American Physical Therapy Association

Orthopaedic Section

National Orthopaedic Physical Therapy Outcomes Database

Knee Pain Pilot Project

Manual of Operations and Procedures

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National Orthopaedic Physical Therapy Outcomes Database

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Introduction

One of the objectives in the Orthopaedic Section Strategic Plan is to develop a National Orthopaedic Physical Therapy Outcomes Database (NOPTOD). The purpose of the NOPTOD is to provide clinicians with a tool that they can use to assess their clinical performance. Additionally, information accumulated in the NOPTOD can be used to describe orthopaedic physical therapy practice and to provide evidence of the value of orthopaedic physical therapy.

As the first step in the development of the NOPTOD, the Orthopaedic Section is conducting several 6-month pilot projects to collect and analyze clinical and process outcome data for patients with pain in various body regions (neck, low back, knee, and shoulder). The purpose of this pilot project is to demonstrate the feasibility of collecting and analyzing outcomes data as well as to determine the usefulness of the information to enhance clinician performance and to establish the value of orthopaedic physical therapy. The results of the pilot study will be used to plan and determine the resources needed for an electronic data capture and analysis system for the NOPTOD. Ultimately, the NOPTOD will be a repository for clinical and process outcomes data for the most common conditions treated by orthopaedic physical therapists.

The knee pain pilot project will be done using paper-based data collection forms. Data that will be collected includes information related to episode of care (duration of care, number of visits), patient characteristics (age, sex, height, weight, comorbidities), symptoms, examination findings, diagnostic classification, interventions, and outcomes. Completed forms will be submitted to the Orthopaedic Section office for data entry and analysis. The data will be summarized to determine completeness of data collection, accuracy of the treatment classification, adherence to evidence-based treatment guidelines, and an assessment of patient outcomes. A summary of personal results will be provided to all Section members that contribute cases to the outcomes database. Additionally, to permit comparison with peers across the country, a summary will be provided to compare an individual's results with the results of all others that submitted data to the outcomes database. All results will be reported anonymously.

Participation in this pilot project is voluntary and open to all physical therapist members of the Orthopaedic Section. Individuals wishing to participate in the pilot project should submit a registration form to the Orthopaedic Section office. The registration form includes the physical therapist's name, date of entry level degree, advanced degrees, completion of residencies and/or fellowships, ABPTS specialist certification, and practice setting and address. Once the registration form is submitted, the Orthopaedic Section office will assign physical therapist and practice identification numbers that are to be included on the individual case report forms for each patient submitted to the database.

The period for collecting and reporting data for the knee pain pilot project will run from June 1 through November 30, 2016. **Data should be collected and recorded throughout the course of care provided to patients.** Retrospective chart reviews of patients treated prior to the data collection period will not be eligible for inclusion in the pilot project. To protect patient confidentiality, no patient identifiers should be included on the data collection forms. Completed forms will be submitted to the Orthopaedic Section office, where the Section staff will input the data.

Registration Information

To participate in the knee pain pilot project, members of the Orthopaedic Section must complete and submit a registration form to the Orthopaedic Section office. Upon receipt and review of the registration form, the Orthopaedic Section will issue a physical therapist identification number as well as a clinic/facility identification number. These numbers will be placed on individualized Case Report Forms that will be sent to you for your use to submit data to the NOPTOD.

To register for the project, please e-mail Leah Vogt, Executive Assistant at the Orthopaedic Section, at lvogt@orthoPT.org to request a registration form. Please use the subject line "NOPTOD Knee Pilot Project".

Once you receive and complete the form, you may return it to Leah Vogt via:

- E-mail: lvogt@orthoPT.org
- Fax: (608) 788-3965
- Postal mail: Orthopaedic Section, APTA, Inc; 2920 East Avenue South, Suite 200; La Crosse, WI 54601

Knee Pain Case Report Form

Please see Appendix D for a blank copy of this form.

General Information.

A separate Case Report form should be completed for EACH patient that is submitted to the database.

DO NOT INCLUDE ANY PATIENT IDENTIFICATION INFORMATION ON THE FORM.

At the top of each form, please complete the fields indicating your clinic/facility ID, physical therapist ID, and patient ID. Instructions for completing the forms are as follows:

Episode of Care.

- Start of Care Date: Please enter the date of the first/evaluation visit.
- End of Care Date: Please enter the date of the last visit.
- # of Visits: Please enter the total number of PT visits for the episode of care
- End of Care Status (select one):
    - Discharged by PT: select this option if the patient completed the full episode of care and was determined by the treating physical therapist to be ready for discharge.
    - Patient terminated treatment: select this option if the patient made the decision to stop attending PT without achieving goals and/or without agreement from the physical therapist
    - Physician terminated treatment: select this option if the patient's physician told the patient to stop attending PT before goals were achieved or without agreement from the physical therapist
    - Other: select this option if none of the other three options fit the scenario (i.e. patient death, patient moving out of town, etc.)

Patient Characteristics.

- Demographics
    - Age (in years)
    - Gender
    - Height (in inches)
    - Weight (in pounds)
    - Ethnicity
    - Race (check ALL that apply and use "other" line if needed)
    - Insurance (check ALL that apply and use "other" line if needed)
- Comorbidities (check ALL that apply):
    - Arthritis (check if patient has symptomatic osteoarthritis OR rheumatoid arthritis)
    - Osteoporosis
    - Asthma
    - Chronic obstructive pulmonary disease or acute respiratory distress syndrome
    - Angina
    - Congestive heart failure or coronary artery disease
    - History of myocardial infarction
    - Neurological disorder, e.g. multiple sclerosis, Parkinson disease
    - History of cerebrovascular accident or transient ischemic attack

- Peripheral vascular disease
- Diabetes mellitus, type I or II
- Upper gastrointestinal disease (e.g. reflux, esophageal ulcers)
- Depression
- Anxiety or panic disorder
- Visual impairment (e.g. cataracts, glaucoma, or other uncorrected impairment)
- Hearing impairment
- Degenerative disc disease or spinal stenosis
- Obesity (BMI ≥ 30 kg/m^2)
- Smoking: indicate if patient is a current or former smoker or "none".

