

## Rehabilitation Protocol for ACL Reconstruction

This protocol is intended to guide clinicians and patients through the post-operative course of an ACL reconstruction. Specific intervention should be based on the needs of the individual and should consider exam findings and clinical decision making. If you have questions, contact the referring physician.

### Considerations for allograft and hamstring autograft

Early weight bearing and early rehabilitation intervention vary for allograft and hamstring autograft. Please reference specific instructions below. Expectations are the early return to sport phase will be delayed.

### Considerations with concomitant injuries

Be sure to follow the more conservative protocol with regards to range of motion, weight bearing, and rehab progression when there are concomitant injuries (i.e. meniscus repair).

### Post-operative considerations

If you develop a fever, intense calf pain, excessive drainage from the incision, uncontrolled pain or any other symptoms you have concerns about you should call your doctor.

### PHASE I: IMMEDIATE POST-OP (0-2 WEEKS AFTER SURGERY)

<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"> <li>• Protect graft</li> <li>• Reduce swelling, minimize pain</li> <li>• Restore patellar mobility</li> <li>• Restore full extension, gradually improve flexion</li> <li>• Minimize arthrogenic muscle inhibition, re-establish quad control, regain full active extension</li> <li>• Patient education <ul style="list-style-type: none"> <li>○ Keep your knee straight and elevated when sitting or laying down. Do not rest with a towel placed under the knee</li> <li>○ Do not actively kick your knee out straight; support your surgical side when performing transfers (i.e. sitting to laying down)</li> <li>○ Do not pivot on your surgical side</li> </ul> </li> </ul>
<b>Weight Bearing</b>	<p><i>Walking</i></p> <ul style="list-style-type: none"> <li>• Initially brace locked, crutches</li> <li>• May start walking without crutches as long as there is no increased pain <ul style="list-style-type: none"> <li>○ Allograft and hamstring autograft continue partial weight bearing with crutches for 6 weeks unless otherwise instructed by MD</li> </ul> </li> <li>• May unlock brace once able to perform straight leg raise without lag</li> <li>• May discontinue use of brace after 6 wks per MD and once adequate quad control is achieved</li> <li>• When climbing stairs, make sure you are leading with the non-surgical side when going up the stairs, make sure you are leading with the crutches and surgical side when going down the stairs</li> </ul>
<b>Intervention</b>	<p><i>Swelling Management</i></p> <ul style="list-style-type: none"> <li>• Ice, compression, elevation (check with MD re: cold therapy)</li> <li>• Retrograde massage</li> <li>• <u>Ankle pumps</u></li> </ul> <p><i>Range of motion/Mobility</i></p> <ul style="list-style-type: none"> <li>• <u>Patellar mobilizations</u>: superior/inferior and medial/lateral <ul style="list-style-type: none"> <li>○ <b>**Patellar mobilizations are heavily emphasized in the early post-operative phase following patella tendon autograft**</b></li> </ul> </li> <li>• <u>Seated assisted knee flexion extension</u> and <u>heel slides with towel</u></li> <li>• Low intensity, long duration extension stretches: <u>prone hang</u>, <u>heel prop</u></li> <li>• <u>Standing gastroc stretch</u> and <u>soleus stretch</u></li> </ul>



	<ul style="list-style-type: none"> <li>• <u>Supine active hamstring stretch</u> and <u>supine passive hamstring stretch</u></li> </ul> <p><i>Strengthening</i></p> <ul style="list-style-type: none"> <li>• <u>Calf raises</u></li> <li>• <u>Quad sets</u></li> <li>• NMES high intensity (2500 Hz, 75 bursts) supine knee extended 10 sec/50 sec, 10 contractions, 2x/wk during sessions—use of clinical stimulator during session, consider home units distributed immediate post op</li> <li>• <u>Straight leg raise</u> <ul style="list-style-type: none"> <li>○ <b>**Do not perform straight leg raise if you have a knee extension lag</b></li> </ul> </li> <li>• <u>Hip abduction/side leg lift</u></li> <li>• Multi-angle isometrics 90 and 60 deg knee extension</li> </ul>
<b>Criteria to Progress</b>	<ul style="list-style-type: none"> <li>• Knee extension ROM 0 deg</li> <li>• Quad contraction with superior patella glide and full active extension</li> <li>• Able to perform straight leg raise without lag</li> </ul>

