A KNEE FUNCTION ASSESSMENT CHART

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From the British Orthopaedic Association Research Sub-Committee

A standard chart for assessing the function of the knee before and after reconstructive operations is described in detail. The advantages and difficulties encountered in its routine use are discussed.

The function of the knee is difficult to assess and especially so in arthritic conditions where many joints are involved. Destructive arthritis of the knee may be treated by many surgical methods and now, with the expansion in the range and scope of techniques for arthroplasty, the British Orthopaedic Association Research Sub-Committee has attempted to provide guidelines in such assessment. Arthritic conditions, rather than traumatic internal derangements, and the results of treatment are considered in this assessment.

The orthopaedic literature is now full of records of new prostheses and techniques, and of the results of treatment. In most cases individual surgeons or orthopaedic units are providing their own assessment forms which frequently involve the use of a computer for their processing. Some charts are designed to give a final score and others to produce results in the form of a histogram. The Committee felt that it was important to produce a chart consisting of only fundamental measurements recorded in a simple way and this endeavour has led to much compromise. It is stressed that the chart records basic measurements and any surgeon or unit with a specific interest in the subject will always be able to add additional facts appropriate to his specific needs. The majority of the Committee also felt that arrangements for computer processing and presentation of final scores should be made by individual surgeons rather than by the incorporation of these features in the chart. It is, in fact, a simple matter to transfer this record to a computer and also to arrange the results as a final score.

The production of a chart to assess the function of the knee is well nigh impossible if the hips, feet or ankles are also arthritic. Nevertheless an attempt must be made to try to compare the results of treatment of the knee, as it is only by such recording that one scientific paper can be compared with another. With a large number of prosthetic replacements of the knee now being used throughout the world the problem has become a matter of some importance and urgency. The Americans and Continental Europeans are also attempting to standardise the assessment of the function of the knee. With this in mind, and after a certain amount of discussion with them, we have attempted to produce a chart which can form a useful basis for future international discussion.

Our form is a compromise. We have attempted to keep it short and suitable for completion by our residents and registrars. We realise that it will be controversial and even amongst ourselves it has taken a very long time to iron out the disagreements involved in such a difficult task. It should not be considered the "final version", for with further recording, together with innovations in techniques and prostheses, changes will doubtless have to be made.

THE COLLECTION OF INFORMATION

The interview with the patient will give an assessment of his or her satisfaction with the treatment received. An attempt is made to determine whether or not the present disability is wholly due to the knee in question. Pain is extremely difficult to assess and we have defined four simple grades with "no pain" at best, "severe pain" at worst and two categories between. The effect of analgesics has not been considered. The ability to walk should be graded according to the distance or to the time. The simple assessment 0–4 in the use of walking aids should indicate decreasing dependence upon such supports. The assessment of gait in this chart is referred entirely to the knee concerned and no further consideration of "limp" is made. The range of movement is indicated by records of the flexion deformity and of the maximum flexion achieved. The extension lag is recorded as the number of degrees additional to the angle of flexion contracture if one is present. A full assessment of stability is impossible in such a simple chart and we appreciate that insecurity felt by the patient is not necessarily related to the laxity assessed by the observer. Nevertheless, we feel a simple record of valgus and varus instability is necessary. No record of “cruciate" or “rotary instability" has been attempted. The grading of the function of the patient is based solely on the ability to get out of a chair and to climb stairs. Again the grading is oversimplified but the record aims to give assessment of some home activities.

Editorial Note. This chart has been used in the assessment of the results of the various techniques of arthroplasty of the knee described in this Issue. There are many possible ways of expressing these assessments and I am grateful to the authors for allowing me to show their results in a uniform manner. R.C.F.C.
### KNEE FUNCTION ASSESSMENT CHART

(BRITISH ORTHOPAEDIC ASSOCIATION RESEARCH SUB-COMMITTEE)

<table>
<thead>
<tr>
<th>NAME</th>
<th>Age</th>
<th>Sex</th>
<th>Occupation</th>
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<tbody>
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</tbody>
</table>