- Knee History
  - **Note for patients being treated for bilateral knee pathology:**
    - If the patient is being treated for a similar condition in both knees (i.e. bilateral knee OA), please complete this section of the form for the MORE AFFECTED side.
    - If the patient is being treated for two different conditions (i.e. L knee TKA and R knee OA), please complete two separate forms entirely – 1 for each knee. We recognize this is an increased paperwork burden on both the therapist and patient, but this should occur fairly infrequently.
  - Current use of NSAIDs, prescription opioids, oral steroids. Check ALL that apply.
  - Recent knee injections: check if patient has received
    - Corticosteroid injection within the past 1 month
    - Viscosupplementation (hyaluronen, Synvisc, etc.) within the past 3 months
  - Number of prior knee surgeries: indicate how many surgeries have been received on the involved knee(s)
    - If patient is being treated unilaterally, please indicate the number of surgeries performed on that side
    - If patient is being treated bilaterally, please indicate the total number of knee surgeries
  - Side being treated: please indicate if treatment is unilateral or bilateral
  - Is surgery the reason for the current episode of care?
    - If YES, please skip the column titled "Non-Surgical" and only complete the column titled "Surgical".
    - If NO, please skip the column titled "Surgical" and only complete the column titled "Non-Surgical"
    - If patient is receiving treatment bilaterally, please indicate "yes" if the answer is "yes" for either of the knees being treated.
- Non-Surgical Cases (complete this column only for patients for whom surgery is not the reason for the current episode of care)
  - Onset: please indicate the date of onset of the current condition
  - Mechanism: please select the best of the 3 options listed (gradual or chronic; sudden, nontraumatic; traumatic)
  - Recurrent problem: please indicate if this is a reoccurrence of a prior problem and the length of its history
    - If patient is receiving treatment bilaterally, please indicate "yes" and the length of history if the answer is "yes" for either of the knees being treated.

- Surgical Cases
    - Surgery date
    - Date of injury leading to surgery: please indicate the date of onset of the initial injury or condition. For traumatic injuries (ligament tear, fracture) this should be relatively straightforward. For surgeries such as TKA or other procedure, please indicate the onset of the increase in symptoms that led to the decision to have surgery.
    - Cause of surgery: please select the best of the 3 options listed (gradual or chronic; sudden, nontraumatic; traumatic)
    - Surgery received – check all that apply, only indicating surgical procedure(s) received as a direct precursor to the current episode of care
        - Meniscectomy
        - Meniscus repair
        - Anterior cruciate ligament reconstruction or repair
        - Other ligamentous reconstruction or repair (e.g. PCL, MCL, LCL)
        - Cartilage procedure (e.g. mosaicplasty, osteochondral autograft transfer system, autologous chondrocyte implantation, microfracture, chondroplasty)
        - Patellofemoral procedure (e.g. lateral release, trochleoplasty, proximal-distal realignment)
        - Total knee arthroplasty
        - Unicompartmental knee arthroplasty
        - High tibial osteotomy
        - Open reduction internal fixation OR other fracture repair
        - Arthroscopic lavage/debridement
        - Other, please list.

<u>Functional Status.</u>

Please check yes, no, or not applicable regarding whether the patient has limitations with activities of daily living, work/homemaking, and/or strenuous activity/sport.

<u>Diagnostic Classification & Corresponding Examination Findings.</u>

Please check ALL of the examination findings and diagnostic classifications that apply. A patient may fit into several classification categories. If any of the examination findings listed below a classification is checked, then the box for that classification should also be checked. For example, if a patient demonstrates limited flexion ROM of greater than 5 degrees compared to the opposite side, the therapist should also check the box for "Impaired Knee Joint Motion". There are 7 diagnostic classifications:

1. Impaired Knee Joint Motion
2. Impaired Quadriceps Strength or Endurance
3. Impaired Musculotendinous Length
4. Impaired Hip Strength or Endurance
5. Pain or Impaired Mobility of Soft Tissue
6. Impaired Structural Alignment
7. Impaired Neuromuscular Control

Please see the next section of this manual for detailed descriptions of each classification category.

Diagnostic Classification & Corresponding Examination Findings

The following diagnostic classification categories are not intended to match to any specific pathology or medical diagnosis. Instead, they are based upon symptoms and examination findings and should help to guide treatment strategy.

Many diagnostic classifications are based upon clinical examination findings comparing side-side symmetry or comparing to a reference scale. However, there may be occasions when a patient's limitation is not identified by comparing sides or reference comparisons but the PT determines that a functional limitation exists based on some other aspect of the clinical presentation. This is reflected below in bullets describing "functional limitations" in many of the diagnostic classification categories.

Note: An asterisk following the name of an examination tool or special test indicates that a more complete description of the test appears in Appendix A.*

Impaired Knee Joint Motion

Please check the box for this diagnostic classification if the patient presents with any of the following:

- Limited extension range of motion, defined as a side/side difference of greater than 3 degrees
- Limited flexion range of motion, defined as a side/side difference of greater than 5 degrees
- Functional limitation of ROM (i.e. the difference between the two sides doesn't fit either of the previous two descriptions, but the therapist's examination determines that a ROM restriction is limiting the patient's function)
- Stiffness reported by the patient that the therapist determines is limiting the patient's function

Impaired Quadriceps Strength or Endurance

Please check the box for this diagnostic classification if the patient presents with any of the following:

- Presence of a quadriceps lag
- Manual muscle test of 4/5 or lower on one or both sides
- Deficit of ≥ 10% compared to uninvolved side when assessing strength with 1-repetition maximum or dynamometer
- Functional strength or endurance deficit as observed by the PT (this may be checked if the above three criteria are not met but the therapist's examination reveals that function is limited by a lack of strength or endurance of the quadriceps muscle group. This may be particularly useful when the patient demonstrates bilateral and symmetrical deficits in strength or endurance.)

