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Panorama Hip Preservation Center

Rehabilitation and Physical Therapy Protocol

Combined Hip Arthroscopy and Ganz Osteotomy

Daniel B. Haber, MD

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Dear Therapist,

Thank you for caring for our patient following their combined hip arthroscopy and open peri-acetabular osteotomy (PAO; aka Ganz ostetotomy). This surgery is designed to correct severe acetabular dysplasia with associated intra-articular pathologies. This extensive procedure requires an inpatient hospital stay of several days, and patients will progress at a much slower rate in therapy compared to isolated hip arthroscopy procedures.

Our goal is support you in this process and to provide *guidelines* for progression of rehabilitation. This protocol is meant to provide the basic exercises and techniques you will need to guide your patient to their return to normal function. At their 6-8 week follow up and if appropriate, Drs. Haber and Hugate will assess the patient and determine whether they are ready to return to advanced functional training /sports specific rehab under your guidance.

- Progression through each phase is based on clinical criteria/goal achievement versus time lines. Please allow patient progress to dictate the rehab, **not solely rehab timelines!**
    - Please tailor this program to each individual based on their ability to progress and respond to treatment.

- Please monitor for any signs/symptoms of pelvic floor dysfunction or hip flexor tendinitis throughout this protocol.

- Primary goals at **10 weeks post-op** are normalized gait and good gluteal recruitment.
    - We expect ROM restrictions at this time!
    - Do not push through pain to achieve greater range, these specific motions will improve naturally with a return to functional activity and not with overly aggressive stretching!

- *We have provided suggested patient handouts for weight bearing progression, partner assisted PROM, and a basic pool program in the appendix section of this protocol.*
    - *This also includes therapeutic exercises and potential hip self-mobilizations if appropriate for your patient.*

Sincerely,

Daniel B. Haber, MD

Panorama Orthopedics
Hip Arthroscopy & Sports Medicine

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Combined Hip Arthroscopy + Ganz Osteotomy

General PT Protocol Guidelines

This protocol is for the treating therapist and DOES NOT substitute as a home exercise program for patients. Please always use clinical decision making/patient response vs strict timelines

- POC for patient to be seen 1-3x/week for 12-16 weeks
- Appropriate protocol progression calls for a hands on approach to care and manual therapy techniques to prevent/minimize post-operative scarring or tightness
    - It is essential to restore normal joint mobility as appropriate per protocol precautions
    - Please keep previous dysplasia and Beighton scale scores in mind.
- Return to full activities/sport is generally achieved between 5-6 months postoperatively, but may take up to 1 year for some patients

Initial Precautions

Weight Bearing

- Patients will remain FFWB for 6 weeks as bony healing takes place. This is followed by weaning from crutches, which may take an additional 2 weeks. Think low, slow impact!
- Pool programs are an essential part of rehab when incisions are closed and well healed!

Range of Motion Restrictions (first 2 weeks)

- Flexion to 90°
- Extension to 0°
- No external rotation at this time!
- Abduction to 20°
- **After 14 days range of motion may progress as tolerated**

Please emphasize partner assisted ROM as an essential part of early post-operative rehab; see patient videos available on our website or patient handouts available in the Appendix section

Other Comments/Restrictions

- Avoid hip flexor irritation in early phases due to interaction with the capsule/surgical repair.
    - The hip has been re-oriented in surgery, this will cause natural increase in feelings of anterior tightness!
    - **Patients will be most comfortable lying supine with bolstered knees during the first week. Please progress to lying flat as tolerated.**
- Hip brace
    - To be used for 6 weeks set to 0-90° flexion at neutral rotation and abduction/adduction
- CPM
    - To be used at least 2-4 hours daily for first 4-6 weeks

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Phase 1- Protection and Basic Motor Control Phase (Post op weeks 1-8)

Precautions

- **No stretching of the anterior capsule! It is imperative that this heals appropriately. For that reason we limit both hip extension and hip external rotation during phase 1.**
    - **No hip flexor stretching, no prone press ups. Prone lying will be our primary anterior stretch in this phase.**
- Avoid anterior aggravation/hip flexor irritation.
- Avoid anterior capsular pain or pinching with ROM
- Manage scarring around portal sites and at the anterior/lateral hip
- Do not push through pain with exercise or passive range of motion.

Goals

- Educate patient on post op precautions including joint protection and WB status
- Reduce pain and swelling
- Begin passive range of motion and partner assisted PROM.
- Initial muscle activation and appropriate motor control/proprioception around the hip and pelvis
- Initiate return to weight bearing/crutch weaning

Pain and Swelling Control

- PRICE: 5x/day for 20 minute sessions
    - You may begin this process in supine in early phases, but it is encouraged to complete in prone positions to allow for mild stretching of the hip flexors
- Ankle pumps- for swelling and DVT prevention: 25 reps/hour
- Modalities as indicated; specifically vasopneumatics and electrical stimulation

Manual Therapy/ Range of motion

- STM: light retrograde massage beginning distally
    - Progress to light distal release of vastus lateralis, rectus femoris at visit 2-3
- Scar massage x 5 minutes
    - Incision portals – begin post op day 2 – week 3
- PROM: 15-20 minutes/session
    - Flexion 0-90° x2 weeks, progressing as tolerated in weeks 3-4
    - Circumduction at 10° flexion
    - Abduction 0-20° x2 weeks, then progress to 45°
    - IR to 20°, can be bolstered or completed as a logroll
    - ER (therapist only) after 2 weeks in a 20° arc completed in 90° flexion
- Partner assisted ROM, 2 sets of 15 minutes daily, completed for 5-6 weeks post op (See appendix for patient handouts)
    - Circumduction
    - Abduction
    - Flexion

