

Lumbar Spine Fusion/Multi-Level Laminectomy Rehabilitation Protocol

Phase 1	0-6 Weeks Post-op
Rehabilitation Goals	<ul style="list-style-type: none"> • Protect the incision, encourage healing, and monitor for signs of possible infection • Independent in ambulation and ADL's • Improved aerobic tolerance • Good sitting/standing posture • Good motor control/body mechanics during all transitional and functional activities • Independence in phase 1 exercises • Maintain the nerve root mobility and prevent an adherent nerve root • Independence in donning/doffing back brace • Able to walk for 10 to 15 minutes 2 times per day
Appointments	<ul style="list-style-type: none"> • Every 1 to 2 weeks to advance home exercise program or more as indicated by reassessment
Precautions	<ul style="list-style-type: none"> • No trunk flexion, extension, side bending or rotation • Limit hip flexion to 90 degrees (use a toilet seat extender as needed) • Limit sitting to 30 minutes • No lifting over 10 pounds • No sharp low back or radicular pain during or following exercises
Brace	<ul style="list-style-type: none"> • As recommended by Spine Surgeon
Treatment Strategies	<ul style="list-style-type: none"> • Instruct the patient to protect the incision site and to inspect for signs of infection • Gait training as needed with maintenance of proper posture • Instruct/re-instruct in proper sitting and standing posture • Instruct in transfers and bed mobility with maintenance of neutral spine and ADIM • ADL training with maintenance of neutral spine position and correct body mechanics • Instruct in donning/doffing of back brace • Instruct in using ice to control pain and inflammation 2 to 4 times per day for 20 minutes

<p>Therapeutic Exercises</p>	<ul style="list-style-type: none"> • Phase 1 home exercise program in an unloaded supported position <ul style="list-style-type: none"> ○ Diaphragmatic (abdominal) breathing ○ Transversus abdominis setting (ADIM) ○ Gluteal sets ○ Lat sets ○ Lower trapezius sets ○ Nerve flossing
<p>Advancement Criteria</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Pain and swelling within tolerance, including no radicular symptoms <input type="checkbox"/> Independent in phase one home exercises <input type="checkbox"/> Functional with ADL's (self-care, hygiene, all transitional activities and brace donning/doffing) <input type="checkbox"/> Achieve all phase 1 goals

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Phase 2	6-8 Weeks Post-op
Rehabilitation Goals	<ul style="list-style-type: none"> • Healed incision • Independent normal gait without an assistive device • Able to ambulate 20 to 30 minutes 1 to 2 times per day • Good postural habits in sitting/standing • No nerve tension or pain provocation with the Slump test in sitting or SLR in supine • Progress from unloaded to partially loaded and supported phase 2 lumbar stabilization exercises • Good motor control during phase 2 exercises and ADL's
Appointments	<ul style="list-style-type: none"> • Every 1 to 2 weeks to advance home exercise program or more as indicated by re-assessment
Brace	<ul style="list-style-type: none"> • As recommended by Spine Surgeon
Precautions	<ul style="list-style-type: none"> • Avoid excessive loading of lumbar spine • Avoid twisting and end-range motions of lumbar spine • No standing lumbar AROM testing • No sharp low back or radicular pain during or following exercises • No lifting over 10 pounds
Treatment Strategies	<ul style="list-style-type: none"> • Normalize scar tissue mobility • Instruct in progressive walking program (20-30 minutes) • Re-instruct in maintaining good posture as needed • Re-instruct in motor control and proper body mechanics for transitional and functional activities • Re-assess nerve tension and advance nerve flossing as tolerated
Therapeutic Exercises	<ul style="list-style-type: none"> • Instruct in phase 2 post-operative lumbar exercises: <ul style="list-style-type: none"> ○ Supine arm lifts ○ Supine bent leg raises ○ Side lying bent leg hip abduction/external rotation ○ Prone arm lifts or sitting elastic band rowing ○ Sitting arm lifts with back supported ○ Standing balance exercises ○ Partial squats ○ Heel lifts