Impaired Musculotendinous Length

Please check the box for this diagnostic classification if the following muscles are limiting knee function:

- Rectus femoris: may be measured via
    - modified Thomas test*: <80 degrees knee flexion with hip at 0 degrees
    - prone knee flexion (Ely's test)*: >5-degree difference in prone knee flexion between the two sides

- Hamstrings: may be measured via
    - Straight leg raise* (<70 degrees of hip flexion with knee extended)
    - Popliteal angle* (> 20 degrees from full extension)
- Iliotibial band and/or tensor fascia latae: may be measured via
    - Ober test*: thigh above the horizontal in sidelying position
    - modified Thomas test*: deviation of femur into abduction in Thomas test position
- Gastrocnemius
    - Side/side difference of at least 5 degrees of ankle dorsiflexion with knee fully extended (patient in supine)
- Other muscle, limiting function
    - This may be checked if the therapist's examination reveals reduced flexibility of a different muscle or muscle group that is limiting the patient's function

Impaired Hip Strength or Endurance

Please check the box for this diagnostic classification if the patient presents with any of the following:

- Manual muscle test of 4/5 or lower for the gluteus medius, gluteus maximus, and/or hip rotators
- Deficit of ≥ 10% compared to uninvolved side when assessing strength of hip musculature with 1-repetition maximum or dynamometer
- Inability to perform 10 hip hikes while in unilateral weightbearing

Pain or Impaired Mobility of Soft Tissue

Please check the box for this diagnostic classification if the patient presents with any of the following:

- Limited and/or painful scar mobility at/near the knee
- Painful or hypomobile patellofemoral glides in any direction and/or positive patellar tilt test*
- Pain with palpation of knee soft tissue

Impaired Structural Alignment

Please check the box for this diagnostic classification if the patient presents with any of the following AND the physical therapist can reasonably relate abnormal structural alignment to the patient's current symptoms or functional limitations:

- Abnormal frontal plane (varus or valgus) knee alignment observed in static postural examination
- Abnormal foot pronation or supination observed in static postural examination
    - May be observed during static postural exam or measured objectively using Foot Posture Index*
- True leg length discrepancy measured by PT
- *Note: Please be sure to differentiate the items in this category from dynamic tests. For example, a structural genu valgum would fall into this classification category, but a dynamic knee valgus (abnormal frontal or transverse plane knee motion) during a squat would fall into the next category (Impaired Neuromuscular Control).*

Impaired Neuromuscular Control

Please check the box for this diagnostic classification if the patient presents with any of the following:

- Patient-reported sense of instability or "giving-way" of the knee joint
- Abnormal laxity
    - May be observed during formal testing of the integrity of knee cruciate and/or collateral ligaments
- Unwanted compensatory movement and/or balance strategies during weight bearing functional tasks, for example:
    - Abnormal frontal and/or transverse plane motion at the knee
    - Lack of appropriate sagittal plane motion at the knee
    - Excessive pelvic tilt
    - Excessive trunk flexion, extension, or lateral bend
    - Excessive OR insufficient pronation or supination at the ankle/foot complex
    - May be measured using any validated measure of balance or neuromuscular control. Examples include
        - Step-down test*
        - Sit-to-stand transfer
        - Double-leg squat
        - Hop tests
- Impaired balance or proprioception
    - May be measured using any validated measure of balance or neuromuscular control (Berg balance test, etc.)

Submission of Case Report Forms

Data should be collected and recorded throughout the course of care provided to patients. Completed case report forms should be forwarded to the Orthopaedic Section office. Forms may be scanned and E-mailed, faxed, or sent by the US Postal Service. It is preferred that you submit the Case Report Forms soon after the end of care. However, if you prefer to send completed case report forms monthly or at the end of the data collection period, that is acceptable as well.

Knee Pain Treatment Form

Please see Appendix D for a blank copy of this form.

General Information.

Please complete the Clinic ID, PT ID, and Patient ID fields at the top left. Please complete one column per WEEK of treatment (not per visit). To save space, weekly columns are only listed through week 6. All visits from week 7 forward can be summed into the DC (discharge) category. For example, if a patient was seen twice in week 7 and twice in week 8 including a discharge visit, you may enter the number "4" in the Aerobic Exercise line to indicate that the patient had performed aerobic exercise 4 additional times since week 6.

Not Scheduled/Discharged/Terminated Tx: Please check the box on the fourth line if the patient was not seen during the week in question – either due to treatment being discharged/terminated OR if the patient simply was not scheduled that week. For example, if the patient was seen for two weeks, then was out of town for a week, then returned and resumed PT, in Week 3 you'll check the box that says "Not Scheduled/Discharged/Terminated Tx", leave the remainder of that column blank, and resume filling in intervention information in the column for Week 4. If the patient was seen for two weeks and then discharged, you'll check the box that says "Not Scheduled/Discharged/Terminated Tx" and leave all future columns completely blank.

Change in Classification: If the patient's classification has changed, check "yes" and complete the opposite side of the page. If not, check "no" and leave the corresponding column on the opposite side of the page blank.

Irritability: Please indicate your assessment of the patient's level of irritability. Select the best/most appropriate option from the following definitions:

> **High:** effusion of at least 2+ on sweep test*, moderate to severe pain, limited range of motion with pain before end range, increased skin temperature
>
> **Medium:** stable 1+ or lower effusion on sweep test, mild and stable pain levels, pain around the end of range of motion
>
> **Low:** trace or zero effusion with sweep test, no pain at rest or with ADLs, may have some pain with overpressure at end of range of motion
>
> *Note: The term "irritability" refers to the current acuity of the patient's condition. Others, including Maitland, have used the term "severity" for this. For the purpose of this manual, please consider the two terms to be synonymous.*

Interventions.

Please indicate the NUMBER OF TIMES each intervention was provided during the week. An intervention may fit into multiple categories; please categorize it based upon its primary goal. (For example, if the patient is riding a stationary cycle it may be classified as range of motion or aerobic exercise; please place it in only 1 category based on upon the primary purpose of prescribing the intervention.)

