



## Stress Injury Guideline

Individual patient circumstances may affect the guideline such as site of injury, chronicity, severity, etc.  
*Please defer to physician notes for specific instructions*

Phase	Goals	Precautions/Restrictions	Treatment
Phase I	<ul style="list-style-type: none"> <li>• Remove stress from injured site</li> <li>• Reduce pain</li> <li>• Limit deconditioning</li> <li>• Maintain strength throughout kinetic chain</li> <li>• <u>Progress to Phase II when ADLs are pain-free</u></li> </ul>	<ul style="list-style-type: none"> <li>• See physician note for specific WB instructions</li> <li>• See below for general WB timeframes</li> </ul>	<ul style="list-style-type: none"> <li>• PRICE               <ul style="list-style-type: none"> <li>○ Avoid icing directly over area</li> </ul> </li> <li>• Open-chain LE strengthening               <ul style="list-style-type: none"> <li>○ Clamshells, LAQs, Ankle 3-way, foot intrinsic</li> </ul> </li> <li>• Core strengthening</li> <li>• Education on WB, boot wear</li> <li>• Aerobic conditioning               <ul style="list-style-type: none"> <li>○ Cycling, pool, UBE</li> </ul> </li> </ul>
Phase 2	<ul style="list-style-type: none"> <li>• Improve LE strength</li> <li>• Return to ADLs</li> <li>• <u>Criteria to progress to Phase III:</u> <ul style="list-style-type: none"> <li>○ Walk up to 30 minutes with minimal to no increase in pain</li> <li>○ Single leg hop up to 15 times with no pain</li> <li>○ Excellent forward step down mechanics</li> <li>○ SL heel raise up to 25 repetitions with no pain</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Progress to WBAT (wean crutches)</li> <li>• Discuss with physician, ATC, support team potential activity modifications</li> <li>• Adhere to soreness rules (appendix)</li> </ul>	<ul style="list-style-type: none"> <li>• ROM: as tolerated</li> <li>• Progress strengthening               <ul style="list-style-type: none"> <li>○ Open to closed chain                   <ul style="list-style-type: none"> <li>• Squats, step ups, lateral band walks</li> </ul> </li> <li>○ Double to single leg                   <ul style="list-style-type: none"> <li>• Heel raises, Single leg squat</li> </ul> </li> </ul> </li> <li>• Proprioceptive activities</li> <li>• Aerobic conditioning               <ul style="list-style-type: none"> <li>○ Cycling, underwater treadmill, Alter-G (if applicable)</li> </ul> </li> <li>• Walking program 3x/week</li> </ul>
Phase 3	<ul style="list-style-type: none"> <li>• Normalize LE strength</li> <li>• Return to running and prior activity level pain-free</li> </ul>	<ul style="list-style-type: none"> <li>• Adhere to soreness rules</li> <li>• Avoid increase of &gt;20% of volume from week to week</li> </ul>	<ul style="list-style-type: none"> <li>• Progress strengthening as tolerated</li> <li>• Begin return to run program (see appendix)</li> <li>• Utilize running analysis (if applicable)</li> <li>• Increase plyometrics</li> </ul>

Stress Fracture	Risk	Average time to WB activities
Sesamoid	High	6 weeks
Navicular	High	6 weeks
Femoral Neck	High	4-6 weeks
Anterior tibia	High	6-8 weeks
Posteromedial tibia	Low	3 to 12 weeks (depending on area)
Metatarsal (1-4)	Low	4-6 weeks
Femoral shaft	Low	6-8 weeks
Sacrum/pelvis	Low	7-12 weeks

This guideline is not meant to be prescriptive but a recommendation to the rehabilitation process. Progress may vary based on specifics of injury and procedure.

## Running Program

(Adapted from Brinlee et al and UD ACL group)

