

JAY F. DEIMEL, MD

HIP ARTHROSCOPY with MICROFRACTURE

POSTOPERATIVE PHYSICAL THERAPY PROTOCOL

Patient Checklist :

Weightbearing:

FFWB x 8 weeks
(Flat Foot - 20 lb)

CPM:

8 weeks
8 hrs/day

Lie on Stomach:

1-2 hrs 2-3x/day

*** LABRAL REPAIR:**

Rotational Boot:

When laying on back
and not in CPM
18-21 days

Brace:

0-90 x 2 weeks

ROM Limits:

Flexion: 90° x 2 wks

Ext: 0° x 3 wks

Abd: 25° x 3 wks

ER: 0° x 3 wks

IR: no limits

Modalities

Active Release
Technique.
Ultrasound, and E-Stim
as needed starting
week 3.

Time Lines:

Week 1 (1-7 POD)
Week 2 (8-14 POD)
Week 3 (15-21 POD)
Week 4 (22-28 POD)

Phase I: Initial Exercises	week	1	2	3	4	5	6	7	9	13	17	21	25
Ankle Pumps		•	•										
Gluteus Slide		•	•	•	•	•	•						
Isometrics		•	•										
Stationary Bike with no resistance		•	•	•	•								
Passive ROM / CIRCUMDUCTION **		•	•	•	•	•	•						
→ add extension and ER (FABER)					•	•	•						
Soft tissue massage and scar mobs		•	•	•	•	•	•						
Passive Stretching: Quad & Piriformis		•	•	•	•	•	•						
→ add Hip Flexor Stretching				•	•	•	•						
Deep Water Progression			•	•	•	•	•	•	•				
Quadruped Rocking			•	•	•								
Standing Hip IR			•	•	•	•	•	•	•	•	•	•	•
Resisted Prone IR/ER			•	•	•	•	•	•	•	•	•	•	•
Lower Abdominal Progression & Transverse Abdominals **		•	•	•	•	•	•	•					
Glute Progression **		•	•	•	•	•	•	•					
Bridging Progression **					•	•	•	•					
Leg Press (limited weight) (VMO Strengthen)					•	•	•	•					
Gait Progression "crutch weaning"								•	•				
Straight Leg Raise w/ Transverse Abd **			•	•	•	•	•	•					
Proprioception exercises		•	•	•	•	•	•	•					
Phase II: Intermediate Exercises		1	2	3	4	5	6	7	9	13	17	21	25
Balance Progression **									•	•			
Stationary Biking with Resistance						•	•	•	•	•			
Double 1/3 Knee bends									•	•			
Advanced Core Progression									•	•			
→ Pilates Exercises (w/ instructor)									•	•			
Manual Mobilizations (w/ PT) **				•	•	•	•	•	•	•			
Side Stepping										•	•		
Elliptical/Stairclimber										•	•		
Single 1/3 Knee Bends (after OK Double)										•	•		
→ Lateral step downs										•	•		
→ Balance Squats										•	•		
MultiDirectional Lunges										•	•	•	
Phase III: Advanced Exercises		1	2	3	4	5	6	7	9	13	17	21	25
Plyometrics Progression										•	•	•	
Side to side lateral movement											•	•	
Fwd/Bkwd Running w/ cord													•
Running/Skating/Golf etc progression													•
Agility Drills - returning to sport													•
Phase IV: High Level Activities		1	2	3	4	5	6	7	9	13	17	21	25
Functional Sport Testing											•		
Multi-Plane Agility see attached											•	•	
Sport Specific Drills											•	•	•

**** = see attached sheets**

***Please direct questions to Dr. Deimel and his team at 814-454-2401.**

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Phases I and II

PHASE I: Initial Hip Exercises

A. Ankle Pumps

20 repetitions, 2 times/ day

1. Toe flexion and extension (toe crunches)
2. Ankle Dorsiflexion and plantar flexion
3. Ankle inversion and eversion
 - Done with therabands, against manual resistance or towel
 - Calf pumps
 - Joint mobs