The list of possible interventions is as follows:

- Range of motion (could be active, active-assisted, or passive; could also be cycling or continuous passive motion)
- Stretching
    - Manual
    - Mechanical or self-stretching
- Joint Mobilization
    - Patellofemoral joint
    - Tibiofemoral joint
    - Other joint (reasonably related to knee symptoms or function)
- Soft Tissue Mobilization
    - Instrumented (e.g. Graston tools)
    - Non-instrumented
- Strengthening
    - Quadriceps non-weightbearing
    - Hamstrings non-weightbearing
    - Hip muscles (weightbearing or non-weightbearing)
    - Calf muscles (gastrocnemius and soleus)
    - Weightbearing multijoint (i.e. quadriceps and hamstrings co-contraction)
    - Trunk (including trunk stabilization exercises)
- Modalities
    - Heat or cold therapy
    - Ultrasound
    - Electrical stimulation for pain or edema
    - Electrical stimulation for muscle strength (intent = increase force-generating capacity)
    - Electrical stimulation for muscle re-education (intent = increase muscle fiber recruitment or timing)
    - Iontophoresis or phonophoresis
    - Dry needling
- Aerobic exercise: please only check this box if cardiovascular fitness is the primary intent of the exercise
- Orthotics/bracing
- Taping for pain or dysfunction at the knee: This may include taping at joints remote from the knee, IF the goal is to influence knee mechanics.
- Agility training (walking/running-based)
- Balance training (including perturbation training)
- Movement re-education
- Task-specific training (may include ADLs, gait, stairs, transfers, occupation-specific or sport-specific tasks)
- Plyometrics
- Assistive device fitting, prescription
- Other (please list)

Note: Muscle Energy Techniques (METs) and Mobilizations With Movement (MWMs) have not been included as separate categories. If you perform these interventions, please document them under the above category which bests represents the primary intent of the technique (i.e. joint mobilization, flexibility, etc.)

Outcome Measures

Two patient-reported outcome measures have been selected; each clinic/facility will be assigned one of the two.

Please assess patient-reported outcomes weekly.

International Knee Documentation Committee (IKDC). This outcome measure is scored on a scale of 0 to 100, with higher scores indicating better function.

Score calculation is as follows:

[(sum of item scores) / 87] * 100

An online scoring tool is available at:
http://www.orthopaedicscore.com/scorepages/international_knee_documentation_comitee.html

The IKDC is generally easy to administer in the clinic. It consists of 18 items, so patient burden should be relatively low. It has been shown to have high internal consistency (Cronbach alpha 0.87-0.88). (Higgins 2007) Test-retest reliability is high (ICC 0.90-0.96). (Crawford 2007, Greco 2010, Irrgang 2001, Haverkamp 2006) Minimum detectable change was found to be 8.8 points in a sample of patients with meniscus pathology. (Crawford 2007) Other studies have estimated MDC as 19.98 in a sample of patients undergoing ACL reconstruction (Padua 2004) and 12.83 in a sample of patients with varying knee problems (Irrgang 2001). Minimum clinically important difference (MCID) was found to be 11.5 points in a study by Irrgang and colleagues. (Irrgang 2006)

Please see Appendix B for the full IKDC questionnaire.

Knee injury and Osteoarthritis Outcome Score (KOOS). This outcome measure consists of 5 subscales including pain, symptoms, ADLs, sports/recreation, and quality of life. There is no total or aggregate score; outcomes should be reported separately for each of the 5 subscales. Within subscales, each item is assigned a score from 0 (no symptoms) to 4 (extreme syndrome). Each subscale score may range from 0 (extreme symptoms) to 100 (no symptoms). (Roos 2003)

Calculation for each subscale is as follows:

100 – [(mean item score * 100) / 4]

An online scoring tool is available at:
http://www.orthopaedicscore.com/scorepages/knee_injury_osteopaedic_outcome_score.html.

The KOOS was developed for both clinical and research use for a variety of knee conditions including acute injuries and osteoarthritis. Its use does not require licensing or permission. Test-retest reliability for the KOOS is high; intraclass correlation coefficients (ICCs) for individuals with knee injury are as follows: pain subscale 0.85-0.93; symptoms subscale 0.83-0.95; ADL subscale 0.75-0.91; sports and recreation subscale 0.61-0.89; quality of life subscale 0.83-0.95. Similar ICCs were found in patients with knee OA. (Alviar 2011)

The authors of the KOOS recommend using a minimal important change (MIC) of 8-10 points for each subscale. Specific minimal detectable change (MDC) values for each subscale for individuals with knee injury and for those with knee osteoarthritis can be found at http://www.koos.nu/. (Collins 2011)

Please see Appendix C for the full KOOS questionnaire.

References

Roos EM, Lohmander LS. Knee injury and Osteoarthritis Outcome Score (KOOS): from joint injury to osteoarthritis. Health Qual Life Outcomes 2003;1:64.

Collins NJ, Misra D, Felson DT, Crossley KM, Roos EM. Measures of knee function: International Knee Documentation Committee (IKDC) Subjective Knee Evaluation Form, Knee Injury and Osteoarthritis Outcome Score (KOOS), Knee Injury and Osteoarthritis Outcome Score Physical Function Short Form (KOOS-PS), Knee Outcome Survey Activities of Daily Living Scale (KOS-ADL), Lysholm Knee Scoring Scale, Oxford Knee Score (OKS), Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), Activity Rating Scale (ARS), and Tegner Activity Score (TAS). Arthritis care & research 2011;63 Suppl 11:S208-28.

Alviar MJ, Olver J, Brand C, Hale T, Khan F. Do patient-reported outcome measures used in assessing outcomes in rehabilitation after hip and knee arthroplasty capture issues relevant to patients? Results of a systematic review and ICF linking process. Journal of rehabilitation medicine: official journal of the UEMS European Board of Physical and Rehabilitation Medicine 2011;43:374-81.

Higgins LD, Taylor MK, Park D, et cl; International Knee Documentation Committee. Reliability and validity of the International Knee Documentation Committee (IKDC) Subjective Knee Form. *Joint Bone Spine* 2007;74(6):594-9.

Crawford K, Briggs KK, Rodkey WG, Steadman JR. Reliability, validity, and responsiveness of the IKDC score for meniscus injuries of the knee. *Arthroscopy* 2007;23(8):839-44.

Greco NJ, Anderson AF, Mann BJ, et al. Responsiveness of the International Knee Documentation Committee Subjective Knee Form in comparison to the Western Ontario and McMaster Universities Osteoarthritis Index, modified Cincinnati Knee Rating System, and Short Form 36 in patients with focal articular cartilage defects. *Am J Sports Med* 2010;38(5):891-902.

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(5):600-13.

Pdua R, Bondi R, Ceccarelli E, et al. Italian version of the International Knee Documentation Committee Subjective knee Form: cross-cultural adaptation and validation. *Arthroscopy* 2004;20(8):819-23.

Irrgang JJ, Anderson AF, Boland AL, et al; International Knee Documentation Committee. Responsiveness of the International Knee Documentation Committee Subjective Knee Form. *Am J Sports Med* 2006;34(10):1567-73.

