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## Gluteal Tendon Surgery Rehabilitation Guidelines

**Table 4** The proposed phases of pre- and post-operative management in patients undergoing hip abductor tendon (HAT) repair, outlining estimated timeframes, specific goals, weight bearing (WB) graduation, hip range of motion (ROM) and exercise prescription

Phase (estimated timeframe)	Phase goals	WB and hip ROM restrictions	Patient education and exercise prescription
Phase 1 (Pre-surgery)	<ol style="list-style-type: none"> <li>1. Patient education on surgical procedure, safe post-operative ambulatory requirements and contraindicated postures/ movements</li> <li>2. Physical preparation of the patient and introduction of early post-operative exercises</li> </ol>	N/A	<ul style="list-style-type: none"> <li>• Upper limb/trunk exercises to assist post-operative bed/chair transfers and crutch ambulation</li> <li>• Education on dietary intake and safe cardiovascular exercise options to encourage weight reduction and a faster surgical recovery</li> <li>• Education on provocative positions (excessive hip flexion, internal rotation and adduction), as well as how these may compromise integrity of the early surgical repair</li> <li>• Exercise prescription individualized for the patient, dictated by pain, symptoms and specific presentation (both for physical preparation though also to ensure the patient is familiar with the early post-operative exercises that will be undertaken)</li> </ul>
Phase 2 (0–2 weeks)	<ol style="list-style-type: none"> <li>1. Reduce post-operative pain and oedema</li> <li>2. Avoid excessive WB (&gt; 20% BW)</li> <li>3. Avoid provocative postures and positions that may adversely stretch/load the repair site</li> <li>4. Maintain lower limb joint mobility, muscle tone and circulation</li> </ol>	<ul style="list-style-type: none"> <li>• WB: ≤20% of BW with 2 forearm crutches</li> <li>• ROM: passive and active-assisted 'comfortable' hip ROM (avoidance of hip flexion &gt; 90°, adduction beyond the midline and internal rotation)</li> </ul>	<ul style="list-style-type: none"> <li>• Educate on strategies to reduce pain/inflammation (including analgesic medication and cryotherapy)</li> <li>• Education and practice in proficient heel-toe PWB ambulation</li> <li>• Reinforce the need to avoid provocative postures and positions that may adversely stretch/load the repair site</li> <li>• Passive and active-assisted hip ROM exercises within a pain-free ROM</li> <li>• Active ankle dorsi- and plantar-flexion exercises</li> <li>• Isometric contraction of the quadriceps, hamstrings, adductor and gluteal musculature</li> <li>• Terminal range knee extension</li> </ul>
Phase 3 (2–4 weeks)	<ol style="list-style-type: none"> <li>1. Pain and oedema well managed</li> <li>2. Proficient heel-toe gait at 50% BW with 1–2 crutches</li> <li>3. Proficiency in undertaking home-exercise program</li> </ol>	<ul style="list-style-type: none"> <li>• WB: ≤20% BW (1–2 weeks) to 50% BW (4 weeks), with 1–2 forearm crutches</li> <li>• ROM: as per Phase 2</li> <li>• Avoidance of resisted hip abduction, extension and internal rotation in flexion</li> </ul>	<ul style="list-style-type: none"> <li>• Continue Phase 2 exercises</li> <li>• Education on quality of gait, particularly with the progression toward a single forearm crutch</li> <li>• Introduce gentle stretching of the hip flexors</li> <li>• Introduce additional home-based exercises, such as: prone knee flexion, multi-plane isometric hip adduction, bilateral supine bridging, resisted knee flexion, heel raises, standing weight shift activities and standing hip extension</li> <li>• Introduce hydrotherapy, including: deep water walking (forwards, backwards, sideways), heel raises, mini squats, straight leg hip flexion and extension, cycling, modified scissor kicks</li> <li>• Remedial massage and tissue mobilisation as required</li> <li>• Please note: graduation in WB and exercise should be based upon the assumed healing of the surgical repair, as well as the individuals' surgical details, pain response and tolerance to load, lower limb strength/function, and other musculoskeletal (i.e. knee, lower back) or health issues</li> </ul>



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Table 4 (continued)

