Comparing Outcomes after Anterior Cruciate Ligament Reconstruction with either Hamstring or Patellar Tendon Grafts: A Systematic Review

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# 1) Consort Checklist

**CONSORT Checklist of items to include when reporting a randomized trial**

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<tr>
<th>PAPER SECTION</th>
<th>Item</th>
<th>Description</th>
<th>Reported on Page #</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TITLE &amp; ABSTRACT</strong></td>
<td>1</td>
<td>How participants were allocated to interventions <em>(e.g., “random allocation”, “randomized”, or “randomly assigned”).</em></td>
<td></td>
</tr>
<tr>
<td><strong>INTRODUCTION</strong></td>
<td>2</td>
<td>Scientific background and explanation of rationale.</td>
<td></td>
</tr>
<tr>
<td><strong>METHODS</strong></td>
<td>3</td>
<td>Eligibility criteria for participants and the settings and locations where the data were collected.</td>
<td></td>
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<tr>
<td>Participants</td>
<td>4</td>
<td>Precise details of the interventions intended for each group and how and when they were actually administered.</td>
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<tr>
<td>Interventions</td>
<td>5</td>
<td>Specific objectives and hypotheses.</td>
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<tr>
<td>Objectives</td>
<td>6</td>
<td>Clearly defined primary and secondary outcome measures and, when applicable, any methods used to enhance the quality of measurements <em>(e.g., multiple observations, training of assessors).</em></td>
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<tr>
<td>Outcomes</td>
<td>7</td>
<td>How sample size was determined and, when applicable, explanation of any interim analyses and stopping rules.</td>
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<tr>
<td>Sample size</td>
<td>8</td>
<td>Method used to generate the random allocation sequence, including details of any restrictions <em>(e.g., blocking, stratification).</em></td>
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<tr>
<td>Randomization -- Sequence generation</td>
<td>9</td>
<td>Method used to implement the random allocation sequence <em>(e.g., numbered containers or central telephone), clarifying whether the sequence was concealed until interventions were assigned.</em></td>
<td></td>
</tr>
<tr>
<td>Randomization -- Allocation concealment</td>
<td>10</td>
<td>Who generated the allocation sequence, who enrolled participants, and who assigned participants to their groups.</td>
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<tr>
<td>Randomization -- Implementation</td>
<td>11</td>
<td>Whether or not participants, those administering the interventions, and those assessing the outcomes were blinded to group assignment. When relevant, how the success of blinding was evaluated.</td>
<td></td>
</tr>
<tr>
<td>Blinding (masking)</td>
<td>12</td>
<td>Statistical methods used to compare groups for primary outcome(s); Methods for additional analyses, such as subgroup analyses and adjusted analyses.</td>
<td></td>
</tr>
<tr>
<td>Statistical methods</td>
<td>13</td>
<td>Flow of participants through each stage <em>(a diagram is strongly recommended). Specifically, for each group report the numbers of participants randomly assigned, receiving intended treatment, completing the study protocol, and analyzed for the primary outcome. Describe protocol deviations from study as planned, together with reasons.</em></td>
<td></td>
</tr>
<tr>
<td>RESULTS <strong>Participant flow</strong></td>
<td>14</td>
<td>Dates defining the periods of recruitment and follow-up.</td>
<td></td>
</tr>
<tr>
<td>Recruitment</td>
<td>15</td>
<td>Baseline demographic and clinical characteristics of each group.</td>
<td></td>
</tr>
<tr>
<td>Baseline data</td>
<td>16</td>
<td>Number of participants <em>(denominator)</em> in each group included in each analysis and whether the analysis was by “intention-to-treat”. State the results in absolute numbers when feasible <em>(e.g., 10/20, not 50%).</em></td>
<td></td>
</tr>
<tr>
<td>Numbers analyzed</td>
<td>17</td>
<td>For each primary and secondary outcome, a summary of results for each group, and the estimated effect size and its precision <em>(e.g., 95% confidence interval).</em></td>
<td></td>
</tr>
<tr>
<td>Outcomes and estimation</td>
<td>18</td>
<td>Address multiplicity by reporting any other analyses performed, including subgroup analyses and adjusted analyses, indicating those pre-specified and those exploratory.</td>
<td></td>
</tr>
<tr>
<td>Ancillary analyses</td>
<td>19</td>
<td>All important adverse events or side effects in each intervention group.</td>
<td></td>
</tr>
<tr>
<td>Adverse events</td>
<td>20</td>
<td>Interpretation of the results, taking into account study hypotheses, sources of potential bias or imprecision and the dangers associated with multiplicity of analyses and outcomes.</td>
<td></td>
</tr>
<tr>
<td>DISCUSSION <strong>Interpretation</strong></td>
<td>21</td>
<td>Generalizability <em>(external validity)</em> of the trial findings.</td>
<td></td>
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<tr>
<td>Generalizability</td>
<td>22</td>
<td>General interpretation of the results in the context of current evidence.</td>
<td></td>
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</tbody>
</table>
2) IKDC Scoring system

