Brace: per surgeon
- No Tobacco! Smoking cessation education
- All patients progress at different rates
- Outpatient PT typically starts at 12 weeks; Home PT at discharge as needed

Phase 1 (POD 1 – 6-12 weeks)

- Brace, if needed, patient specific
    - Typically needed for those with poor bone quality, smokers, sustained spinal fractures

Focus:

- Mobilization, correctly performing ADLs
    - Don/doff shoes, appropriate sitting posture, appropriate body mechanics when picking items off ground, etc
- Ambulation, endurance, posture
    - Begin progressive walking program (goal 30 minutes twice per day)
- Correct usage of assistive device for ambulation
- Diaphragmatic breathing, deep pursed lip breathing exercises

Phase 2 (12-16 weeks)

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

Goals:

- Maintain erect posture throughout the day
- Reestablish neuromuscular control of the lumbar stabilizers
- Volitional contraction of TA and lumbar multifidi for 5 sets x 5 sec
- Improve LE strength & functional mobility
- Demonstrate appropriate functional movement within precautions
- Continue progressive walking program
- Independent with home exercise program
- Progress exercises once patient demonstrates proper form/technique and control of neutral spine with each repetition (<8-10 lbs x 3 mos lifting precautions)
- 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, pully 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 sets x 10-20 repetitions
        - 1. Hook-lying pelvic neutral (hip at 45°): marches → SL heel slide → leg lift with knee ext.
        - 2. Dead bug: alt. UE → alt. LE → alt. opposite UE/LE
        - 3. Bridges
        - 4. Birddog: alt. UE → alt. LE → alt. opposite UE/LE
        - 5. Pelvic tilts
    - LE strengthening exercises (maintain neutral spine) – 2 sets x 10-20 repetitions (progress with resistance):
        - 1. Wall squats
        - 2. Hook-lying bent knee fall outs
        - 3. Side-lying hip abduction/clamshells
        - 4. Standing steam-boats
- Stretching, LE flexibility
    - Bilateral LE stretching 3 sets of 30s (gastoc/soleus, hamstrings, hip flexor)
    - Nerve glides 2 sets of 10-20 repetitions
- 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
        - Lift slowly, close to body
        - Bring feet/leg up to self when donning/doffing shoes, socks
- Education/review on precautions, anatomy/biomechanics, surgical procedure, prognosis
- Control pain/inflammation
    - Ice/modalities

        - Manual
            - 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

Avoid:
- Lifting, bending, twisting > 8-10 lbs until 3 + months post-op (BLTs)
    - Includes yardwork, pushing/pulling with vacuum, etc.
- 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
    - Side-lying with pillow between knees

<u>Phase 3 (4- 6+ months)</u>
- 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 isometrics 5 sets 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
- Continue, ultimately complete progressive walking program
- 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 sets x 10,15,20 repetitions:
                - 1. Hook-lying pelvic neutral (hip at 90°): marches → SL heel slide → leg lift c knee ext, bent knee fall outs
                - 2. Sitting or standing pelvic neutral: alt. UE → marching → marching c alt. UE, steam boats
                - 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 sets of 10, 15, 20 repetitions
                - 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 sets x 10,15,20 repetitions (progress c resistance)
                - Stability ball wall squats
                - Standing hip abduction and extension
                - Side stepping
                - Lunges
                - SL deadlifts
            - Further progression (2-4x)
                - Squats (DL → SL)

        - SL deadlift on Dynadisc or BOSU
        - Lateral band walks
        - Lunges
    - Core strengthening (full planks as appropriate, only if high level functioning at baseline)
- 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
    - 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 physical demand:

Work Type:	**Return to Work:**
Sedentary (<10lbs) or Light (frequently 10lbs, occasionally 20lbs)	After 10-14 weeks with limited sitting duration for 30 minutes and consider restricted work hours if lifting is involved for 2-3 weeks
Moderate (frequently 20lbs, occasionally 50lbs)	Between 12-16 weeks patient may return to light duty if available – no lifting >10 lbs and may consider restricted work hours 14+ weeks: Increase weight tolerance every other week by 5 lbs (preferably working with PT) After 24+ weeks: Return to full duty if tolerable
Heavy (frequently 50lbs, occasionally 100lbs)	12-16 weeks, patient may return to light duty if available – no lifting >10 lbs and may consider restricted work hours 16+ weeks, moderate duty – no lifting >25lbs (at 14 weeks, may start increasing weight tolerance increasing 5# every other week to cap at 25#, preferably working with PT) After 24+ weeks: Return to full duty if tolerable

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