#### DIAGNOSIS

- **VOL.**
- **FOLLOW**
- **ANKLES**
- **STATE**
- **OTHER**

#### DURATION OF DISEASE

- **SIDE**
- **PREVIOUS KNEE OPERATIONS**
- **OTHER JOINTS (See Appendix)**

#### STATE OF OTHER KNEE

- **Normal**
- **Slightly affected**
- **Moderately affected**
- **Severely affected**
- **Replaced**

#### STATE OF HIPS

**RIGHT**

- **Normal**
- **Slightly affected**
- **Moderately affected**
- **Severely affected**
- **Replaced**

**LEFT**

- **Normal**
- **Slightly affected**
- **Moderately affected**
- **Severely affected**
- **Replaced**

#### STATE OF FEET/ANKLES

**RIGHT**

- **Normal**
- **Slightly affected**
- **Moderately affected**
- **Severely affected**
- **Replaced**

**LEFT**

- **Normal**
- **Slightly affected**
- **Moderately affected**
- **Severely affected**
- **Replaced**

#### FOLLOW UP (months)

1. **ASSESSMENT BY THE PATIENT**
   - **A.** After treatment the patient is:
     1. (4) Enthusiastic
     2. (3) Satisfied
     3. (2) Non-committal
     4. (1) Disappointed
   - **B.** Is the patient's present disability due to the affected knee?
     1. (4) Entirely
     2. (3) Mainly
     3. (2) Partially
     4. (1) Scarcely at all

2. **PAIN**
   - (4) None
   - (3) Mild pain, not interfering with activities or sleep
   - (2) Moderate pain, either reducing activities or disturbing sleep
   - (1) Severe pain

3. **ABILITY TO WALK**

<table>
<thead>
<tr>
<th>Distance</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>(5) &gt; 1 kilometre (unlimited)</td>
<td>(4) Up to 1 kilometre</td>
</tr>
<tr>
<td>(3) Up to 50 metres</td>
<td>(2) 50–100 metres (outdoors)</td>
</tr>
<tr>
<td>(1) Indoors only</td>
<td>(0) Unable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;60 minutes</td>
</tr>
<tr>
<td>30–60 minutes</td>
</tr>
<tr>
<td>10–30 minutes</td>
</tr>
<tr>
<td>5–10 minutes</td>
</tr>
<tr>
<td>Indoors only</td>
</tr>
<tr>
<td>Unable</td>
</tr>
</tbody>
</table>

4. **WALKING AID**

- (4) None
- (3) Stick outside
- (2) Stick always
- (1) Two sticks/crutches/frame
- (0) Unable to walk

5. **GAIT**

- (4) Normal free swing
- (3) Slight limitation of swing
- (2) Minimal movement
- (1) Stiff knee

6. **FLEXION DEFORMITY**

- (5) 0 degrees
- (4) <10 degrees
- (3) 11–20 degrees
- (2) 21–30 degrees
- (1) >30 degrees

7. **MAXIMUM FLEXION**

- (4) >100 degrees
- (3) 81–100 degrees
- (2) 61–80 degrees
- (1) <60 degrees

8. **EXTENSION LAG**

- Additional to flexion contracture if present
- (4) 0 degrees
- (3) <10 degrees
- (2) <20 degrees
- (1) >20 degrees

9. **VALGUS ANGLE**

- When the tibia is stressed laterally
- (4) 0–10 degrees
- (3) <10 degrees
- (2) <20 degrees
- (1) >20 degrees

10. **VARUS ANGLE**

- When the tibia is stressed medially
- (5) 0 degrees
- (4) <10 degrees
- (3) <20 degrees
- (2) <30 degrees
- (1) >30 degrees

11. **ABILITY TO GET OUT OF CHAIR**

- (4) With ease
- (3) With difficulty
- (2) Only by using arms
- (1) Unable

12. **ABILITY TO CLIMB STAIRS**

- (4) Normal
- (3) One step at a time
- (2) Only with a bannister, stick or both
- (1) Unable or only by bizarre method

#### APPENDIX

**STATE OF OTHER JOINTS**

**SLIGHTLY AFFECTED**

Infrequent pain
Minor stiffness—no functional deficit
Walking minimally affected. No support required

**MODERATELY AFFECTED**

Moderate pain
Joint stiffness producing some function deficit
Walking interrupted and support required

**SEVERELY AFFECTED**

Severe pain
Stiffness with marked functional disability
Unable to walk or walking with difficulty using a major support