INTRODUCTION

The entire IKDC form, which includes a MODEMS™ compatible demographic form, current health assessment form, subjective knee evaluation form, knee history form, surgical documentation form, and knee examination form, may be used as separate forms. Researchers who want to remain MODEMS™ compatible and use benchmarking data are required to complete the demographic form and current health assessment form. The knee history form and surgical documentation form are provided for convenience. All researchers are required to complete the subjective knee evaluation and knee examination form. Instructions for scoring the subjective knee evaluation form and the knee examination form are provided on the back of the forms.

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1. Demographic Form
2. Current Health Assessment Form
3. Subjective Knee Evaluation Form
4. Knee History Form
5. Surgical Documentation Form
6. Knee Examination Form
IKDC DEMOGRAPHIC FORM

Your Full Name ______________________________________________________

Your Date of Birth _________/___________/___________
Day      Month                Year

Your Social Security Number ____-___-_____

Your Gender: ☐ Male ☐ Female

Occupation __________________________________________________________

Today’s Date _____________/___________/___________
Day      Month                Year

The following is a list of common health problems. Please indicate “Yes” or “No” in the first column, and then skip to the next item. If you do have the problem, please indicate in the second column if you receive medications or some other type of treatment for the problem. In the last column, indicate if the problem limits any of your activities.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Do you have problem?</th>
<th>Do you receive treatment for it?</th>
<th>Does it limit your activities?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart disease</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
</tr>
<tr>
<td>High blood pressure</td>
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<td>☐ ☐</td>
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<tr>
<td>Asthma or pulmonary disease</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
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<tr>
<td>Diabetes</td>
<td>☐ ☐</td>
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<td>☐ ☐</td>
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<tr>
<td>Ulcer or stomach disease</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
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<tr>
<td>Bowel disease</td>
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<td>☐ ☐</td>
<td>☐ ☐</td>
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<tr>
<td>Kidney disease</td>
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<td>☐ ☐</td>
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<tr>
<td>Liver disease</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
</tr>
<tr>
<td>Anemia or other blood disease</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
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<tr>
<td>Overweight</td>
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<tr>
<td>Cancer</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
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<tr>
<td>Depression</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
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<tr>
<td>Osteoarthritis, degenerative arthritis</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
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<tr>
<td>Rheumatoid arthritis</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
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<tr>
<td>Back pain</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
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<tr>
<td>Lyme disease</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
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<tr>
<td>Other medical problem</td>
<td>☐ ☐</td>
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<td>☐ ☐</td>
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<tr>
<td>Alcoholism</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
</tr>
</tbody>
</table>
1. Do you smoke cigarettes?
   - [ ] Yes
   - [ ] No, I quit in the last six months.
   - [ ] No, I quit more than six months ago.
   - [ ] No, I have never smoked.

2. Your height ______ centimeters ______ inches

3. Your weight ______ kilograms ______ pounds

4. Your race (indicate all that apply)
   - [ ] White
   - [ ] Black or African-American
   - [ ] Hispanic
   - [ ] Asian or Pacific Islander
   - [ ] Native American Indian
   - [ ] Other

5. How much school have you completed?
   - [ ] Less than high school
   - [ ] Graduated from high school
   - [ ] Some college
   - [ ] Graduated from college
   - [ ] Postgraduate school or degree

6. Activity level
   - [ ] Are you a high competitive sports person?
   - [ ] Are you well-trained and frequently sporting?
   - [ ] Sporting sometimes
   - [ ] Non-sporting
IKDC CURRENT HEALTH ASSESSMENT FORM *

Your Full Name ________________ Your Date of Birth _________/___________/___________

Today’s Date _______________/___________/___________

Day      Month                Year

1. In general, would you say your health is: ☐ Excellent  ☐ Very Good  ☐ Good  ☐ Fair  ☐ Poor

2. Compared to one year ago, how would you rate your health in general now?
   ☐ Much better now than 1 year ago  ☐ Somewhat better now than 1 year ago  ☐ About the same as 1 year ago
   ☐ Somewhat worse now than 1 year ago  ☐ Much worse now than 1 year ago