    - Internal rotation
- Prone quad stretch as tolerated after visit 2-3, provided patient can lie prone comfortably
- Joint mobilization
    - 3-12 weeks post op
        - Week 3: grade 1-2 long axis oscillations
        - Week 5-6: begin a gr II-III caudal glide during flexion mobilization
        - Week 6 : begin grade II-III posterior/inferior glides to decrease capsular tightness
            - Include belted mobilizations in supine or side lying as needed
        - Week 6+: if necessary begin posterior to anterior hip mobilizations to improve hip extension
            - **DO NOT begin mobilizations that stress the anterior capsule of the hip prior to this point**
        - Weeks 8: focus on the inclusion of mobilizations to increase FABER mobility
            - Including prone and supine PA mobs of the hip
    - Lumbar, SIJ mobilizations may begin at weeks 6-8
- Dry needling
    - Dry needling may begin at week 6 post operatively, as long as your patient is appropriate for dry needling and your state practice act allows you to perform this treatment.
        - Week 6: TFL, rectus femoris, glutes
        - Week 7: deep rotators, adductors
        - Week 7-8 as indicated: psoas, iliacus
    - Dry needling *should not* be the only manual therapy that your patient receives. It is a good complement to your care but please address joint mobility issues as well!

<u>Gait/Weight Bearing Progression</u>

- **Pool program for water walking should be used as an adjunct to patient care at this point**
    - See Appendix for basic pool program
- **See WB progression patient handout in the Appendix section**
    - Foot flat weight bearing (FFWB) and bilateral crutches x6 weeks to keep excessive load off of the hip and protect healing structures.
    - Weaning from crutches. May take up to 2 weeks to completely wean!
        - Begin with standing weight shifts to assess patient tolerance
        - POD 42-48
            - Single crutch on opposite side at home
            - Bilateral crutches with WBAT in public
        - POD 49-52
            - No crutches at home
            - 1 crutch on opposite side in public
        - POD 53-56+
            - Off crutches entirely
        - **Please do not wean completely from crutches unless the patient can ambulate without a significant limp! Do not hesitate to remain at a lower level if patients have an increase in painful symptoms!**

<u>Strength and Motor Control</u> (See appendix for pictures or email with questions)

Weeks 0-3

- Gluteal, quadriceps, TrA isos
- Supine or hooklying diaphragmatic breathing, 3 sets of 15 breaths daily
    - Especially important in patients post Ganz osteotomy for pelvic floor and adductor relaxation!
- Bike for ROM, no resistance. Beginning on visit 2, 5-15 minutes per session
- Prone 10% max voluntary isometric contraction (MVIC) manual isos, increasing to 25% MVIC if patient achieves appropriate activation. In this population begin with pillows under hips for comfort
    - IR/ER isometric in 10° abduction
    - Abduction/adduction
    - Hamstring
- Week 2-3: begin quad set or SAQ bolstered NMES for quad control. These patients often complain of weakness and patellofemoral pain as they achieve increased weight bearing.

- Blood Flow Restriction Training (BFR)
    - BFR may begin on non-operative limb on visit 1 post op with a trained practitioner
    - May begin on operative limb per BFR parameters with a trained practitioner when incisions are fully healed
    - Please contact us with any questions about suggested exercises, or for specific literature regarding the benefits of BFR

Weeks 3-6+

- Glute progression
    - Double leg bridges with increasing range
        - Increase to abduction or adduction biased bridges in weeks 4-5
    - Prone glut progression
        - Glute isometric with pillow under hips (in hip flexion bias to protect anterior hip)
        - Prone iso with knee extension for reciprocal walking
        - Low quadruped donkey kicks on operative side
        - Alternating donkey kicks
    - **NO clams x8 weeks**. These patients will over recruit TFL due to new pelvic orientation
    - Bird dogs
    - Progress to bird dog row in week 6 with higher level patients
    - Standing hip abduction/extension, standing on non-operative limb only
        - May require trunk flexion, UE support for comfort
- Rhythmic Stabilization
    - Week 3-4: Prone glute progression and rhythmic stabilization
        - cont with pillows under hips for patient comfort as needed
    - Week 5+ quadruped gluteal rhythmic stabilization gluteal and deep rotator focus

  - Week 6: Tall kneeling rhythmic stabilization
  - Week 5-6, begin light hip flexor activation when appropriate. Not appropriate if patient has a history of hip flexor tendinitis prior to surgery, or if the patient is currently presenting with symptoms consistent with internal snapping hip or hip flexor tendinitis!
    - Begin supine, gravity eliminated hip flexor rollouts
    - Supine 1" marching
    - Seated 1" marching (week 6-7)
- Quadruped self-mobility, beginning week 5-6
  - Rocking
  - Cat/cow
- Cardiovascular training
  - Weeks 6+ Bike light resistance 5-20 minutes per session
  - Week 8+: experienced swimmers may return to swimming with LE buoy and no flip turns!

Criteria for Advancement to Phase 2

- Range of motion
  - Flexion to 100°
  - Extension within 5° of contralateral side
  - 25-50% FABER motion compared to non-operative side
  - 50% FADIR motion compared to non-operative side
- No hip flexor contractures, if this occurs remain in Phase 1
- Mild deviations in gait with mild discomfort only
  - The most common compensation is due to decreased hip extension and a subsequent increase in pelvic rotation/lumbar extension.
  - Many of these patients will have increased, necessary anterior acetabular coverage post op, and may have mild continued deviations in hip extension, ER

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Phase 2- Advanced Motor Control and Strength Phase (Post op weeks 8-16)

Precautions

- Continue to avoid soft tissue irritation and flare ups that could delay progression
- Strength and motor control should increase simultaneously with increased activity to prevent compensation due to fatigue.
- Appropriate self-mobility should also increase with activity level
- Do not push through pain

Goals

- Full, pain free AROM and PROM
- Normalized gait pattern- the most common compensation is due to decreased hip extension and a subsequent increase in pelvic rotation/lumbar extension.

