Dr. Ben Petre
Orthopedic Surgery

PATIENT NAME: _____

Hip Arthroscopy

Post-Operative Care

And

Rehabilitation Protocol

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Dr. Petre would like to thank Dr. Marc J Philippon, Sean Garvey, and the staff at Howard Head Sports Medicine in Vail Colorado for the creation of this rehab protocol. It has been updated and modified to accurately reflect the needs of Dr. Petre's patients.

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After Surgery Care and Information

Many questions arise during the first week after surgery. There are many new sensations felt in the body, especially in the operative hip and leg. The following will help answer many of your questions to help relieve normal anxiety.

General Instructions

Take your medications only as prescribed. If they are not working call Dr Petre's team at 410.280.4717 during business hours or the on call physician at 410.268.8862 after hours.

You should try to drink plenty of water after surgery.

Your responsible adult caregiver should stay with you for the first 24 hours after surgery to help you with medications, movement, encourage fluids, activities of daily living, and to help observe you for any possible complications.

Follow your weight bearing and movement restrictions closely.

Elevate your extremity to help reduce swelling.

Use ice to help with pain control and swelling control.

Wear your TED stockings (white compression stockings) for 2 weeks after surgery on both legs if possible

Active calf Pumps: do 10 up and down pumps of your feet every hour while awake.
Foot pump and calf pump rational: Compression of plantar venous plexus causing return of the blood in your lower legs to your heart.

****Please use the incentive spirometer or 10 deep breaths every one hour while awake. Continue for first week post-op.**

****When lying on back (supine) in bed during days 1-3 post-op, please place 3 pillows behind head and neck to raise head and improve ability to cough and deep breath.**

Call us immediately if you have:

- Pain not controlled by your pain medication (you will always have some pain after surgery, however severe pain not controlled by medication is abnormal)
- Fever more than 101.5. A low grade temperature is normal after surgery. Fevers over 101.5 are abnormal. You do not need to routinely take your temperature, only do this if you feel that you have a fever.
- An increase in leg swelling, redness or foul smelling drainage from wounds.
- Chest pain, shortness of breath or other medical emergency should call 911 and inform our office after the emergency is over.

Returning to work or school:
You may return to work or school light duty only in the immediate days after surgery if pain is tolerable. You must take the time to honor your commitments to physical therapy and office visits. Returning to heavy labor will be determined by your progression through physical therapy and the cartilage condition on the acetabulum and femoral head.

Crutch use:
Flat Foot Weight bearing for 3 Weeks
After surgery, you will be flat foot weight bearing with 20 pounds of pressure with the aid of crutches from with a goal of returning to full activity as soon as possible. The length of flat foot weight bearing status will be determined by what procedure/s you have done.

Hip brace:
You will need to **wear the hip brace** for 2 weeks. Place it securely around your waist and thigh, this serves as a reminder to control Hyperextension and Abduction. You will need to wear this brace when you are walking and do not need in when you are sitting or lying down. Once the brace is on, use your crutches and walk with *flat foot weight bearing*.

Microfracture only : CPM (Continuous Passive Motion) : 6 Weeks , 8-12 hrs/day to be uses in 10 degrees of Abduction. CPM settings to remain at 30-70 degrees for total time using the machine; DO NOT CHANGE THE SETTINGS.

You will be given a **CPM** in the recovery room. You will use this machine up to the required amount of hours per day. Do not go over the required time per day; more time in the CPM machine is not better. **You will need assistance to get into the CPM for the first couple of days after surgery.**

To help in the prevention of lower back pain try and maintain proper Spine alignment while in the CPM. Additionally you may roll a towel or use a small pillow behind your lower back.
Additional Tips: Place the CPM unit in the middle of the bed to aide in the prevention of the machine and your leg falling off the bed. Avoid placing the unit on a couch or narrowed place for reclining. Use a power strip to plug in CPM and Ice machine. This allows turning off of one switch versus multiple switches.

Risk: There are several risks to any surgery that must be taken into account…

Infection: is decreased with a sterile operating environment and antibiotics. Also, careful handling of the incision sites following surgery reduces the risk of infection.

DVT: (deep vein thrombosis, blood clot) is decreased through instituting early motion, mechanical means (foot/ankle pumps) and medication. Following the pre-operative and post-operative instructions will reduce the risk of deep vein clots.

Pain: with any surgical procedure there is a potential complication of pain. Medication, ice, rest, compression, elevation and therapy reduce post-operative pain.

Numbness: with hip arthroscopy, there is a small chance of numbness in the genitalia region briefly postoperatively. Also, you may experience some numbness of the upper outer portion of the thigh on the operative leg after surgery. This is due to the lateral femoral cutaneous

nerve is close to the surgical area and this nerve may be stretched or bruised during the procedure. This is normal and the numbness will resolve over time.

Wound Care Instructions

Care of your wounds after surgery is very important to ensure a quick recovery and to minimize the chance of infection. Here is a list of **good practices**:

- Keep your incisions clean and dry
- Elevation minimizes swelling which helps wound healing
- Change your dressing every other day to maintain a clean environment unless otherwise instructed
- Leave “steri-strips” or butterfly bandages in place

Here are things you should **avoid**

- Do not let your extremity dangle or swell
- Do not remove the “steri-strips”
- Do not adjust or remove any sutures or staples
- Do not use creams, ointments, vitamins, scar reducers or other products on the wounds
- Do not take a bath, swim, go in a pool/hot tub or otherwise submerge the wound until you are instructed that you can or at least 2 weeks have passed
- by day 3 if no drainage is present the incision should remain uncovered and keep clean clothing only covering the sites.
- Do not allow pets to sit on your lap or sleep in your bed for at least 6 weeks following surgery. Pets may harbor fleas or mites or other organisms that may cause a wound infection!

The original dressing should be removed 24 hours after surgery. Apply an opsite, water-proof dressing over the incision site until you have stopped draining. After drainage has stopped, apply band aids over the incisions. Do this daily or as needed throughout the day if the op-sites or band-aid becomes soiled or wet. Do not put any ointments or lotions over the incisions.

Showering: You may start showering as soon as your first dressing is removed if waterproof bandages or “op-site” dressings are covering your wound to keep them dry. If you do not have waterproof dressings, you may get the wounds wet 3 days after surgery with running water in the shower as long as they are no longer draining any fluid. At this point you may use mild soap on the wounds such as Dial Soap. Do not scrub the wounds. Pat them dry with a clean towel after showering and place a fresh clean bandage.

If you should have any questions or concerns regarding you incisions, the best thing to do is to take a digital picture of the incision and e-mail it to a member of Dr. Petre’s team.

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Medications After Surgery

New Prescriptions: Dr Petre will provide you at least two if not more prescriptions for after surgery. These will include:

- A narcotic pain medicine (percocet, vicodin, oxycodone, etc). This medication should only be taken "as needed" for pain. You will likely have some pain after surgery, this medication will help with your pain but will likely not take 100% of the pain away. These medications last 4-6 hours, if you are not experiencing pain, do not take them as they can have side effects such as constipation, nausea, vomiting and respiratory depression. **DO NOT DRIVE** if you are taking narcotics. . **It will help to take your pain medication thirty minutes before therapy** if you are experiencing any pain. You should plan to wean yourself from pain medicine by the time your 2 week visit is to occur.
- A blood thinner such as lovenox, aspirin or coumadin. Depending upon your risk of getting a blood clot after surgery (also called a DVT), Dr. Petre will prescribe you a blood thinner to minimize this risk. Every patient will receive TED stockings to help minimize the risk of clots, these need to be worn on BOTH legs for 2 weeks after surgery
    - High risk patients (lower extremity fractures, joint replacements): Lovenox injections for 2 weeks followed by 4 weeks of aspirin 325mg daily
    - Medium Risk patients (lower extremity arthroscopy or small procedures): Aspirin 325mg daily for 4 weeks
    - Low Risk Patients (shoulder arthroscopy, upper extremity fractures): Early mobilization and ambulation.
- Anti-inflammatory medications: These can be added as needed for additional pain control. Routine daily use can slow down certain type of healing and daily use should be avoided in: Fracture healing, rotator cuff repairs, ligament reconstructions, meniscal repairs. Specific anti-inflammatories may be prescribed in certain surgeries such as hip arthroscopy to prevent the formation of heterotopic ossification.
- Your previous home medications: You should resume any/all blood pressure medications, heart medications, thyroid medications, diabetes medications. Please refrain from taking non-prescribed supplements or over the counter medications until 2 weeks after surgery. Please refrain from taking gout medicines or rheumatoid medicines for 2 weeks after surgery if possible.