3. The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

   a. Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports
   b. Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf
   c. Lifting or carrying groceries
   d. Climbing several flights of stairs
   e. Climbing one flight of stairs
   f. Bending, kneeling or stooping
   g. Walking more than a mile
   h. Walking several blocks
   i. Walking one block
   j. Bathing or dressing yourself

4. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

   a. Cut down on the amount of time you spent on work or other activities
   b. Accomplished less than you would like
   c. Were limited in the kind of work or other activities
   d. Had difficulty performing the work or other activities (for example, it took extra effort)

5. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

   a. Cut down on the amount of time you spent on work or other activities
   b. Accomplished less than you would like
   c. Didn’t do work or other activities as carefully as usual
6. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

   - Not At All
   - Slightly
   - Moderately
   - Quite a Bit
   - Extremely

7. How much bodily pain have you had during the past 4 weeks?

   - None
   - Very Mild
   - Mild
   - Moderate
   - Severe
   - Very Severe

8. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

   - Not at All
   - A Little Bit
   - Moderately
   - Quite a Bit
   - Extremely

9. These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks...

   - All of the time
   - Most of the time
   - A good bit of the time
   - Some of the time
   - A little of the time
   - None of the time

   a. Did you feel full of pep?
   b. Have you been very nervous?
   c. Have you felt calm and peaceful?
   d. Did you have a lot of energy?
   e. Have you felt down-hearted and blue?
   f. Did you feel worn out?
   g. Have you been a happy person?
   h. Did you feel tired?

10. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?

    - All of the time
    - Most of the time
    - Some of the time
    - A little of the time
    - None of the time

11. How TRUE or FALSE is each of the following statements for you?

    - Definitely True
    - Mostly True
    - Don’t Know
    - Mostly False
    - Definitely False

   a. I seem to get sick a little easier than other people
   b. I am as healthy as anybody I know
   c. I expect my health to get worse
   d. My health is excellent

---

*This form includes questions from the SF-36™ Health Survey. Reproduced with the permission of the Medical Outcomes Trust, Copyright © 1992.
2000 IKDC SUBJECTIVE KNEE EVALUATION FORM

Your Full Name______________________________________________________
Today’s Date: ______/_______/______ Date of Injury: ______/________/_____
       Day  Month  Year        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?
   ☐ Very strenuous activities like jumping or pivoting as in basketball or soccer
   ☐ Strenuous activities like heavy physical work, skiing or tennis
   ☐ Moderate activities like moderate physical work, running or jogging
   ☐ Light activities like walking, housework or yard work
   ☐ Unable to perform any of the above activities due to knee pain

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

   0  1  2  3  4  5  6  7  8  9  10
Never ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Constant

If you have pain, how severe is it?

   0  1  2  3  4  5  6  7  8  9  10
No pain ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Worst pain imaginable

During the past 4 weeks, or since your injury, how stiff or swollen was your knee?
   ☐ Not at all
   ☐ Mildly
   ☐ Moderately
   ☐ Very
   ☐ Extremely

What is the highest level of activity you can perform without significant swelling in your knee?
   ☐ Very strenuous activities like jumping or pivoting as in basketball or soccer
   ☐ Strenuous activities like heavy physical work, skiing or tennis
   ☐ Moderate activities like moderate physical work, running or jogging
   ☐ Light activities like walking, housework, or yard work
   ☐ Unable to perform any of the above activities due to knee swelling

During the past 4 weeks, or since your injury, did your knee lock or catch?
   ☐ Yes  ☐ No

What is the highest level of activity you can perform without significant giving way in your knee?
   ☐ Very strenuous activities like jumping or pivoting as in basketball or soccer
   ☐ Strenuous activities like heavy physical work, skiing or tennis
   ☐ Moderate activities like moderate physical work, running or jogging
   ☐ Light activities like walking, housework or yard work
   ☐ Unable to perform any of the above activities due to giving way of the knee
Page 2 – 2000 IKDC SUBJECTIVE KNEE EVALUATION FORM

SPORTS ACTIVITIES:

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

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

3. How does your knee affect your ability to:

<table>
<thead>
<tr>
<th></th>
<th>Not difficult at all</th>
<th>Minimally difficult</th>
<th>Moderately Difficult</th>
<th>Extremely difficult</th>
<th>Unable to do</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Go up stairs</td>
<td></td>
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<td></td>
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<tr>
<td>b. Go down stairs</td>
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<tr>
<td>c. Kneel on the front of your knee</td>
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<tr>
<td>d. Squat</td>
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<tr>
<td>e. Sit with your knee bent</td>
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<tr>
<td>f. Rise from a chair</td>
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<tr>
<td>g. Run straight ahead</td>
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<tr>
<td>h. Jump and land on your involved leg</td>
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<tr>
<td>i. Stop and start quickly</td>
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</table>