<p>Advancement Criteria</p>	<ul style="list-style-type: none"> <input type="checkbox"/> No increase in LBP or any radicular pain with home exercise program <input type="checkbox"/> Independent with home exercise program for phase II <input type="checkbox"/> Able to maintain a neutral spine, ADIM, and proper breathing technique for all transitional activities and exercises. <input type="checkbox"/> Independent in postural correction in sitting, standing, and lying <input type="checkbox"/> Dynamic sitting and standing tolerance of 20 to 30 minutes <input type="checkbox"/> Able to ambulate for 20 to 30 minutes at a moderate pace
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Phase 3	8-12 Weeks Post-op
Rehabilitation Goals	<ul style="list-style-type: none"> • Normal scare tissue mobility • Progressive walking/cardiovascular program 30 minutes/day • Normal sitting and standing posture without verbal cues • Normal nerve tissue mobility • Progression to phase 3 post-op lumbar exercises • No mechanical signs or symptoms • Control pain and inflammation
Appointments	<ul style="list-style-type: none"> • Every 1 to 2 weeks to advance home exercise program or more as indicated by re-assessment
Brace	<ul style="list-style-type: none"> • As recommended by Spine Surgeon
Precautions	<ul style="list-style-type: none"> • Avoid reproduction of low back and radicular pain. • Avoid pre-loading the spine in a posterior pelvic tilt. • Avoid end range lumbar AROM/passive stretching • No high load, low repetitions for strengthening • 15-to-20-pound lifting restriction
Treatment Strategies	<ul style="list-style-type: none"> • Walking 30 minutes at a moderate to brisk rate • Re-instruct in postural correction as indicated • Re-instruct in motor control and body mechanics for transitional and functional activities as indicated. • Re-assess nerve tension & advance nerve flossing as indicated
Therapeutic Exercises	<ul style="list-style-type: none"> • Instruct in phase 3 post-operative exercises: <ul style="list-style-type: none"> ○ Supine unilateral arm lifts ○ Supine SLR ○ Supine bridges ○ Side lying straight leg hip abduction ○ Quadruped FWD/BWD rocking ○ Lumbar stabilization exercise sitting on a ball ○ Squatting & lunging to 60 degrees progressing to 90 degrees ○ Strengthen neurologically compromised muscles PRN ○ Mobilize/stretch tight tissues

<p>Advancement Criteria</p>	<ul style="list-style-type: none"> <input type="checkbox"/> No increase in LBP or any radicular pain with phase 3 exercise program <input type="checkbox"/> Independent with home exercise program for Phase III <input type="checkbox"/> Able to maintain a neutral spine and ADIM during all ADL's and extremity-strengthening exercises <input type="checkbox"/> Able to demonstrate proper breathing technique during all home strengthening exercises <input type="checkbox"/> Independent in postural correction and body mechanics for ADL's <input type="checkbox"/> Demonstrate dynamic sitting and standing tolerance of 30 minutes <input type="checkbox"/> Able to tolerate walking and cardiovascular exercise for 30 minutes
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Phase 4	12-24 Weeks Post-op
Rehabilitation Goals	<ul style="list-style-type: none"> • Good postural habits in sitting and in standing • Lumbar AROM will be WFL's through all planes • No nerve tension or pain provocation with nerve tension testing • 4+ to 5/5 strength for all trunk and hip musculature with MMT • Independence in Phase 4 post-operative lumbar exercises • Functional lift training to achieve all functional goals • No mechanical signs or symptoms with HEP and ADL's
Appointments	<ul style="list-style-type: none"> • Every 1 to 2 weeks to advance home exercise program or more as indicated by re-assessment
Precautions	<ul style="list-style-type: none"> • Avoid reproduction of low back and radicular pain. • Avoid pre-loading the spine in a posterior pelvic tilt. • Avoid end-range passive stretching of lumbar spine • No symptoms with functional lift training • Follow weight-lifting restrictions as indicated by surgeon
Treatment Strategies	<ul style="list-style-type: none"> • Re-instruct in postural correction as indicated • Re-instruct in motor control and body mechanics for ADL and functional activities as indicated • Assess lumbar AROM if ordered by surgeon • Manual muscle testing of all trunk and hip musculature instructing in specific strengthening exercises as indicated • Advance patient's progressive walking program, 30 to 45 minutes, 1-2 times per day at a brisk rate • Instruct in neural mobilization to normal end range response with overpressure as needed