Pain/Swelling Control

- Continue PRICE if there is residual swelling
- Modalities as indicated

Manual Therapy

One of the main goals of this phase is to achieve appropriate range of motion. It is essential that your patients continue to receive manual therapy during this time!

Strength, Flexibility, and Motor Control Training: See Appendix for pictures or email with questions

Weeks 8-12

- Strength
  - quadriceps
    - Wall ball squats or TRX supported squats above 60-70° hip flexion
    - Step ups
  - Gluteal progression
    - Continue bridge variations; abd/add isometrics, SL etc
    - Prone edge of table hip extension
    - Hip thrusts edge of bench in small range
    - Clams, reverse clams
    - Double leg hip hinge with fitball or TRX support
- Motor Control
  - Continued prone, quadruped, or tall kneeling rhythmic stabilization (RS)
    - Prone RS IR/ER with CLX band
    - Quadruped CLX band RS
  - Continued light hip flexor progress as tolerated and indicated
    - Deadbugs (Week 8-10 plus)
- Flexibility
  - Kneeling hip flexor stretch weeks 8-10 (no forward lunge, focus on posterior pelvic tilt)

- Hamstring stretch week 6+
- Light standing hip flexor/quad stretching weeks 6-8
- Foam rolling of quadriceps, ITB, gluteals weeks 6-8
- Supported butterfly slides, BKFO for improved FABER mobility weeks 8+. Must be pain free
- Prone self IR/ER in a pain free arc weeks 8-10

Weeks 12-14

- Strength
  - Quads
    - Leg press: double to single leg progressions as tolerated
    - TRX or supported DL squatting
    - Forward to lateral step up progression
    - ½ depth split squats to tolerance
  - Glutes
    - Begin backwards only monster walks
    - Continue bridge variations/thrusters as indicated
    - Continue clams and reverse clams as indicated
    - SL supported RDL/diver
      - Option to perform a kickstand RDL
      - Progress to banded or weighted as tolerated
  - hamstrings
    - Hamstring curls variations as indicated/tolerated
- Motor Control
  - Week 10: Begin kneeling front planks
    - Progress to full front plank after 1 session if there is no anterior hip/hip flexor compensation
  - Week 11-12: add kneeling side plank and progress as above
  - Week 12+: begin adductor walkouts if pain free in patients without a history of osteitis pubis
  - Continue with rhythmic stabilization training
  - Continue dead bugs with increasing range,
    - initiate low standing march for light hip flexor activation if indicated
    - begin banded dead bugs
- Flexibility
  - Foam rolling of quadriceps, ITB, gluteals
  - Supported butterfly slides, BKFO for improved FABER mobility. Must be pain free
  - Prone self IR/ER in a pain free arc
- Cardiovascular training
  - Week 12: begin elliptical trainer, starting with 10 minute session and progress 5 min/week
  - Week 14: begin combination program: alternate stationary bike/elliptical for 20 minutes

Weeks 14-16

- Strength
  - Quads
    - Step up progression: include curtsy and lateral
    - Lunge progressions
    - Single leg knee bend> pistol squat
  - Glutes
    - Lateral band walks/x-walks
    - Standing fire hydrants
    - Prone FABER liftoffs

- Motor Control
  - Core training
    - Continue plank progression
  - Proprioception
    - Single plane divers> progressing to single leg airplanes
    - Rotational RDL
  - Marching progression: low march and stick, increasing marching height per tolerance
- Flexibility
  - Continued stretching and self-mobilization as indicated
  - Adductor foam rolling
  - May begin banded self-mobilizations as indicated (See appendix)
    - Keep in mind Beighton Scale scores

<u>Criteria for Advancement to Phase 3</u>

- Full AROM and PROM without pain
  - This includes full FABER and FADIR compared to non-operative side
- Able to ascend/descent stairs and walk 1 mile on level surface without pain or compensation
- At least 1 minute of double knee bends without compensation
- Single leg knee bends/pistol squats to 70° flexion without compensation

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Phase 3: Advanced Strengthening

(Weeks 16 through-Successful Sport Test Completion)

Patients who do not participate in higher-level activities may not need to advance to phase 3. Activities that require advanced strengthening/completion of this phase include: running, cutting, rotational, or bounding sports. This will include: skiing, snowboarding, golf, basketball, racquet sports, soccer, football, hockey, dance, and gymnastics. Please contact our team with any specific patient questions or return to sport guidelines.

Goals

- Restore multi-directional strength without compensation
- Restore ability to absorb impact on operative limb
- Initiate plyometric strength
- Pass sports test for return to formal running/impact protocol

Manual Therapy

- Continue as indicated based on your patient's presentation

Strength and Motor Control

Weeks 16-20

- Quads:
  - Continue with lunge and pistol squat progressions, adding progressive resistance and dynamic stability challenges
  - Add rear foot elevated/Bulgarian split squats
- Glutes
  - Continue to build strength and load, continuing to add progressive resistance and dynamic stability
- Motor Control/Core
  - Initiate rotational core demands with chops/kicks etc.
  - When patient passes sports test they may initiate rotational power, specifically important in throwing/kicking athletes
- Continue cardiovascular progression, plan to begin running at 5-6 months post operatively depending on your patient's activity level

Plyometric training

Weeks 20-24

- May begin light, double leg shuttle jumping at week 10 in bounding athletes

Criteria to advancement to Phase 4

- Pass sports test

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Phase 4- Return to Sport (successful completion of Sports test—24 weeks)

Goals prior to a Return to Sport

- Progress the patient back to a full participation in their chosen sports
- Pass Functional Sports Test
- **See Appendix for Functional Sports test directions, to be used upon completion of strength and agility training**

Manual Therapy

- Continue with appropriate manual therapy to achieve full lumbopelvic ROM

Strength and Agility

- These are suggested outlines of strength, agility, and plyometric testing to allow patients to return to their chosen sports over 8-10 sessions or 6 weeks.
    - These are suggestions and must be tailored to your specific athletes
    - **The same rules apply as with all other areas of our protocol, this progression back to sport must be pain free, return to standard physical therapy as needed**
- We complete assessment/testing with DARI screening tools, but we understand this is not available in all clinics. We trust that in that case the treating therapist will assess any remaining deficits in strength, power, or agility. These progressions may be completed by the treating therapist or by an assigned strength/performance coach or ATC.