FUNCTION:

4. 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:

Cannot perform
limitation
daily activities

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>in daily activities</th>
</tr>
</thead>
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</table>

CURRENT FUNCTION OF YOUR KNEE:

Cannot perform
limitation
daily activities

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<th>0</th>
<th>1</th>
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<th>in daily activities</th>
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Scoring Instructions for the 2000 IKDC Subjective Knee Evaluation Form

Several methods of scoring the IKDC Subjective Knee Evaluation Form were investigated. The results indicated that summing the scores for each item performed as well as more sophisticated scoring methods.

The responses to each item are scored using an ordinal method such that a score of 1 is given to responses that represent the lowest level of function or highest level of symptoms. For example, item 1, which is related to the highest level of activity without significant pain is scored by assigning a score of 1 to the response “Unable to Perform Any of the Above Activities Due to Knee” and a score of 5 to the response “Very strenuous activities like jumping or pivoting as in basketball or soccer”. For item 2, which is related to the frequency of pain over the past 4 weeks, the response “Constant” is assigned a score of 1 and “Never” is assigned a score of 11.

The IKDC Subjective Knee Evaluation Form is scored by summing the scores for the individual items and then transforming the score to a scale that ranges from 0 to 100. **Note:** The response to item 10 “Function Prior to Knee Injury” is not included in the overall score. The steps to score the IKDC Subjective Knee Evaluation Form are as follows:

1. Assign a score to the individual’s response for each item, such that lowest score represents the lowest level of function or highest level of symptoms.
2. Calculate the raw score by summing the responses to all items with the exception of the response to item 10 “Function Prior to Your Knee Injury”
3. Transform the raw score to a 0 to 100 scale as follows:

$$\text{IKDC Score} = \left[\frac{\text{Raw Score} - \text{Lowest Possible Score}}{\text{Range of Scores}}\right] \times 100$$

Where the lowest possible score is 18 and the range of possible scores is 87. Thus, if the sum of scores for the 18 items is 60, the IKDC Score would be calculated as follows:

$$\text{IKDC Score} = \left[\frac{60 - 18}{87}\right] \times 100$$

$$\text{IKDC Score} = 48.3$$

The transformed score is interpreted as a measure of function such that higher scores represent higher levels of function and lower levels of symptoms. A score of 100 is interpreted to mean no limitation with activities of daily living or sports activities and the absence of symptoms.

The IKDC Subjective Knee Score can still be calculated if there are missing data, as long as there are responses to at least 90% of the items (i.e. responses have been provided for at least 16 items). To calculate the raw IKDC score when there are missing data, substitute the average score of the items that have been answered for the missing item score(s). Once the raw IKDC score has been calculated, it is transformed to the IKDC Subjective Knee Score as described above.
2000 IKDC KNEE HISTORY FORM

Patient Name ______________________________________ Birthdate _____/_____/______

Date of Injury _____/_____/_____ Date of Initial Exam _____/_____/_____ Today’s Date _____/_____/_____  

Day Month Year Day Month Year Day Month Year

Involved Knee: ☐Right ☐Left

Contralateral: ☐Normal ☐Nearly Normal ☐Abnormal ☐Severely abnormal

Onset of Symptoms: (date) _____/_____/_____  

Day Month Year

Chief Complaint: ________________________________________________________________

Activity at Injury: ☐ADL ☐Sports ☐Traffic ☐Work

Mechanism of Injury:

 ☐Non-traumatic gradual onset ☐Traumatic non-contact onset
 ☐Non-traumatic sudden onset ☐Traumatic contact onset

Previous Surgery:

Type of Surgery: (check all that apply)

Meniscal Surgery

☐Medial meniscectomy ☐Lateral meniscectomy  
☐Medial meniscal repair ☐Lateral meniscal repair  
☐Medial meniscal transplant ☐Lateral meniscal transplant

Ligament Surgery

☐ACL Repair ☐Intraarticular ACL reconstruction ☐Extraarticular ACL reconstruction  
☐PCL Repair ☐Intraarticular PCL reconstruction ☐Posterolateral corner reconstruction  
☐Medial collateral ligament repair/reconstruction ☐Lateral collateral ligament repair/reconstruction