Other prescriptions you may receive:

- Ambien: this will aid in sleep and may be prescribed for certain procedures. Only take this medicine at night if you are having troble sleeping
- Oxycontin: This is a long acting narcotic medication and should only be taken twice a day as prescribed
- Zofran: Zofran is a nausea medication that helps with some of the side effects of narcotics
- Antibiotic: If you were prescribed an anti-biotic after surgery, you should take this exactly as directed. Try not to miss any pills and take the entire prescription until it runs out.

Over the Counter Medications you may want to consider taking:

- Colace or Senna (Senna Kot): Many people get constipation from pain medicine, these medications will help with constipation
- Tylenol (acetaminophen): Tylenol is a good adjunct for pain control because it works in a different way than narcotics and anti-inflammatories. Some narcotics will have tylenol built into the pill already. **If your narcotic prescription has acetaminophen, APAP, or tylenol listed on it, DO NOT TAKE ADDITIONAL TYLENOL.** There is a 4000mg limit per day for tylenol in adults, it can damage your liver if you take more than this amount.

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Ice After Surgery and Ice Devices

Ice after surgery is a great way to decrease your pain and reduce swelling. It will speed your recovery and is recommended.

Ice Technique: If you are using ice or ice packs from your freezer, it is most convenient to apply the ice for 20 minutes on and then 20 minutes off. Place a thin piece of cloth between the ice pack and your skin.

Ice with a splint or cast: Ice will help if it is cold enough to penetrate. If you can feel it, then it is working. With a cast or splint, you need to use extra caution to prevent water from leaking into the cast/splint.

I**ce and Nerve Blocks:** Use caution if you have had a nerve block when using ice in the first 24-72 hours as you may not be able to sense how cold your skin is getting. This puts you at risk of getting frostbite.

Ice Device: You may be prescribed a cooler with a bladder to circulate ice water after surgery. These devices do a great job of keeping your surgical site iced down. If you have difficulty with your device, please call the technical assistance number on the device as the on-call doctor at the office will not likely be able to talk you through trouble shooting the machine.

Benjamin M. Petre, MD | 2000 Medical Parkway, Annapolis, MD 21401 | 410-280-4717

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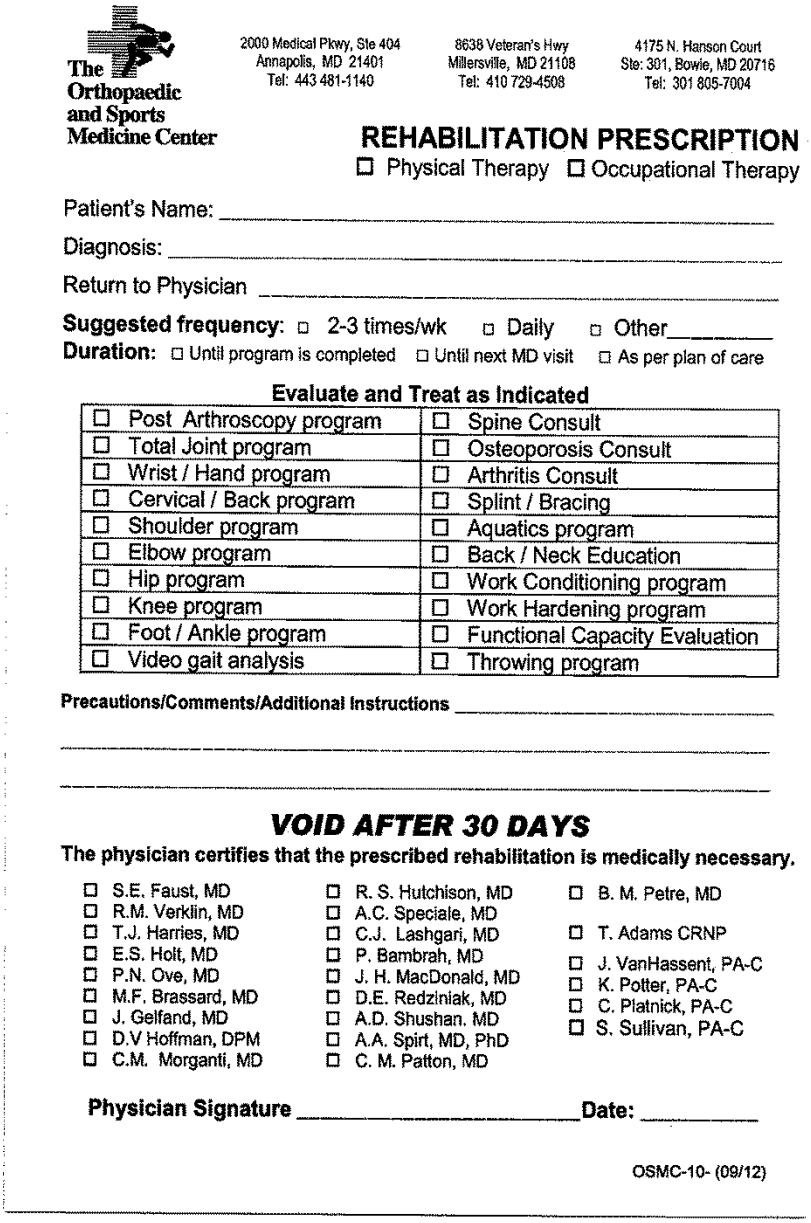
Physical Therapy

Physical Therapy is a crucial part of your recovery. Most patients will start physical therapy directly after surgery. **You should call to schedule your physical therapy appointment now.** Therapy can start the day after surgery unless otherwise directed. Please see the attached therapy prescription for office numbers and locations. Please ask your therapist to follow the included protocol, we are always happy to discuss treatment modalities, progress and questions with your therapist. If these questions arise, you can encourage them to contact the office anytime via phone or email.



The Orthopaedic and Sports Medicine Center

2000 Medical Pkwy, Ste 404
Annapolis, MD 21401
Tel: 443 481-1140

8638 Veteran's Hwy
Millersville, MD 21108
Tel: 410 729-4508

4175 N. Hanson Court
Ste: 301, Bowie, MD 20716
Tel: 301 805-7004

REHABILITATION PRESCRIPTION

☐ Physical Therapy ☐ Occupational Therapy

Patient's Name: _____

Diagnosis: _____

Return to Physician _____

Suggested frequency: ☐ 2-3 times/wk ☐ Daily ☐ Other_____

Duration: ☐ Until program is completed ☐ Until next MD visit ☐ As per plan of care

Evaluate and Treat as Indicated

☐ Post Arthroscopy program	☐ Spine Consult
☐ Total Joint program	☐ Osteoporosis Consult
☐ Wrist / Hand program	☐ Arthritis Consult
☐ Cervical / Back program	☐ Splint / Bracing
☐ Shoulder program	☐ Aquatics program
☐ Elbow program	☐ Back / Neck Education
☐ Hip program	☐ Work Conditioning program
☐ Knee program	☐ Work Hardening program
☐ Foot / Ankle program	☐ Functional Capacity Evaluation
☐ Video gait analysis	☐ Throwing program

Precautions/Comments/Additional Instructions _____

_____

_____

VOID AFTER 30 DAYS

The physician certifies that the prescribed rehabilitation is medically necessary.