Haverkamp D, Sierevelt IN, Breugem SJ, Lohius K, Blankevoort L, van Dijk CN. Translation and validation of the Dutch version of the International Knee Documentation Committee Subjective Knee Form. *Am J Sports Med* 2006;34(10:1680-4.

Cook CE, Hegedus EJ. Orthopedic Physical Examination Tests: An Evidence-Based Approach. Upper Saddle River, NJ: Pearson Prentice Hall, 2008.

Peeler J, Anderson JE. Reliability of the Ely's test for assessing rectus femoris muscle flexibility and joint range of motion. *J Orthop Res* 2008;26(6):793-9.

"90-90 straight leg raising test." Segen's Medical Dictionary. 2011. Farlex, Inc. 14 Aug. 2015 http://medical-dictionary.thefreedictionary.com/90-90+straight+leg+raising+test

Piva SR, Fitzgerald GK, Irrgang JJ, et al. Reliability of measures of impairments associated with patellofemoral pain syndrome. *BMC Musculoskeletal Disorders* 2006;7:33.

Watson CJ, Leddy HM, Dynjan TD, Parham JL. Reliability of the lateral pull test and tilt test to assess patellar alignment in subject with symptomatic knees: student raters. *J Orthop Sports Phys Ther* 2001;31(7):368-74.

Sturgill LP, Snyder-Mackler L, Manal TJ, Axe MJ. Interrater reliability of a clinical scale to assess knee joint effusion. *J Orthop Sports Phys Ther* 2009;39(12):845-9.

Redmond AC, Crosbie J, Ouvrier RA. Development and validation of a novel rating system for scoring standing foot posture: the Foot Posture Index. *Clin Biomech* 2006;21:89-98.

Kendall FP, McCreary EK, Provance PG. *Muscles Testing and Function.* 4th ed. Philadelphia, PA: Lippincott Williams and Wilkins; 1993.

Appendix A: Description of Special Tests

1) Modified Thomas Test to identify rectus femoris flexibility restriction (Cook 2008)
    - Patient sits at the edge of the plinth, then lays onto his/her back while tucking both knees in toward his/her chest until the lower back lays flat upon the table
    - Patient continues to hold one knee to the chest while the other leg is slowly lowered to zero degrees of hip extension
    - Therapist measures the amount of knee flexion that is available while keeping the hip at neutral
    - Positive test: less than 80 degrees of knee flexion with hip at 0 degrees

2) Modified Thomas Test to identify tensor fascia latae / iliotibial band flexibility restriction (Cook 2008)
    - Patient sits at the edge of the plinth, then lays onto his/her back while tucking both knees in toward his/her chest until the lower back lays flat upon the table
    - Patient continues to hold one knee to the chest while the other leg is slowly lowered into hip extension
    - Therapist allows for and observes the natural abduction/adduction/rotation that occurs at the hip and knee as the thigh is lowered into hip extension
    - Positive test: deviation of the femur into abduction as the leg is lowered
    - *Note: some authors also describe lateral deviation of the patella, internal rotation of the thigh/hip, and/or external rotation of the lower leg on the femur as (+) findings for flexibility restriction of the TFL/ITB. Please use your discretion and clinical experience to determine whether any of those findings are present and related to TFL/ITB restriction.*

3) Ely's test to identify rectus femoris flexibility restriction (Peeler 2008)
    - Patient is positioned in prone and is asked to perform active knee flexion of the involved limb
    - Positive test: hip spontaneously flexes off the plinth when performing active knee flexion, bringing the anterior hip off the table

4) Straight Leg Raise test to identify hamstring flexibility restriction
    - Patient lies supine
    - Therapist passively flexes the affected hip while keeping knee in full extension
    - Positive test: less than 70 degrees of hip flexion available with knee fully extended

5) Popliteal Angle test (aka 90-90 test) to identify hamstring flexibility restriction (Segen's Medical Dictionary)
    - Patient lies supine with hips and knees flexed to 90 degrees and is asked to actively extend one knee
    - Positive test: inability to extend the knee to within 20 degrees of full knee extension

6) Ober test to identify tensor fascia latae / iliotibial band flexibility restriction (Cook 2008)

- Patient lies sidelying with the affected limb upward
- Therapist stabilizes the pelvis at the iliac crest and places the knee into some flexion.
- Therapist moves the hip into extension and slight abduction and slowly allows it to adduct
- Therapist measures the amount of hip abduction/adduction at the hip
- Positive test: failure of the thigh to drop below the horizontal

7) Patellar Tilt Test for tightness of soft tissue structures surrounding the knee (Watson 2001)
   - Patient is supine with knees extension
   - Therapist lifts the lateral edge of the patella off the lateral femoral condyle using the index finger and thumb of the other hand
   - Positive test: Patella laterally subluxes out of the trochlear groove

8) Foot Posture Index (Redmond 2006)
   - Patient is positioned in relaxed standing
   - Each of 6 components are scored from -2 to +2; -2 indicates clear signs of supination, 0 indicates neutral, and +2 indicates clear signs of pronation
     - Talar head palpation
     - Supra and infra lateral malleolar curvature
     - Calcaneal frontal plane position
     - Prominence in the region of the talonavicular joint
     - Congruence of the medial longitudinal arch
     - Abduction/adduction of the forefoot on the rearfoot
   - The user manual for the FPI may be accessed at http://www.leeds.ac.uk/medicine/FASTER/z/pdf/FPI-manual-formatted-August-2005v2.pdf

9) Step-Down Test for neuromuscular control at the knee (Piva 2006)
   - Patient stands on a 20-cm step in single limb support with knee extended hands on waist; contralateral limb is positioned over the floor adjacent to the step
   - Patient bends the tested knee until the contralateral leg gently touches the floor, and then extends the knee to the starting position. This is repeated 5 times.
   - Scoring is based on 5 criteria:
     - Arm strategy: add 1 point if patient uses an arm strategy to recover balance
     - Trunk movement: add 1 point if the trunk leaned to any side
     - Pelvis plane: add 1 point if the pelvic rotated or elevated on one side compared to the other
     - Knee position: add 1 point if knee deviates medially across the 2nd toe; add 2 points if knee deviated beyond the medial border of the foot
     - Steady stance: add 1 point if patient stepped down on the non-tested side OR if tested limb became unsteady
   - Total score of 0-1 = good quality of movement; total score of 2-3 = medium quality; total score 4+ = poor quality