**PHASE II: INTERMEDIATE POST-OP (3-5 WEEKS AFTER SURGERY)**

<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"> <li>• Continue to protect graft</li> <li>• Maintain full extension, restore full flexion (contra lateral side)</li> <li>• Normalize gait</li> </ul>
<b>Additional Intervention</b> <i>*Continue with Phase I interventions</i>	<p><i>Range of motion/Mobility</i></p> <ul style="list-style-type: none"> <li>• <u>Stationary bicycle</u></li> <li>• Gentle stretching all muscle groups: <u>prone quad stretch</u>, <u>standing quad stretch</u>, <u>kneeling hip flexor stretch</u></li> </ul> <p><i>Strengthening</i></p> <ul style="list-style-type: none"> <li>• <u>Prone hamstring curls</u></li> <li>• <u>Step ups</u> and <u>step ups with march</u></li> <li>• <u>Partial squat exercise</u></li> <li>• <u>Ball squats</u>, <u>wall slides</u>, <u>mini squats</u> from 0-60 deg</li> <li>• Lumbopelvic strengthening: <u>bridge &amp; unilateral bridge</u>, <u>sidelying hip external rotation-clamshell</u>, <u>bridges on physioball</u>, <u>bridge on physioball with roll-in</u>, <u>bridge on physioball alternating</u>, <u>hip hike</u></li> </ul> <p><i>Balance/proprioception</i></p> <ul style="list-style-type: none"> <li>• Single leg standing balance (knee slightly flexed) static progressed to dynamic and level progressed to unsteady surface</li> <li>• Lateral step-overs</li> <li>• Joint position re-training</li> </ul>
<b>Criteria to Progress</b>	<ul style="list-style-type: none"> <li>• No swelling (Modified Stroke Test)</li> <li>• Flexion ROM within 10 deg contra lateral side</li> <li>• Extension ROM equal to contra lateral side</li> </ul>

**PHASE III: LATE POST-OP (6-8 WEEKS AFTER SURGERY)**

<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"> <li>• Continue to protect graft site</li> <li>• Maintain full ROM</li> <li>• Safely progress strengthening</li> <li>• Promote proper movement patterns</li> <li>• Avoid post exercise pain/swelling</li> <li>• Avoid activities that produce pain at graft donor site</li> </ul>
<b>Additional Intervention</b> <i>*Continue with Phase I-II Interventions</i>	<p><i>Range of motion/Mobility</i></p> <ul style="list-style-type: none"> <li>• Rotational tibial mobilizations if limited ROM</li> </ul> <p><i>Cardio</i></p> <ul style="list-style-type: none"> <li>• Elliptical, stair climber, flutter kick swimming, pool jogging</li> </ul> <p><i>Strengthening</i></p> <ul style="list-style-type: none"> <li>• Gym equipment: <u>leg press machine</u>, <u>seated hamstring curl machine</u> and <u>hamstring curl machine</u>, <u>hip abductor and adductor machine</u>, <u>hip extension machine</u>, <u>roman chair</u>, <u>seated calf machine</u> <ul style="list-style-type: none"> <li>○ Hamstring autograft can begin resisted hamstring strengthening at 12 weeks</li> </ul> </li> </ul>



	<ul style="list-style-type: none"> <li>Progress intensity (strength) and duration (endurance) of exercises</li> <li>**The following exercises to focus on proper control with emphasis on good proximal stability</li> <li><u>Squat to chair</u></li> <li>Lateral lunges</li> <li><u>Romanian deadlift</u></li> <li>Single leg progression: <u>partial weight bearing single leg press</u>, <u>slide board lunges</u>, <u>step ups</u> and <u>step ups with march</u>, <u>lateral step-ups</u>, <u>step downs</u>, <u>single leg squats</u>, <u>single leg wall slides</u></li> <li><u>Knee Exercises</u> for additional exercises and descriptions</li> <li><i>Balance/proprioception</i></li> <li>Progress single limb balance including perturbation training</li> </ul>
<b>Criteria to Progress</b>	<ul style="list-style-type: none"> <li>No swelling/pain after exercise</li> <li>Normal gait</li> <li>ROM equal to contra lateral side</li> <li>Joint position sense symmetrical (&lt;5 degree margin of error)</li> <li>Quadriceps index ≥80%; HHD mean preferred (isokinetic testing if available)</li> </ul>