☐ S.E. Faust, MD
☐ R.M. Verklin, MD
☐ T.J. Harries, MD
☐ E.S. Holt, MD
☐ P.N. Ove, MD
☐ M.F. Brassard, MD
☐ J. Gelfand, MD
☐ D.V Hoffman, DPM
☐ C.M. Morganti, MD
☐ R. S. Hutchison, MD
☐ A.C. Speciale, MD
☐ C.J. Lashgari, MD
☐ P. Bambrah, MD
☐ J. H. MacDonald, MD
☐ D.E. Redzniak, MD
☐ A.D. Shushan. MD
☐ A.A. Spirt, MD, PhD
☐ C. M. Patton, MD
☐ B. M. Petre, MD
☐ T. Adams CRNP
☐ J. VanHassent, PA-C
☐ K. Potter, PA-C
☐ C. Platnick, PA-C
☐ S. Sullivan, PA-C

Physician Signature _____ **Date:** _____

OSMC-10- (09/12)

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Surgery Descriptions

Labral repair: The labrum is reattached to the acetabulum with suture anchors to hold it in place.

Debridement: Removal of small frayed edges of the torn labrum by an arthroscopic burr tool.

Osteoplasty: An osteoplasty is performed at the head- neck junction of the femur. During this procedure a motorized burr is used to shave down the bony abnormality and re-creates a "normal" shape of the femoral neck.

Rim Trimming: A rim trimming procedure is used to address the bony abnormality of the acetabulum (socket)of the hip using a motorized burr.

Microfracture: A microfracture technique is performed to cartilage lesions on the acetabulum or on the femoral head. A pic (awl) is used to create bleeding of the bony surface where the cartilage is damaged. This blood forms a clot which matures into new cartilage. The clot is delicate and requires minimal weight-bearing and good mobility for proper healing.

Chondroplasty: Minimal cartilage damage is repaired using a motorized burr tool to shave off any frayed edges.

Capsular Plication: A plication is done to tighten a loose capsule. During a capsular plication the capsular tissue is pulled together and closed with sutures to hold the tissues together and adding stability to the joint.

Thermal Capsulorraphy: During a thermal capsulorraphy, a high temperature probe is moved across the tissue in a striped pattern causing shrinkage of the tissue which stabilizes the joint.

Ligamentum teres debridement*:* In patients with partial tearing of the ligamentum teres, frayed tissue is removed similar to the labral debridement.

Synovectomy: A synovectomy is performed in patients who exhibit significant inflammation of the lining of the joint. During this procedure a probe is used to remove the irritated tissue.

Iliotibial Band Release: The ITB is a thick band of tissue that runs from the hip to the knee along the outer side of the thigh. A release is done when the ITB is excessively tight, causing irritation (bursitis) to the outer side of the hip.

Labral Reconstruction: This procedure is performed when the labrum is diminutive (small) or not repairable. A piece of the ITB is used to replace the damaged labrum. It is held in place with suture anchors along the acetabular rim.

Benjamin M. Petre, MD | 2000 Medical Parkway, Annapolis, MD 21401 | 410-280-4717

Medical and Rehabilitation Definitions

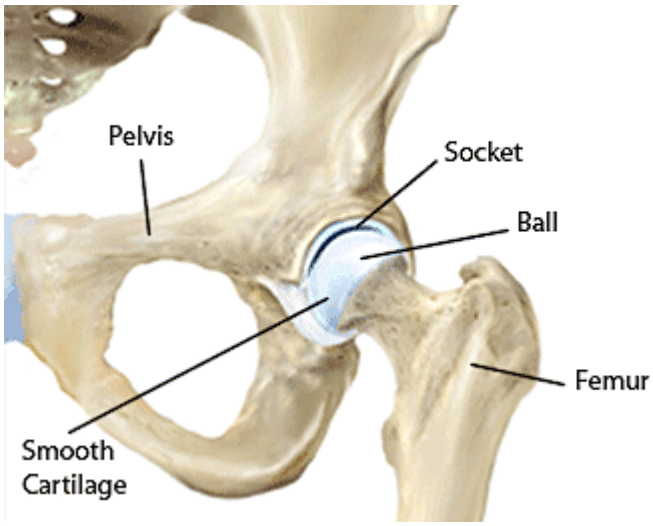

image from smithnephew.com

Acetabulum: hip socket

Anterior: towards the front of the body

Closed Chain: movement in which the end segment of the exercised limb is fixed to the ground. Ex. Standing exercises, leg press

Concentric: contraction of a muscle as it is shortening. Ex. “upward phase” of a biceps curl

Eccentric: contraction of a muscle as it is lengthening. Ex. “lowering phase” of a biceps curl

FAI: femoral acetabular impingement

Femur: upper leg bone

Gait: walking pattern

Inflammation: the body’s natural response to protect from infection and surgical trauma. Can cause swelling, heat, and pain.

Isometric: contraction of a muscle without movement

Joint Mobs: Joint mobilization is a type of passive movement of a skeletal joint. It is usually aimed at a 'target' synovial joint with the aim of decreasing joint stiffness or decreasing pain.

Labrum: a fibrocartilaginous rim extending off the acetabulum to deepen the socket and provide a suctioning effect

Lateral: further away from the body's midline

Medial: towards the body's midline

Muscle Imbalances: differences in strength or tightness in muscles on either side of the joint

Muscle Inhibition: "shutting down" of a muscle usually due to pain or inflammation

Posterior: towards the back of the body

PROM: "passive range of motion" patient does nothing, movement performed by someone else

Prone: lying on your stomach

ROM: range of motion

RPM: revolutions per minute

Supine: lying on your back

Transverse Abdominis (TA): deepest of the major abdominal muscles which stabilize the spine and pelvis.

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Dear Therapist,

Thank you for continuing the rehabilitation with Dr. Petre's patient following their hip arthroscopic surgery. The intent of this program is to provide *guidelines* for progression of rehabilitation. It provides the basic exercises and techniques you will need to guide the patient to return to normal function. At the 6-8 week follow-up and if appropriate for the patient, Dr. Petre will determine whether the patient is ready to progress to an advanced functional training program for return to sport, a maintenance strength program, or to continue to work on "the basics" before progressing further.

- Utilize the rehab outline and exercise descriptions as a guide. This is a proven program in terms of exercises and treatment, but some patients may need to move slower.

- Utilize clinical decision making to adjust treatments if needed within given guidelines and precautions.

- Progression through each phase of rehabilitation is based on clinical criteria and time frames.

- Understand that the program should be tailored for the individual based on their ability to progress and respond to treatment. This concept should continually be emphasized to the patient. Advancing through the rehabilitation process involves an accurate assessment of joint function, strength, mobility and progressive overload based on the patient's response.

- Primary goals at approx. **6 weeks out (non-mcfx)** and **10 weeks out (McFx)** are a normalized gait and good glute recruitment. We expect ROM restrictions at this time especially External Rotation, Internal Rotation and Extension. Do not push through pain to achieve more as these ranges with increase with a return to functional activity not with overly aggressive stretching.

If there are any questions regarding rehab, please call Dr Petre's office at 410.280.4717

Benjamin M. Petre, MD | 2000 Medical Parkway, Annapolis, MD 21401 | 410-280-4717

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Rehabilitation Program
Phase I

Weeks 0-4 for non- microfracture
Weeks 0-8 for microfracture

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Tips on avoiding hip flexion at 90 degrees for the 1st two weeks: use a higher chair, a recliner chair, or while sitting you can slouch forward or backward. Please have the physical therapist do all **circumduction** exercises in **70 degrees of flexion**.