10) Sweep Test for knee effusion (Sturgill 2009)

- Patient is positioned in supine with knees fully extended
- Therapists begins with hand beneath the medial tibiofemoral joint line, then strokes the hand upward toward the suprapatellar bursa 2-3 times in a sweeping motion. Next, therapist strokes downwards on the lateral aspect of the thigh just superior to the suprapatellar bursa toward the lateral joint line.
- Positive test: Therapist detects an effusion on the medial aspect of the knee just inferior to the patella. Scoring is as follows:
    - Zero: no wave produced upon downstroke
    - Trace: downward stroke produces small bulge on medial aspect of knee
    - 1+: downward stroke produces larger bulge on medial aspect of knee
    - 2+: medial fluid spontaneously returns to its position without therapist performing a downward sweep
    - 3+: excess of fluid that makes it impossible to stroke the medial fluid away

Appendix B: International Knee Documentation Committee (IKDC) Subjective Knee Form

(Please see the following 2 pages for a blank copy of the IKDC form.)

IKDC SUBJECTIVE KNEE EVALUATION FORM

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.

IKDC1. 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

IKDC2. 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
	○	○	○	○	○	○	○	○	○	○	○	

IKDC3. If you have pain, how severe is it?

No Pain	0	1	2	3	4	5	6	7	8	9	10	Worst Pain Imaginable
	○	○	○	○	○	○	○	○	○	○	○	

IKDC4. During the past 4 weeks, or since your injury, how stiff or swollen was your knee?

- Not at all
- Mildly
- Moderately
- Very
- Extremely

IKDC5. 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

IKDC6. During the past 4 weeks, or since your injury, did your knee lock or catch?

- Yes
- No

IKDC7. 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

SPORTS ACTIVITIES:

IKDC8. 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

IKDC9. How does your knee affect your ability to:

		Not difficult at all	Minimally difficult	Moderately difficult	Extremely difficult	Unable to do
9a	Go up stairs	☐	☐	☐	☐	☐
9b	Go down stairs	☐	☐	☐	☐	☐
9c	Kneel on the front of your knee	☐	☐	☐	☐	☐
9d	Squat	☐	☐	☐	☐	☐
9e	Sit with your knee bent	☐	☐	☐	☐	☐
9f	Rise from a chair	☐	☐	☐	☐	☐
9g	Run straight ahead	☐	☐	☐	☐	☐
9h	Jump and land on your involved leg	☐	☐	☐	☐	☐
9i	Stop and start quickly	☐	☐	☐	☐	☐

FUNCTION:

IKDC10. 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?

10a. *Function before your knee INJURY*:

Could not perform daily activities	0	1	2	3	4	5	6	7	8	9	10	No Limitation
	○	○	○	○	○	○	○	○	○	○	○	

10b. *Current function of your knee*:

Cannot perform daily activities	0	1	2	3	4	5	6	7	8	9	10	No Limitation
	○	○	○	○	○	○	○	○	○	○	○	

Appendix C: Knee injury and Osteoarthritis Outcome Score (KOOS) Form

(Please see next 4 pages for blank KOOS form)

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
☐	☐	☐	☐	☐

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

Never	Rarely	Sometimes	Often	Always
☐	☐	☐	☐	☐

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

Never	Rarely	Sometimes	Often	Always
☐	☐	☐	☐	☐

S4. Can you straighten your knee fully?

Always	Often	Sometimes	Rarely	Never
☐	☐	☐	☐	☐

S5. Can you bend your knee fully?

Always	Often	Sometimes	Rarely	Never
☐	☐	☐	☐	☐

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
☐	☐	☐	☐	☐

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

None	Mild	Moderate	Severe	Extreme
☐	☐	☐	☐	☐

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
☐	☐	☐	☐	☐

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
☐	☐	☐	☐	☐

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
☐	☐	☐	☐	☐

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

None	Mild	Moderate	Severe	Extreme
☐	☐	☐	☐	☐

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
☐	☐	☐	☐	☐

SP2. Running

None	Mild	Moderate	Severe	Extreme
☐	☐	☐	☐	☐

SP3. Jumping

None	Mild	Moderate	Severe	Extreme
☐	☐	☐	☐	☐

SP4. Twisting/pivoting on your injured knee

None	Mild	Moderate	Severe	Extreme
☐	☐	☐	☐	☐

SP5. Kneeling

None	Mild	Moderate	Severe	Extreme
☐	☐	☐	☐	☐

Quality of Life

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

Never	Monthly	Weekly	Daily	Constantly
☐	☐	☐	☐	☐

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

Not at all	Mildly	Moderately	Severely	Totally
☐	☐	☐	☐	☐

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

Not at all	Mildly	Moderately	Severely	Extremely
☐	☐	☐	☐	☐

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

None	Mild	Moderate	Severe	Extreme
☐	☐	☐	☐	☐

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

Appendix D: Blank Forms for Participating Physical Therapists

Included in the following pages: Case Report (intake) Form; Treatment Form (IKDC version); Treatment Form (KOOS version).

Clinic ID _____ PT ID _____ Patient ID _____

National Orthopaedic Physical Therapy Outcomes Database
Orthopaedic Section, APTA
Knee Case Report Form

Episode of Care		
Start of Care Date: __ / __ / __	End of Care Date: __ / __ / __	# of Visits: _____
End of care status (select one): ❑ Discharged by PT ❑ Patient terminated treatment ❑ Physician terminated treatment ❑Other		