**PHASE IV: TRANSITIONAL (9-12 WEEKS AFTER SURGERY)**

<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"> <li>Maintain full ROM</li> <li>Safely progress strengthening</li> <li>Promote proper movement patterns</li> <li>Avoid post exercise pain/swelling</li> <li>Avoid activities that produce pain at graft donor site</li> </ul>
<b>Additional Intervention</b> <i>*Continue with Phase I-III interventions</i>	<ul style="list-style-type: none"> <li>Begin sub-max sport specific training in the sagittal plane</li> <li>Bilateral PWB plyometrics progressed to FWB plyometrics</li> </ul>
<b>Criteria to Progress</b>	<ul style="list-style-type: none"> <li>No episodes of instability</li> <li>Maintain quad strength</li> <li>10 repetitions single leg squat proper form through at least 60 deg knee flexion</li> <li>Drop vertical jump with good control</li> <li><u>KOOS-sports questionnaire</u> &gt;70%</li> <li><u>Functional Assessment</u> <ul style="list-style-type: none"> <li>Quadriceps index &gt;80%; HHD mean preferred (isokinetic testing if available)</li> <li>Hamstring, glut med, glut max index ≥80%; HHD mean preferred (isokinetic testing for HS if available)</li> <li>Single leg hop test ≥75% compared to contra lateral side (earliest 12 wks)</li> </ul> </li> </ul>

**PHASE V: EARLY RETURN TO SPORT (3-5 MONTHS AFTER SURGERY)**

<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"> <li>Safely progress strengthening</li> <li>Safely initiate sport specific training program</li> <li>Promote proper movement patterns</li> <li>Avoid post exercise pain/swelling</li> <li>Avoid activities that produce pain at graft donor site</li> </ul>
<b>Additional Intervention</b> <i>*Continue with Phase II-IV interventions</i>	<ul style="list-style-type: none"> <li>Interval running program <ul style="list-style-type: none"> <li><u>Return to Running Program</u></li> </ul> </li> <li>Progress to plyometric and agility program (with functional brace if prescribed) <ul style="list-style-type: none"> <li><u>Agility and Plyometric Program</u></li> </ul> </li> </ul>



<b>Criteria to Progress</b>	<ul style="list-style-type: none"> <li>• Clearance from MD and ALL milestone criteria below have been met</li> <li>• Completion jog/run program without pain/swelling</li> <li>• <u>Functional Assessment</u> <ul style="list-style-type: none"> <li>○ Quad/HS/glut index <math>\geq 90\%</math>; HHD mean preferred (isokinetic testing if available)</li> <li>○ Hamstring/Quad ratio <math>\geq 70\%</math>; HHD mean preferred (isokinetic testing if available)</li> <li>○ Hop Testing <math>\geq 90\%</math> compared to contra lateral side</li> </ul> </li> <li>• <u>KOOS-sports questionnaire</u> <math>&gt; 90\%</math></li> <li>• <u>International Knee Committee Subjective Knee Evaluation</u> <math>&gt; 93</math></li> <li>• <u>Psych Readiness to Return to Sport (PRRS)</u></li> </ul>
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**PHASE VI: UNRESTRICTED RETURN TO SPORT (6+ MONTHS AFTER SURGERY)**

<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"> <li>• Continue strengthening and proprioceptive exercises</li> <li>• Symmetrical performance with sport specific drills</li> <li>• Safely progress to full sport</li> </ul>
<b>Additional Intervention</b> <i>*Continue with Phase II-V interventions</i>	<ul style="list-style-type: none"> <li>• Multi-plane sport specific plyometrics program</li> <li>• Multi-plane sport specific agility program</li> <li>• Include hard cutting and pivoting depending on the individuals' goals (~7 mo)</li> <li>• Non-contact practice → Full practice → Full play</li> </ul>
<b>Criteria to Progress</b>	<ul style="list-style-type: none"> <li>• Last stage, no additional criteria</li> </ul>

Revised January 2018

<b>Contact</b>	Please call 617.643.9999 with any questions specific to this protocol
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References

Adams D, Logerstedt D, et al. Current Concepts for Anterior Cruciate Ligament Reconstruction: A Criterion-Based Rehabilitation Progression. *JOSPT* 2012 42(7): 601-614.

