

## Rehabilitation after Tibial tubrosity Transfer

Time following surgery	Goal	Treatment guidelines
Stage I Acute Recovery Week 1-4	To facilitate bony union of fracture site Minimise concurrent postoperative complication Minimise muscular atrophy	Remain TWB on crutches until at least 4 weeks Brace to remain on at all times until 6 weeks postop Instruction regarding use of crutches TWB Reduction of swelling and pain using ice, elevation and exercises Exercises instructed from day 1 postop: static quads, straight leg raise and ankle ROM exercises.
Stage II 4-6 Weeks	Facilitation of bony union through PWB Minimise concurrent postoperative complications	Continue exercises as above Commence partial weight bearing within pain free threshold. May progress to full weight bearing by week 6 if pain free Gait retraining with crutches focusing on correct heel strike/toe off
Stage III 6-12 weeks	Restoration of normal gait pattern Restoration of muscular strength and ROM	Gait retraining focusing on correct heel strike/toe off and VMO activation during stance Aim for a full range of motion using active and passive techniques Encourage VMO activation with co-contraction and biofeedback techniques. Progress by increasing repetitions, length of contraction and dynamic condition Hamstring strengthening with static weight bearing co-contractions progressing to active free hamstring contractions then to resisted hamstring strengthening Gym equipment can be introduced such as stationary bike (encourage daily), stepper, leg press, mini trampoline, cross trainer with minimal resistance Pool work starting with deep water running. Swimming with pool buoy progressing to free kicking Muscle tightness can be addressed with soft tissue techniques and stretching particularly hamstrings and calf muscles  Open chain exercises should be avoided, rather use closed chain exercises performed with co-contraction of hamstrings and quadriceps which lessen the patello-femoral joint forces and ensure more functional stress on the joint and entire limb Once full ROM achieved commence rower Once sufficient quadriceps strength commence functional eccentric quads exercises such as steps downs starting with a 10cm high platform as progresses Treat beyond the knee joint for any deficits, e.g. gluteal control, tight hamstrings, ITB, gastrocs and soleus, etc.
Stage IV 12 Weeks +	Continuation of functional rehabilitation	Progress co-contractions to more dynamic movements, e.g. step lunges, half squats, wall squats Start cycling on normal bicycle Progress resistance on gym equipment such as exercise bike, rower, cross trainer Ensure successful gait restoration or continue instructions as above Pool work can include using

Note: This rehabilitation regime has been adapted with permission from North Sydney Orthopaedic and Sports Medicine Centre, practiced by A/Prof. Leo Pinczewski