CASE STUDY

GENERAL PRINCIPLES
This protocol for lower extremity stress fractures is designed to provide the rehabilitation professional with a general guideline for patient care with the AlterG Anti-Gravity Treadmill®. As such, it should be stressed that this is only a protocol and should not be a substitute for professional clinical decision-making regarding a patient’s progression. And it should be further noted that progression should be individualized based upon each patient’s specific needs, pain level, physical examination, progress, and presence of any complications.

PHASE I (Immediate):
Week 1-Week 2

GOALS
• Control pain and inflammation
• Maintain joint mobility and AROM/PROM of appropriate joints
• Maintain base level of cardiovascular conditioning
• Promote normal walking gait mechanics within the AlterG

TREATMENT OPTIONS:
Modalities
Ice and interferential electric stimulation for pain/inflammation control, Game ready as needed to control swelling

Manual Therapy
Appropriate ankle joint mobilizations as needed to maintain ankle mobility (Gr 2/3), Mild PROM for foot/ankle and knee as appropriate, Edema massage as appropriate, Soft tissue mobilization techniques to the plantar fascia, gastrocnemius, soleus, peroneals, and anterior/posterior tibialis. Lower extremity PNF patterns (hip D1/2 F/E)

Therapeutic Exercise
Stationary Bike, LE stretches, NWB or PWB AROM (i.e: Babst/Wobble/Teeter board), Towel stretches in long sitting, Controlled closed chain activities in AlterG Anti-Gravity Treadmill® (Squats, Single Leg Mini-Squats, SLS, Heel and toe raises), Progression to FWB: Squats, Leg Press, Step-Ups, Band walks

Gait Training
Emphasis on proper gait mechanics within the AlterG Anti-Gravity Treadmill®. Utilize forward and backward walking in the AlterG – 65% to 75% BW. Walking 3.5 mph to 6.0 mph at 0% to 6% incline (incline at lower walking speeds only). Beginning week 3 may increase incline range for lower walking speeds to 0% to 8%

PHASE II (Early Recovery Phase):
Week 3–Week 4

GOALS
• Control pain and inflammation
• Maintain joint mobility and AROM/PROM of appropriate joints
• Begin weight bearing activities
• Initiate strengthening progression
• Maintain base level of cardiovascular conditioning
• Promote normal walking gait mechanics within the AlterG

TREATMENT OPTIONS:
Modalities
Ice and interferential electric stimulation for pain/inflammation control, Game ready as needed to control swelling

Manual Therapy
Advanced mobilization techniques for foot and ankle to normalized ROM and mechanics. Ankle PNF patterns. Lower extremity PNF patterns (hip D1/2 F/E). Edema massage as appropriate, Soft tissue mobilization techniques to the plantar fascia, gastrocnemius, soleus, peroneals, and anterior/posterior tibialis.

Therapeutic Exercise
Continue with foundation strengthening activities. Begin lower level functional training (progress linear to lateral movements). Begin progressive dynamic proprioceptive activities.

PHASE III (Intermediate Phase):
Week 5–Week 7

GOALS
• Painfree ADL’s
• Full painfree AROM/PROM
• FWB closed chain strengthening progression
• Progress to sports and recreational activity progressions
• Progress walking and jogging progressions on AlterG

TREATMENT OPTIONS:
Modalities
Ice and interferential electric stimulation for pain/inflammation control, Game ready as needed to control swelling

Manual Therapy
Appropriate ankle joint (subtalar and talocrural) mobilizations as needed to maintain ankle mobility (Gr 2/3), Mild PROM for foot/ankle and knee as appropriate, Edema massage as appropriate, Soft tissue mobilization techniques to the plantar fascia, gastrocnemius, soleus, peroneals, and anterior/posterior tibialis. Lower extremity PNF patterns (hip D1/2 F/E)
Gait Training
In AlterG Anti-Gravity Treadmill® single leg strengthening; Walk and jog/run progressions at 70% to 85% BW at 2% to 4% incline (incline at lower speeds only). Speeds from 5 mph to 8 mph. During week 5 may increase to 75% to 90% BW at 2% to 6% incline at lower speeds only.