<p>Therapeutic Exercise</p>	<ul style="list-style-type: none"> • Instruct in phase 4 postoperative lumbar exercises <ul style="list-style-type: none"> ○ Front, back and side planks progressing from standing to lying ○ Sustained bridge with alternating bent leg lifts and alternating knee extension ○ Push-ups in standing progressing to lying ○ Advanced lumbar stabilization exercises in supine and in prone on a ball ○ Squatting, lunge matrix, and functional lift training (floor to waist, waist to chest, chest to crown, front carry, unilateral carry, push/pull)
<p>Advancement Criteria</p>	<ul style="list-style-type: none"> • No increase in low back pain or any radicular pain during physical therapy or with patient's home exercise program • Independence with home exercise program for phase 4 • Lumbar, thoracic and hip AROM within normal functional limits • 4+ to 5/5 strength for all trunk and lower extremity musculature • Good static and dynamic sitting and standing balance • Demonstrate dynamic sitting and standing tolerance of 30 minutes • Able to tolerate 35 to 45 minutes of brisk walking or other cardiovascular exercises

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Phase 5	24 Weeks Post-op and Beyond
Rehabilitation Goals	<ul style="list-style-type: none"> • Patient will be independent in a comprehensive home stretching and strengthening program for the low back • Patient will be able to demonstrate normal sitting and standing posture • Patient will be able to demonstrate normal thoracic, lumbar and hip AROM • Patient will be able to demonstrate 5/5 strength for all trunk and hip musculature with manual muscle testing • Patient will be able to demonstrate good cardiovascular fitness • Patient will be able to participate in a full mechanical evaluation without pain or increased symptoms • Patient's functional capacity results will be suitable for employment, sports and ADLs/functional activities at home • Patient will return to full activity or fully redefined activity level • Patient will be responsive to mechanical signs and symptoms
Appointments	<ul style="list-style-type: none"> • PRN
Precautions	<ul style="list-style-type: none"> • Any mechanical signs or symptoms with testing • Any neurological signs or symptoms
Treatment Strategies	<ul style="list-style-type: none"> • Assess patient's ability to perform their independent home exercise program for maintenance of functional status • Assess sitting and standing posture instructing in correction as indicated • If ordered by surgeon, instruct lumbar fusion patients in passive stretching exercises to recover full lumbar AROM • Perform a full mechanical evaluation • Manual testing of all trunk and hip musculature • Assess gait on multiple surfaces • Assess cardiovascular status • Set up a functional capacity evaluation (results suitable for employment, sports and ADLs/functional activities at home) if ordered by physician • Instruct patient in how to return to activities or fully redefined activities

Advancement Criteria (Discharge)	<ul style="list-style-type: none"><input type="checkbox"/> Achievement of all phase 5 goals<input type="checkbox"/> A full understanding of prophylaxis<ul style="list-style-type: none"><input type="checkbox"/> Maintenance of normal posture<input type="checkbox"/> Functional ROM/flexibility<input type="checkbox"/> Functional trunk and extremity strength<input type="checkbox"/> Good cardiovascular fitness<input type="checkbox"/> Responsive to mechanical signs and symptoms<input type="checkbox"/> Proactive
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