

Industrial Insurance Medical Advisory Committee (IIMAC)

AGENDA

Date: April 28, 2016

Time: 1:00 p.m. to 5:00 pm

Location: Seattle-Tacoma International Airport
Port of Seattle-**Beijing Room**
17801 International Blvd
Seattle, WA 98158 206.787.5698

Teleconference Dial-in Number: 1-866-715.6499
Conference ID: 7749726844#

Note: All times are approximate and may change at the Chair's discretion and based on time needed.

*Denotes an action item

<u>Min</u>	<u>Time & Lead</u>	<u>Topic</u>
10	1:00-1:10 Dianna Chamblin	Welcome Safety Tip Approve minutes from 01/28/16 meeting*
10	1:10-1:20 Leah Hole-Marshall	Update from the Advisory Committee on Healthcare Innovation and Evaluation (ACHIEV)
15	1:20-1:35 Stephen Thielke or Bob Mootz	Update on development of the Psychosocial Determinants Influencing Recovery
85	1:35-3:00 Chris Howe	Knee Guideline VOTE* Discussion Public Testimony Review & Vote
15	3:00-3:15	Break
20	3:15-3:35 Angela Jones	IIMAC bylaw changes VOTE*
25	3:35-4:00 Carly Eckert	Catastrophic Care Transformation Project Update Review of findings of Catastrophic Retrospective Analysis
45	4:00-4:45 Chris Howe Zach Gray	Foot and Ankle Subcommittee: Update on participants, scope of questions, types of surgeries, data results, National Guideline Clearinghouse Inclusion Criteria and Plans
10	4:45-4:55 Leah Hole-Marshall	Legislative Session & Risk of Harm Update
5	4:55-5:00 Dianna Chamblin	Wrap-up

Remaining 2016 Meeting dates: July 28th & October 27th

January 28, 2016 Industrial Insurance Medical Advisory Committee Meeting

Draft Minutes (*actions taken)

Topic	Discussion & Outcome(s)
<p>Members present: Drs. Chamblin, Friedman, Gutke, Harmon, Howe, Lang, Leveque, Seaman, Thielke, Haines, Carter & Waring both on phone</p> <p>Members absent: Drs. Tauben (Zoltani – no longer on committee)</p> <p>L&I staff present: Gary Franklin, Leah Hole-Marshall, Carly Eckert, Nicholas Reul, Hal Stockbridge, Simone Javaher, Angela Jones, Ian Zhao, Zach Gray, Jena Williams</p> <p>Public: Shari Fowler, Regine Neiders</p>	
<p>Welcome, Introductions, Minutes, Announcements</p>	<p>Dr. Chamblin welcomed Angela Jones BSN, RN as the new ONC for L&I organizing the IIMAC meetings and writing the guidelines, Jena Williams, Medical Program Specialist (ACHIEV), and Christy Pham, Pharm D</p> <p>Safety Tip provided regarding protection during lightning storm</p> <p>*The minutes from 10/22/2015 were read and approved unanimously.</p>
<p>Advisory Committee on Healthcare Innovation and Evaluation (ACHIEV)</p>	<p>Leah Hole-Marshall updated the committee on the morning's ACHIEV meeting. ACHIEV focused on three of the "clusters" in Healthy Worker 2020 (HW2020). Presentations and minutes available at: http://www.lni.wa.gov/ClaimsIns/Providers/ProjResearchComm/PNAG/default.asp</p> <ul style="list-style-type: none"> Cluster #1: Core Occupational Care best practice – the focus was on understanding access and capacity needs of the "new" workforce that will be needed to practice in a collaborative, accountable system. The Medical Provider Network is important for removal of a small number of providers, but does not set the standard for best practices. The MPN "access" measures of counting approved providers are important but not sufficient to achieve success in HW2020. Current data sources on panel sizes; types of providers; other insurance access standards; L&I "heat map" data was presented to begin the discussion. Cluster #2: Surgical best practices: L&I has three major areas that will need to be integrated for a comprehensive surgical best practice cluster: Ortho-Neuro program – a currently existing program incentivizing 6 best practices for surgeons; surgical best practices – a three site pilot that includes best practices and care coordination; and a new purchasing method not yet deployed, based on the Bree Collaborative, that includes both warrantee and bundles for certain surgeries including knee/hip replacement, and for lumbar fusion. ACHIEV members provided feedback about how L&I would integrate those programs. Cluster #3: Catastrophic care- 5 point plan was reviewed with progress in each. Top Tier update: L&I incorporated the feedback from the previous meeting and is moving forward with an approach that will allow providers to reach top tier using several pathways – one is through being a COHE high adopter and demonstrating certain best practices; another approach is through an application to top tier where equivalent high adoption of best practices occurs. These routes are primarily for primary care. More routes could be added for specialty, such as high adoption in the new combined surgical best practice program. L&I also confirmed that demonstration of an ability to work within a system and have care coordination is central to any top tier qualification and that the willingness to take complex claims is important but not a requirement.