Patient Characteristics

Demographics	Comorbidities	Knee History	Non-Surgical	Surgical
Age: _____ years		**Current use of:** ❑ NSAIDs ❑ Rx opioids ❑ Oral steroids	**Onset:** __ / __ / __	**Surgery date:** __ / __ /__
Gender: ❑ M ❑ F	❑ Arthritis (OA or RA)		**Mechanism:** ❑ Gradual or chronic ❑ Sudden, nontraumatic ❑ Traumatic	**Date of injury leading to surgery:** __ /__ / __
Height: _____ inches	❑ Osteoporosis	**Recent knee injections:** ❑ Corticosteroids ❑ Viscosupplementation		**Cause of surgery:** ❑ Gradual or chronic ❑ Sudden, nontraumatic ❑ Traumatic
Weight: _____ pounds	❑ Asthma	**# of prior knee surgeries** ❑ 0 ❑ 1 ❑ ≥ 2	**Recurrent problem?** ❑ No ❑ Yes, < 1 month hx ❑ Yes, 1-6 month hx ❑ Yes, 6-12 month hx ❑ Yes, > 12 month hx	**Surgery (check all that apply)** ❑ Menisectomy ❑ Meniscus repair ❑ ACL reconstruction/repair ❑ Other lig. recon./repair ❑ Cartilage procedure ❑ Patellofemoral procedure ❑ TKA ❑ UKA ❑ HTO ❑ ORIF or other fx repair ❑ Arthroscopic lavage/debridement ❑ Other _____
Ethnicity: ❑ Not Hispanic ❑ Hispanic	❑ COPD, ARDS ❑ Angina ❑ CHF, CAD ❑ MI ❑ Neuro (MS, PD) ❑ CVA or TIA ❑ PVD ❑ DM (I or II) ❑ Upper GI ❑ Depression ❑ Anxiety, panic ❑ Visual impairment ❑ Hearing impairment ❑ DDD, stenosis ❑ Obesity (BMI ≥ 30)	**Side(s) being treated:** ❑ Unilateral ❑ Bilateral		
Race (all that apply): ❑ White/Caucasian ❑ Black/African-American ❑ Asian ❑ Hawaiian/Pacific Islander ❑ Am. Indian/Alaska Native ❑ Other _____		**Is surgery the reason for current episode of care?** ❑ Y (skip next column) ❑ N (complete next column, skip last column)		
Insurance (all that apply): ❑ Commercial ❑ Medicare ❑ Medicaid ❑ Self-Pay ❑ Automobile ❑ Workers Compensation ❑ Other _____	Smoking: ❑ None ❑ Current ❑ Past			

Clinic ID _____ PT ID _____ Patient ID _____

Functional Status

Limitations with activities of daily living	Limitations with work or homemaking duties	Limitations with strenuous activity or sport
❑ Y ❑ N ❑ N/A	❑ Y ❑ N ❑ N/A	❑ Y ❑ N ❑ N/A

Diagnostic Classification & Corresponding Examination Findings (check all that apply)

❑ Impaired Knee Joint Motion
- ❑ Limited extension ROM (>3 deg side/side difference)
- ❑ Limited flexion ROM (>5 deg side/side difference)
- ❑ Functional limitation of ROM, or stiffness

❑ Impaired Quadriceps Strength or Endurance
- ❑ Presence of lag
- ❑ MMT 4/5 or lower on one or both sides
- ❑ 10% or greater deficit compared to uninvolved side on 1RM or dynamometer
- ❑ Functional strength or endurance deficit observed by PT

❑ Impaired Musculotendinous Length
- ❑ Rectus Femoris
- ❑ Hamstrings
- ❑ Iliotibial band / tensor fascia latae
- ❑ Gastrocnemius
- ❑ Other muscle, limiting function

❑ Impaired Hip Strength or Endurance
- ❑ MMT 4/5 or lower (glut med, glut max, and/or hip rotators)
- ❑ 10% or greater deficit compared to uninvolved side on 1RM or dynamometry
- ❑ (+) hip hike test

❑ Pain or Impaired Mobility of Soft Tissue
- ❑ Limited or painful scar mobility
- ❑ Painful or hypomobile patellar glides
- ❑ Pain with palpation of knee soft tissue

❑ Impaired Structural Alignment
- ❑ Knee varus or valgus observed in static postural exam
- ❑ Abnormal foot pronation or supination in static postural exam
- ❑ True leg length discrepancy

❑ Impaired Neuromuscular Control
- ❑ Sense of instability
- ❑ Abnormal laxity
- ❑ Unwanted compensatory movement and/or balance strategies during WB functional tasks
- ❑ Impaired balance/proprioception

Clinic ID: _____ PT ID: _____ **Patient ID: _____**	**Initial**	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**DC**
Date:							
Not Scheduled/Discharged/Terminated Tx:	❑	❑	❑	❑	❑	❑	❑
Irritability (H = high; M = medium; L = low)	❑H ❑M ❑L	❑H ❑M ❑L	❑H ❑M ❑L	❑H ❑M ❑L	❑H ❑M ❑L	❑H ❑M ❑L	❑H ❑M ❑L
Interventions (# of times provided during week)							
ROM (A, AA, or P; could also be CPM or cycling)							
Stretching – manual							
Stretching – mechanical							
Joint mobilization – patellofemoral							
Joint mobilization – tibiofemoral							
Joint mobilization – other joint							
Soft tissue mobilization – instrumented							
Soft tissue mobilization – non-instrumented							
Strengthening: quadriceps NWB							
Strengthening: hamstrings NWB							
Strengthening: hips (WB or NWB)							
Strengthening: calves							
Strengthening: WB multijoint							
Strengthening: trunk (incl. trunk stabilization)							
Aerobic exercise							
Orthotics/bracing							
Taping for pain or dysfunction @ knee							
Modalities: heat or cold therapy							
Modalities: ultrasound							
Modalities: e-stim for pain/swelling							
Modalities: e-stim for muscle strength							
Modalities: e-stim for muscle re-education							
Modalities: Iontophoresis or phonophoresis							
Modalities: dry needling							
Agility training (walking/running-based)							
Balance training (incl. perturbation training)							
Movement re-education							
Task-specific training							
Plyometrics							
Assistive device fitting/prescription							
Other, please list _____							
Change in Classification? (if Y, go to other side)	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N
Outcomes	**Initial**	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**DC**
IKDC (0 to 100, 100 = best function): *Calculation: (sum of item scores / 87) * 100*							