Phase (estimated timeframe)	Phase goals	WB and hip ROM restrictions	Patient education and exercise prescription
Phase 4 (4–8 weeks)	<ol style="list-style-type: none"> <li>1. Pain-free gait and full WB as tolerated from 8 weeks* (1 crutch permitted for protection, stability and/or safety as required)</li> <li>2. Pain-free during low demand daily tasks</li> <li>3. Proficiency in performing Phase 4 home-based exercises</li> <li>4. Near full and comfortable hip ROM (<math>\geq 80\%</math> hip ROM in all planes compared to the contralateral hip)</li> </ol> <p>* full WB and resistance work may be delayed in direct repair situations</p>	<ul style="list-style-type: none"> <li>• WB: 50% BW (4 weeks) to full WB as tolerated from 6 weeks, with 1 forearm crutch as required</li> <li>• ROM: Progress toward full pain-free passive and active hip ROM</li> </ul>	<ul style="list-style-type: none"> <li>• Continue Phase 2 and 3 exercises</li> <li>• Education on improving quality of gait as required</li> <li>• Increase demand of home-based exercises, including: isometric and isotonic external hip rotation (using theraband), prone hip extension, supine hip flexion, bilateral supine bridging (with isometric abduction using theraband) and standing hip abduction and extension</li> <li>• Introduce WB functional exercises/activities as tolerated, including: bilateral wall and free-standing squats (with assistance if required), step exercises, single leg stance balance and weight shift activities</li> <li>• Introduce stationary cycling (week 4–6) and gentle freestyle swimming for hip ROM and/or fitness</li> <li>• Hydrotherapy: continue Phase 3 exercises, plus shallow water walking (waist depth), straight leg hip abduction and circumduction, deep squats, step ups/downs, lunges, single leg balance and proprioception exercises</li> </ul>
Phase 5 (8–12 weeks)	<ol style="list-style-type: none"> <li>1. Pain-free and full active hip ROM (<math>\geq 90\%</math> hip ROM in all planes compared to contralateral hip)</li> <li>2. Pain-free six-minute walk test without the use of walking aids (gait speed patient dependent)</li> <li>3. Ability to single leg stand for 15–30 s, with VAS <math>\leq 3/10</math></li> <li>4. Proficiency in performing home- and clinic-based exercises for the independent continuation of post-discharge rehabilitation</li> </ol>	<ul style="list-style-type: none"> <li>• WB: full WB as tolerated, with a crutch/cane for stability as required</li> <li>• ROM: as per Phase 4</li> </ul>	<ul style="list-style-type: none"> <li>• Continue Phase 3 and 4 exercises</li> <li>• Further education on quality of gait and undertaking functional activities (i.e. stairs, rising from sitting, etc.) as required</li> <li>• Increase demand of home-based WB and non-WB exercises, including: trunk flexion and core stability activities, quadruped 4-point kneel) exercises with hip extension, standing resisted (theraband) hip extension and abduction, side-lying hip abduction and variation in single leg stance (with proprioceptive focus), varied step and lunge-orientated exercises</li> <li>• Continue Phase 3 and 4 hydrotherapy exercises</li> </ul>
Phase 6 (3–6 months)	<ol style="list-style-type: none"> <li>1. Normal, pain-free unaided gait</li> <li>2. Hip abductor strength <math>\geq 90\%</math> using MMT and/or HHD, compared with contralateral limb</li> <li>3. Comfort in ambulating stairs (ascent and descent) and gradients</li> <li>4. Ability to single leg stand for 15–30 s, with VAS <math>\leq 1-2/10</math></li> <li>5. Return to work (dependent on occupational demands)</li> <li>6. Proficiency in performing all full WB strengthening, functional and proprioception activities</li> </ol>	<ul style="list-style-type: none"> <li>• WB: full WB, no crutches</li> <li>• ROM: full and pain-free active hip ROM</li> </ul>	<ul style="list-style-type: none"> <li>• Continue Phase 4 and 5 exercises</li> <li>• Education and exercises pertinent to the training of daily activities for the individual patient is required</li> <li>• End range stretching and soft tissue therapy of surrounding hip musculature, including (though not limited to): gluteus medius, minimus, hip flexors, iliotibial band and tensor fascia lata</li> <li>• Increase demand of home-based exercises, including: single limb supine bridge exercise, side and prone bridging, pelvic hitching, lateral band side steps (crab walks) and other varied WB activities</li> <li>• Outdoor road cycling is permitted, and rowing ergometry and elliptical trainers can be introduced</li> <li>• Phase 3 and 4 hydrotherapy exercises can be ceased upon initiation of a more functional land-based program</li> <li>• Continuation of Phase 4–6 strengthening and functional WB exercises as required, with a focus on exercise technique and appropriate lower limb alignment</li> <li>• Exercises employed should begin to replicate what is required for the patient's individual activity goals, which may include sport-specific activities</li> <li>• Ongoing education may be required in undertaking specific work, recreational and/or sporting activities, with particular reference to optimal ergonomic and/or technique modification to avoid provocative positions and/or movements that could be implicated in a recurrence of symptoms</li> </ul>
Phase 7 (6–24 months)	<ol style="list-style-type: none"> <li>1. Ability to tolerate pain-free walking distances of any length/duration</li> <li>2. Hip abductor strength <math>\geq 95\%</math> using MMT and/or HHD, compared with contralateral limb</li> <li>3. Ability to perform all activities of daily living pain-free</li> <li>4. Ability to effectively negotiate uneven terrain and soft sand</li> <li>5. Return to pre-operative low-impact recreational activities and/or sport as required</li> </ol>	<ul style="list-style-type: none"> <li>• WB: full WB, no crutches</li> <li>• ROM: full and pain-free active hip ROM</li> </ul>	<ul style="list-style-type: none"> <li>• Exercises employed should begin to replicate what is required for the patient's individual activity goals, which may include sport-specific activities</li> <li>• Ongoing education may be required in undertaking specific work, recreational and/or sporting activities, with particular reference to optimal ergonomic and/or technique modification to avoid provocative positions and/or movements that could be implicated in a recurrence of symptoms</li> </ul>

Note, the proposed WB time frame, activity/movement restrictions and exercise progression may vary with the type of surgery, specific surgeon preferences and the patient's physical condition and tendon status. For example, a direct HAT repair may require longer WB and resistance training restrictions than an augmented HAT repair

ROM range of motion, WB weight bearing, PWB partial weight bearing, BW body weight, VAS Visual Analogue Pain Scale, MMT Manual Muscle Testing, HHD Hand Held Dynamometry



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