



## Mosaicplasty and OATS Rehabilitation Protocol

### **PHASE 1: 0 – 2 weeks after surgery**

You will go home with **crutches, cryocuff cold therapy unit and a CPM machine.**

#### **GOALS:**

1. Protect the cartilage transfer – avoid weight bearing if instructed to do so
2. Ensure wound healing
3. Attain and maintain full knee extension
4. Gain knee flexion (knee bending) to 90 degrees
5. Decrease knee and leg swelling
6. Promote quadriceps muscle strength
7. Avoid blood pooling in the leg veins

#### **ACTIVITIES:**

##### **CONTINUOUS PASSIVE MOTION (CPM)**

Use the CPM machine at home as much as possible. Do not wear the brace when in the CPM machine. **You should use the machine at least 10 hours per day.** You may move the machine to a sofa, the floor or onto a bed as you change positions and locations. You should use the machine at night while sleeping; slow down the machine at night to facilitate sleeping. **Extension** (knee straight) on the machine should be set at **minus five** degrees at all times to help your knee extend. **It is very important that you straighten the knee completely!** The machine should be programmed to include an extension pause of 5 seconds (in other words, when the knee is straightened out, it pauses in the straight position to allow you to stretch it out straight). This flexion setting will start at around 30 – 40 degrees and should be gradually increased to 90 degrees as you can tolerate more bending of your knee.

##### **BRACE/CRUTCHES**

For patellar and trochlear groove lesions, you will wear a knee brace, which is set to allow your knee to bend only 30 degrees and straighten fully. Use it when walking and put as much weight on your operated leg as possible (without pain) when walking. You should use the crutches in the beginning, but can discontinue the crutches when you have confidence in the knee to support you.

For femoral condyle defects, no brace is used, but crutches and restricted weight bearing will be necessary for longer periods. Your doctor will give special instructions in these cases.

## **CRYOCUFF (COLD APPLICATION)**

If you are experiencing pain, swelling, or discomfort, we suggest icing for 15-20 minutes with at least a 60-minute break in between. Use your cryocuff or place ice in a zip lock bag and/or in a towel and apply to the injured area. Never place ice directly on the skin.

## **WOUND CARE**

Remove your bandage on the second morning after surgery but leave the small pieces of white tape (steri strips) across the incision. You can wrap an elastic bandage (ace) around the knee at other times to control swelling. You may now shower and get your incision wet, but **do not** soak the incision in a bathtub or Jacuzzi until the stitches have been removed.

## **ASPIRIN / ELASTIC STOCKINGS**

Take an aspirin each morning, wear an elastic stocking (TED) below the knee, and do at least 10 ankle pump exercises each hour to help prevent phlebitis (blood clots in the veins).

## **FREE / MACHINE WEIGHTS**

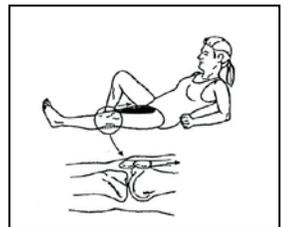
### **Upper Body/Trunk Only**

We suggest that you do not use any lower extremity free or machine weights. If you are doing free or machine weights for the upper body and trunk, we suggest a very light resistance of 3 sets of 15-20 repetitions. Do not place yourself in a compromising position with your recently operated knee.

## **EXERCISE PROGRAM**

**QUADRICEPS SETTING** - to maintain muscle tone in the thigh muscles and straighten the knee.

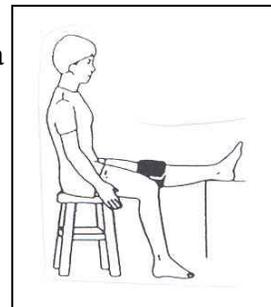
Lie on your back with the knee extended fully straight as in figure. Tighten and hold the front thigh muscle making the knee flat and straight. If done correctly, the kneecap will slide slightly upward toward the thigh muscle. The tightening action of the quadriceps should make your knee straighten and be pushed flat against the bed or floor. Hold 5 seconds for each contraction. Do 20 repetitions three times a day.



**HEEL PROP**- to straighten (extend) the knee.

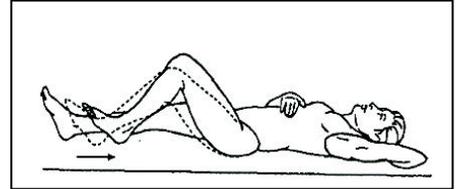
Lie on your back with a rolled up towel under your heel or sit in a chair with the heel on a stool as shown in the figure. Let the knee relax into extension (straight). If the knee will not straighten fully, you can place a weight (2 to 5 pounds) on the thigh, just above the kneecap.