Di Stasi S, Myer GD, Hewett TE. Neuromuscular Training to Target Deficits Associated with Second Anterior Cruciate Ligament Injury. *JOSPT* 2013 43 (11): 777-792.

Glazer DD. Development and Preliminary Validation of the Injury-Psychological Readiness to Return to Sport (I-PRRS) Scale. *Journal of Athletic Training*. 2009;44(2):185-189.

Irrgang JJ, Anderson AF, Boland AL, et al. Development and validation of the International Knee Documentation Committee Subjective Knee Form. *Am J Sports Med*. 2001;29:600-613.

Mandelbaum BR, Silvers HJ, Watanabe DS, et al. Effectiveness of a Neuromuscular and Proprioceptive Training Program in Preventing Anterior Cruciate Ligament Injuries in Female Athletes: 2-year follow-up. *Am J Sports Med*. 2005;33:1003-1010.

Wright RW, Haas AK, et al. Anterior Cruciate Ligament Reconstruction Rehabilitation: MOON Guidelines. *Sports Health* 2015 7(3): 239-243.

Wilk KE, Macrina LC, et al. Recent Advances in the Rehabilitation of Anterior Cruciate Ligament Injuries. *JOSPT* 2012 42(3): 153-171.



**Range of motion** is recorded in X-0-X format: for example, if a patient has 6 degrees of hyperextension and 135 degrees of flexion, ROM would read: 6-0-135. If the patient does not achieve hyperextension, and is lacking full extension by 5 degrees, the ROM would simply read: 5-135.

**Pain** is recorded as an average value over the past 2 weeks, from 0-10. 0 is absolutely no pain, and 10 is the worst pain ever experienced.

**Knee Effusion** is tested using the Modified Stroke Test. An upstroke is applied to medial side of knee, followed by downstroke on lateral side. The therapist observes for movement of fluid with each stroke.

- 0: no wave produced with downward stroke
- Trace: small wave of fluid on medial side of knee
- 1+: large bulge of fluid on medial side of knee with downstroke
- 2+: Effusion returns to medial side of knee without downstroke
- 3+: inability to move effusion from medial side of knee

**Quadriceps strength** is measured using a handheld dynamometer. The patient is secured in 60 degrees of knee flexion and the HHD is placed between the patient's tibia and the resistance arm, 1 inch proximal to the midline between the malleoli. The patient is instructed to apply a maximal isometric effort force the HHD and the average of 3 trials is recorded for each limb.

**Hamstring strength** is measured using a handheld dynamometer. The patient is secured in 60 degrees of knee flexion and the HHD is placed between the patient's lower leg and the resistance arm, 1 inch proximal to the midline between the malleoli. The patient is instructed to apply a maximal isometric force against the HHD and the average of 3 trials is recorded for each limb.

**Hamstring:quadriceps ratio** is calculated for each limb based on the average of 3 trials for flexion and extension, respectively. The average isometric hamstring strength is divided by the average quadriceps strength.

**Hop testing** is performed per standardized testing guidelines. The average of 3 trials is recorded to the nearest centimeter for each limb.

## Return to Running Program

This program is designed as a guide for clinicians and patients through a progressive return-to-run program. Patients should demonstrate > 80% on the Functional Assessment prior to initiating this program (after a knee ligament or meniscus repair). Specific recommendations should be based on the needs of the individual and should consider clinical decision making. If you have questions, contact the referring physician.

### PHASE I: WARM UP WALK 15 MINUTES, COOL DOWN WALK 10 MINUTES

Day	1	2	3	4	5	6	7
Week 1	W5/J1x5		W5/J1x5		W4/J2x5		W4/J2x5
Week 2		W3/J3x5		W3/J3x5		W2/J4x5	
Week 3	W2/J4x5		W1/J5x5		W1/J5x5		<b>Return to Run</b>

Key: W=walk, J=jog

**\*\*Only progress if there is no pain or swelling during or after the run**

### PHASE II: WARM UP WALK 15 MINUTES, COOL DOWN WALK 10 MINUTES

Week	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	20 min		20 min		20 min		25 min
2		25 min		25 min		30 min	
3	30 min		30 min		35 min		35 min
4		35 min		40 min		40 min	
5	40 min		45 min		45 min		45 min
6		50 min		50 min		50 min	
7	55 min		55 min		55 min		60 min
8		60 min		60 min			