PHASE I	**MAXIMUM PROTECTION AND MOBILITY**
GOALS	1. Protect the integrity of the repaired tissues 2. Diminish pain and inflammation 3. Restore range of motion within the restrictions 4. Prevent muscular inhibition 5. Education
RESTRICTIONS	<u>Range of Motion (ROM) - Protect the capsule and labral repair:</u> ☐ Flexion 0-120 for: 3 weeks ☐ Abduction 0-45 for: 3 weeks ☐ No Ext Rot for: 2 weeks ☐ Extension to 0 deg for: 3 weeks ☐ Internal Rotation: NO limit ☐ Adduction: NO limit <u>Weight Bearing (WB) status:</u> ☐ Non-Microfracture: 20# FFWB for 3 weeks 50% WB for 1 week Then WBAT ☐ Microfracture: 20# FFWB for 6 weeks then wean as tolerated for 1weeks <u>Brace:</u> 3 weeks from 0-120 degrees when walking <u>Sitting:</u> Avoid sitting at 90 degrees of hip flexion for 2 weeks

PHASE I	MAXIMUM PROTECTION AND MOBILITY
TREATMENT STRATEGIES	1. Continuous passive motion (CPM): 30-70 degrees placed in 10 degrees abduction □ Microfracture: 6-8 hours/day x 8 weeks 2. Ice and compression: as needed Phase I 3. Non-resistant stationary bicycle: 20 minutes 1-2x/day x 6 weeks 4. Circumduction (passive motion): 2x/day x 2 wks then daily through 10 wks 5. Laying on stomach MINIMUM two hours per day 6. Lymphatic massage / soft tissue: as needed 7. Pain-free gentle muscle stretching 8. Isometrics 9. Active range of motion (see specific exercises) 10. Aquatic pool program (see Pool Table) 11. Cardiovascular and upper body exercises (See Cardio Table)
MINIMUM CRITERIA TO ADVANCE TO PHASE II	1. Minimal complaints of pain with all Phase I exercises 2. Proper muscle firing pattern with all Phase I exercises 3. Minimal complaints of “pinching” sensation in the hip before 100 degrees of flexion 4. Full weight bearing is allowed and tolerated.

POOL	NON-MICROFRACTURE	MICROFRACTURE
Phase I	1. Deep water aquajogging with flotation belt: 10 minutes 2. Light kicking on back: 10 minutes 3. Standing abduction: Day 5: 3x10 4. Walking: forward, backward, lateral: Day 15: 4 minutes each direction 5. Swimming with pull-buoy (cardio) if swimming is normal activity	1. Deep water aquajogging with flotation belt: 10 minutes 2. Light kicking on back: 10 minutes 3. Standing abduction: Day 5: 3x10 4. Swimming with pull-buoy (cardio) if swimming is normal activity

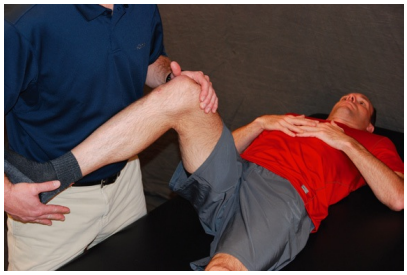
CARDIO	Cardiovascular Fitness	Upper Body / Sport Specific Conditioning
Phase I	55-70% max heart rate up to 30 minutes 1. Upper body ergometry (UBE) 2. Single well-leg rowing 3. Swimming with pull-buoy	1. Cord-resistance training 2. Suspension-type training a. TRX

Range Of Motion Phase I

STATIONARY BIKE
(WEEK 0)
- Set bike seat so that knee extends to approximately 5 degrees at bottom of stroke
- NO resistance is used on bike phase 1
- Max time 20 minutes, 2 times per day

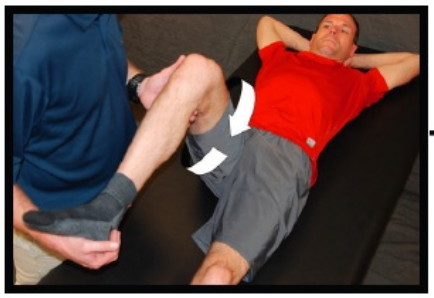
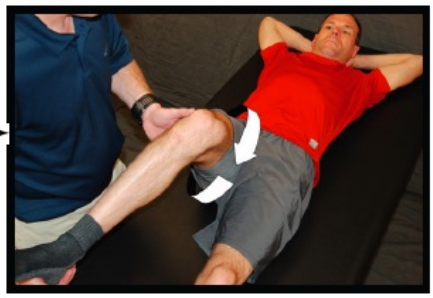
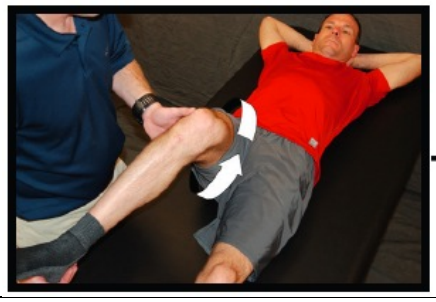
PASSIVE RANGE OF MOTION:
LOG ROLLS (WEEK 0)
Therapist gently rolls affected leg from neutral into internal rotation for 2-3 minutes


INTERNAL ROTATION (WEEK 0)
- Lying on your back, bend knee to 90 degrees and hip to approx. 70 degrees
- Slowly rotate foot outwardly to create Internal rotation at the hip
- Don't push into a pinching sensation
- Repeat 20 times

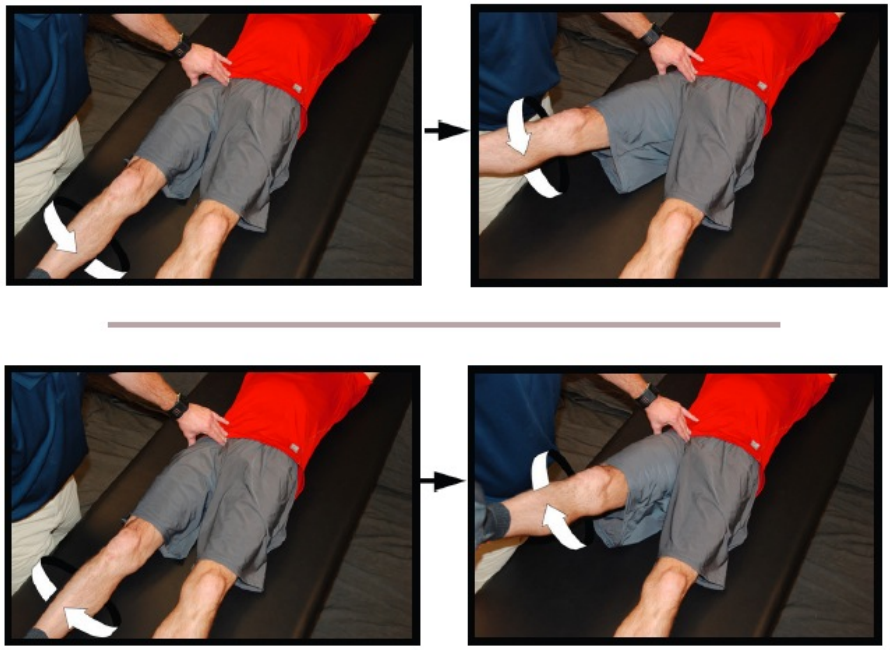
CIRCUMDUCTION AT 70 DEGREES
(WEEK 1)
Lying on your back with hip in 70 degrees of flexion, have partner/therapist move the knee in a **clockwise** circular pendulum motion for 5 minutes
- Lying on your back with hip in 70 degrees of flexion, have partner/therapist move the knee in a **counterclockwise** circular pendulum motion for 5 minutes