Try to hold this position for **5 minutes, three times a day. While maintaining this extended position, practice quadriceps setting.**



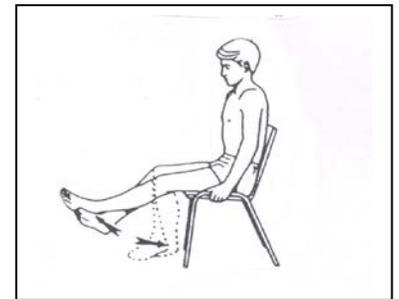
**HEEL SLIDES** - to regain the bend (flexion) of the knee.

While lying on your back, actively slide your heel backward to bend the knee. Keep bending the knee until you feel a stretch in the front of the knee. Hold this bent position for 5 seconds and then slowly relieve the stretch and straighten the knee. While the knee is straight, you may repeat the quadriceps setting exercise. Repeat 20 times, three times a day.



**SITTING HEEL SLIDES** - to regain the bend (flexion of the knee).

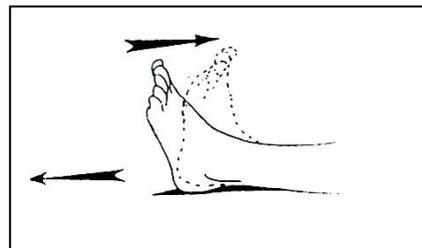
When sitting in a chair, slide the heel backward as if trying to get the foot underneath the chair (figure 5). Hold 5 seconds and slowly relieve the stretch by sliding the foot forward. You can help with the opposite foot if necessary.



Repeat 20 times, three times a day.

**ANKLE PUMPS** - to stimulate circulation in the leg.

You should do at least 10 ankle pump exercises each hour.



**OFFICE VISIT**

Please return to see Dr. Gill approximately **ten to fourteen days** after your surgery. At this time, your sutures will be removed and your progress will be checked.

## **Mosaicplasty and OATS Rehabilitation Protocol**

### **Phase Two: 2 to 6 weeks after surgery**

#### **Goals:**

1. Protect the knee from overstress and allow healing
2. Regain full motion
3. Begin muscle strengthening

#### **Brace and Crutches:**

For patellar and trochlear groove lesions, you will wear a knee brace, which is set to allow your knee to bend only 30 degrees and straighten fully. Use it when walking and put as much weight on your operated leg as possible (without pain) when walking. You should use the crutches in the beginning, but can discontinue the crutches when you have confidence in the knee to support you.

For femoral condyle defects, no brace is used, but crutches and restricted weight bearing will be necessary for longer periods. Dr. Gill will give special instructions in these cases.

#### **Exercise Program**

The following exercise program should be followed as directed by your doctor or the physical therapist. Do the exercises daily unless otherwise noted.

#### **STATIONARY BICYCLE**

Utilize a stationary bicycle to move the knee joint and increase knee flexion. If you cannot pedal all the way around, then keep the foot of your operated leg on the pedal, and pedal back and forth until your knee will bend far enough to allow a full cycle. Most people are able to achieve a full cycle revolution backwards first, followed by forward. You may ride the cycle with no resistance for 20 to 30 minutes a day. Set the seat height so that when you are sitting on the bicycle seat, your knee is fully extended with the heel resting on the pedal in the fully bottom position. You should then actually ride the bicycle with your forefoot resting on the pedal.



**WATER WORKOUT** (optional)

Utilize an Aqua jogger floatation vest to run in deep water with **no foot contact** to the pool floor or swim flutter kick only for up to 20 minutes 2 or 3 times a week

**QUADRICEPS SETTING** - to maintain muscle tone in the thigh muscles and straighten the knee. See figure in phase 1.

Lie on your back with the knee extended fully straight. Tighten and hold the front thigh muscle making the knee flat and straight. If done correctly, the kneecap will slide slightly upward toward the thigh muscle. The tightening action of the quadriceps should make your knee straighten and be pushed flat against the bed or floor.



Hold 5 seconds for each contraction. Do 20 repetitions three times a day until you can fully straighten your knee equal to the unoperated side.

**HEEL PROP** - to straighten (extend) the knee.

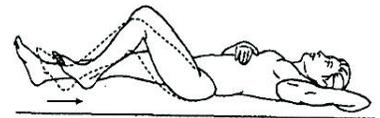
Lie on your back with a rolled up towel under your heel or sit in a chair with the heel on a stool as shown in the figure. Let the knee relax into extension (straight). If the knee will not straighten fully, you can place a weight (2 to 5 pounds) on the thigh, just above the kneecap.