- With questions and concerns, please contact Corey Townsend, our PROformance Navigator at ctownsend@panoramaortho.com or via phone at (720) 410-8855.
- You may also email Lara Baum at ltbaum@panoramaortho.com or Ayla Olk-Szost PT, DPT at aolkszost@panoramaorthro.com for more specific progressions.

Linear Athletes: running/cycling

Sessions 1-4: Initial treatment session/assessment

Addressing movement deficits, educate patient on long term self-mobilization

Dynamic movement warm-up and muscle activation

Single leg strength and eccentrics: please include hip flexor strength as needed

Development of mileage and incline (if applicable) progression program

Sessions 4-8: Dynamic Drills and Agility training; i.e. triple extension

Introduction to jumping/plyometric power

Progression of strength per patient deficits

Continuation of mileage and incline (if applicable) progression program

Initiate sprinting progression if applicable to patient

Sessions 8-10: Re-test movement

Continued focus on strength and plyometric power

Finalizing long term strength program

Finalize long-term mileage and incline (if applicable) progression program

Rotational Athletes: golf, hockey, throwing athletes

Sessions 1-4: Initial treatment session

Addressing movement deficits, educate on long term self-mobilization

Dynamic movement warm-up and muscle activation

Rotational core and hip strength: deceleration and eccentric control

Single leg focus strength training

Introduction to agility training

Development of return to sport progression

Sessions 4-8: Dynamic balance and drills: i.e. hip loading, weight shifting, dissociation drills

Progression of agility training

Introduction to sport specific power training and jumping

Progression of strength

If applicable, initiate throwing progression and light batting progression

If applicable, initiate putting/chipping with golf, progressing to longer/powerful hitting

Sessions 8-10: Re-test movement and dynamic balance

High level, sport specific agility and plyometric training: including rotational power

Finalize long term strength program

Finalize return to sport progression with athlete, associated coaching staff

Kicking Athletes: Soccer, dance, gymnastics

Sessions 1-4: Initial treatment session

Address movement deficits, educate patient on long term self-mobilization

Dynamic movement warm-up and muscle activation

Rotational core: deceleration and eccentric control

Single leg focus strength training

Introduction to agility training

Development of return to sport progression

Sessions 4-8: Drills and dynamic balance: i.e. hip loading, weight shifting, dissociation drills

Kicking training: deceleration and eccentric control; focus on hip flexors and adductors

Progression of agility training

Introduction to sport specific power training and jumping: include rotational power

Progression of strength

Sessions 8-10: Re-test movement and dynamic balance

Kicking training: concentric and power based kicking

High level, sport specific agility and plyometric training

Finalize long term strength program

Finalize return to sport progression: consider that with gymnastics and dance this will require a higher level of impact, jump training than for a soccer player. All three of these athlete subcategories require repetitive kicking that must be pain free!

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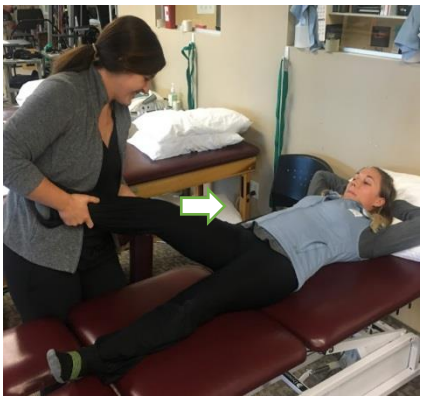
Partner Assisted Passive Range of Motion (PROM)

- PROM is an essential part of your post-operative protocol, and we suggest including this in your rehab for the first 5-6 weeks after surgery
    - It is important that your hip continues to move as normally as possible, in order to meet protocol guidelines for advancement
- This includes 4 directions of range of motion as listed below
- **Please complete 2 sessions daily, 5 minutes in each direction**
- In each range of motion, avoid fallout at the knee. Keep the kneecap pointing straight up towards the ceiling!

Flexion

This is best completed on the edge of a table or high surface. Stand beside the patient and make sure they are well supported. While supporting your patient's leg, move until the knee is directly in front of the hip, or a right angle/90°. If the patient notes the onset of anterior pain, do not move quite so high

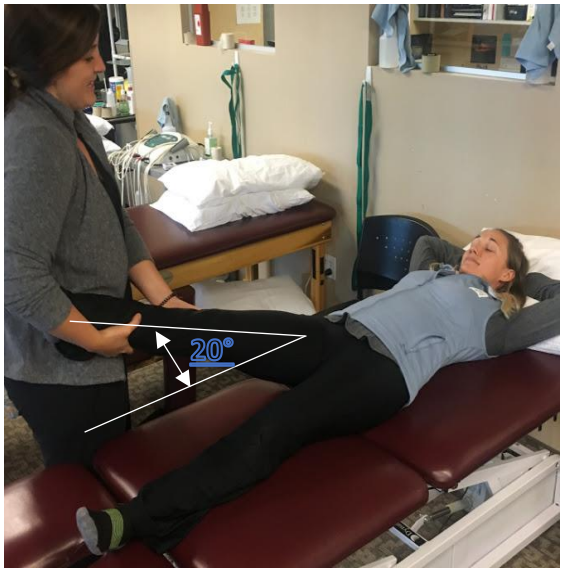


Circumduction

Stand to the side of the patient at the edge of the table, and lift their leg/ankle 10° up off of the table. Make small circles (about the size of large coffee mug) in clockwise and counterclockwise directions.

