



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 depending 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 and 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 with a frame of reference for rehabilitation. It is not intended to substitute clinical judgment regarding the patient's post-injury care based on exam or 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 expected healing timeline
 - 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 outcome.¹
 - Athletes who initiate physical therapy earlier are able to return to sport sooner than those who wait until after 3 months to initiate physical therapy.²
- Imaging
 - Repeat imaging is only recommended for patients who remain symptomatic after 12 weeks.³
- 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 typical time frame to return is longer than a unilateral defect.
 - Increased risk of developing 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 <i>Protection and Early Strengthening Phase</i></p> <p>Weeks: 0-6 weeks</p> <p>Expected visits: 2-4</p>	<p>Immobilization (usually determined by physician)</p> <ul style="list-style-type: none"> Bracing is typically reserved for patients whose symptoms fail to improve with conservative treatment.⁷ If patient has pain only with higher-level and/or sporting activities, they may not require bracing. <p>Control of inflammatory process</p> <p>Specific Instructions: Promote neutral lumbar spine position to avoid pain-provoking and loaded lumbar extension activities.</p> <p>Suggested Treatments:</p> <p>Manual therapy: Soft tissue mobilization paraspinals, quadratus lumborum, gluteals and piriformis as needed</p> <p>Modalities as indicated: Ultrasound, electrical stimulation, heat and ice to control pain</p> <p>ROM/flexibility (encourage decreased lumbar stress during extension movement):</p> <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 <p>Strength:</p> <ul style="list-style-type: none"> Side lying clamshell Side lying hip abduction <p>Neuromuscular re-education:</p> <ul style="list-style-type: none"> Abdominal isometric Progression to quadruped and standing transverse abdominis (TA) activation⁴ TA biofeedback Dead bugs Beginner bird-dog <p>Other activities: <i>May bike without resistance as appropriate, identify and address other areas of the body integral to the athlete's sport</i></p>	<p>Goals of Phase:</p> <ol style="list-style-type: none"> Patient education to minimize fear-avoidance beliefs Protect the injured joint Initiate local muscle activation Control pain/inflammation <p>Criteria to Advance to Next Phase:</p> <ol style="list-style-type: none"> Pain is controlled Edema is controlled Full lumbar range of motion (extension is an exception) Prone pressure biofeedback test >10 seconds with 4 mmHG drop⁴

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<p>Phase II Intermediate Strengthening Phase</p> <p>Weeks: 6-9</p> <p>Expected visits: 4-6</p>	<p>Specific Instructions: Continue to avoid excessive spinal loading and spinal extension.</p> <p>Suggested Treatments: Continue modalities and manual therapy as needed. ROM/flexibility (continue from phase I)</p> <p>Strengthening:</p> <ul style="list-style-type: none"> • Continue neutral trunk stabilization <ul style="list-style-type: none"> o Front plank o Side plank o Curl up o Bridging o Iliopsoas strengthening • Closed-chain gluteal strengthening <ul style="list-style-type: none"> o Side-step band walk o Band squat isometric o Standing clam o Single leg stance activities • Focus on endurance training of the trunk and gluteals <p>Neuromuscular re-education:</p> <ul style="list-style-type: none"> • Continue progression of TA and multifidus activation in more functional positions <p>Cardiovascular: Treadmill walking, biking, elliptical if no pain during or after</p>	<p>Goals of Phase:</p> <ol style="list-style-type: none"> 1. Restore mobility 2. Restore strength in pain-free ROM 3. Improve trunk and hip endurance 4. Improve neuromuscular control <p>Criteria to Advance to Next Phase:</p> <ol style="list-style-type: none"> 1. 60-second hold <ol style="list-style-type: none"> a. Front plank b. Side plank c. Lumbar extension endurance 2. Supine DL lowering <70o⁴ 3. ROM full 4. Light jog at 50% intensity without pain
<p>Phase III Fundamental Movements and Advanced Strengthening</p> <p>Weeks: 9-12</p> <p>Expected visits: 4-6</p>	<p>Specific Instructions: Continue gradual loading to the lumbar spine in more functional positions.</p> <p>Suggested Treatments:</p> <ul style="list-style-type: none"> • Continue trunk stabilization in greater ranges of motion - progress to unstable surfaces <ul style="list-style-type: none"> o Bridge progression o Plank progression • Anti-extension and anti-rotation exercises for the trunk • Closed-chain gluteal strengthening <ul style="list-style-type: none"> o Side-step band walk o Goblet squat o 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 deadlift o 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 <p>Cardiovascular: Refer to Return to Running guideline</p>	<p>Goals of Phase:</p> <ol style="list-style-type: none"> 1. Prepare for return to running and plyometric activities 2. Improve trunk and hip strength 3. Introduce major movements while emphasizing core stability <p>Criteria to Advance to Next Phase:</p> <ol style="list-style-type: none"> 1. No pain with initial phases of return to running program 2. Minimal to no pain or difficulty with major movements

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<p>Phase IV <i>Sport-specific Return to Sport</i></p> <p><i>Weeks: 12+</i></p>	<p>Specific Instructions:</p> <ul style="list-style-type: none"> • Introduce and gradually progress sport-specific movements • Continue to gradually add loading <p>Suggested Treatments:</p> <p>Strengthening:</p> <ul style="list-style-type: none"> • Continue above noted strengthening exercises <p>Plyometrics:</p> <ul style="list-style-type: none"> • Begin with double-limb and progress to single-limb • Cardiovascular: Continue return to running program, sport-specific conditioning 	<p>Criteria to Advance to Next Phase:</p> <ol style="list-style-type: none"> 1. No symptoms with change of direction, plyometrics, agility drills and sport-specific drills with workloads mimicking sport demands. 2. No symptoms with weight room activities with appropriate modifications as needed.
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****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

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