



Tibial Tubercle Osteotomy (TTO)

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- **Phase I – Immediate Post Surgical Phase (Week 0-2)**
 - Goals
 - Maintain integrity of repair (No lateral patellar mobilization for 6 weeks)
 - Gradually increase PROM
 - Decrease pain and inflammation
 - Prevent muscular inhibition
 - Cryotherapy for pain/inflammation
 - Ice 15-20 minutes every hour
 - Brace
 - Hinged knee brace/knee immobilizer
 - Locked in extension for ambulation
 - May remove for hygiene and exercises
 - Sleeping
 - Sleep in brace/knee immobilizer
 - Weight Bearing
 - Toe-touch weight-bearing (TTWB)
 - ROM
 - Flexion to 90 degrees, gentle AAROM only
 - Muscle Retraining
 - Quadriceps isometrics, SLR
 - No lateral patellar mobilization for 6 weeks
 - No active knee extension until osteotomy is healed (as demonstrated on xray at follow up appointment)
 - Usually about 6-8 weeks

- **Phase II – Protection Phase (Week 2-6)**
 - Goals
 - Allow healing of soft tissue/bone
 - Do not overstress healing tissue
 - Gradually increase ROM
 - Progression based on swelling/inflammation
 - Decrease pain and inflammation

- Brace
 - Continue hinged brace/knee immobilizer
 - Keep locked in extension for ambulation
 - May open 0-90 degrees when not ambulating
 - Weight bearing
 - Continue TTWB
 - Can sleep without hinged brace/knee immobilizer after 2 weeks
 - ROM guidelines (PROM, AAROM)
 - 0-90, progress to full as tolerated
 - E-stim to quads
 - Quad isometrics
 - SLR
 - Gentle, submaximal isometric knee extension
 - Floor-based core, hip, glutes work
- **Phase III – Intermediate Phase (Week 6-9)**
 - DO NOT begin intermediate phase until cleared by Dr. Hess (usually with radiographic healing of osteotomy)
 - Goals
 - Gradual improvement in ROM
 - Eliminate swelling
 - Control forces on extensor mechanism
 - Weight bearing
 - When cleared by Dr. Hess based on xray, may discontinue knee immobilizer and wean crutches
 - Advance weight-bearing by 25% weekly and progress to full weight-bearing with normalized gait pattern
 - Begin lateral stabilizer brace
 - ROM
 - Goal full ROM at 6-8 weeks
 - Continue quadriceps strengthening
 - Continue above exercises
 - Light knee extension (90-60 degrees)
 - Stationary bicycle
 - Hip/core strengthening
 - **Phase IV –Strengthening Phase (Week 9-16)**
 - Goals
 - Maintain full ROM
 - Improve limb strength and endurance
 - Gradual return to functional activities
 - Criteria to progress to Phase IV

- Full, non-painful ROM
 - Absence of swelling/inflammation
 - Voluntary control of quads
 - Continue above exercises
 - Wall squats (0-60 degrees)
 - Knee extension (60-0 degrees)
 - Cycling, elliptical, swimming after 12 weeks
 - Progress to functional drills as tolerated
 - Begin sport specific drills as appropriate
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- Phase V –Return to Activity Phase (Week 18-24)
 - Goals
 - Gradual return to strenuous work activities
 - Gradual return to recreational sports activities
 - Criteria to progress to Phave V
 - Appropriate strength level/Clinical exam