Try to hold this position for **5 minutes, three times a day. While maintaining this extended position, practice quadriceps setting.**

**HEEL SLIDES** - to regain the bend (flexion) of the knee.

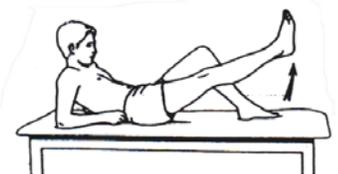
While lying on your back actively slide your heel backward to bend the knee. Keep bending the knee until you feel a stretch in the front of the knee. Hold this bent position for 5 seconds and then slowly relieve the stretch and straighten the knee. While the knee is straight, you may repeat the quadriceps setting exercise. Continue this exercise until you can fully bend your knee equal to the unoperated side.



Repeat 20 times, three times a day.

**STRAIGHT LEG LIFT**

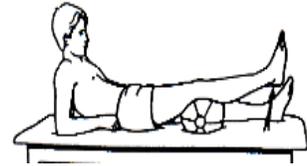
Tighten the quadriceps muscle so that the knee is flat, straight and fully extended. Try to raise the entire operated limb up off of the floor or bed. If you are able to keep the knee straight raise the limb to about 45 degrees, pause one second and then lower slowly to the bed. Relax and repeat.



If the knee bends when you attempt to lift the limb off of the bed, **do not** do this exercise. Keep trying to do the quadriceps setting exercise until you can lift the limb without letting the knee bend. Repeat 20 times.

### **SHORT ARC LIFT**

With the knee bent over a rolled up towel or blanket, lift the foot so that the knee fully straightens. Hold the knee locked in extension for 5 seconds, then slowly lower. Repeat 20 times.



### **STANDING HAMSTRING CURL**

Stand facing the wall, using the wall for balance and support. While standing on the unoperated limb bend the knee of the operated side and raise the heel toward the buttock. Hold this flexed position for one second. Slowly lower the foot back to the floor. Keep the thighs aligned as illustrated. Repeat 20 times.



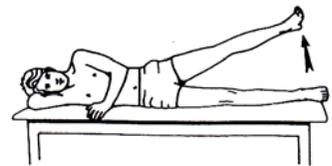
### **STANDING TOE RAISE**

Stand facing a wall, hands on the wall for support and balance. Keep the knees extended fully. Tighten the quadriceps to hold the knee fully straight. Raise up on 'tip-toes' while maintaining the knees in full extension. Hold for one second, then lower slowly to the starting position. Repeat 20 times.



### **HIP ABDUCTION**

Lie on your unoperated side. Keep the knees fully extended. Raise the operated limb upward to a 45 degree angle as illustrated. Hold for one second, and then lower slowly. Repeat 20 times.



### **OFFICE VISIT**

Please make an appointment with Dr. Gill at 3-4 months after surgery.



**Rehabilitation after Mosaicplasty and OATS Surgery**

<b>Post-op Phase</b>	<b>Weight bearing status</b>	<b>Use of brace</b>	<b>Passive ROM and Active ROM</b>	<b>Strength training</b>	<b>Return to running and sports</b>	<b>Recommended Restrictions</b>
<b>Phase One and Two</b> 0 to 6 weeks	Patellar /trochlear groove lesions are WBAT  Femoral condyle defects are TDWB with crutches	Postoperative Brace for patellar/trochlear when ambulating ROM 0-30	CPM 10 hours /day for the first 2 weeks after surgery  Stationary bike with no resistance starting the 3 <sup>rd</sup> postop week	Isometric Quad and knee extension, active and assisted knee flexion, SAQ, straight leg raises, stationary bike	none	Emphasize compliance with weigh bearing restrictions, brace use and CPM
<b>Phase Three</b> 6 to 12 weeks	Progressive weight bearing to full, as tolerated.	Postoperative brace discontinued.  Wean crutches per doctor.	Full Rom  Stationary bike	Progressive ankle weight resistance, partial squats and wall slides 0-30 for patellar/trochlear,	none	No stairmaster or Impact exercises  Avoid pivoting and varus/valgus stresses  Limit OC and CC knee extension arc to 0-30 for patellar/trochlear.
<b>Phase Four</b> 12 to 18weeks	Full	Per doctor's advice	No restrictions Active stretching all muscle groups  Stationary bike Elliptical trainer	Continue closed-chain strengthening, Start step-up-down progression Strength machines OK, except no knee extension machine. No leg press for patellar/trochlear	Consult doctor	Avoid patellofemoral overload  Limit OC and CC knee extension arc to 0-30 with patellar/trochlear