Do NOT push into pinch or painful position

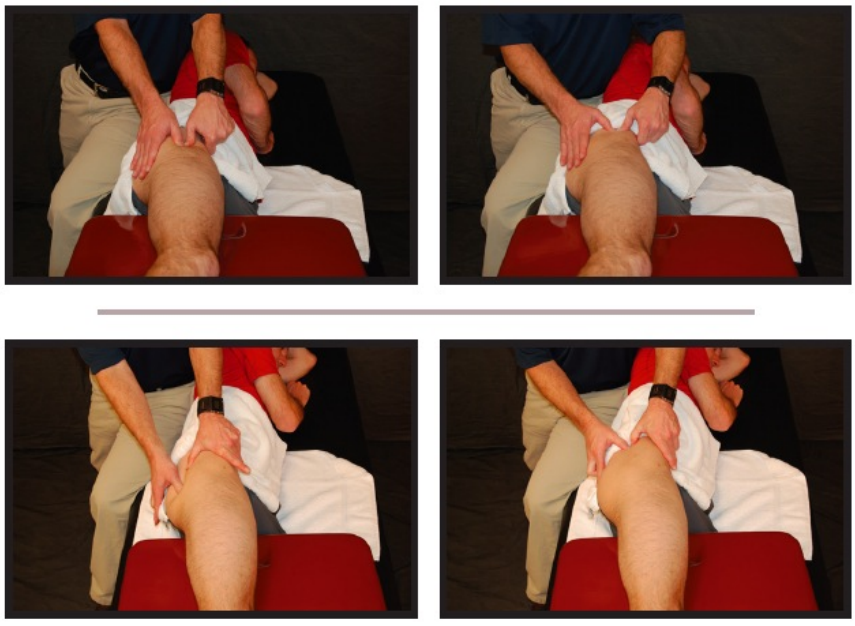

CIRCUMDUCTION AT NEUTRAL (WEEK 0)

• Lying on your back with hip and knee straight, have partner/therapist move leg in a **clockwise** circular pendulum motion for 5 minutes
• Lying on your back with hip and knee straight, have partner/therapist move leg in a **counterclockwise** circular pendulum motion for 5 minutes
Do NOT pull leg into distraction



SOFT TISSUE MOBILIZATION (WEEK 1)

• Lymphatic or light soft tissue (such as effleurage
• techniques) are utilized to flush fluid/swelling from the hip
• Petrissage, myofascial, or deeper strumming techniques are utilized to mobilize deeper tissues after the initial swelling and inflammation has subsided
• Address the TFL, ITB, glutes, adductors, and the low back



Strengthening Phase I

ISOMETRICS:

TRANSVERSE ABDOMINUS (WEEK 1)

- Place your first 2 fingers just inside your pelvic bone
- Take a deep breath in and out, relaxing all your abdominal muscles
- At the end of your exhale, draw in your belly button toward your spine/kegel exercise
- You should feel tension under your fingers without bulging and there should be no movement of the spine or pelvis
- Hold the contraction through 10 normal breaths

(Repeat hourly while awake)


GLUTE SQUEEZES (WEEK 1)

- Gently contract glute muscles
- Hold for 5 seconds and repeat 10 times
- Repeat hourly while awake


QUAD SETS (WEEK 0)

- Gently contract thigh muscles until knee is straight,
- Hold for 5 seconds and repeat 10 times
- Repeat hourly while awake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Stretching Phase I

STRETCHING:

HIP FLEXOR (WEEK 2)

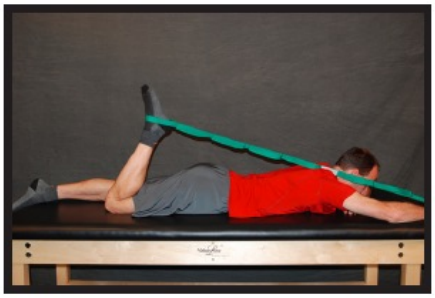
- Lie on your back
- Lift opposite knee to chest

(Hold for 30 seconds, 3 reps, 2 times per day)


QUADRICEPS (WEEK 1)

- Lying on your stomach
- Bring ankle toward buttocks

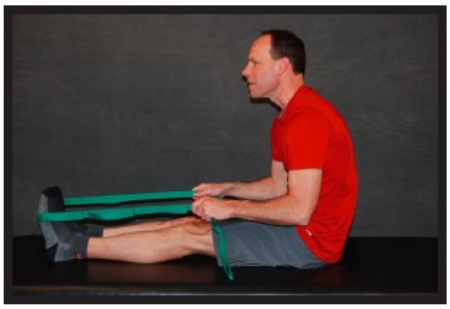
(Hold for 30 seconds, 3 reps, 2 times per day)

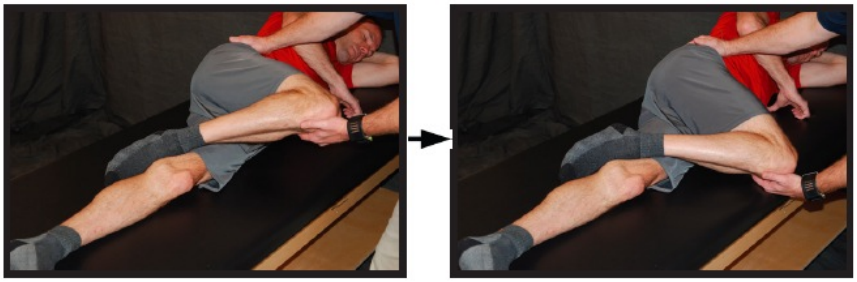
HAMSTRINGS (WEEK 1)

- In a long sitting position with your feet straight out in front of you, reach toward your feet

(Hold for 30 seconds, 3 reps, 2 times per day)

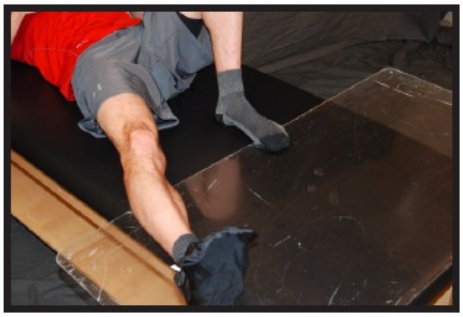



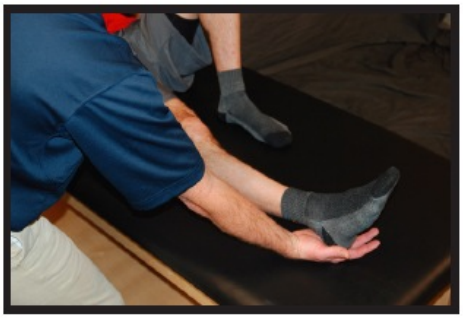
PIRIFORMIS (WEEK 0)
• You may start with pillow to support leg
• Lying on uninvolved side (bottom leg straight, pelvis stacked) bend involved hip into 50-70 degrees of flexion and hook top foot on uninvolved knee
• Stabilizing pelvis, lower involved knee towards the table
• Stretch should be felt in buttock
• Avoid pinch in groin
(Hold for 30 seconds, 3 reps, 2 times per day)

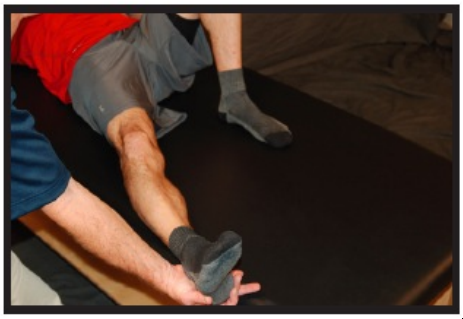


ACTIVE RANGE OF MOTION:
CAT AND CAMEL (WEEK 2)
• Kneeling on your hands and knees, begin with your back in neutral position
• Rotate hips backward while arching your back upward
• Reverse directions and rotate hips forward while extending your back
(20 reps, 2 times per day)

SUPINE ABDUCTION/ADDUCTION (WEEK 1)
• Lie on your back with surgical leg on slideboard/plexiglass type of surface (sock on foot)
• Keep leg straight while sliding foot out, then return to neutral
• Additional help may be provided by therapist
(20 reps, 2 times per day)



