

Lumbar Spondylolysis/Listhesis Rehabilitation Guideline

This rehabilitation program is designed to return the individual to their activities as quickly and safely as possible. It is designed for rehabilitation following a non-operative lumbar spondylolysis/listhesis. Modifications to this guideline may be necessary dependent on physician specific instruction, specific tissue healing timeline, chronicity of injury and other contributing impairments that need to be addressed. This evidence-based non-operative rehabilitation guideline is criterion-based; time frames and visits in each phase will vary depending on many factors including patient demographics, goals, and individual progress. This guideline is designed to progress the individual through rehabilitation to full sport/ activity participation. The therapist may modify the program appropriately depending on the individual's goals for activity following the non-operative rehabilitation guideline below.

This guideline is intended to provide the treating clinician a frame of reference for rehabilitation. It is not intended to substitute clinical judgment regarding the patient's post injury care, based on exam/treatment findings, individual progress, and/or the presence of concomitant injuries or complications. If the clinician should have questions regarding progressions, they should contact the referring physician.

General Guidelines/Precautions:

- General healing timeline expected
 - Highly variable, but can expect anywhere from 3-6 months; athletes who stop sports participation for at least 3 months are 16 times more likely to have an excellent outcome¹
- Precautions to certain exercises for this injury
 - Avoid lumbar extension, spinal loading and impact activity early in the course of care
- ROM/ Strength expectations at beginning of therapy?
 - Limit lumbar extension range of motion and strengthening past neutral lumbar spine in the early phases of rehabilitation
- Severity/ Irritability/ Nature/ Chronicity of symptoms that may affect progressions
 - Bilateral pars defects typically timeframe to return is longer than a unilateral defect
 - Increased risk to develop chronic ankle pain, instability, and limitation in hopping >6 after injury

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PHASE	SUGGESTED INTERVENTIONS	GOALS/MILESTONES FOR PROGRESSION
<p>Phase I Active Rest 0-6 Weeks 2-4 Expected Visits</p>	<ul style="list-style-type: none"> • Immobilization (usually determined by physician) • Bracing is recommended if patient is experiencing pain with activities of daily living • If patient only has pain with higher level and/or sporting activities they may not require bracing • Control of inflammatory process <p>Specific Instructions:</p> <ul style="list-style-type: none"> • Avoid loading the spine, lumbar extended positions <p>Suggested Treatments:</p> <ul style="list-style-type: none"> • Modalities as indicated: <ul style="list-style-type: none"> • Ultrasound, electrical stimulation, heat, ice to control pain • ROM/flexibility (encourage decreased lumbar stress during extension movement): <ul style="list-style-type: none"> • Shoulder flexion and latissimus dorsi stretching • Hip flexor stretching • Hamstring stretching • Hip rotation stretching • Thoracic extension mobilization/manipulation and self-stretching • Strength <ul style="list-style-type: none"> • Side lying clam shell • Side lying hip abduction • Abdominal isometric <p>Other Activities:</p> <ul style="list-style-type: none"> • May bike without resistance as appropriate 	<p>Goals of Phase:</p> <ul style="list-style-type: none"> • Protect the injured joint • Control inflammation • Control pain <p>Criteria to Advance to Next Phase:</p> <ul style="list-style-type: none"> • Pain is controlled • Edema is controlled • Full lumbar range of motion (extension is an exception)
<p>Phase II Early Strengthening 6-9 Weeks 4-6 Expected Visits</p>	<p>Specific Instructions:</p> <ul style="list-style-type: none"> • Continue to avoid excessive spinal loading and spinal extension • Discontinue brace if no pain with activities of daily living <p>Suggested Treatments:</p> <ul style="list-style-type: none"> • Modalities as indicated <ul style="list-style-type: none"> • Ultrasound, heat, electrical stimulation to control pain and stiffness • Manual therapy <ul style="list-style-type: none"> • Soft tissue mobilization paraspinals, quadratus lumborum, gluteals, piriformis as needed • ROM/flexibility (continue from phase I) • Strengthening: <ul style="list-style-type: none"> • Begin neutral trunk stabilization <ul style="list-style-type: none"> • Front plank • Side plank • Curl up • Bridging • Arm-opposite leg lifting • Closed-chain gluteal strengthening <ul style="list-style-type: none"> • Side step band walk • Band squat isometric • Standing clam • Focus on isometric holds to improve endurance of the trunk and gluteals • Cardiovascular: <ul style="list-style-type: none"> • Treadmill walking, biking, elliptical if no pain during or after 	<p>Goals of Phase:</p> <ul style="list-style-type: none"> • Restore mobility • Restore strength in pain-free ROM • Improve trunk and hip endurance • Improve neuromuscular control <p>Criteria to Advance to Next Phase:</p> <ul style="list-style-type: none"> • 60 second hold front plank, side plank, lumbar extension endurance • ROM WNL • No pain without brace for all activities other than sport • Light jog at 50% intensity without pain
<p>Phase III Fundamental Movements and Advanced Strengthening 9-12 Weeks 4-6 Expected Visits</p>	<p>Specific Instructions:</p> <ul style="list-style-type: none"> • Begin gradual loading to the lumbar spine • Suggested Treatments: • Modalities as indicated <ul style="list-style-type: none"> • Ultrasound, heat, electrical stimulation to control pain and stiffness • Manual therapy <ul style="list-style-type: none"> • Soft tissue mobilization paraspinals, quadratus lumborum, gluteals, piriformis as needed <p style="text-align: right;"><i>(continued on next page)</i></p>	<p>Goals of Phase:</p> <ul style="list-style-type: none"> • Prepare for return to running and plyometric activities • Improve trunk and hip strength • Introduce major movements while emphasizing core stability <p style="text-align: right;"><i>(continued on next page)</i></p>