B. Gluteal Slides

- Lay supine and abduct hip with lower extremity in slight internal rotation – start post op day 2-3
- Do Standing starting at 10 days (if no microfracture), with the hip in slight extension and internal rotation

C. Isometrics

20 repetitions, 2 times/ day

1. Gluteal Sets

Tighten buttock muscles – hold 5 seconds

2. Quad Sets

Tighten thigh muscles – hold 5 seconds

- May add straight leg raises week 2 if able to do with good transverse abdominus contraction / control

3. Transverse abdominal isometrics

Draw belly button in towards spine without moving pelvis/ spine – hold while taking 5 breaths

- Begin with knees bent
- Progress to Knees Straight

This exercise to be practiced with all core stabilization exercises

4. Hip abduction isometrics

Lying on your back with hip and knees bent, place a belt around thighs near knees and push out against belt – hold 5 seconds

- At Week 3 - May add weighted resistance to abduction exercises after week 2
- At week 3 – may add chicken wings – on hands and knees, raise affected knee out to side

5. Hip adduction isometrics

Lying on your back with hip and knees bent, place a ball or towel between your knees and squeeze the ball or towel – hold 5 seconds. This is to be done with the transverse abdominals contracting

- At Week 5 – add weighted resistance to adduction exercises – 4 way hip

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D. Stationary Biking with minimal resistance

20 minutes, 2 times/day

Increase time 5 minutes after 3-4 days up to 45 minutes 2 times/day. No resistance should be added until a week 5-6.

E. Straight Leg Raises and Short Arc Quads.

3 sets of 10 repetitions, twice a day

Lying on your back, raise your operative leg 24 inches off the table. This is to be done with the transverse abdominals contracting. Hold for 5 seconds. Lower the leg. If hip flexor tendonitis begins, hold off on this exercise.

- May progress to 2 sets of 20 repetitions twice a day with weights.
- Keep opposite knee bent to 45 deg to limit low back lordosis

F. Proprioception Exercises

At Week 1 - Sit on Swiss Ball and contract Transversus Abdominus Muscles – Flex hip.

- Lying supine with the hips at 90 degrees of flexion and the knees at 90 degrees of flexion, hold a roller between the knees and begin rhythmic stabilizations.
- Progress at week 2 or 3 to laying supine and hold a ball on the wall with the affected leg having the hip at 90 degrees of flexion and 90 degrees of knee flexion.
- Then Progress to rhythmic stabilizations exercises

G. Passive ROM (performed by therapist and caretaker)

2 times/day for 6 weeks

- 1. Circumduction:** Lying on your back with hip in 70° flexion, move knee in a circular motion (pendulum motion). Knee not rotating beyond the shoulder – **3 sets of 5 minutes**
- 2. Passive Supine hip roll (IR):** Lying on your back with legs straight, have partner rotate thigh inward – **20 repetitions.**
- 3. Flexion:** Lying on your back have partner bend knee toward chest (90° limit for 10 days). Increase range as tolerated after 10 days – **20 repetitions.**
- 4. Rotation in Flexion:** Lying on your back have partner flex hip to 70°, rotate thigh so that the ankle moves inward (with hip flexed >70°, ER is safe) – **20 repetitions.**
- 5. Abduction:** Lying on your back with leg straight have partner bring leg away from your midline (25° limit for 3 weeks). Increase range as tolerated after 3 weeks – **20 repetitions.**
- 6. Prone Internal Rotation:** Lying on stomach with knee bent to 90°, have partner bring ankle away from the body (to the side). No external rotation in prone for 3 weeks – **20 repetitions.**
- 7. Extension: (Start 4th week)** Lying on your stomach have partner grasp knee and lift leg up from the table – **20 reps.**
- 8. FABER for ER: (Start 4th week)** Lying on your back bring involved leg into figure of four position with ankle resting on the opposite knee. Gently lower bent knee towards the table. You may need to start with ankle resting on the shin or inside of leg. It is normal to feel lateral (outer) hip discomfort. Do not push on knee.