#### Recommendations

- Runs should occur on softer surfaces during Phase I
- Non-impact activity on off days
- Goal is to increase mileage and then increase pace; avoid increasing two variables at once
- 10% rule: no more than 10% increase in mileage per week



## Agility and Plyometric Program after ACL Reconstruction

This program is designed as a guide for clinicians and patients through a progressive series of agility and plyometric exercises to promote successful return to sport and reduce injury risk. Patients should demonstrate > 80% on the Functional Assessment prior to initiating this program. Specific intervention should be based on the needs of the individual and should consider clinical decision making. If you have questions, contact the referring physician.

### PHASE I: ANTERIOR PROGRESSION

<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"> <li>○ Safely recondition the knee</li> <li>○ Provide a logical sequence of progressive drills for pre-sports conditioning</li> </ul>
<b>Agility</b>	<ul style="list-style-type: none"> <li>● Forward run</li> <li>● Backward run</li> <li>● Forward lean in to a run</li> <li>● Forward run with 3-step deceleration</li> <li>● Figure 8 run</li> <li>● Circle run</li> <li>○ Ladder</li> </ul>
<b>Plyometrics</b>	<ul style="list-style-type: none"> <li>● Shuttle press: Double leg → alternating leg → single leg jumps</li> <li>● Double leg: <ul style="list-style-type: none"> <li>○ Jumps on to a box → jump off of a box → jumps on/off box</li> <li>○ Forward jumps, forward jump to broad jump</li> <li>○ Tuck jumps</li> <li>○ Backward/forward hops over line/cone</li> </ul> </li> <li>● Single leg: <ul style="list-style-type: none"> <li>○ Double to single leg jumps on to a box → double to single leg jumps off a box → single to single leg jumps on to a box → single to single leg jumps on/off box</li> <li>○ Bounding run</li> <li>○ Scissor jumps</li> <li>○ Backward/forward hops over line/cone</li> </ul> </li> </ul>
<b>Criteria to Progress</b>	<ul style="list-style-type: none"> <li>● No increase in pain or swelling</li> <li>● Pain-free during loading activities</li> <li>● Demonstrates proper movement patterns</li> </ul>

### PHASE II: LATERAL PROGRESSION

<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"> <li>● Safely recondition the knee</li> <li>● Provide a logical sequence of progressive drills for the Level 1 sport athlete</li> </ul>
<b>Agility</b> <i>*Continue with Phase I interventions</i>	<ul style="list-style-type: none"> <li>● Side shuffle</li> <li>● Carioca</li> <li>● Crossover steps</li> <li>● Shuttle run</li> <li>● Zig-zag run</li> <li>● Ladder</li> </ul>
<b>Plyometrics</b> <i>*Continue with Phase I interventions</i>	<ul style="list-style-type: none"> <li>● Double leg: <ul style="list-style-type: none"> <li>○ Lateral jumps over line/cone</li> <li>○ Lateral tuck jumps over cone</li> </ul> </li> <li>● Single leg: <ul style="list-style-type: none"> <li>○ Lateral jumps over line/cone</li> <li>○ Lateral jumps with sport cord</li> </ul> </li> </ul>
<b>Criteria to Progress</b>	<ul style="list-style-type: none"> <li>● No increase in pain or swelling</li> <li>● Pain-free during loading activities</li> <li>● Demonstrates proper movement patterns</li> </ul>