Abduction

Stand to the side of the patient and lift the patient's leg 10° off of the table. With the patient's ankle secure to your side, shift your weight sideways 20°, and then return to the starting position.



Internal Rotation

There are two options for this range of motion. 1) Stand at the edge of the table and move the toes from straight up (12 o'clock) to 20 degrees of internal rotation (almost 1 o'clock). 2) Place a bolster or foam roller behind the patient's knees, and place hands on the side of their kneecap. Move the kneecap in the same range of motion and return to neutral.

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Hip Labral Repair+ Ganz Osteotomy

Weight Bearing Progression

Initial Weight Bearing Restrictions

- You will be partial weight bearing for 3 weeks using bilateral crutches
- You will use the brace for 6 weeks
- During that time you will be Foot Flat Weight Bearing, meaning that you will place approximately 20 lbs of your weight through your foot during walking!
    - This is very important to prevent hip flexor irritation in early healing phases

Weaning from crutches

- **This make take 2 weeks total!** This handout does not mean that you should wean from crutches without therapist guidance, it is meant to better explain the process. Please keep symptom changes in mind while progressing from crutches, it is not wrong to extend these phases as symptoms require!

Progression for weaning from crutches

- Option 1: Beginning at 3 weeks post op with labral repair
    - Day 1-4
        - Single crutch at home only
        - Two crutches in public or for longer distances
    - Day 5-8
        - No crutches at home only
        - 1 crutch in public or for longer distances
    - Day 9-10
        - Completely wean from crutches
- Option 2: This progression is to be completed with MD or PT approval!
    - Day 1-4
        - WBAT with crutches, focused on appropriate weight bearing mechanics to be reviewed with your PT
    - Day 5-8
        - No crutches at home
        - WBAT with crutches in public
    - Day 9-10
        - Completely wean from crutches
- If you have any onset of hip pain or significant anterior tightness, return to level below current progression
    - Example: if you have pain on day 5 of your progression, return to single crutch at home, 2 in public and follow up with your physical therapist for instruction.

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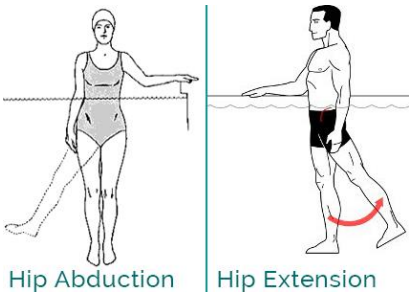
Pool Program

The primary goal of our pool program is to facilitate normalized gait and introduce light strengthening while you are weaning from crutches. You should have no pain during this program, and it can begin as soon as your incisions are closed! Begin this program in chest height water.

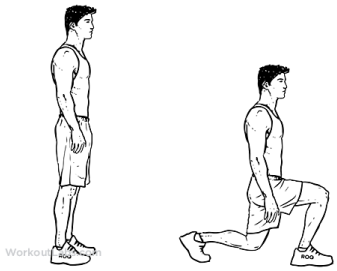
Week 1

1. Forward and backward walking: 5 minutes
2. Side steps: 5 minutes, begin during your second session provided you have no pain
3. Double leg squats; ¼ depth 3x10
4. Hip abduction and extension: 3x10 bilaterally (only moving from the hip, not the back!)
5. Forward and backward walking: 5 minutes



Week 2

1. Forward and backward walking: 5 minutes
2. Side steps: 5 minutes
3. Double leg squats; 1/2 depth 3x10
4. Forward lunges 2x10 bilaterally
5. Forward and backward walking: 5 minutes



Week 3

1. Forward and backward walking: 5 minutes
2. Side steps: 5 minutes
3. Double leg squats: normal depth 3x10
4. Forward lunges 2x10 bilaterally
5. Standing hip external and internal rotation (as cleared by your PT)
6. Forward and backward walking: 5 minutes

For additional questions and progressions please contact your physical therapist!

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Beighton's Scale

Joint	Finding	Points
left little (fifth) finger	passive dorsiflexion beyond 90°	1
	passive dorsiflexion <= 90°	0
right little (fifth) finger	passive dorsiflexion beyond 90°	1
	passive dorsiflexion <= 90°	0
left thumb	passive dorsiflexion to the flexor aspect of the forearm	1
	cannot passively dorsiflex thumb to flexor aspect of the forearm	0
right thumb	passive dorsiflexion to the flexor aspect of the forearm	1
	cannot passively dorsiflex thumb to flexor aspect of the forearm	0
left elbow	hyperextends beyonds 10°	1
	extends <= 10	0
right elbow	hyperextends beyonds 10°	1
	extends <= 10	0
left knee	hyperextends beyonds 10°	1
	extends <= 10	0
right knee	hyperextends beyonds 10°	1
	extends <= 10	0
forward flexion of trunk with knees full extended	palms and hands can rest flat on the floor	1
	palms and hands cannot rest flat on the floor	0

- A Beighton score of 5/9 or greater is considered significant. [6]

- **A patient with a Beighton Scale score that is considered significant will not be appropriate for aggressive joint mobilizations. They will do better with consistent strength and motor control training**