Please Indicate Changes in Classification	Initial	Week 2	Week 3	Week 4	Week 5	Week 6	DC
Date:							
Impaired Knee Joint Motion	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N
Limited extension ROM	❑	❑	❑	❑	❑	❑	❑
Limited flexion ROM	❑	❑	❑	❑	❑	❑	❑
Functional limitation of ROM, or stiffness	❑	❑	❑	❑	❑	❑	❑
Impaired Quadriceps Strength or Endurance	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N
Presence of lag	❑	❑	❑	❑	❑	❑	❑
MMT 4/5 or lower on one or both sides	❑	❑	❑	❑	❑	❑	❑
10% or greater deficit compared to uninvolved side	❑	❑	❑	❑	❑	❑	❑
Functional strength or endurance deficit observed	❑	❑	❑	❑	❑	❑	❑
Impaired Musculotendinous Length	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N
Rectus Femoris	❑	❑	❑	❑	❑	❑	❑
Hamstrings	❑	❑	❑	❑	❑	❑	❑
Iliotibial band/tensor fascia latae	❑	❑	❑	❑	❑	❑	❑
Gastrocnemius	❑	❑	❑	❑	❑	❑	❑
Other muscle, limiting function	❑	❑	❑	❑	❑	❑	❑
Impaired Hip Strength or Endurance	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N
MMT 4/5 or lower (glut med, max, hip rotators)	❑	❑	❑	❑	❑	❑	❑
10% or greater deficit compared to uninvolved side	❑	❑	❑	❑	❑	❑	❑
(+) hip hike test if MMT 5/5	❑	❑	❑	❑	❑	❑	❑
Pain or Impaired Mobility of Soft Tissue	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N
Limited or painful scar mobility	❑	❑	❑	❑	❑	❑	❑
Painful or hypomobile patellar glides	❑	❑	❑	❑	❑	❑	❑
Pain with palpation of knee soft tissue	❑	❑	❑	❑	❑	❑	❑
Impaired Structural Alignment	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N
Knee varus or valgus observed in static posture	❑	❑	❑	❑	❑	❑	❑
Abnormal foot pron/supin in static posture	❑	❑	❑	❑	❑	❑	❑
True leg length discrepancy	❑	❑	❑	❑	❑	❑	❑
Impaired Neuromuscular Control	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N
Sense of instability	❑	❑	❑	❑	❑	❑	❑
Abnormal laxity	❑	❑	❑	❑	❑	❑	❑
Unwanted compensatory movement during tasks	❑	❑	❑	❑	❑	❑	❑
Impaired balance/proprioception	❑	❑	❑	❑	❑	❑	❑

Clinic ID: _____ **PT ID:** _____ **Patient ID:** _____		**Initial**	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**DC**
Date:								
Not Scheduled/Discharged/Terminated Tx:		❑	❑	❑	❑	❑	❑	❑
Change in Classification? (if Y, go to other side)		❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N
Irritability (H = high; M = medium; L = low)		❑H ❑M ❑L	❑H ❑M ❑L	❑H ❑M ❑L	❑H ❑M ❑L	❑H ❑M ❑L	❑H ❑M ❑L	❑H ❑M ❑L
Interventions (# of times provided during week)								
ROM (A, AA, or P; could also be CPM or cycling)								
Stretching	Manual							
	Mechanical/self-stretch							
Joint Mobilization	Patellofemoral							
	Tibiofemoral							
	Other Joint							
Soft Tissue Mobilization	Instrumented							
	Non-instrumented							
Strengthening	Quadriceps NWB							
	Hamstrings NWB							
	Hips (WB or NWB)							
	Calves							
	WB multijoint							
	Trunk (incl.stabilization)							
Modalities	Heat/Cold therapy							
	Ultrasound							
	Estim pain/swelling							
	Estim muscle strength							
	Estim muscle re-ed							
	Ionto or Phonophoresis							
	Dry needling							
Aerobic exercise								
Orthotics/bracing								
Taping for pain or dysfunction @ knee								
Agility training (walking/running-based)								
Balance training (incl. perturbation training)								
Movement re-education								
Task-specific training								
Plyometrics								
Assistive device fitting/prescription								
Other, please list _____								
Outcome (KOOS) *100 – [(mean item score * 100) / 4]*		**Initial**	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**	**DC**
Pain Subscale								
Symptom Subscale								
ADL Subscale								
Sport/Recreation Subscale								
QOL Subscale								

Please Indicate Changes in Classification	Initial	Week 2	Week 3	Week 4	Week 5	Week 6	DC
Date:							
Impaired Knee Joint Motion	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N
Limited extension ROM	❑	❑	❑	❑	❑	❑	❑
Limited flexion ROM	❑	❑	❑	❑	❑	❑	❑
Functional limitation of ROM, or stiffness	❑	❑	❑	❑	❑	❑	❑
Impaired Quadriceps Strength or Endurance	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N
Presence of lag	❑	❑	❑	❑	❑	❑	❑
MMT 4/5 or lower on one or both sides	❑	❑	❑	❑	❑	❑	❑
10% or greater deficit compared to uninvolved side	❑	❑	❑	❑	❑	❑	❑
Functional strength or endurance deficit observed	❑	❑	❑	❑	❑	❑	❑
Impaired Musculotendinous Length	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N
Rectus Femoris	❑	❑	❑	❑	❑	❑	❑
Hamstrings	❑	❑	❑	❑	❑	❑	❑
Iliotibial band/tensor fascia latae	❑	❑	❑	❑	❑	❑	❑
Gastrocnemius	❑	❑	❑	❑	❑	❑	❑
Other muscle, limiting function	❑	❑	❑	❑	❑	❑	❑
Impaired Hip Strength or Endurance	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N
MMT 4/5 or lower (glut med, max, hip rotators)	❑	❑	❑	❑	❑	❑	❑
10% or greater deficit compared to uninvolved side	❑	❑	❑	❑	❑	❑	❑
(+) hip hike test if MMT 5/5	❑	❑	❑	❑	❑	❑	❑
Pain or Impaired Mobility of Soft Tissue	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N
Limited or painful scar mobility	❑	❑	❑	❑	❑	❑	❑
Painful or hypomobile patellar glides	❑	❑	❑	❑	❑	❑	❑
Pain with palpation of knee soft tissue	❑	❑	❑	❑	❑	❑	❑
Impaired Structural Alignment	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N
Knee varus or valgus observed in static posture	❑	❑	❑	❑	❑	❑	❑
Abnormal foot pron/supin in static posture	❑	❑	❑	❑	❑	❑	❑
True leg length discrepancy	❑	❑	❑	❑	❑	❑	❑
Impaired Neuromuscular Control	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N	❑ Y ❑ N
Sense of instability	❑	❑	❑	❑	❑	❑	❑
Abnormal laxity	❑	❑	❑	❑	❑	❑	❑
Unwanted compensatory movement during tasks	❑	❑	❑	❑	❑	❑	❑
Impaired balance/proprioception	❑	❑	❑	❑	❑	❑	❑