**PHASE III: MULTI-PLANAR PROGRESSION**

<b>Rehabilitation Goals</b>	<ul style="list-style-type: none"> <li>• Challenge the Level 1 sport athlete in preparation for final clearance for return to sport</li> </ul>
<b>Agility</b> <i>*Continue with Phase I-II interventions</i>	<ul style="list-style-type: none"> <li>• Box drill</li> <li>• Star drill</li> <li>• Side shuffle with hurdles</li> </ul>
<b>Plyometrics</b> <i>*Continue with Phase I-II interventions</i>	<ul style="list-style-type: none"> <li>• Box jumps with quick change of direction</li> <li>• 90 and 180 degree jumps</li> </ul>
<b>Criteria to Progress</b>	<ul style="list-style-type: none"> <li>• Clearance from MD</li> <li>• <u>Functional Assessment</u> <ul style="list-style-type: none"> <li>○ Quad/HS/glut index <math>\geq 90\%</math> contra lateral side (isokinetic testing if available)</li> <li>○ Hamstring/Quad ratio <math>\geq 70\%</math></li> <li>○ Hop Testing <math>\geq 90\%</math> contralateral side</li> </ul> </li> <li>• KOOS-sports questionnaire <math>&gt;90\%</math></li> <li>• International Knee Committee Subjective Knee Evaluation <math>&gt;93</math></li> <li>• <u>Psych Readiness to Return to Sport (PRRS)</u></li> </ul>



# KOOS KNEE SURVEY

Today's date: \_\_\_\_/\_\_\_\_/\_\_\_\_ Date of birth: \_\_\_\_/\_\_\_\_/\_\_\_\_

Name: \_\_\_\_\_

**INSTRUCTIONS:** This survey asks for your view about your knee. This information will help us keep track of how you feel about your knee and how well you are able to perform your usual activities. Answer every question by ticking the appropriate box, only one box for each question. If you are unsure about how to answer a question, please give the best answer you can.

### Symptoms

These questions should be answered thinking of your knee symptoms during the **last week**.

S1. Do you have swelling in your knee?

- |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Never                    | Rarely                   | Sometimes                | Often                    | Always                   |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

S2. Do you feel grinding, hear clicking or any other type of noise when your knee moves?

- |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Never                    | Rarely                   | Sometimes                | Often                    | Always                   |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

S3. Does your knee catch or hang up when moving?

- |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Never                    | Rarely                   | Sometimes                | Often                    | Always                   |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

S4. Can you straighten your knee fully?

- |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Always                   | Often                    | Sometimes                | Rarely                   | Never                    |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

S5. Can you bend your knee fully?

- |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Always                   | Often                    | Sometimes                | Rarely                   | Never                    |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

### Stiffness

The following questions concern the amount of joint stiffness you have experienced during the **last week** in your knee. Stiffness is a sensation of restriction or slowness in the ease with which you move your knee joint.

S6. How severe is your knee joint stiffness after first wakening in the morning?

- |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| None                     | Mild                     | Moderate                 | Severe                   | Extreme                  |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

S7. How severe is your knee stiffness after sitting, lying or resting **later in the day**?

- |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| None                     | Mild                     | Moderate                 | Severe                   | Extreme                  |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |



Knee injury and Osteoarthritis Outcome Score (KOOS), English version LK1.0

**Pain**

P1. How often do you experience knee pain?

- Never
- Monthly
- Weekly
- Daily
- Always

What amount of knee pain have you experienced the **last week** during the following activities?

P2. Twisting/pivoting on your knee

- None
- Mild
- Moderate
- Severe
- Extreme

P3. Straightening knee fully

- None
- Mild
- Moderate
- Severe
- Extreme

P4. Bending knee fully

- None
- Mild
- Moderate
- Severe
- Extreme

P5. Walking on flat surface

- None
- Mild
- Moderate
- Severe
- Extreme

P6. Going up or down stairs

- None
- Mild
- Moderate
- Severe
- Extreme

P7. At night while in bed

- None
- Mild
- Moderate
- Severe
- Extreme

P8. Sitting or lying

- None
- Mild
- Moderate
- Severe
- Extreme

P9. Standing upright

- None
- Mild
- Moderate
- Severe
- Extreme

**Function, daily living**

The following questions concern your physical function. By this we mean your ability to move around and to look after yourself. For each of the following activities please indicate the degree of difficulty you have experienced in the **last week** due to your knee.

A1. Descending stairs

- None
- Mild
- Moderate
- Severe
- Extreme

A2. Ascending stairs

- None
- Mild
- Moderate
- Severe
- Extreme



Knee injury and Osteoarthritis Outcome Score (KOOS), English version LK1.0

For each of the following activities please indicate the degree of difficulty you have experienced in the **last week** due to your knee.

