Rehabilitation Protocol for Core Muscle Repair

This protocol is intended to guide clinicians through the post-operative course for a Core Muscle Repair. This protocol is time based (dependent on tissue healing) as well as criterion based. Specific intervention should be based on the needs of the individual and should consider exam findings and clinical decision making. The timeframes for expected outcomes contained within this guideline may vary based on surgeon's preference, additional procedures performed, and/or complications. If a clinician requires assistance in the progression of a post-operative patient, they should consult with the referring surgeon.

The interventions included within this protocol are not intended to be an inclusive list of exercises. Therapeutic interventions should be included and modified based on the progress of the patient and under the discretion of the clinician.

Considerations for the Post-operative Core Muscle Repair
Many different factors influence the post-operative Core Muscle Repair rehabilitation outcomes, including complexity of surgery and structures repaired, chronicity of injury prior to surgery and pre-operative condition of the patient. It is recommended that clinicians collaborate closely with the referring physician regarding the above.

PHASE I: IMMEDIATE POST-OP (0-1 WEEKS AFTER SURGERY)

Rehabilitation Goals	• Pain control • Reduce swelling • Improve muscle length of pelvic girdle musculature • Improve Lumbar and hip range of motion (ROM)
Precautions	• Avoid lifting or other activities that increase intra-abdominal pressure (Valsalva)
Interventions	*Manual Therapy* • Peri incisional mobilization • Soft tissue mobilization (STM) along the adductor muscle group and associated pelvic musculature as needed • Passive range of motion (PROM) of the hip • Grade I-II lumbar and hip joint mobilizations as needed *Stretching* • Lumbar: trunk rotations • Adductor: figure 4 • Hip flexor: Thomas • Hip rotator: cross body • Hamstring: supine *Therapeutic Exercise* • Gluteal and quad sets • Ankle pumps *Cardiovascular:* • Walking (15 min, 2x/day at an easy pace) • Upper body ergometer (UBE)

Criteria to Progress	• 2 weeks post op • Minimal pain with activities of daily living (ADLs) and gait

PHASE II: INTERMEDIATE POST-OP (2-3 WEEKS AFTER SURGERY)

Rehabilitation Goals	• Pain control • Reduce swelling • Introduce core strengthening progressions • Introduce proprioceptive progressions • Normalize muscle length of pelvic girdle musculature • Normalize lumbar and hip PROM
Precautions	• Avoid lifting or other activities that increase intra-abdominal pressure (Valsalva)
Additional Interventions **Continue with Phase I interventions as appropriate*	*Manual Therapy* • Peri incisional mobilization • STM along the adductor muscle group and associated pelvic musculature as needed • PROM of the hip as needed • Grade III-IV lumbar and hip joint mobilizations as needed *Stretching* • Gentle stretching: Continue from previous phase or until ROM in normalized *Therapeutic Exercise* • Isometrics of the adductors: ball squeeze hip extended and hook lying • Transverse Abdominus (TrA) progressions • Quadruped Progressions • Bridge progressions • Side lying hip abduction • Straight leg raises (SLR) • Prone hip extension • Proprioception: Single leg balance progressions • Functional: squat, step up *Cardiovascular:* • Walking 30 minutes at moderate pace 1x/wk • Bike • Aquatic Treadmill (if available)
Criteria to Progress	• Full lumbar and hip ROM • Full adductor muscle length • Normal and pain-free gait • Pain-free ADLs • Pain-free therapeutic exercises

PHASE III: LATE POST-OP (4-5 WEEKS AFTER SURGERY)

Rehabilitation Goals	• Able to maintain good pelvic stabilization during core exercise program • Initiate Progressive resistive exercises (PRE)
Additional Interventions **Continue with Phase I-II Interventions as appropriate*	*Stretching* • Continue as needed *Therapeutic Exercise* • Core: Continue above progressions, plank progressions • Concentric hip strengthening with PRE: 4 way standing • Concentric Rectus Abdominus (RA): straight and oblique crunch and full • Functional: Squat, Stepdown, Forward lunge, RDL with PRE • Proprioceptive: continue above progressions with airex *Cardiovascular:* • Elliptical
Criteria to Progress	• Pain-free exercises • 6 weeks post-operative

PHASE IV: TRANSITIONAL (6-8 WEEKS AFTER SURGERY)

Rehabilitation Goals	• Normalize strength • Initiate eccentric strengthening
Additional Interventions **Continue with Phase I-III interventions*	*Stretching* • Continue as needed *Therapeutic Exercise* • Concentric RA: Full sit up straight and oblique • Eccentric Adductor: Copenhagen adduction progressions • Functional: Lateral lunge, slide board, adductor slides with PRE • Proprioceptive: Continue above progressions with BOSU *Cardiovascular:* • Return to jogging program
Criteria to Progress	• Pain-free jogging • Pain-free exercises • Hip index (flexion, abduction, adduction, extension) <20%

PHASE V: EARLY RETURN TO SPORT (9-12 WEEKS AFTER SURGERY)

Rehabilitation Goals	• Normalize strength • Initiate plyometric program • Initiate sprinting program • Initiate agility program
Additional Interventions **Continue with Phase II-IV interventions as appropriate*	*Therapeutic Exercise* • Functional: Continue with PRE as previously defined • Medicine ball routine: chest pass, side to side pass, Overhead pass • Plyometric protocol • Agility protocol • Return to sprinting protocol

Criteria to Progress	• Clearance from MD and ALL milestones met
	• Completion of plyometric, sprinting and agility program
	• Functional Assessment:
	  ○ Hip index (flexion, abduction, adduction, extension) ≥90%; HHD mean or isokinetic testing @ 60d/s
	  ○ Adductor/Abductor ratio >80% using HHD (values for isokinetic have not yet been determined for return to sport criteria)
	  ○ Hop Testing ≥90% compared to contra lateral side, demonstrating good landing mechanics
	• HAGOS questionnaire >90%

PHASE VI: UNRESTRICTED RETURN TO SPORT (3 MONTHS AFTER SURGERY)

Rehabilitation Goals	• Return to practice
Additional Interventions **Continue with Phase II-V interventions*	• Return to practice/scrimmage • Multi-plane sport specific plyometrics program • Multi-plane sport specific agility program • Include hard cutting and pivoting depending on the individuals' goals • Non-contact practice→ Full practice→ Full play
Criteria to Progress	• Last stage, no additional criteria

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Contact	Please email MGHSportsPhysicalTherapy@partners.org with questions specific to this protocol

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