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H. Soft tissue massage and scar mobilizations

As needed, 2 times/ day

Massage to mobilize and gently flush out edema. May use suction cups to assist – especially Adductors, Pectineus, Iliopsoas and Sartorius.

I. Passive Stretching

5 repetitions, hold 20 seconds, 2 times/ day

- 1. Piriformis Stretch:** Lying on uninvolved side, (bottom leg straight/ pelvis stacked) bend involved hip to 50-70° flexion, hook top foot behind uninvolved knee. Stabilizing pelvis, lower the involved knee towards table. Stretch should be felt in buttock. Avoid pinch in groin.
- 2. Quadriceps Stretch:** Lying on stomach, have partner bring ankle toward buttock, feeling a stretch in front of thigh.
- 3. Kneeling hip flexor stretch: (Start Week 4)** In a half kneeling position with the involved knee on the floor tighten stomach muscles. Shift weight forward while keeping trunk upright, feeling stretch in front of hip / thigh. (Microfracture patients are allowed to perform) (PT can start using Thomas stretch in therapy)
- 4. Traction / Distraction (Start Day 10) – Physical Therapist** to pull traction on the foot distally and laterally with the patient supine to distract the joint.

J. Water Progression (if you have access to a therapy pool)

10-30 minutes, 3 times a week

- 1. Water Walking** – Walk forward, backward and lateral in chest deep water. Emphasize full weight shift to involved side. Microfracture patients should use an aqua jogger or life jacket and not have the foot touch the bottom of the pool while walking.
- 2. Water Jogging** – In deep water using an aqua-jogger, jog in place (bicycle pedaling motion). May jog in pool with water at chest height (or AlterG at 50%) if no microfracture
- 3. Swimming** – Started at 10 days with buoy (pull only, do not use legs to kick until 5 weeks). **Avoid** frog kick as in the breast stroke.

Avoid egg beater motion (treading water)

K. Quadruped Rocking

3 sets, 20 repetitions, Once a day

On your hands and knees shift your body weight forward on your arms then back onto your legs. You may also shift side to side in diagonal directions.

L. Standing Hip IR

3 sets, 20 repetitions, Once a day

Place knee of involved leg on a stool. Rotate hip without moving trunk, so that the stool turns (moving your foot outward from the body).

- Progress to using a resisted band.

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M. Active Prone IR/ER

20 repetitions, Once a day

Lying on your stomach with knee bent to 90°, allow foot to drop out so hip is in full internal rotation. **Actively** rotate hip back to neutral only.

- Partner gradually adds resistance to this motion in both directions, can go beyond neutral after 3 weeks.

N. Lower Abdominal Progression

20 repetitions, Once a day

- 1. Heel Slides with Strap:** Lying on your back, place strap around foot and use arms to pull heel towards your buttocks keeping heels on mat and core stable.
- 2. Heel slides without strap:** Gradually reduce the use of your arms and strap and increase the use of hip muscles to slide heel until you do not need the strap (monitor for hip flexor pain)
- 3. Heel Slide to a March:** Perform heel slide then lift your heel off table so hip is bent to 90° keeping core stable, return leg to starting position. Alternate legs (PT can advance to even more difficult exercises as long as you avoid hip flexor pain)

O. Glute Progression

3 sets, 10 repetitions, Once a day

1. Two way leg raises

- a. Lying on uninvolved side, raise top leg up and slightly back without moving your trunk (side leg raise)
- b. Lying on your stomach raise your involved leg up 6-8 inches (stomach leg raise) – begin after 4 – 5 weeks

2. Rose Wall Slides (week 4): Lying on uninvolved side, shoulders, hips, and heels flush up against a wall. Slowly slide top involved heel along wall maintaining drawn in abdominal muscles.