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<p>Phase III</p>	<p><i>(continued from previous page)</i></p> <p>Specific Instructions:</p> <ul style="list-style-type: none"> • Strengthening: <ul style="list-style-type: none"> • Continue neutral trunk stabilization – progress to unstable surface <ul style="list-style-type: none"> • Front plank • Side plank • Curl up • Bridging • Arm-opposite leg lifting • Anti-extension and anti-rotation exercises for the trunk • Closed-chain gluteal strengthening <ul style="list-style-type: none"> • Side step band walk • Goblet squat • Single limb strengthening <ul style="list-style-type: none"> • Upper body movements <ul style="list-style-type: none"> • Chest press • Overhead press • Pull-downs • Lower body movements <ul style="list-style-type: none"> • Single leg squat • Single leg dead lift • Loaded carry <ul style="list-style-type: none"> • Farmer carry – progress to single arm carries including suitcase and waiter carry • Focus on increasing weight and decreasing repetitions • Cardiovascular: <ul style="list-style-type: none"> • Begin return to running progression if patient can walk for 30 minutes without pain 	<p><i>(continued from previous page)</i></p> <p>Criteria for Return to Sport:</p> <ul style="list-style-type: none"> • No pain with initial phases of return to running program • Minimal to no pain or difficulty with major movements
<p>Phase IV <i>Sport-specific Return to Sport</i></p>	<p>Specific Instructions:</p> <ul style="list-style-type: none"> • Introduce sport specific movements • Continue to gradually add loading <p>Suggested Treatments:</p> <ul style="list-style-type: none"> • Modalities as indicated • Manual therapy <ul style="list-style-type: none"> • Soft tissue mobilization paraspinals, quadratus lumborum, gluteals, piriformis as needed • Strengthening: <ul style="list-style-type: none"> • Continue above noted strengthening exercises • Plyometrics <ul style="list-style-type: none"> • Begin with double limb and progress to single limb • Cardiovascular: <ul style="list-style-type: none"> • Continue return to running program, sport-specific conditioning 	

****NOTE:** all phases may need to be extended depending on patient symptoms. Bilateral pars defect and longer duration of symptoms can lengthen time of rehabilitation

REFERENCES:

1. Alvarez P. Conservative treatment of lumbar spondylolysis in young soccer players. *Knee Surg Sports Traumatol Arthrosc.* 2011;19:2111-2114.
2. Standaert et al. Expert opinion and controversies in sports and musculoskeletal medicine: the diagnosis and treatment of spondylolysis in adolescent athletes. *Arch Phys Med Rehab.* 2007;88:537-40.
3. Johnson RJ. Low-back pain in sports: managing spondylolysis in young patients. *The Physician and Sports Medicine.* 1993;4:53-59.
4. Garet M. Nonoperative treatment in lumbar spondylolysis and spondylolisthesis: a systematic review. *Sports Health.* 2013; 10:1-8