PHASE IV (Advanced Phase): Week 8+

GOALS
- Advanced progressions with sports and recreational activity
- Advanced progressions with jogging and running on the AlterG

TREATMENT OPTIONS:
Modalities
Ice and interferential electric stimulation for pain/inflammation control, Game ready as needed to control swelling

Manual Therapy
Advanced mobilization techniques for foot and ankle to normalize ROM and mechanics – AS NEEDED. Ankle PNF patterns. Lower extremity PNF patterns (hip D1/2 F/E). Massage/Soft tissue mobilization as needed to assist in recovery and soreness to the plantar fascia, gastrocnemius, soleus, peroneals, and anterior/posterior tibialis.

Therapeutic Exercise
Continue with foundation strengthening activities. Begin advanced functional training (progress linear to lateral movements). Begin plyometric and advanced agility as appropriate. Progress dynamic proprioceptive activities.

Gait Training
In AlterG Anti-Gravity Treadmill® single leg strengthening; 1st week of PHASE IV to consist of active rest period with decreased BW% (65% to 75% BW) at 4.5 mph to 6.0 mph (incline of 2% to 6% at lower speeds only). Following first week of active rest may begin jogging and running progressions at 85% to 90% BW at 0% to 2% incline as appropriate. Speeds from 6 mph to 12 mph. Second week after active rest may increase BW% range to 85% to 100% BW.

ALTERG PROGRESSION TABLE

<table>
<thead>
<tr>
<th>Day or Week (for surgical patients this must be listed as “post-op week”)</th>
<th>Program Walking? Running?</th>
<th>Speed (mph)</th>
<th>Incline (%)</th>
<th>Time (Minutes)</th>
<th>Frequency (How many times per day or week was the exercise or training?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHASE I (1 – 3 weeks in duration)</td>
<td>Walking? % Body Weight</td>
<td>60 - 65%</td>
<td>2.5 to 3.5 mph</td>
<td>2%</td>
<td>15 to 30 minutes</td>
</tr>
<tr>
<td>PHASE IIa (2 weeks in duration)</td>
<td>65 - 75%</td>
<td>3.5 to 6.0 mph</td>
<td>Can do incline intervals from 2 – 6% (incline at lower walking speeds only)</td>
<td>*20 to 30 minutes (jog/walk intervals combined with incline intervals)</td>
<td>3x/week plus pool</td>
</tr>
<tr>
<td>PHASE IIb (1 week duration)</td>
<td>65 - 75%</td>
<td>4.5 to 6.0 mph</td>
<td>Can do incline intervals from 2 – 8% (incline at lower walking speeds only)</td>
<td>*20 to 30 minutes (jog/walk intervals combined with incline intervals)</td>
<td>3x/week plus pool and cross training</td>
</tr>
<tr>
<td>PHASE IIIa - FUNCTIONAL (2 weeks in duration)</td>
<td>70 - 85%</td>
<td>5.0 to 8.0 mph</td>
<td>Can do incline intervals from 2 – 6% (incline at lower speeds only)</td>
<td>*30 min Run/jog intervals – can be combined with incline intervals</td>
<td>3 - 5x/week (intervals x 3 distance x 1) plus cross training</td>
</tr>
<tr>
<td>PHASE IIIb – FUNCTIONAL (1 week in duration)</td>
<td>75 - 90%</td>
<td>5.0 to 8.0 mph</td>
<td>Can do incline intervals from 2 – 6% (incline at lower speeds only)</td>
<td>*30 min Run/jog intervals – can be combined with incline intervals</td>
<td>3 - 5x/week (intervals x 3 distance x 1) plus cross training</td>
</tr>
<tr>
<td>ACTIVE REST PHASE (1 week in duration)</td>
<td>65 – 75%</td>
<td>4.5 to 6.0 mph</td>
<td>Can do incline intervals from 2 – 6% (incline at lower speeds only)</td>
<td>*30 min jog/walk or run/jog intervals can be combined with incline intervals</td>
<td>3x/week plus aquajog, plus cross training</td>
</tr>
<tr>
<td>Week 7 - RTA</td>
<td>85% - 95%</td>
<td>6.0 to 12.0 mph</td>
<td>1-2%</td>
<td>*35 min continuous run</td>
<td>2-3x/week plus overland &amp; agility</td>
</tr>
<tr>
<td>Week 8 - RTA</td>
<td>85% – 100%</td>
<td>6.0 to 12.0 mph</td>
<td>1-2%</td>
<td>*45 min continuous run</td>
<td>2-3x/week plus overland &amp; agility</td>
</tr>
</tbody>
</table>

* In time column denotes that this time does not include a 5-10 minute walking warm up at the workout weight percentage prior to the designated workout.