Type of Graft

Patella tendon graft ☐Ipsilateral ☐Contralateral

☐Single hamstring graft ☐2 Bundle hamstring graft ☐4 Bundle hamstring graft

☐Quadriceps tendon graft ☐Allograft ☐Other
Extensor Mechanism Surgery
- Patella tendon repair
- Quadriceps tendon repair

Patellofemoral Surgery
- Extensor Mechanism Realignment
- Soft Tissue Realignment
  - Medial imbrication
  - Lateral release
- Bone Realignment
  - Movement of the tibial tubercle
    - Proximal
    - Distal
    - Medial
    - Lateral
    - Anterior
- Trochleoplasty
- Patellectomy

Osteoarthritis Surgery
- Osteotomy
  - Articular Surface Surgery
  - Shaving
  - Abrasion
  - Drilling
  - Microfracture
  - Cell therapy
  - Osteochondral autograft transfer/mosaic-plasty
  - Other

Total number of previous surgeries_________________

Imaging Studies:
- Structural
- MRI
- CT
- Arthrogram
- Metabolic (Bone Scan)

Findings:
- Ligament
- Meniscus
- Articular Cartilage
- Bone
2000 IKDC SURGICAL DOCUMENTATION FORM

Patient’s Name: _______________________________  Date of Index Procedure: _____/_____/_____
                                      Day    Month     Year

Postoperative Diagnosis:

1. __________________________________________________________________________

2. __________________________________________________________________________

3. __________________________________________________________________________

Status After Procedure:

ARTICULAR CARTILAGE STATUS:

Document the size and location of articular cartilage defects on these figures according to the ICRS mapping system.

![Diagram of articular cartilage and mapping system]
# Record size, location and grade of articular cartilage lesions.

## Femur

<table>
<thead>
<tr>
<th>Side</th>
<th>Right</th>
<th>Left</th>
<th>Condyle</th>
<th>Medial</th>
<th>Lateral</th>
<th>Sagittal plane</th>
<th>Trochlear</th>
<th>Anterior</th>
<th>Middle</th>
<th>Posterior</th>
<th>Frontal plane</th>
<th>Lateral</th>
<th>Central</th>
<th>Medial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cartilage lesion (Grade) (*)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Defect size pre-debridement</td>
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<tr>
<td>Defect size post-debridement</td>
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</tr>
</tbody>
</table>

## Tibia

<table>
<thead>
<tr>
<th>Side</th>
<th>Right</th>
<th>Left</th>
<th>Plateau</th>
<th>Medial</th>
<th>Lateral</th>
<th>Sagittal Plane</th>
<th>Anterior</th>
<th>Middle</th>
<th>Posterior</th>
<th>Frontal Plane</th>
<th>Lateral</th>
<th>Central</th>
<th>Medial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cartilage lesion (Grade) (*)</td>
<td></td>
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<tr>
<td>Defect size pre-debridement</td>
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<tr>
<td>Defect size post-debridement</td>
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</tr>
</tbody>
</table>

## Patella

<table>
<thead>
<tr>
<th>Side</th>
<th>Right</th>
<th>Left</th>
<th>Sagittal plane</th>
<th>Distal</th>
<th>Middle</th>
<th>Proximal</th>
<th>Frontal plane</th>
<th>Lateral</th>
<th>Central</th>
<th>Medial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cartilage lesion (Grade) (*)</td>
<td></td>
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</tr>
<tr>
<td>Defect size pre-debridement</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Defect size post-debridement</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Diagnosis:
- ❑ Traumatic cartilage lesion
- ❑ OD
- ❑ OA
- ❑ AVN
- ❑ Others

## Biopsy/Osteochondral Plugs:
- Location: 
- Number of Plugs: 
- Diameter of Plugs: mm

## Treatment:
- ❑ Shaving
- ❑ Abrasion
- ❑ Drilling
- ❑ Microfracture
- ❑ Osteochondral autograft transfer/mosaic-plasty
- ❑ Cell therapy
- ❑ Other

## Notes:
MENISCUS STATUS:

Procedure:  
- Medial meniscectomy
- Lateral meniscectomy
- Medial meniscal repair
- Lateral meniscus repair
- Medial meniscal transplant
- Lateral meniscal transplant
- Medial abrade & trephine
- Lateral abrade & trephine

Right Knee  
Left Knee

Document tears of the menisci or meniscectomy on these figures

Medial:
- Normal
- 1/3 Removed
- 2/3 Removed
- 3/3 Removed

Circumferential Hoop Fibers:  
- Intact
- Disrupted

Remaining Meniscal Tissue:  
- Normal
- Degenerative changes
- Stable tear
- Unstable tear
- Tear left in situ