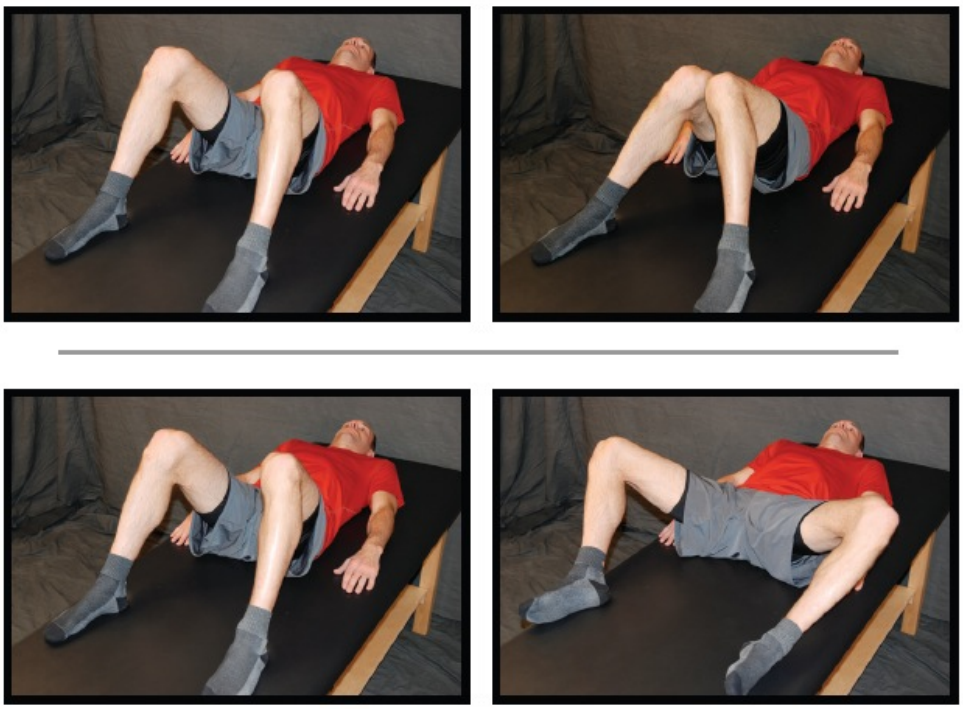




ACTIVE REVERSE BUTTERFLIES (WEEK 2)

- Lie on your back, feet shoulder width apart, flat on the floor
- Bring inside of knees towards each other leaving feet in place
- Squeeze knees together and hold 5 seconds
- Allow knees to drop out to the side and hold 5 seconds
- Bring back to start position

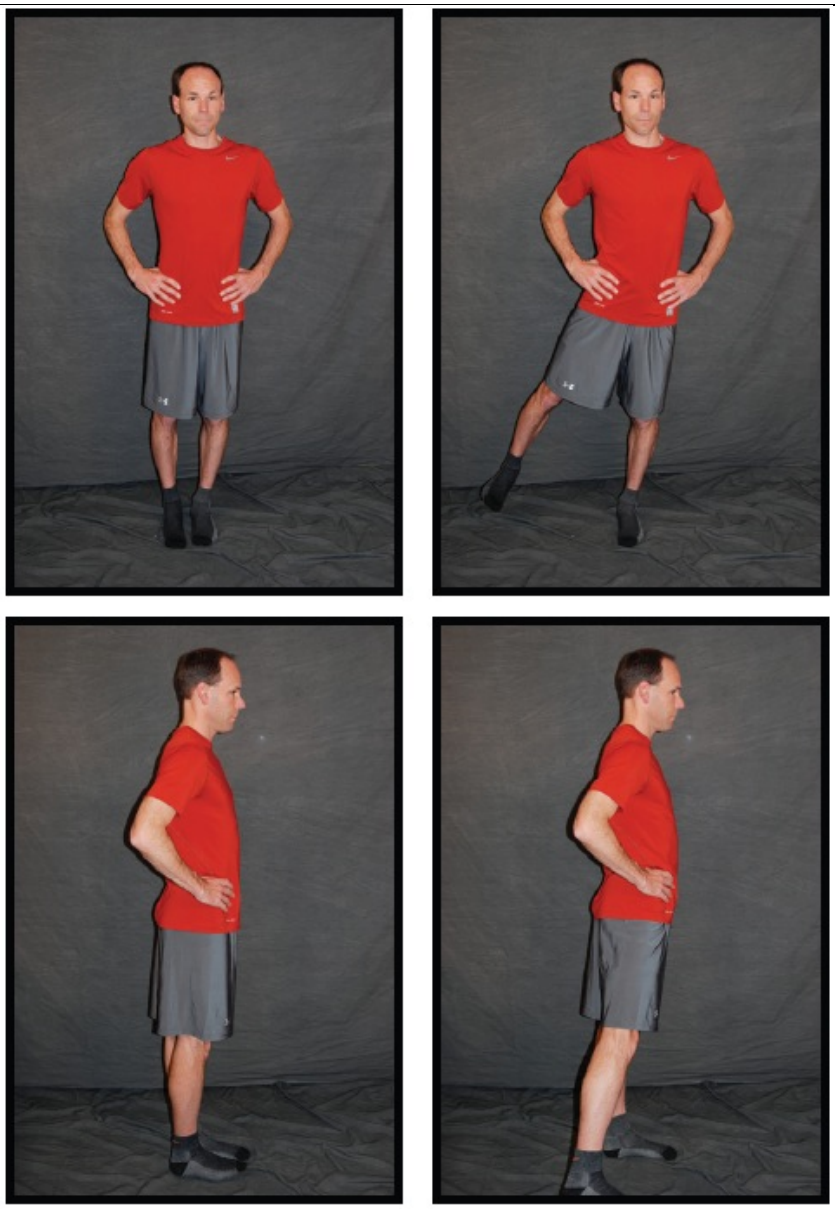
(20 reps, 2 times per day)



STANDING ABDUCTION WITH INTERNAL ROTATION (WEEK 2)

- Standing on nonsurgical
- leg while keeping surgical leg straight, rotate slightly into internal rotation (point toes inward)
- Lift your leg out to the side
- Hold for 2-3 seconds, then return to starting
- position
- Do Not lean away from the moving leg

(3 sets of 10 reps, 2 times per day)



FABER SLIDES (WEEK 4)

- Begin once external rotation restrictions are lifted
- Lie on your back and engage TA to ensure pelvic stability
- With control, slide heel up table along opposite leg while allowing knee to fall outward
- Therapist to provide assistance initially

(20 reps, 2 times per day)

DOUBLE LEG BRIDGES (WEEK 4) • Lie on your back with arms at your sides and hips and knees bent • Squeeze Glutes and Raise buttocks while keeping core stable • Slowly return to start position and repeat (3 sets of 10 reps, 2 times per day)	 
STOOL ROTATIONS (WEEK 3) • Stand and place the knee of your surgical leg • on a stool • The level of the stool should allow you to rest your leg on the top of the stool while being • straight up and down without dropping or hiking your hips • Rotate the leg that is resting on the stool both directions without moving your trunk (3 sets of 10 reps, 2 times per day)	   

Dr. Ben Petre
Orthopedic Surgery

The Orthopaedic and Sports Medicine Center L.L.C.
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Rehabilitation Program
Phase II

Weeks 5-12 Non-Microfracture
Weeks 9-12 Microfracture

Benjamin M. Petre, MD | 2000 Medical Parkway, Annapolis, MD 21401 | 410-280-4717

PHASE II	CONTROLLED STABILITY & EARLY STRENGTH
GOALS	1. Normalize gait 2. Restore full range of motion 3. Improve neuromuscular control, balance, proprioception 4. Initiate functional exercises maintaining core and pelvic stability
PRECAUTIONS	1. **RECOMMEND NO TREADMILL USE** 2. Avoid hip flexor and adductor irritation 3. Avoid joint irritation: Too much volume, force, or not enough rest 4. Avoid ballistic or aggressive stretching
TREATMENT STRATEGIES	1. **WEAN OFF CRUTCHES** /gait training with emphasis on glut / core control 2. Weight-shifting exercises 3. Non-resistant stationary bicycle until minimal six weeks 4. Circumduction (passive motion): as indicated in Phase I 5. Continue laying on stomach 6. Soft Tissue: as needed 7. Pain-free gentle muscle stretching 8. Active range of motion / early strengthening (see specific exercises per MJP) 9. Progress aquatic pool program (see Pool Table) 10. Progress cardiovascular and upper body exercises (see Cardio Table)
MINIMUM CRITERIA TO ADVANCE	1. Gait is pain free and normalized 2. Full range of motion with mild “stiffness” into external rotation 3. No joint inflammation, muscular irritation, or pain 4. Successfully initiated functional exercises without pain and good neuromuscular control