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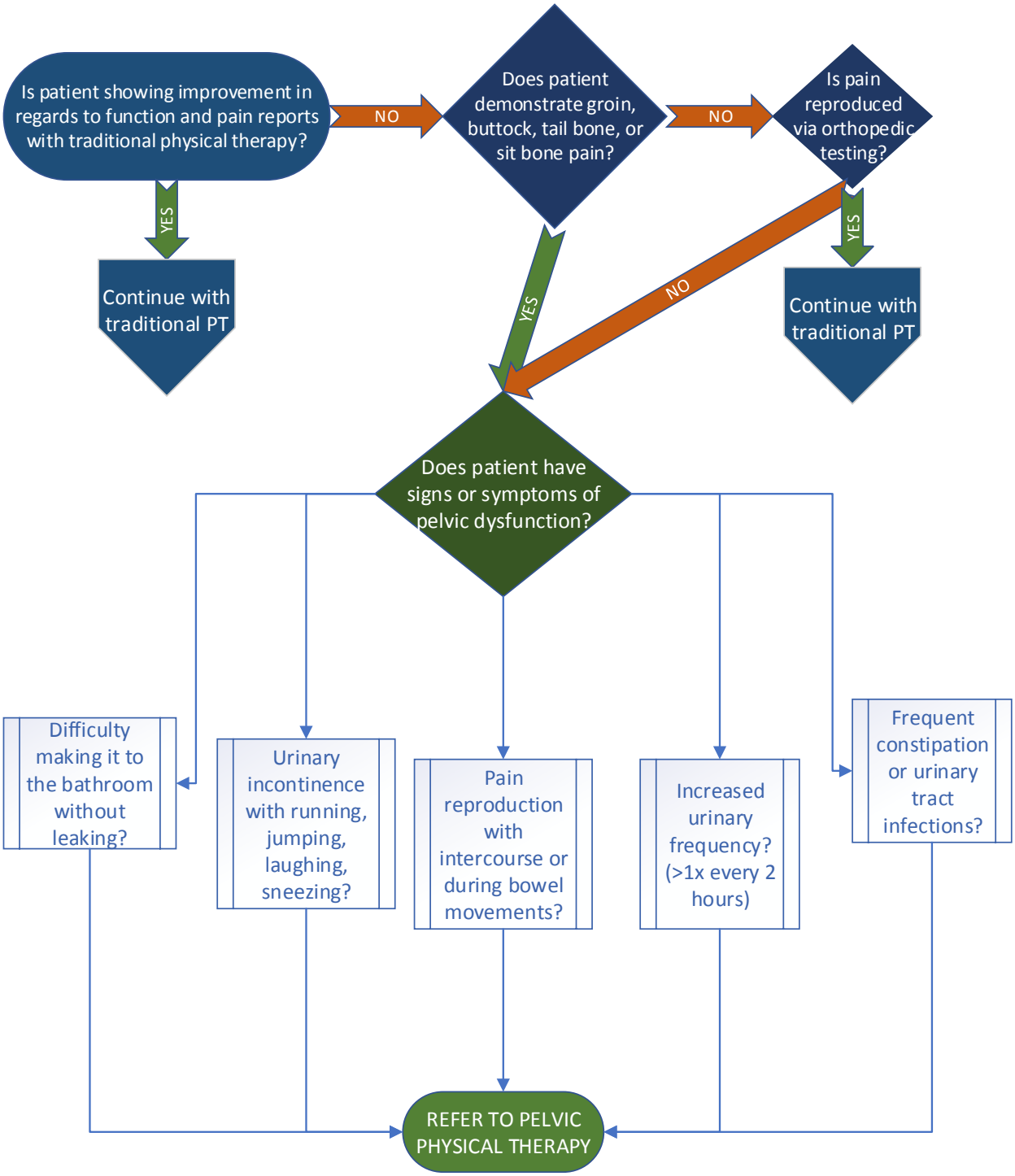
Trouble-shooting: When to refer to Pelvic Physical Therapy



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Exercise Appendix

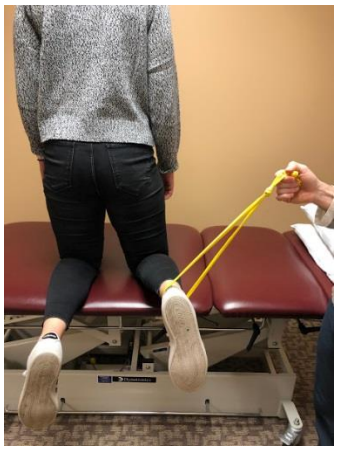
Please note that this is NOT a comprehensive list of all suggested exercises within our rehab protocol. We have included exercise progressions and ideas that may be unique to this protocol to make sure we are all on the same page! We assume that all practitioners are award of the standard exercises and form such as bridges, clams, etc. Again, if you have questions about cuing please reach out to us!

Rhythmic Stabilization Progression

Prone Rhythmic Stabilization (beginning manually vs CLX in week 3-4, both into IR and ER)

Quadruped Rhythmic Stab Progression, (Wk 5+, Both into IR and ER, progressing to hip ext bias)

Tall Kneeling Rhythmic Stabilization (Wk 6, bias into IR/ER, no anterior/groin pain)



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Glute progression exercises

Prone glut isometric, transition to glut iso + TKE for gait (Wk 3+ as tolerated)

Edge of table hip extension for reciprocal inhibition (wk 7-8): begin with pillow under hips to bias hip flexion vs true extension, squeeze glut and lift knee from table to neutral extension. No back activation!