3. Prone Heel Squeeze (week 5): Lie on your stomach. Slightly separate then bend your knees about 45°, place your heels together (Froggie). Draw abdominals in and squeeze heels together for 5 seconds. Increase difficulty by lifting your thighs off the mat with heel squeeze maintaining a stable pelvis. Do not arch your back.

P. Bridging Series

3 sets, 20 repetitions, 1-2 times / day

1. Double leg bridge: Lying on your back, place a rubber ball between your knees (size of ball should be such that the hips are in neutral) with hip and knees bent. Gently squeeze the ball and raise buttocks while keeping core stable then slowly lower.

- Progress to using a rubber tubing around knees and while pushing out against the bands, but keeping the hips and knees at neutral, raise the buttocks while keeping the core stable and slowly lower.
- Progress to single leg bridging

2. Bridge on Swiss Ball: Lying on your back place feet up on Swiss ball. Keep knees straight and core stable as you raise your buttocks, hold 5 seconds then lower.

- Progress to laying with shoulders on ball and feet on floor then lowering and raising your buttocks.
- Add arm rotations in this position or perform with single leg bridge

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Q. Leg Press (limited weight) – Start Week 5 (after straight leg raises and short arc quads)

3 sets, 30 repetitions, Once a day

Using light weight (20-30 lbs), perform leg press. Increase weight in Phase II.

R. Gait Progression: “Crutch weaning”

After the indicated amount of weeks on crutches:

Gradually add 25% weight on surgical leg every 1-3 days until 100% continuing to use both crutches during this period. Avoid limping and focus on correct walking weight shift and mechanics. Weight shifting exercises should be used during this time. Make sure patient is getting full hip extension. Return to crutches for early fatigue.

General Rules About Weight Bearing

- 8 weeks of 20 lb Foot Flat Weight Bearing After Microfracture
- If No Microfracture, but There is a Chielectomy / Osteoplasty
 - 2 weeks of 20 lb Foot Flat Weight Bearing if Female < 40 y/o or Males < 60 y/o
 - Add 1 week of limited Weight Bearing for each decade after 40 for Females or 60 for males (example, 45 year old female 3 weeks, 55 year old female 4 weeks)

S. Cardiovascular

- a. Deep water pool
 - i. Aqua jog / walk
 - ii. Scissors
 - iii. Swim (no kick at first, regular, flutter kick after 4 weeks)

T. General

- a. Caution – Tendinitis may occur with too aggressive rehab early on, particularly eccentric training
 - i. Adductors
 - ii. Hip flexors (rectus femoris)
 - iii. Piriformis.
- b. Critical early on to rehab / focus
 - i. Gluteal muscle group
 - ii. Iliopsoas
 - iii. Hip rotators

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Phase II: Intermediate Exercises *“Close Chain, Single Plane”*

A. Balance Progression

3 sets, hold 30 seconds, Once a day

1. Double Leg Stance – after fully weight bearing, stand on uneven surface for balance

2. Single Leg Stance – after 1 week of double leg stance on uneven surface, do single leg stance on regular surface

- Progress to single leg stance on uneven surface.

2. Dyna-disc: Start with poles for support

- Progress by touching the opposite foot to ground @9, 10.5, 12, 1.5 and 3 o'clock positions.
- Add **Dynamic Balance** activities as tolerated

B. Stationary biking with resistance

30-45 minutes

Increase resistance slowly while maintaining 60-80 RPM. Reduce time on bike when initiating resistance.

For Cyclists: Due to the correct pedaling motion and the great amount of hip flexor use:

1st three weeks: use flats on trainer

3rd to 4th weeks: clip-less with no resistance

C. Double 1/3 knee bends

3 sets, 20 repetitions, Once a day

Start standing with feet shoulder width apart, bend at the knees to 60°. Do not allow knees to go past toes.

- Progress by using a sport cord for resistance.

D. Advanced Core Progression

3 sets, 20 repetitions, Once a day

1. Planks: (not before week 4) Lie on either side with your knees bent resting on your elbow. Lift your hips up to a straight line, then slowly lower.