<p>Bio-psycho-social practice resource Now called: Psychosocial Determinants Influencing Recovery (PDIR)</p>	<p>On behalf of the joint IIMAC and Industrial Insurance Chiropractic Advisory Committee (IICAC) project, Dr. Stephen Thielke presented an update on Psychosocial Determinants Influencing Recovery (PDIR). It is designed to look at better ways of managing psychosocial risk factors, as opposed to diagnosing and separately managing psychiatric disease and illness in more traditional ways, which have not proven beneficial. He presented 3 screening algorithms developed so far. Asking, "What are your expectations for recovery?" is an example of a question that may lead to further stepped care management.</p> <p>Multiple questions were asked from the committee members about access to mental health services within the L&I system. Lack of access to mental health professionals is a current barrier; and lack of training about managing mental health and psychosocial issues were mentioned as obstacles. L&I is discussing a plan to help implement techniques like motivational interviewing, and incentivizing a collaborative care model for chronic pain and behavioral health. Members offered suggestions including early behavior intervention in the workplace, workplace advocacy programs, promoting community mental health workers, and training for doctors in motivational interviewing techniques with structured language.</p>
<p>Knee guideline and subcommittee</p>	<p>Dr. Chris Howe, Chair of the knee surgery subcommittee, gave an update on the progress of the guideline. An ambitious time line was presented- the subcommittee will bring a final draft to IIMAC in April. A new uniform and systematic format for the narrative section was presented with an example from the total knee arthroplasty section.</p> <p>Some discussion of the impact of BMI in the knee criteria-a BMI greater than 40 indicates worse outcomes, and an example was presented as to how this was integrated into the criteria table. Comments were offered about obesity being a frequent barrier to recovery due to problems with rehab methods such as exercise. The status of viscosupplementation was raised; there is a HTCC decision that all but prohibits use—a link to this coverage decision will be included in the guideline narrative.</p>
<p>Foot and Ankle Subcommittee</p>	<p>Angela Jones presented procedures covered in the current guideline, which was written in 1992. Committee members were solicited for recommendations of physicians to sit on the subcommittee, and several MDs and Podiatrists were discussed. Dr. Chris Howe agreed to chair the subcommittee and Drs. Friedman and Harmon agreed to participate. Dr Howe and Dr Chamblin will approach the recommended foot specialists for potential participation.</p>
<p>Catastrophic Injury Project</p>	<p>Dr. Nicholas Reul presented the committee with an update on catastrophic care, and spoke to integration with other quality care measures and best practices. There are approximately 250 catastrophically injured workers per year in WA state. 8 % of claims account for 81% of the cost to L&I. Approximately 75% of that is high cost non-catastrophic claims, the most common being low back injury. The 3 overall goals and 5 point transformation plan was reviewed. L&I will establish a foundation of outcomes that relies on clinically meaningful measures of function. L&I was successful in allocating internal resources as demonstrated by dedicating nurse consultants and claims managers to catastrophically injured workers having 100% of catastrophic claims tracked and coordinated in the Occupational Health Management System. Current median time frame from date of injury to report of accident is 1 day. The RFP for external nurse care managers was also completed; they are already being assigned to catastrophically injured workers; projecting 90% will be assigned by the end of February 2016.</p> <p>The second portion of Dr. Reul's presentation involved a live demonstration of the catastrophic claims systems captured in the Occupational Health Management System (OHMS). The system demonstration showed how nurses and L&I staff can enter hospitalizations (even if claims not yet established), and track progress on claim acceptance, injured worker location and demographics, and assignment of resources. This significantly enhances communication and speeds decision making.</p>

