



POSTERIOR LUMBAR INTERBODY FUSION (PLIF): POST-OP REHABILITATION PROTOCOL

Week	Restrictions & Precautions	Aims of phase	Physio treatment (1-2 x per week)	Rehabilitation exercises Perform daily (can be spread out across the day). NB: Not all exercises appropriate for all clients - ex's & reps determined by the physio.	Criteria for progression to next phase/level
1-2	Avoid spinal bending/twisting (flexion/extension/rotation) first 2 weeks No lifting first 2 weeks Log-roll for getting out of bed	Neutral spine awareness in static exercises and daily tasks Diaphragmatic breathing Deep core activation (pelvic floor and TA)	Real time ultrasound for core activation (TA and PF) Massage for muscle spasm Education on daily task modifications	1. Diaphragm breathing 2. Side lying clams 3. Calf raises 4. Hip hinge to wall/chair (neutral spine) 5. Supine alternate foot lifts 6. Gentle walking (<10-mins per walk)	<input type="checkbox"/> Can activate core muscles <input type="checkbox"/> Neutral spine in hip hinge <input type="checkbox"/> 10-mins walking with minimal pain <input type="checkbox"/> Able to use diaphragmatic breathing in daily tasks <input type="checkbox"/> Wound healing satisfactory
2-4	Small range of motion for spinal bending/twist (avoid end ROM) Lifting maximum of 10% bodyweight Keep feet/legs supported in supine/kneeling exercises Avoid prolonged periods in one position (e.g. excessive sitting/lying)	Neutral spine in dynamic exercises Diaphragmatic breathing during exercises Commence gentle ROM Improve walking tolerance	Teach rehab exercises Massage for muscle spasm/tone Manual therapy for hip and thoracic mobility	1. Bodyweight squats to chair 2. Bodyweight upright lunges 3. Small ROM cat/cow 4. 4pt-kneeling: rocking, single arm lifts, single knee lifts (neutral spine) 5. Light reformer supine leg-work 6. Supported SL balance 7. Increase walking tolerance to 20-mins 8. Lower limb stretches (neutral spine, avoid hamstring stretch if ongoing sciatic nerve irritation) 9. Hydrotherapy optional	<input type="checkbox"/> Minimal pain with small ROM spinal movements <input type="checkbox"/> Can maintain neutral spine in exercises <input type="checkbox"/> Able to use diaphragmatic breathing in all exercises <input type="checkbox"/> 20-mins walking with minimal pain <input type="checkbox"/> Can lift up to 10% bodyweight without pain



4-6	<p>Medium range of motion for spinal bending/twist (avoid full/end ROM)</p> <p>Lifting maximum of 15% bodyweight</p> <p>Keep exercises slow</p> <p>Avoid prolonged periods in one position (e.g. excessive sitting/lying)</p>	<p>Increase range of movement</p> <p>Increase exercise demands of core muscles</p> <p>Increase walking tolerance</p>	<p>Teach new rehab exercises</p> <p>Massage for muscle spasm/tone</p> <p>Manual therapy for hip and thoracic mobility</p> <p>Low grade manual therapy to lumbar segments adjacent to operated levels (avoid op-site)</p>	<ol style="list-style-type: none">1. Bird dogs2. 4pt-kneeling knee hovers3. Supine and standing reformer exercises (light springs)4. Bodyweight lunge and squat (bigger ROM)5. Glute bridge with neutral spine6. Supine tabletop hold & breathe7. Isometric standing wall plank (front and side)8. Increase walking tolerance to 30-40-mins9. ROM: kneeling and standing lumbar ROM (50-75% full ROM: flex/ext/LF/rot)10. Lower limb stretches (neutral spine, avoid hamstring stretch if ongoing sciatic nerve irritation)	<ul style="list-style-type: none"><input type="checkbox"/> Minimal pain with larger ROM spinal movements<input type="checkbox"/> Can maintain neutral spine in exercises<input type="checkbox"/> Able to use diaphragmatic breathing in all exercises<input type="checkbox"/> 30-40 mins walking with minimal pain<input type="checkbox"/> Can lift up to 15% bodyweight without pain
6-8	<p>Full range of motion for spinal bending/twist</p> <p>Lifting maximum of 20% bodyweight</p> <p>Keep exercises slow</p> <p>Minimise sedentary behaviour</p>	<p>Functional movement</p> <p>Introduce light resistance training</p> <p>Progress core and glute strength</p> <p>Commence light cardio (swim, stationary bike, light jog)</p>	<p>Teach new rehab exercises</p> <p>Massage/needling for muscle spasm/tone</p> <p>Manual therapy for hip and thoracic mobility</p> <p>Low grade manual therapy to</p>	<ol style="list-style-type: none">1. Bird dogs with hips forward2. Bear pose3. 8-pt plank4. Prone extensions5. Supine/prone/standing reformer exercises (light-medium springs)6. Lunge and squat with weights7. Standing rotations with theraband8. Glute bridge	<ul style="list-style-type: none"><input type="checkbox"/> Minimal pain with full ROM spinal movements<input type="checkbox"/> 8-point plank for >1-min<input type="checkbox"/> Standing wall side-plank >1-min<input type="checkbox"/> 60-mins walking with minimal pain<input type="checkbox"/> Can lift up to 20% bodyweight without pain