Lateral:
- Normal
- 1/3 Removed
- 2/3 Removed
- 3/3 Removed

Circumferential Hoop Fibers:  
- Intact
- Disrupted

Remaining Meniscal Tissue:  
- Normal
- Degenerative changes
- Stable tear
- Unstable tear
- Tear left in situ
**LIGAMENT STATUS:**

Procedure:
- □ ACL repair □ Intraarticular ACL reconstruction □ Extraarticular ACL reconstruction
- □ PCL repair □ Intraarticular PCL reconstruction □ Posterolateral corner repair/reconstruction
- □ Medial collateral ligament repair/reconstruction
- □ Lateral collateral ligament repair/reconstruction

Graft:
- □ Autologous patella tendon □ Hamstring tendons □ Quadriceps tendon
- □ Other____________

**Previous Graft Harvest:**
- □ Autologous patella tendon □ Hamstring tendons □ Quadriceps tendon

*Document drill hole placement for ligament reconstruction on these figures.*
## 2000 IKDC KNEE EXAMINATION FORM

### Patient Information
- **Name:**
- **Date of Birth:**
- **Gender:**
- **Age:**
- **Date of Examination:**

### Generalized Laxity
- **Tight**
- **Normal**
- **Lax**

### Alignment
- **Obvious Varus**
- **Normal**
- **Obvious Valgus**

### Patella Position
- **Obvious Baja**
- **Normal**
- **Obvious Alta**

### Patella Subluxation/Dislocation
- **Centered**
- **Subluxable**
- **Subluxed**
- **Dislocated**

### Range of Motion (Ext/Flex)
- **Index Side:**
  - Passive
  - Active
- **Opposite Side:**
  - Passive
  - Active

### SEVEN GROUPS

<table>
<thead>
<tr>
<th>Group</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passive Motion Deficit</td>
<td>? &lt;3°</td>
<td>? 3 to 5°</td>
<td>? 6 to 10°</td>
<td>? &gt;10°</td>
</tr>
<tr>
<td>Lack of extension</td>
<td>? 0 to 5°</td>
<td>? 6 to 15°</td>
<td>? 16 to 25°</td>
<td>? &gt;25°</td>
</tr>
<tr>
<td>Lack of flexion</td>
<td>? -1 to 2mm</td>
<td>? 3 to 5mm(1°)</td>
<td>? 6 to 10mm(2°)</td>
<td>? &gt;10mm(3°)</td>
</tr>
<tr>
<td>△Lachman (25° flex) (134N)</td>
<td>? 0 to 2mm</td>
<td>? 3 to 5mm</td>
<td>? 6 to 10mm</td>
<td>? &gt;10mm</td>
</tr>
<tr>
<td>△Total AP Translation (25° flex)</td>
<td>? 0 to 2mm</td>
<td>? 3 to 5mm</td>
<td>? 6 to 10mm</td>
<td>? &gt;10mm</td>
</tr>
<tr>
<td>△Total AP Translation (70° flex)</td>
<td>? 0 to 2mm</td>
<td>? 3 to 5mm</td>
<td>? 6 to 10mm</td>
<td>? &gt;10mm</td>
</tr>
<tr>
<td>△Posterior Drawer Test (70° flex)</td>
<td>? 0 to 2mm</td>
<td>? 3 to 5mm</td>
<td>? 6 to 10mm</td>
<td>? &gt;10mm</td>
</tr>
<tr>
<td>△Med Joint Opening (20° flex/valgus rot)</td>
<td>? 0 to 2mm</td>
<td>? 3 to 5mm</td>
<td>? 6 to 10mm</td>
<td>? &gt;10mm</td>
</tr>
<tr>
<td>△Lat Joint Opening (20° flex/varus rot)</td>
<td>? 0 to 2mm</td>
<td>? 3 to 5mm</td>
<td>? 6 to 10mm</td>
<td>? &gt;10mm</td>
</tr>
<tr>
<td>△External Rotation Test (30° flex prone)</td>
<td>? &lt;5°</td>
<td>? 6 to 10°</td>
<td>? 11 to 19°</td>
<td>? &gt;20°</td>
</tr>
<tr>
<td>△External Rotation Test (90° flex prone)</td>
<td>? &lt;5°</td>
<td>? 6 to 10°</td>
<td>? 11 to 19°</td>
<td>? &gt;20°</td>
</tr>
<tr>
<td>△Pivot Shift</td>
<td>? equal</td>
<td>? glide</td>
<td>? ++(clunk)</td>
<td>? +++(gross)</td>
</tr>
</tbody>
</table>