POOL	NON-MICROFRACTURE	MICROFRACTURE
Phase II	1. Deep water aquajogging with flotation belt: 10 minutes 2. Light kicking on back: 10 minutes 3. Walking: forward, backward, lateral: 4 minutes each direction 4. Standing abduction bilateral: 3x10 5. Swimming with pull-buoy 6. Squats, lunges in waist deep water: Week 6: 3x10	1. Deep water aquajogging with flotation belt: 10 minutes 2. Light kicking on back: 10 minutes 3. Walking: forward, backward, lateral Week 6: 4 minutes each direction 4. Standing abduction bilateral: Wk 6-8: 3x10 5. Swimming with pull-buoy

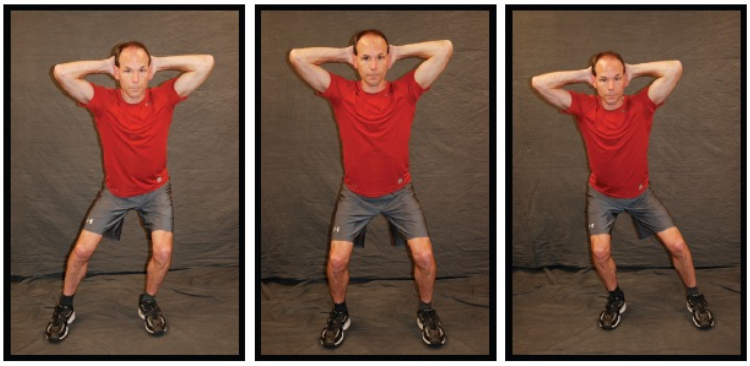
CARDIO	Cardiovascular Fitness	Upper Body / Sport Specific Conditioning
Phase II	85% for Phase I cardio exercises 55%-70% for Phase II exercises 1. Swimming with pull-buoy 2. Easy return to ice for skating sports 3. Resistance on bicycle	1. Pre-surgery upper body regimen: a. Dumbbells / Barbells b. Machines at lower resistance 2. Core conditioning: a. Planks, crunches b. Avoid hip flexor dominate exercises

WEAN OFF CRUTCHES (WEEK 3 for non-microfracture, WEEK 6 for microfracture)
- Week 3: 50% flat foot weight bearing
- Progress to 75% flat foot weight bearing for 1-3 days
- Progress to 100% flat foot weight bearing with crutches for 1-3 days

If soreness increases return to previous level for 1-2 days

WEIGHT SHIFTING EXERCISES

LATERAL AND FORWARD/BACKWARD (WEEK 4)
- Beginning with weight primarily distributed on non-surgical leg
- Progressively shift weight to surgical leg
- Statically hold for 30-60 second intervals
- Avoid hiking, dropping, and/or rotating hip



SINGLE LEG STANCE (WEEK 5)
- Stand on one leg using support as appropriate
- Statically hold for 30-60 second intervals
- Avoid hiking, dropping, and/or rotating hip
- Do NOT progress to standing on unstable surfaces (i.e. dyna disk, bosu ball, or foam roll) until you can maintain correct form for 60 seconds

FORWARD SHIFT TO ROMANIAN DEAD LIFT (RDL) - (WEEK 6)

• Standing on one leg bend forward and reach for the ground
• Keep hips in neutral, do not let hips rotate
• Return to start position and repeat

STRETCHING:
Continue all Phase I stretches

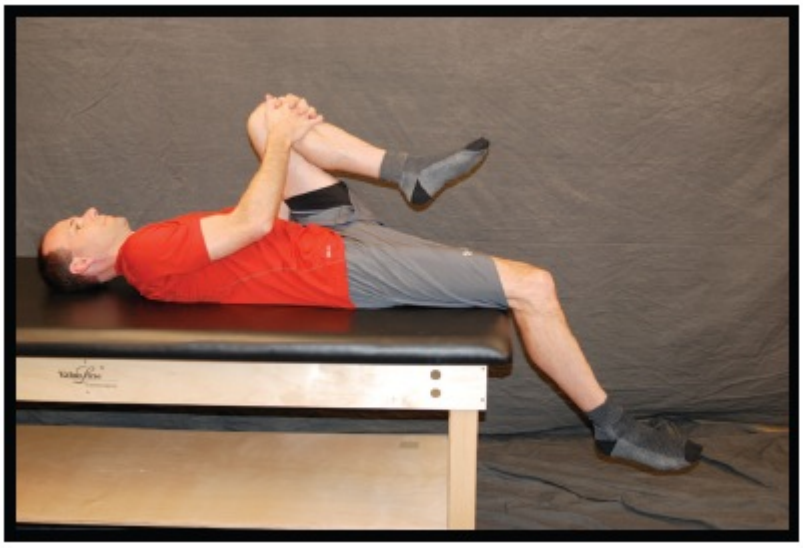
HIP FLEXOR (WEEK 4)

• Let your knee of the surgical leg bend over the end of the table
Lift opposite knee to chest

OR:

• In a half kneeling position with the involved knee on the floor, tighten glutes and shift your weight forward while keeping trunk upright

(Hold for 30 sec, 3 reps, 3-4 times per day)



QUADRICEPS (WEEK 5) • In a standing position, bring ankle toward buttock (Hold for 30 seconds, 3 reps, 1 time per day)	
HAMSTRINGS (WEEK 5) • In a standing position with your knees straight, reach toward the floor (Hold for 30 seconds, 3 reps, 1 time per day)	
ILIOTIBIAL (IT) BAND (WEEK 4) • In a standing position, cross your nonsurgical leg in front of the surgical leg • Keep your pelvis level and straight while you shift your body weight over your surgical leg • Most of your weight should be on your surgical leg (Hold 2-3 minutes, 1 time per day)	

ACTIVE RANGE OF MOTION/ EARLY STRENGTHENING:

Continue all Phase I Exercises plus:

DOUBLE LEG BRIDGES (WEEK 6)

- With theraband around your knees lie on your back with arms at your sides and hips and knees bent
- Squeeze glutes and raise buttocks while keeping core stable
- Slowly return to start position and repeat

(3 sets of 10 reps, 2 times per day)


PRONE HIP EXTENSION OFF EDGE OF BED (WEEK 7)

- Lie flat on stomach
- Tighten TA, squeeze glute, and with knee straight, lift leg to neutral position
- Start with knee bent and progress toward straight leg technique

(3 sets of 10 reps, 1 time per day)



