

DEVELOPED BY MERRICK J. WETZLER, M.D.

**Rehabilitation Protocol for ACL Reconstructions Incorporating The  
X-iser Machine™**

**Post-op Week 1**

- Weight Bearing as Tolerated in Hinged Brace Locked in Extension
- Passive Knee Extension to 0° (Pillow under heel, prone hangs -- advance time as tolerated, but not to exceed 10 minutes)
- Passive Knee Flexion to 90° in Hinged Brace unlocked (heel slides, wall slides)
- Quadriceps Isometric Contractions (10 times per hour)
- Straight Leg Raises (SLR) in 4 directions as tolerated with Hinged Knee Brace Locked
- Plantar Flexion Strengthening -- heel raises (stand on tiptoe) or theraband plantar flexion as tolerated
- Cryocuff or Ice for pain and edema (swelling) reduction

**Post-op Week 2-3**

- Reinforce proper gait pattern
- May remove hinged brace while in therapy
- Passive Knee Flexion to full as tolerated (in therapy only)
- Stationary Bike
- Muscle Re-education Electrical Stimulation -- if no active quadriceps contraction
- Squats (0° to 45°) with support with both arms and knee must be over ankle
- Patella Mobilization (superior/inferior, medial/lateral)
- Electrical Stimulation combined with ice (for pain and swelling reduction)
- Patient to start on X-iser Machine™ once 60° of flexion obtained and patient has quadriceps control and can do a straight leg raise
  - First time machine should be used with arms able to be supported by parallel bars/walker/table  
During this time X-iser should only be used in the presence of a Physical Therapist or Athletic Trainer
  - Use proper form at all times (see Short Burst Exercise Form instructions)
  - Once comfortable on X-iser machine use in doorway for balance support only if necessary
  - Initially start with 4, 30-second intervals sub maximal effort.  
Once comfortable with this may increase interval to 1 minute and increase effort to maximum
  - Once deemed independent with machine may begin home Short Burst Exercise Program of four 1 minute intervals at maximum effort with at least 30 minute rest between intervals

**Post-op Week 4-8**

- Active knee extension without any weights Treadmill, Nordic Track, Stair Master
- Progress mini-squats with weight as tolerated
- Closed Chain Exercises (foot on the floor or against plate or pedal) with terminal knee extension
- Simulated ambulation with resistance to emphasize hamstring eccentric contraction
- Lateral Step-ups as tolerated (knee directly over ankle at all times)
- Proprioceptive Activities

- Uni-leg stances (on floor or mini trampoline)
- Single plane proprioceptive board
- Continued Electrical Stimulation
- Continue X-iser Short Blast Exercise program™ and begin X-iser Pump Program™ (See Pump Progression)
  - Pump Program: 2 times a week in the presence of a Physical Therapist or Athletic Trainer
  - Start at Level 1 and progress as tolerated. May increase by one level each session if tolerated

### **Post-op Week 9-12**

- Continue X-iser Short Blast Exercise Program and Pump Program
- Progress to Multi-plane Proprioception Exercises (no shoes)

### **Post-op Week 12 -14**

- Continue X-iser Short Blast Exercise Program and Pump Program
- Functional Evaluation
  - Vertical Jump -- both legs, right, left
  - Multiple jumps -- both legs, right, left
  - One Legged Timed Hop (20 feet) -- right, left
  - Agility Test
- Initiated jogging on level surfaces if isokinetic quad strength is 80% of uninjured side
- Knee Extension Isotonics (90° to 0°)
- Continue Plyometrics with sports cords or therabands

### **Post-op Week 14**

- Continue X-iser Short Blast Exercise Program and Pump Program
- Single Plane Plyometrics while wearing functional brace
  - Step-ups, Jump Rope
  - Shuffle Steps (anterior/posterior), Lateral Shuffles, Depth Jumps
  - Knee Extension Isotonics (90° to 0°) (Eccentric)

### **Post-op Week 16**

- Continue with above and X-iser Short Blast Exercise Program and Pump Program
- Sport Specific drills: plyometrics (cariocas, figure-8, "T" running)