A3. Rising from sitting

None  Mild  Moderate  Severe  Extreme

A4. Standing

None  Mild  Moderate  Severe  Extreme

A5. Bending to floor/pick up an object

None  Mild  Moderate  Severe  Extreme

A6. Walking on flat surface

None  Mild  Moderate  Severe  Extreme

A7. Getting in/out of car

None  Mild  Moderate  Severe  Extreme

A8. Going shopping

None  Mild  Moderate  Severe  Extreme

A9. Putting on socks/stockings

None  Mild  Moderate  Severe  Extreme

A10. Rising from bed

None  Mild  Moderate  Severe  Extreme

A11. Taking off socks/stockings

None  Mild  Moderate  Severe  Extreme

A12. Lying in bed (turning over, maintaining knee position)

None  Mild  Moderate  Severe  Extreme

A13. Getting in/out of bath

None  Mild  Moderate  Severe  Extreme

A14. Sitting

None  Mild  Moderate  Severe  Extreme

A15. Getting on/off toilet

None  Mild  Moderate  Severe  Extreme



Knee injury and Osteoarthritis Outcome Score (KOOS), English version LK1.0

For each of the following activities please indicate the degree of difficulty you have experienced in the **last week** due to your knee.

A16. Heavy domestic duties (moving heavy boxes, scrubbing floors, etc)

None	Mild	Moderate	Severe	Extreme
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

A17. Light domestic duties (cooking, dusting, etc)

None	Mild	Moderate	Severe	Extreme
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Function, sports and recreational activities**

The following questions concern your physical function when being active on a higher level. The questions should be answered thinking of what degree of difficulty you have experienced during the **last week** due to your knee.

SP1. Squatting

None	Mild	Moderate	Severe	Extreme
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SP2. Running

None	Mild	Moderate	Severe	Extreme
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SP3. Jumping

None	Mild	Moderate	Severe	Extreme
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SP4. Twisting/pivoting on your injured knee

None	Mild	Moderate	Severe	Extreme
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SP5. Kneeling

None	Mild	Moderate	Severe	Extreme
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Quality of Life**

Q1. How often are you aware of your knee problem?

Never	Monthly	Weekly	Daily	Constantly
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q2. Have you modified your life style to avoid potentially damaging activities to your knee?

Not at all	Mildly	Moderately	Severely	Totally
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q3. How much are you troubled with lack of confidence in your knee?

Not at all	Mildly	Moderately	Severely	Extremely
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q4. In general, how much difficulty do you have with your knee?

None	Mild	Moderate	Severe	Extreme
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Thank you very much for completing all the questions in this questionnaire.**



**2000 IKDC SUBJECTIVE KNEE EVALUATION FORM**

Your Full Name \_\_\_\_\_

Today's Date: \_\_\_\_/\_\_\_\_/\_\_\_\_  
Day Month Year

Date of Injury: \_\_\_\_/\_\_\_\_/\_\_\_\_  
Day Month Year

**SYMPTOMS\*:**

\*Grade symptoms at the highest activity level at which you think you could function without significant symptoms, even if you are not actually performing activities at this level.

1. What is the highest level of activity that you can perform without significant knee pain?

- 4  Very strenuous activities like jumping or pivoting as in basketball or soccer
- 3  Strenuous activities like heavy physical work, skiing or tennis
- 2  Moderate activities like moderate physical work, running or jogging
- 1  Light activities like walking, housework or yard work
- 0  Unable to perform any of the above activities due to knee pain

2. During the past 4 weeks, or since your injury, how often have you had pain?

Never	0	1	2	3	4	5	6	7	8	9	10	Constant
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

3. If you have pain, how severe is it?

No pain	0	1	2	3	4	5	6	7	8	9	10	Worst pain imaginable
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

4. During the past 4 weeks, or since your injury, how stiff or swollen was your knee?

- 4  Not at all
- 3  Mildly
- 2  Moderately
- 1  Very
- 0  Extremely

5. What is the highest level of activity you can perform without significant swelling in your knee?

- 4  Very strenuous activities like jumping or pivoting as in basketball or soccer
- 3  Strenuous activities like heavy physical work, skiing or tennis
- 2  Moderate activities like moderate physical work, running or jogging
- 1  Light activities like walking, housework, or yard work
- 0  Unable to perform any of the above activities due to knee swelling

