

## Lumbar Spine Fusion/Multi Level Laminectomy Rehabilitation Protocol

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

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

## Lumbar Spine Fusion/Multi Level Laminectomy Rehabilitation Protocol

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

<p>Advancement Criteria</p>	<ul style="list-style-type: none"> <li>• No increase in LBP or any radicular pain with home exercise program</li> <li>• Independent with home exercise program for phase II</li> <li>• Able to maintain a neutral spine, ADIM, and proper breathing technique for all transitional activities and exercises.</li> <li>• Independent in postural correction in sitting, standing, and lying</li> <li>• Dynamic sitting and standing tolerance of 20 to 30 minutes</li> <li>• Able to ambulate 20 to 30 minutes at a moderate pace</li> </ul>
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## Lumbar Spine Fusion/Multi Level Laminectomy Rehabilitation Protocol

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

<p>Advancement Criteria</p>	<ul style="list-style-type: none"> <li>• No increase in LBP or any radicular pain with phase 3 exercise program</li> <li>• Independent with home exercise program for Phase III</li> <li>• Able to maintain a neutral spine and ADIM during all ADL's and extremity strengthening exercises</li> <li>• Able to demonstrate proper breathing technique during all home strengthening exercises</li> <li>• Independent in postural correction and body mechanics for ADL's</li> <li>• Demonstrate dynamic sitting and standing tolerance of 30 minutes</li> <li>• Able to tolerate walking and cardiovascular exercise for 30 minutes</li> </ul>
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## Lumbar Spine Fusion/Multi Level Laminectomy Rehabilitation Protocol

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

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



## Lumbar Spine Fusion/Multi Level Laminectomy Rehabilitation Protocol

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

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