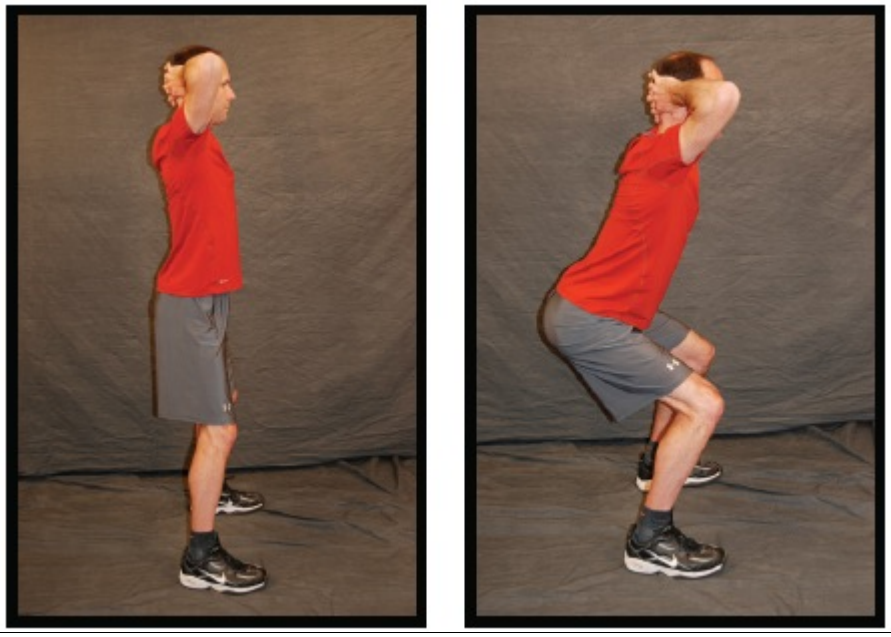

RESISTED STOOL ROTATIONS (WEEK 8)

• Stand and place the knee of your surgical leg on a stool with sport cord around ankle and attached to wall opposite direction of motion
• The level of the stool should allow the leg to rest on the top of the stool while being straight up and down without dropping or hiking your hips
• Rotate the leg that is resting on the stool without moving your trunk (turning the stool outward, back to neutral, then inward)
(3 sets of 10 reps, 2 times per day)

DOUBLE KNEE BENDS (WEEK 7)

• Stand with feet shoulder width apart
• Bend knees to 30 degrees, keeping knees behind toes
• Return to starting position with knees slightly bent

(2 sets, 20 reps, 2-3 times per day)



DOUBLE KNEE BEND TO CALF RAISE (WEEK 8) • Use same technique as knee bends • Return to the starting position with the addition of a heel raise (2 sets, 20 reps, 2-3 times per day)	
REVERSE LUNGE/STATIC HOLD (WEEK 9) • Stand in a lunge position with the involved leg forward • Allow the toe of the unaffected leg to touch and assist balance • Bend the involved knee to 45 degrees and hold that position (2-3 sets, 10 reps, 10+ second holds, 3 times per week)	

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Rehabilitation Protocol

Phase III and IV

All Patients

Benjamin M. Petre, MD | 2000 Medical Parkway, Annapolis, MD 21401 | 410-280-4717

Phase III: Advanced Exercises "multi-directional & plyometric"

A. Side to side lateral agility with cord

2 sets to fatigue, 3 times/week

Attach the sport cord from the side with the surgical leg facing the cord. Step sideways to create tension on the cord. 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 80 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.

B. Diagonal side to side with cord

2 sets to fatigue, 3 times/week

Attach the sport cord from the side with the surgical leg facing the cord. Step sideways to create tension on the cord. The athlete will hop diagonally forward at a 45° 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 45° angle. The goal is 80 seconds total. Each repetition of 1 second includes exploding diagonally forward or backward at 45° 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.

C. Forward Box Lunges with cord

2 sets to fatigue, 3 times/week

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 2.5 minutes. The movement is a forward lunge with maximum hip extension without compensation at the pelvis or spine throughout the 2.5 minutes.

D. Plyometrics – water to dry land progression

10 sets, 1-2 minutes, 3-5 times/week

Begin with water: In chest deep water, perform forward bounding. Focus on absorption when landing. Progress to dry land plyos.

E. Sport specific Progressions - NEVER USE TREADMILL

RUNNING: Expect to have mild limping/discomfort/awkwardness – this should go away gradually. Common sense dictates that if limp worsens or there is pain, running should stop. Progress to the next phase each week.

No treadmill. Use softer surface / grass to start

	Walk Run Ratio	Sets/Total Time	Frequency
R 1	4 minutes/1 minute	4 sets = 20 min	4-5 times/week
R 2	3 minutes/2 minute	4 sets = 20 min	4-5 times/week
R 3	2 minutes/3 minute	4 sets = 20 min	4-5 times/week
R 4	1 minutes/4 minute	4 sets = 20 min	4-5 times/week
R 5	5 minute Jog	2 sets = 10 min	4-5 times/week
From 10 min jogging, increase as tolerated			

SKATING: **Goalie – hold back pads an extra week
Progress to the next phase each week

	SKATING PROGRESSION	Time	Frequency
S1	Skate no pads forward and back with crossover	20-30 min	4-5 times/week
S2	Skate Use of Pads with change of direction, stop/start	20-30 min	4-5 times/week
S3	Sport Specific Drills		2-4 times/week
S4	Sports Test (to be cleared)		Week 10 + of protocol
S5	Full Contact – Practice w Team		After passing test

BALLET/DANCE: May incorporate D1-D5 as part of Phase II exercises. Frequency 4-5 times / week.

	DANCE PROGRESSION	
D1- Week 2	4-Way ankle strength w TheraBand	
D2- Week 4	Bar Work: stabilization on surgical leg AND Progress Turn Out	*Single Leg Balance = Tendu Turned Out Bridges on Ball*

D3 Week 5	Multi plane muscle stretching	*Including Pike & V Stretching → progress to splits over a 4 week period. Approx 8 weeks.*
D4 Week 5	Double Knee Bends = Plie	
D5 Week 6	Multi plane muscle single leg activities/moves	*(eg) ER Leg Lift (when pain free short lever hip flexion)*
D6	Sport Test	
D7	Jumps	*D5 After passing sport test*

GOLF: Begin after 3 wks of walking. Don't carry bag. Do not pull cart

	GOLF PROGRESSION	Volume	Frequency
G1	Put, Chip, ½ swing only	1 bucket	1-2 weeks
G2	8-9 Irons, ¾ swing only	1 bucket	2 weeks
G3	All Irons, Use cart, full swing	9 holes	2 weeks
G4	Full play, walking 18 holes	18 holes	

E. Initial agility drills – Straight Plane Agility

Chop-Downs/Back Pedaling-jog forward, stutter step to a stop, absorb and push off smoothly into a back pedal.

Side Shuffles-Start with feet shoulder width apart, maintain an athletic stance and shuffle to the right, then back to the left.

Phase IV: High Level Activities-

Functional Sport Test
Passing the Sport Test = you are cleared per MD discretion!!!
Once the patient passes the Functional Sports Test, HHSM leaves the responsibility up to the patient and coach to continue to progress training for sport. This includes proper conditioning and sport specific agility.

A. Multi-Plane Agility

1. **Z Cuts**
2. **W Cuts**
3. **Cariocas**
4. **Ghiardelli's**

   Start by crossing the right leg over the left, then swing the left leg out from behind the right absorbing and touching the ground with your left hand in one fluid motion. Repeat to the right side.

B. Sport Specific Training

POOL	NON-MICROFRACTURE	MICROFRACTURE
Phase III	Dependent on individual patient: 1. Swimming without pull-buoy (cardio) 2. Functional: Running, Agility 3. Breast stroke	Dependent on individual patient: Swimming without pull-buoy (cardio) 1. Squats, lunges in waist deep water 2. Breast stroke
Phase IV	1. Advanced functional drills 2. Advanced plyometrics	1. Functional: Running, Agility 2. Advanced plyometrics

CARDIO	Cardiovascular Fitness	Upper Body / Sport Specific Conditioning
Phase III	70%-90% max heart rate 1. Swimming without pull-buoy 2. Running progression in pool (non-Mfx) 3. Running, skating, cycling progressions 4. Strength days emphasizing power, agility, quickness (PAQ) with minimum rest between sets in late phase III	1. Sport specific progressions: a. Shooting b. Swinging c. Hitting d. Dribbling e. Kicking f. Throwing
Phase IV	1. Maximize pre-surgery fitness regimen: running, cycling, skating, swimming, strengthening	1. Advanced sport specific drills: agilities, cutting, jumping, plyometric training
Mfx = microfracture		