			<p>lumbar segments adjacent to operated levels (avoid op-site)</p> <p>Whole body alignment check</p>	<p>with curl up</p> <ol style="list-style-type: none"> Supine dead bugs (small ROM) Isometric leaning wall side plank Hammy curl and quad extension machines Increase walking tolerance to 60-mins ROM: kneeling and standing lumbar ROM Introduce light swimming and stationary bike Lower limb stretches (neutral spine, avoid hamstring stretch if ongoing sciatic nerve irritation) 	
8-10	<p>Full ROM</p> <p>Lifting maximum of 30% bodyweight</p> <p>Keep running slow</p>	<p>Increase strength and endurance</p> <p>Commence light running</p> <p>Increase lateral and rotational demands</p>	<p>Teach new rehab exercises</p> <p>Perform new objective strength measures</p> <p>Massage & needling for muscle spasm/tone</p> <p>Manual therapy for hip and thoracic mobility</p> <p>Low grade manual therapy to lumbar segments adjacent to operated</p>	<ol style="list-style-type: none"> 6-point plank Bear pose with alt leg lifts Prone extensions on ball (bigger ROM) Supine/prone/standing reformer exercises (heavier springs) Lunge and squat with weights Standing rotations with cable Single leg glute bridge Supine dead bugs with bigger ROM Side plank (knees down) Light RDL's Walking 	<p><input type="checkbox"/> No pain with full ROM spinal movements</p> <p><input type="checkbox"/> 6-point plank for >1-min</p> <p><input type="checkbox"/> Side-plank on knees >1-min</p> <p><input type="checkbox"/> >60-mins walking with no pain</p> <p><input type="checkbox"/> Can lift up to 30% bodyweight without pain</p> <p><input type="checkbox"/> If jogging (optional), can tolerate up to 20-mins without pain</p>



			levels (avoid op-site) Whole body alignment check	tolerance >60-mins 12. Light jogging <20-mins 13. Progress swimming and stationary bike 14. Lower limb stretches	
10-12	Full ROM Lifting maximum of 40% bodyweight Care with lifting technique	Increase strength and endurance Increase exercise speed/power Increase lateral and rotational demands Return to pre-injury levels by end of phase	Teach new rehab exercises Retest objective strength measures Massage & needling for muscle spasm/tone Manual therapy for hip, thoracic and lumbar mobility Testing for clearance of return to sport and/or discharge	1. Plank with alt arm/leg lifts 2. Push-ups 3. Reformer Pilates 4. Lunge and squat with heavier weights 5. Standing rotations with cable (heavier and bigger ROM) 6. Single leg glute bridge 7. Supine dead bugs with crunch 8. Side plank (knees up) 9. Heavier RDL's 10. Walking tolerance unrestricted 11. Light jogging 20-40 mins 12. Progress swimming and stationary bike 13. Lower limb stretches	<input type="checkbox"/> No pain with full ROM spinal movements <input type="checkbox"/> Can perform all exercises pain free <input type="checkbox"/> Can lift up to 40% bodyweight without pain
12-24	No contact or high velocity sports (e.g. (footy, surfing, cricket, golf, tennis) until after week 24.	Avoid re-injury Continue to improve capacity towards higher level tasks & sports	Consolidate ongoing strength and core program Manage any impairments with manual therapy and soft tissue releases	1. As per week 10-12 program, but progressively increase speed, distance, load, power demands 2. Sports specific rehab.	<input type="checkbox"/> Clearance from Surgeon <input type="checkbox"/> No pain with full ROM spinal movements <input type="checkbox"/> Can perform all exercises pain free <input type="checkbox"/> Discharge testing reflects pre-injury capacity