- Progress by performing with legs straight.
- Progress to performing on back and stomach positions.

2. Pilates: *Perform the following exercises on the reformer with an instructor:*

Footwork series, Skater series, hip extensions.

E. Manual mobilization: (Therapist – as needed)

If post capsule tightness is noted refer to photos for preferred mobs

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F. Side Stepping

3 sets, 20 repetitions, Once a day

Place rubber tubing around ankles. Bend at the knee and sidestep in each direction while maintaining the bent knee position and chest upright. Start with ankles just beyond shoulder width.

G. Elliptical trainer/ stair master

15-20 minutes, 3 times/week

Begin with minimal resistance and progress intensity or time as tolerated.

H. Single 1/3 Knee Bends

3 sets, 20 repetitions, Once a day

Start this exercise after able to do double leg knee bend without shifting weight / trendelenberg. Same starting position as double knee bends but with only surgical leg. Bend knee to 60° flexion while maintaining a level pelvis and not letting the knee “fall in” (corkscrew)

- Progress by adding cord for resistance
- **Other single leg closed kinetic chain exercises:**
 - **Lateral Step Downs:**
 - **Balance Squats:**

I. Strength

- Leg Press

J. Cardiovascular

- Pool running with water at waist height
- Elliptical trainer

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PHASE III AND IV

Phase III: Advanced Exercises “multi-directional & plyometric”

A. Plyometrics – water to dry land progressions

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 plyometrics.

B. Forward/Backward running with cord

3 sets, 1-2 minute intervals, 1 time / day

Jog/ run in place, absorbing your weight as you land on each leg. Repeat for one minute. Turn for backwards running.

C. Initial agility drills – Straight Plane Agility

Chop-Downs/ Back Pedaling – Jog forward, stutter step to a stop, absorb and push off smoothly in 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.

D. Side to side lateral agility with cord

3 sets, 50 reps, 3 times / week

Maintain an athletic stance while stepping/ jumping laterally. As you return to the starting position, absorb onto the involved leg. Progress to lateral jumping.

E. Running/ Skating/ Golf progression

RUNNING: Start each phase with 10 minutes total of walking/ running.

If running on ground, alternate run – walk as below.

If running on treadmill, gradually increase speed and duration.

Progress to the next phase after completing 20 minutes without pain.

Phase	Walk Run Ratio	Total Time	Frequency	Duration
1	4 minutes/ 1 minute	10-20 minutes	3-4 times/ week	1 week
2	3 minutes/ 2 minutes	10-20 minutes	3-4 times/ week	1 week
3	2 minutes/ 3 minutes	10-20 minutes	3-4 times/ week	2 weeks
4	1 minute/ 4 minutes	10-20 minutes	3-4 times/ week	2 weeks

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SKATING: Start each phase with 10 minute rink skating warm up. Progress to the next phase after completing 20 minutes without pain. **Goalie – hold back pads an extra week

Phase			
1	Skate: No pads forward and back with crossover	10-20 minutes	3-4 times/ week
2	Skate: Use of Pads with change of direction, stop/ start	10-20 minutes	3-4 times/ week
3	Sport Specific Drills		2-4 times/ week
4	Sports Test		Week 8+
5	Full Contact – Practice with Team		After Passing Test

BALLET/ DANCE:

Phase	
1	Bar Work: stabilization on surgical leg
2	Multi plane muscle stretching
3	Multi plane muscle single leg activities/ moves
4	Sport Test
5	Jumps

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

Phase			
1	Putt, Chip, ½ swing only	1 bucket	1-2 weeks
2	8-9 Irons, ¾ swing only	1 bucket	2 weeks
3	All Irons, Use cart, full swing	9 holes	2 weeks
4	Full play, walking 18 holes	18 holes	

Phase IV: High Level Activities –

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.