Bird-dog row (unilateral hip extension, alt donkey kicks/fire hydrants not pictured)

Standing hip hinge with support (Wk 8+)

Hip thrusters edge of table (Wk 10+, standard bridge not pictured)

Reverse clams (Wk 9-10, Standard clam not pictured)

Prone FABER liftoffs (Wk 14-16+)

Kickstand RDL (Wk 12-14+), progressing to full or rotational RDL as motor control allows

Standing Fire Hydrants (Wk 14-16)

X-walks (Wk 14-16)

<u>Quad Strength Progression</u>

Not pictured: early step up and lunge progressions. We have only chosen slider progressions here for now. **Slider Reverse lunge** Wk 14-16, **Lateral/Curtsy lunges** wks 16+

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Motor Control and Core Progression

Side Plank variations (Wk 11-12+, not pictured: front plank progressions)

Standard side plank

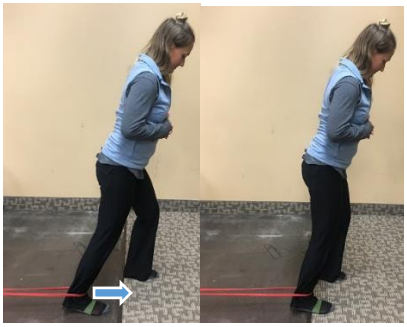
Side plank with a hip tap

Rotational Side plank (Wk 16+)

Hip Flexor rollouts (Week 5-6 in patients without evidence of internal snapping hip, tendinitis ONLY). Progress to supine march, then standing marching for functional progression

Banded Dead Bugs (Week 12-14+ if tolerated)

Hip Flexor Walkouts (Wk 14-16+, NOT appropriate if patient has a history of tendinitis)



Adductor Walkouts (Wk 12+)

Single leg RDL/divers, progressing to single leg airplanes (Wks 12-14+)

Single leg airplanes: rotational control of the SL RDL position prior to loading, sports based power

Rotational RDL (Wks 16+)

Chop and Kick Progression (Wks 12+)

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Self-Mobilizations

We have chosen not to include foam rolling, although this is an important part of the rehab process. We focus instead on other important self-mobilizations for your patients.

Please keep in mind that superband self-mobilizations may not be appropriate for all patients, especially those with high scores on the Beighton Scale (see appendix). These are for your tighter patients!

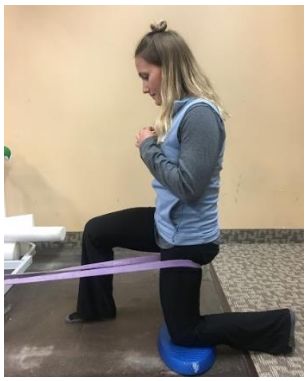
FABER butterfly slides (Wk 8); leg supported on wall or foam roller, relax groin and slide up and down for stretch

Banded self-mob: lateral glide with child's pose (Wk 10-12). Band oriented posterior/laterally

Banded self-mob: caudal glides (Wk 8-10, 2 variations based on patient comfort) Band pulls inferiorly to improve hip flexion comfort

Hip tap self-mob (posterior glide biased self-mob in NEUTRAL hip flexor stretch, Wk 10)

Hip tap self-mob 2 (anterior biased self-mob in NEUTRAL hip flexor stretch, add glut iso to deepen stretch, Wk 9-10 in appropriate patients only)



Squatting with lateral or medial bias (Wk 12+ in appropriate patients).

Pigeon self-mob with lateral bias (Wk 10-12 in appropriate patients) Band pulls at posterior/lateral angle.

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Functional Hip Sports Test

Functional hip sport test		
Exercise	Goal	Points
Single knee bends	3 min	1 point for each 30 s completed
Lateral agility	100s	1 point earned for each 20 s completed
Diagonal agility	100s	1 point earned for each 20 s completed
Forward lunge on box	2 min	1 point earned for each 30 s completed

Wahoff, M, Ryan M. Rehabilitation After Hip Femoroacetabular Impingement Arthroscopy. J Orthop Sports Physical Therapy. 2006 36;503-515.

- Single Knee Bend
  - Performed for 3 minutes at a pace of 1 second down and 1 second up without pelvic obliquity or knee valgus
  - One point for every 30 seconds successfully performed
  - Total of 6 points
- Lateral side-to-side
  - Performed with resistance cord attached to waist on involved side
  - Push off involved side against the resistance of the cord and return onto involved leg with good absorption
    - 30° of knee flexion progressing to 70° in a controlled manner
  - One point for every 20 seconds without compensation for 100 total seconds
  - Total of 5 points if performed correctly without pain
- Diagonal agility
  - Similar to Lateral test but performed at 45° angle forward and backward from frontal plane
  - One point for every 20 seconds without compensation for 100 total seconds
  - Total of 5 points if performed correctly without pain
- Forward box lunge (onto a box set at height of the patient's knee)
  - It is performed for 2 minutes with cord resistance
  - 1 point for every 30 seconds performed without pain or compensation
  - Potential of 4 points

Scoring:

- >17 is passing
- High-level athletes are expected to score 20/20

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Single Knee Bend

Purpose: To test single leg endurance strength and evaluate patellar tracking.

Supplies: Sport Cord (Topper Sports Medicine, black cord)
Goniometer
Stopwatch

Description: The Athlete will perform single knee bends with cord resistance to 60º at a cadence of 1 second up and 1 second down for a goal of 3 minutes. The movement is between 30º-60º of flexion with the knee never fully straightening past 30º throughout the 3 minutes. To cue the athlete the depth of 60º the buttocks can lightly touch the seat of a chair or object. Two fingers are allowed for balance on a chair back.

Setup: 1. With a goniometer, measure a 60º knee bend and place a chair in a position to allow the athlete's buttocks to lightly touch at that depth.
2. The athlete places the heel of the foot on the cord at a position so the D-ring of the handle is aligned with the knee joint line to remove slack from the cord.
3. Tension is set by pulling the cord handle to the waist line and holding. Having the athlete hook their thumb around their pant line is helpful in maintaining tension on the cord.
4. Two fingers of the opposite hand are allowed to lightly touch another chair back for balance

Technique: The athlete must perform each repetition of a single knee bend <u>without</u> the following:

- Trendelenburg sign (pelvis must remain level)
- the knee locking in full extension
- the knee "collapsing" into medial rotation / adduction
- the patella extending past the toe

Cuing should be provided when one of the following compensations are noted. **If unable to correct STOP TEST.**

Scoring: One point is earned for each 30-second increment completed with proper form for a total of 6 possible points.