### Compartments
- **Ant. Compartment**
- **Med. Compartment**
- **Lateral Compartment**

### Compartment Findings
- **Normal**
- **Moderate**
- **Moderate**
- **Moderate**

### Harvest Site Pathology
- **None**
- **Mild**
- **Moderate**
- **Severe**

### X-ray Findings
- **Med. Joint Space**
- **Lat. Joint Space**
- **Patellofemoral**
- **Ant. Joint Space (sagittal)**
- **Post. Joint Space (sagittal)**

### Functional Test
- **One Leg Hop (% of opposite side)**

### Final Evaluation
- ?

---

* Group grade: The lowest grade within a group determines the group grade.
** Final evaluation: the worst group grade determines the final evaluation for acute and subacute patients. For chronic patients compare preoperative and postoperative evaluations. In a final evaluation only the first 3 groups are evaluated but all groups must be documented. △ Difference in involved knee compared to normal or what is assumed to be normal.

**IKDC COMMITTEE**
INSTRUCTIONS FOR THE 2000 IKDC KNEE EXAMINATION FORM

The Knee Examination Form contains items that fall into one of seven measurement domains. However, only the first three of these domains are graded. The seven domains assessed by the Knee Examination Form are:

1. **Effusion**
   An effusion is assessed by ballotting the knee. A fluid wave (less than 25 cc) is graded mild, easily ballotteable fluid – moderate (25-60 cc), and a tense knee secondary to effusion (greater than 60 cc) is rated severe.

2. **Passive Motion Deficit**
   Passive range of motion is measured with a gonimeter and recorded on the form for the index side and opposite or normal side. Record values for zero point/hyperextension/flexion (e.g. 10 degrees of hyperextension, 150 degrees of flexion = 10/0/150; 10 degrees of flexion to 150 degrees of flexion = 0/10/150). Extension is compared to that of the normal knee.

3. **Ligament Examination**
   The Lachman test, total AP translation at 70 degrees, and medial and lateral joint opening may be assessed with manual, instrumented or stress x-ray examination. Only one should be graded, preferably a "measured displacement". A force of 134 N (30 lbs) and the maximum manual are recorded in instrumented examination of both knees. Only the measured displacement at the standard force of 134 N is used for grading. The numerical values for the side to side difference are rounded off, and the appropriate box is marked.

   The end point is assessed in the Lachman test. The end point affects the grading when the index knee has 3-5 mm more anterior laxity than the normal knee. In this case, a soft end point results in an abnormal grade rather than a nearly normal grade.

   The 70-degree posterior sag is estimated by comparing the profile of the injured knee to the normal knee and palpating the medial femoral tibial stepoff. It may be confirmed by noting that contraction of the quadriceps pulls the tibia anteriorly.

   The external rotation tests are performed with the patient prone and the knee flexed 30° and 70°. Equal external rotational torque is applied to both feet and the degree of external rotation is recorded.

   The pivot shift and reverse pivot shift are performed with the patient supine, with the hip in 10-20 degrees of abduction and the tibia in neutral rotation using either the Losee, Noyes, or Jakob techniques. The greatest subluxation, compared to the normal knee, should be recorded.

4. **Compartment Findings**
   Patellofemoral crepitation is elicited by extension against slight resistance. Medial and lateral compartment crepitation is elicited by extending the knee from a flexed position with a varus stress and then a valgus stress (i.e., McMurray test). Grading is based on intensity and pain.

5. **Harvest Site Pathology**
   Note tenderness, irritation or numbness at the autograft harvest site.

6. **X-ray Findings**
   A bilateral, double leg PA weightbearing roentgenogram at 35-45 degrees of flexion (tunnel view) is used to evaluate narrowing of the medial and lateral joint spaces. The Merchant view at 45 degrees is used to document patellofemoral narrowing. A mild grade indicates minimal changes (i.e., small osteophytes, slight sclerosis or flattening of the femoral condyle) and narrowing of the joint space which is just detectable. A moderate grade may have those changes and joint space narrowing (e.g., a joint space of 2-4 mm side or up to 50% joint space narrowing). Severe changes include a joint space of less than 2 mm or greater than 50% joint space narrowing.

