POSTERIOR THORACIC-LUMBAR FUSION (SPINAL DEFORMITY) POST-OPERATIVE REHABILITATION PROTOCOL

- No NSAIDs for 6 months
- No driving while on narcotics
- No scar mobilization for 3 months
- Smoking cessation education
- No jogging/running/horseback riding for 6 months
- All patients progress at different rates

Phase 1 (POD 1 - 6 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 per day)
- Correct usage of assistive device for ambulation
- Diaphragmatic breathing, deep pursed lip breathing exercises

Phase 2 (6 weeks - 3 months)

- 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 (<20 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. Hooklying 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. Hooklying bent knee fall outs
        - 3. Sidelying 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
        - 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

Avoid:

- Lifting, bending, twisting > 20 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

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 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)
- 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 physical demand:

Work Type:	**Return to Work:**
Sedentary (<10lbs) or Light (frequently 10lbs, occasionally 20lbs)	Between 6-12 weeks with limited sitting duration for 30-45 minutes and consider restricted work hours if lifting is involved for 2-3 weeks
Moderate (frequently 20lbs, occasionally 50lbs)	Between 6-12 weeks patient may return to light duty if available – no lifting >20 lbs and may consider restricted work hours 12+ weeks: Increase weight tolerance every other week by 5 lbs After 24+ weeks: Return to full duty if tolerable
Heavy (frequently 50lbs, occasionally 100lbs)	6-12 weeks, patient may return to light duty if available – no lifting >20 lbs and may consider restricted work hours 12+ weeks: Increase weight tolerance every other week by 5 lbs After 24+ weeks: Return to full duty if tolerable

Reviewers:

Dr. Andrew Grossbach, Neurological Surgery, The Ohio State University Wexner Medical Center

Dr. Jonathan Karnes, Orthopaedic Surgery, The Ohio State University Wexner Medical Center

Dr. Safdar Khan, Orthopaedic Surgery, The Ohio State University Wexner Medical Center

Dr. Stephanus Viljoen, Neurological Surgery, The Ohio State University Wexner Medical Center

Dr. Elizabeth Yu, Orthopaedic Surgery, The Ohio State University Wexner Medical Center

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