Testing is stopped if and when:

- Form: once the subject is unable to complete single knee bends without compensation even with cuing.
- Pain: the patient has pain > 3/10 OR reproduces their pain
- Endurance: the athlete fatigues

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Lateral Agility

Description: The athlete will hop laterally with cord resistance from their surgical leg, land momentarily on their non-surgical leg, only to return onto their surgical leg with the cord pulling them back to the starting position for a total test time of 100 seconds. Each repetition of 1 second includes exploding laterally off the surgical side, landing momentarily on the opposite leg, and then returning to the starting position with emphasis on absorbing by bending at the hip and knee with 30 degrees of knee excursion. Excursion is defined as the amount of absorption from knee flexion at landing to max knee flexion.

Setup:
1. Place the belt through the sport cord handles and then attach around the waist.
2. Attach the other end of the sport cord to the door jam or secure post.
3. Stand sideways with the involved leg toward the cord attachment.
4. Step away laterally until tension is reached where the athlete slightly compensates with leaning and place a line with tape on the lateral aspect of the involved foot.
5. Measure the distance from the greater trochanter to the floor.
6. Use this measured distance to place a second tape line parallel to the first.

Technique: The athlete must perform each lateral hop by landing on or inside the first tape line with the <u>involved</u> foot and on or outside the second tape line with the <u>uninvolved</u> foot. Only one foot should be on the ground at the same time and the athlete must absorb onto the involved leg <u>without</u> the following:

- Trendelenburg sign (pelvis must remain level)
- the knee "collapsing" into medial rotation / adduction
- the patella extending past the toe
- losing control or stability

Cuing should be provided when one of the following compensations are noted. **If unable to correct STOP TEST.**

Scoring: One point is earned for each 20 second increment completed with proper form for a total of 5 possible points.

Testing is stopped if and when:

- Form: once the subject is unable to complete single knee bends without compensation even with cuing.
- Pain: the patient has pain > 3/10 OR reproduces their pain
- Endurance: the athlete fatigues

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Diagonal Lateral Agility

Description: The athlete will hop diagonally forward at a 45º angle with cord resistance from their surgical leg, land momentarily on their non-surgical leg, only to return onto their surgical leg with the cord pulling them back to the starting position. The following repetition the athlete will hop diagonally backward at a 45º angle. The goal is 100 seconds total. Each repetition of 1 second includes exploding diagonally forward or backward at 45º angles off the surgical side, landing momentarily on the opposite leg, and then returning to the starting position with emphasis on absorbing by bending at the hip and knee with 30 degrees of knee excursion. Excursion is defined as the amount of absorption from knee flexion at landing to max knee flexion.

Setup:
1. Place the belt through the sport cord handles and then attach around the waist.
2. Attach the other end of the sport cord to the door jam or secure post.
3. Stand sideways with the involved leg toward the cord attachment.
4. Step away laterally until tension is reached where the athlete slightly compensates with leaning and place a line with tape on the lateral aspect of the involved foot.
5. Measure the distance from the greater trochanter to the floor.
6. Use this measured distance to place a second tape line at a 45º angle forward and a third tape line at a 45º backward to form a "V" if connecting the lines.

Technique: The athlete must perform each diagonal lateral hop by landing on or inside the first tape line with the <u>involved</u> foot and on or outside the second or third tape line with the <u>uninvolved</u> foot (Each foot should land parallel with each tape line). Only one foot should be on the ground at the same time and the athlete must absorb onto the involved leg <u>without</u> the following:

- Trendelenburg sign (pelvis must remain level)
- the knee "collapsing" into medial rotation / adduction
- the patella extending past the toe
- losing control or stability

Cuing should be provided when one of the following compensations are noted. **If unable to correct STOP TEST.**

Scoring: One point is earned for each 20-second increment completed with proper form for a total of 5 possible points.

Testing is stopped if and when:

- Form: once the subject is unable to complete single knee bends without compensation even with cuing.
- Pain: the patient has pain > 3/10 OR reproduces their pain
- Endurance: the athlete fatigues

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Forward Box Lunges

Purpose: To test the lower extremity strength and endurance into extension.

Description: The athlete will perform alternating forward lunges onto a box with cord resistance at a cadence of 2 seconds per lunge for a goal of 2 minutes. The movement is a forward lunge with maximum hip extension without compensation at the pelvis or spine throughout the 2 minutes.

Setup:
1. Place the belt through the sport cord handles and then attach around the waist.
2. Attach the other end of the sport cord to the door jam or secure post.
3. Stand facing away from the cord attachment.
4. Step forward until tension is reached where the athlete slightly compensates by leaning and tape a line in front of the feet.
5. Measure the distance from the greater trochanter to the floor.
6. Place a stable box or chair the height of the athlete's knees in front of them at a distance equal to the measure of the greater trochanter to the floor.

Technique: The athlete must perform *alternating* forward lunges onto the box keeping their planted leg behind the line and extending the hip <u>without</u> the following:

- Trendelenburg sign (pelvis must remain level)
- Excessive lumbar hyperextension
- Pelvic rotation

Correct performance of this activity is through proper extension of the hip.

Scoring: One point is earned for each 30-second increment completed with proper form for a total of 4 possible points.

Testing is stopped if and when:

- Form: once the subject is unable to complete single knee bends without compensation even with cuing.
- Pain: the patient has pain > 3/10 OR reproduces their pain
- Endurance: the athlete fatigues