7. **Functional Test**
   The patient is asked to perform a one leg hop for distance on the index and normal side. Three trials for each leg are recorded and averaged. A ratio of the index to normal knee is calculated.
### Lysholm scale

#### TABLE E-1 Lysholm Knee Scale

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Limp (5 points)</strong></td>
<td>None (5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Slight or Periodical (3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Severe and Constant (0)</td>
<td></td>
</tr>
<tr>
<td><strong>Locking (15 points)</strong></td>
<td>No locking/no catching (15)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No locking/catching (10)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Locking occasionally (6)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Locking frequently (2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Locked (0)</td>
<td></td>
</tr>
<tr>
<td><strong>Pain (25 points)</strong></td>
<td>None (25)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Slight during exertion/athletics (20)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marked during exertion/athletics (15)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marked on/after walking &gt;2km (10)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marked on/after walking &lt;2km (5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Constant (0)</td>
<td></td>
</tr>
<tr>
<td><strong>Stair climbing (10 points)</strong></td>
<td>No problems (10)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Slightly impaired (6)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>One step at a time (2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impossible (0)</td>
<td></td>
</tr>
<tr>
<td><strong>Support (5 points)</strong></td>
<td>None (5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stick or crutch (2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Weight-bearing impossible (0)</td>
<td></td>
</tr>
<tr>
<td><strong>Instability (25 points)</strong></td>
<td>Never giving way (25)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rarely, during athletics (20)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frequently, during athletics (or unable to participate) (15)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Occasionally, during daily activities (10)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Often, during daily activities (5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Every step (0)</td>
<td></td>
</tr>
<tr>
<td><strong>Swelling (10 points)</strong></td>
<td>None (10)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Exertion/Athletics (6)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ordinary Exertion/Daily Activities (2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Constant (0)</td>
<td></td>
</tr>
<tr>
<td><strong>Squatting (5 points)</strong></td>
<td>No Problems (5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Slightly Impaired (4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not beyond 90 degrees (2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impossible (0)</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL SCALE:** (Excellent: 95-100, Good: 84-94, Fair: 65-83, Poor <65)
4) Tegner Scale

Please indicate in the spaces below the HIGHEST level of activity that you participated in BEFORE YOUR INJURY and the highest level you are able to participate in CURRENTLY.

BEFORE INJURY:     Level__________     CURRENT:   Level___________

<table>
<thead>
<tr>
<th>Level</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 10</td>
<td>Competitive sports- soccer, football, rugby (national elite)</td>
</tr>
<tr>
<td>Level 9</td>
<td>Competitive sports- soccer, football, rugby (lower divisions), ice hockey, wrestling, gymnastics, basketball</td>
</tr>
<tr>
<td>Level 8</td>
<td>Competitive sports- racquetball or bandy, squash or badminton, track and field athletics (jumping, etc.), down-hill skiing</td>
</tr>
<tr>
<td>Level 7</td>
<td>Competitive sports- tennis, running, motorcars speedway, handball</td>
</tr>
<tr>
<td></td>
<td>Recreational sports- soccer, football, rugby, bandy, ice hockey, basketball, squash, racquetball, running</td>
</tr>
<tr>
<td>Level 6</td>
<td>Recreational sports- tennis and badminton, handball, racquetball, down-hill skiing, jogging at least 5 times per week</td>
</tr>
<tr>
<td>Level 5</td>
<td>Work- heavy labor (construction, etc.)</td>
</tr>
<tr>
<td></td>
<td>Competitive sports- cycling, cross-country skiing,</td>
</tr>
<tr>
<td></td>
<td>Recreational sports- jogging on uneven ground at least twice weekly</td>
</tr>
<tr>
<td>Level 4</td>
<td>Work- moderately heavy labor (e.g. truck driving, etc.)</td>
</tr>
<tr>
<td>Level 3</td>
<td>Work- light labor (nursing, etc.)</td>
</tr>
<tr>
<td>Level 2</td>
<td>Work- light labor</td>
</tr>
<tr>
<td></td>
<td>Walking on uneven ground possible, but impossible to back pack or hike</td>
</tr>
<tr>
<td>Level 1</td>
<td>Work- sedentary (secretarial, etc.)</td>
</tr>
<tr>
<td>Level 0</td>
<td>Sick leave or disability pension because of knee problems</td>
</tr>
</tbody>
</table>


**SURGICAL HISTORY**

Have you had any additional surgeries to your knee other than those performed by Dr. Stone?

Yes / No

If Yes:

What procedure(s) were performed? ___________________________________________________

When was the surgery performed? ___________________________________________________

Who performed the surgery? ______________________________________________________
5) Explanation of abbreviations

ACL         Anterior Cruciate Ligament
BPTB        Bone-Patellar-Tendon-Bone
CONSORT     Consolidated Statement for Reporting Randomized Trials
ROM         Range Of Motion
STG         Semitendinosus Gracilis
ST          Semitendinosus