Running Progression		
	Treadmill	Track
<b>Level 1</b>	0.1 mile walk / 0.1 mile jog, repeat 10 times	Jog straights / walk curves (2 miles)
<b>Level 2</b>	0.1 mile walk / 0.2 mile jog - 2 miles total	Jog straights / jog 1 curves every other lap (2 miles)
<b>Level 3</b>	0.1 mile walk / 0.3 mile jog - 2 miles total	Jog straights / jog 1 curve every lap (2 miles)
<b>Level 4</b>	0.1 mile walk / 0.4 mile jog - 2 miles total	Fast walk 1 ¼ lap / walk curve (2 miles)
<b>Level 5</b>	Jog full 2 miles	Jog full 2 miles
<b>Level 6</b>	Increase workout to 2 ½ miles	Increase workout to 2 ½ miles
<b>Level 7</b>	Increase workout to 3 miles	Increase workout to 3 miles
<b>Level 8</b>	Alternate between running/jogging every ¼ mile	Increase speed on straights / jog curves
<b>Instructions:</b>		
<ul style="list-style-type: none"> <li>- Mandatory 2-day rest between workouts for first two week</li> <li>- Do not advance more than 2 levels per week</li> <li>- Two days rest mandatory between levels 1, 2, and 3 workouts</li> <li>- One day rest mandatory between levels 4-8 workouts</li> </ul>		
<b>Soreness Rules:</b>		
<ul style="list-style-type: none"> <li>- With bone stress injuries (BSI), acceptable level of pain is 0/10 during, after, and day after loading</li> </ul>		
<b>Specific Considerations:</b>		
<ul style="list-style-type: none"> <li>- Non-endurance athletes: must successfully complete level 4 of progression before advancement to sprinting</li> </ul>		

Distance Running Progression (adapted from Chris Johnson, DPT running handout)				
	Run	Walk	Repeat	Total
<b>Level 1</b>	1'	3'	10x	40'
<b>Level 2</b>	2'	2'	10x	40'
<b>Level 3</b>	3'	1'	10x	40'
<b>Level 4</b>	4'	1'	8x	40'
<b>Level 5</b>	5'	1'	7x	42'
<b>Level 6</b>	6'	1'	6x	42'
<b>Level 7</b>	7'	1'	6x	48'
<b>Level 8</b>	8'	1'	6x	54'
<b>Level 9</b>	9'	1'	6x	60'
<b>Level 10</b>	45'	N/A	N/A	45'
<b>Instructions:</b>				
<ul style="list-style-type: none"> <li>- Mandatory 2-day rest between workouts for first two week</li> <li>- Avoid runs on consecutive days</li> <li>- Perform prescribed exercises or drills on non-running days</li> <li>- Target 3-4/10 on RPE scale with intensity</li> <li>- Do not advance more than 2 levels per week</li> </ul>				
<b>Soreness Rules:</b>				
<ul style="list-style-type: none"> <li>- With bone stress injuries (BSI), acceptable level of pain is 0/10 during, after, and day after loading</li> </ul>				

# Plyometric Program

(Adapted from Buckthorpe et al)

- ⇒ Pass RTR criteria
- ⇒ Ability to squat 1.5-2.5 times body weight OR squat body weight + 0.6 times body weight 5 times in under 5 seconds
- ⇒ Start with 40 contacts, increase as tolerated
- ⇒ Remain between 80-120 contacts per session

Plyometric Program				
	Phase 1	Phase 2	Phase 3	Phase 4
<b>Criteria to enter stage</b>	See above	Ability to run > 10 minutes Good BL landing mechanics Good SL squat mechanics Closed-chain strength > 1.25 times body weight Isokinetic/Isometric LSI knee extensor and flexor > 80%	Good BL drop jump mechanics Good SL landing control Closed chain strength > 1.5 times body weight	Isokinetic/Isometric strength > 90% Closed chain strength > 1.5 times body weight Good pre-planned movement quality (UL landing/ deceleration/ BL and UL drop jump/ COD mechanics)
<b>Plyometric task</b>	Lunge push back Impact step up Step off landing from box (6-8 in box) Squat jump (SJ) to box Countermovement jump (CMJ) to box Pogo hops (in place, in-out, scissors) Skips in place Step and hold (forward)	Bilateral (BL) SJ (in place, forward) BL CMJ (in place, forward) BL drop jump (12 inch step) Split jump (same leg land) Split jump (alternating) Step and land (forward, lateral) Step-land-push-back (forward, lateral)	Unilateral (UL) SJ/CMJ to BL landing UL SJ/CMJ to box Rotational jump and land Lateral step-jump-back Tuck jump Hop single -> multiple (in place/ forward/lateral/45°/90°) SL drop jump (box/in place/ lateral to box)	CMJ (hurdles) SJ/CMJ weighted BL/UL DJ (increased height to box) Lateral hop (band/rope/med ball) SL 90 lateral drop jump Step cut (perturbation) Agility and COD drills