6. During the past 4 weeks, or since your injury, did your knee lock or catch?

- 0  Yes    1  No

7. What is the highest level of activity you can perform without significant giving way in your knee?

- 4  Very strenuous activities like jumping or pivoting as in basketball or soccer
- 3  Strenuous activities like heavy physical work, skiing or tennis
- 2  Moderate activities like moderate physical work, running or jogging
- 1  Light activities like walking, housework or yard work
- 0  Unable to perform any of the above activities due to giving way of the knee



**SPORTS ACTIVITIES:**

8. What is the highest level of activity you can participate in on a regular basis?

- 4  Very strenuous activities like jumping or pivoting as in basketball or soccer
- 3  Strenuous activities like heavy physical work, skiing or tennis
- 2  Moderate activities like moderate physical work, running or jogging
- 1  Light activities like walking, housework or yard work
- 0  Unable to perform any of the above activities due to knee

9. How does your knee affect your ability to:

		Not difficult at all	Minimally difficult	Moderately Difficult	Extremely difficult	Unable to do
a.	Go up stairs	4 <input type="checkbox"/>	3 <input type="checkbox"/>	2 <input type="checkbox"/>	1 <input type="checkbox"/>	0 <input type="checkbox"/>
b.	Go down stairs	4 <input type="checkbox"/>	3 <input type="checkbox"/>	2 <input type="checkbox"/>	1 <input type="checkbox"/>	0 <input type="checkbox"/>
c.	Kneel on the front of your knee	4 <input type="checkbox"/>	3 <input type="checkbox"/>	2 <input type="checkbox"/>	1 <input type="checkbox"/>	0 <input type="checkbox"/>
d.	Squat	4 <input type="checkbox"/>	3 <input type="checkbox"/>	2 <input type="checkbox"/>	1 <input type="checkbox"/>	0 <input type="checkbox"/>
e.	Sit with your knee bent	4 <input type="checkbox"/>	3 <input type="checkbox"/>	2 <input type="checkbox"/>	1 <input type="checkbox"/>	0 <input type="checkbox"/>
f.	Rise from a chair	4 <input type="checkbox"/>	3 <input type="checkbox"/>	2 <input type="checkbox"/>	1 <input type="checkbox"/>	0 <input type="checkbox"/>
g.	Run straight ahead	4 <input type="checkbox"/>	3 <input type="checkbox"/>	2 <input type="checkbox"/>	1 <input type="checkbox"/>	0 <input type="checkbox"/>
h.	Jump and land on your involved leg	4 <input type="checkbox"/>	3 <input type="checkbox"/>	2 <input type="checkbox"/>	1 <input type="checkbox"/>	0 <input type="checkbox"/>
i.	Stop and start quickly	4 <input type="checkbox"/>	3 <input type="checkbox"/>	2 <input type="checkbox"/>	1 <input type="checkbox"/>	0 <input type="checkbox"/>

**FUNCTION:**

10. How would you rate the function of your knee on a scale of 0 to 10 with 10 being normal, excellent function and 0 being the inability to perform any of your usual daily activities which may include sports?

FUNCTION PRIOR TO YOUR KNEE INJURY:

Couldn't perform daily activities	0	1	2	3	4	5	6	7	8	9	10	No limitation in daily activities
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

CURRENT FUNCTION OF YOUR KNEE:

Can't perform daily activities	0	1	2	3	4	5	6	7	8	9	10	No limitation in daily activities
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	



## Psychological Readiness to Return to Sport

Patient Name: \_\_\_\_\_

MRN: \_\_\_\_\_

Surgery: \_\_\_\_\_

Date of Surgery: \_\_\_\_\_

Surgeon: \_\_\_\_\_

Please rate your confidence to return to your sport on a scale from 0 – 100

Example:     0 = No confidence at all  
              50 = Moderate confidence  
              100 = Complete confidence

1. My overall confidence to play is \_\_\_\_\_
2. My confidence to play without pain is \_\_\_\_\_
3. My confidence to give 100% effort is \_\_\_\_\_
4. My confidence to not concentrate on the injury is \_\_\_\_\_
5. My confidence in the injured body part to handle demands of the situation is \_\_\_\_\_
6. My confidence in my skill level/ability is \_\_\_\_\_

Total: \_\_\_\_\_

Score: \_\_\_\_\_

Examiner: \_\_\_\_\_