C. Sport Specific Training

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Basketball Progression

Phase I & II (out of 4)

Jogging- running every other day.
Mon- Wed- Fri-Sun- Tu- Thur- Sat.

Monday:

- use of Football practice field
- 200m jog -200m walk x 3 times
- 400m jog. - 400 m walk X 2 times
- Running gait training
- Hip and core training

Wednesday:

Same as Monday

Friday:

- At Football field or 400m Track
- 400 m jog - 200 m walk X 3 times
- 30yd fast pace run (at Football field)
- 8 x 2 sets (7-8 seconds pace)
- Gait training
- Hip and core training

Sunday:

Same as Friday

Actually, one week after the running progression, we usually begin running on the court.

Tuesday:

- 30yd fast pace jog
- 8 x 2 sets (7-8 seconds pace)

- 30 yd (6-6.5sec)
- 10 x 1 set

Gait training

Hip and core training

Thursday:

Same as Tuesday

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Basketball Progression

Saturday:

30 yd

1 x 4 (6 sec)

1 x 4 (5.5sec) X 2 sets

2 x 4 (5 sec)

Diagonal Z pattern jogging

Vertical jumps - lands and runs

Diagonal jog- spin turns.

Lateral walks

Hip and Core training.

Phase III- Once you feel comfortably running everyday, begin to play 1-on-1 offense every other days, then, progress to play defense. Once you start playing defense, you should progress to play 5-on-0.

Phase IV- runs-sprints daily, 5-on-0 full speed, 5-on-5 as tolerate.

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INTERVAL GOLF PROGRAM – Sport Specific Training

	Monday	Wednesday	Friday
1 st week	10 putts 10 chips 5 min rest 15 chips	15 putts 15 chips 5 min rest 25 chips	20 putts 20 chips 5 min rest 20 putts 20 chips 5 min rest 10 chips 10 short irons
2 nd week	20 chips 10 short irons 5 min rest 10 short irons	20 chips 15 short irons 10 min rest 15 short irons 15 chips putting	15 short irons 10 medium irons 10 min rest 20 short irons 15 chips
3 rd week	15 short irons 15 medium irons 10 min rest 5 long irons 15 short irons 15 medium irons 10 min rest 20 chips	15 short irons 10 medium irons 10 long irons 10 min rest 10 short irons 10 medium irons 5 long irons 5 woods	15 short irons 10 medium irons 10 long irons 10 min rest 10 short irons 10 medium irons 10 long irons 10 woods
4 th week	15 short irons 10 medium irons 10 long irons 10 drives 15 min rest Repeat	Play 9 holes	Play 9 holes
5 th week	9 holes	9 holes	18 holes

Note: Flexibility exercises before hitting and use ice after hitting. Key to golf program: chips, pitching wedge; short irons, W,9, 8; medium iron, 7, 6, 5; long irons, 4, 3, 2; woods, 5, 3; drives, driver.

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WATER POLO PROGRESSION

Water Based Activities

1. At 4 weeks: May begin light swimming with pull buoy at all times, no leg kicking.
2. At 6 weeks:
 - a. Start Swimming flutter kick every other day, progressing to every day by 8-9 weeks
 - b. Avoid Loading Flexors too much
 - c. Swim without fins (flutter kick / freestyle only)
 - d. Kicking with Kickboard
3. At 10 weeks:
 - a. Swim with fins (no breaststroke)
4. **NO Egg Beaters or Breast Stroke Until 12 weeks Post Op.**
5. At 12 Weeks:
 - a. Eggbeater with aqua jogger (if desired). Can also swim breaststroke.
 - b. Progress to Eggbeater without resistance, no aqua jogger.
 - c. Progress to Eggbeater with resistance.
 - i. Can start throwing, beginning with short distance.
 - ii. Breaststroke kick upright (not max effort).
 - d. Eggbeater with jumps (multidirectional) in or out of goal
 - e. Progress to Live shots
6. At 16 weeks:
 - a. Return to Full activities and sport as directed by MD and therapist.

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