	<p>Dr. Carly Eckert presented on the retrospective evaluation component of the 5 point plan. She described the study aims including capturing the Injury Severity Score from the WA State Trauma Registry; A detailed description of this risk score was given. Increasing severity is associated with worse outcomes.</p> <p>Question: what is the difference between a COHE and a catastrophic center of excellence? COHEs are designed to apply best practices early in the life of a claim, whereas centers of excellence have deeper resources and can deliver care for a longer term to selected groups of patients, such as catastrophically injured workers. Telehealth has the promise to facilitate quality care to more rural populations; this allows patients to stay within their community and local primary care providers can readily obtain expertise from specialists in larger, more distant centers.</p>
Proposed Bylaw changes	<p>Simone Javaher presented on proposed bylaw changes. Sections affected are G & T. Proposed changes were discussed. Section G changes are intended to clarify terms and nomination process and section T changes aim to clarify and streamline what notice and voting is required to adopt bylaw changes. Questions about having a quorum were raised, along with options for voting remotely and by proxy. Staff will incorporate the feedback into the current proposed changes. A vote is planned for the next IIMAC meeting on April 28.</p>
PMP and EPIC integration	<p>Hal Stockbridge shared information on a new option to integrate the Prescription Monitoring Program (PMP) into EPIC systems (electronic medical record system).</p>
Opioid Update	<p>The AMDG Opioid Guideline was endorsed by the Bree Collaborative, which will allow statewide implementation across multiple payers and health sectors. Short history of opioid addiction and the massive impact the drugs have on the country was explained. One major goal of the Bree opioid implementation workgroup is to reduce the numbers and duration of prescriptions of opioids written for those under the age of 20. The CDC guideline is moving forward with 12 new recommendations. The application of the opioid guideline issues to Top Tier best practices were discussed. Some concern was expressed over legacy cases and MDs being penalized. A 5% non-compliance threshold was reviewed for not escalating new starts. Suggestions given to make PMP queries a requirement for top tier providers. Concerns expressed about surgical patients not being able to receive NSAIDS and Tylenol in hospitals.</p>
Lumbar Fusion	<p>Dr. Gary Franklin gave an update on the Health Technology Clinical Committee (HTCC)'s new decision to not cover lumbar fusion for uncomplicated degenerative disk disease (UDDD). The updated lumbar fusion guideline was discussed, with the only changes being the removal of references to UDDD and Structured Intensive Multidisciplinary Program (SIMP). This means the guideline is returned to its previous version, prior to the addition of the SIMP language. No vote was needed.</p>
Risk of Harm	<p>Brook Martin, via phone, presented on the Risk of Harm analysis related to lumbar spine surgery – complications and reoperation rates. There has been an increase in lumbar surgeries in the age group over 65 and in the complexity of surgery. He presented his study design, including data from L&I. There has been significant analytic work and consultation with a subgroup of IIMAC to identify appropriate criteria, benchmarks and comparators, which the team believes is now fairly solid. Because of the low numbers of cases, it has been difficult to clearly identify significant outliers. Most individuals agreed that adding more years and potentially working with another payer (e.g. Medicaid) to get more cases would be beneficial. Concern was voiced about using the current data to take policy action (e.g. network action). L&I indicated that as with the opioids risk of harm analysis, the data alone will not be used to take action. Identifying patterns of poor care, case analysis and peer review will also be required. L&I plans to expand the analysis to increase the likelihood of accurately</p>



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	identifying outliers.
Legislative Session Update	Leah Hole-Marshall updated the committee on 3 bills that directly affect L&I. Watching other bills as well.
Adjourn	Meeting was adjourned at 5:00.

Work-Related Knee Injuries: Diagnosis and Treatment

Draft of L&I Knee Guideline

A new Surgical Knee Guideline for WA State Workers' Compensation is open for public comment (mail, fax, or email) through **5:00pm on Monday, April 11th**.

The Department's Industrial Insurance Medical Advisory Committee and its Surgical Knee Guideline Subcommittee developed this treatment guideline as a best practice standard for surgical treatment of certain knee conditions. Providers who are in the department's Medical Provider Network are required to follow this guideline as it applies to the treatment they provide to injured workers.

A draft of the Surgical Knee Guideline will be presented to the Industrial Insurance Medical Advisory Committee in an open public meeting on April 28, 2016 (see the L&I website for [meeting details](#)). The department's response to all public comments will be available, and there will be time on the agenda for public testimony.

Work-Related Knee Injuries: Diagnosis and Treatment 2016

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I. Review Criteria for Knee Surgery

A request may be appropriate for	If the patient has		AND the diagnosis is supported by all the following subjective and objective findings and imaging results:		Required or recommended
Surgical Procedure	Condition or Diagnosis	Subjective	Objective	Imaging	Non-operative care
Knee arthroscopy for diagnosis or for osteoarthritis	<p><u>Diagnosis:</u> MRI is now the diagnostic method of choice. Arthroscopy for diagnostic purposes will only be considered if an MRI is contraindicated, (e.g. for a patient with a cochlear implant or pacemaker).</p> <p><u>Osteoarthritis:</u> Arthroscopic debridement and lavage is not covered as treatment for osteoarthritis; based on a 2008 HTA decision.</p>				
Chondroplasty	<p>Chondroplasty is most commonly done in conjunction with a meniscal surgery or marrow stimulating procedure; it is rarely done as a stand-alone procedure. A chondroplasty, by itself, is covered only when:</p> <p>a) During a previously authorized surgery that was aborted, a chondral lesion was discovered and documented with intraoperative imaging (e.g. photo), OR</p> <p>b) A chondral lesion, such as a loose flap, is seen preoperatively on MRI and surgery is indicated to remove or correct it.</p>				
Autologous Chondrocyte Implantation (ACI)	Non-covered procedure (for explanation, see Autologous Chondrocyte Implantation in the narrative section)				
Patellar tendon realignment procedure with or without lateral retinacular release	Patellar dislocation	History of acute traumatic dislocation	Lateral tracking of the patella OR Recurrent effusion OR Positive patellar apprehension test OR Synovitis with or without crepitus OR Recurrent dislocations	MRI (not x-ray or CT scan) shows: Medial Patellofemoral Ligament (MPFL) disruption OR Osseous contusion OR Cartilage injury	6 weeks of physical therapy is <u>required</u> for first time dislocation; physical therapy is not required for recurrent dislocations or if loose osteochondral body is confirmed by MRI or x-ray and needs to be surgically addressed.

A request may be appropriate for	If the patient has	AND the diagnosis is supported by all the following subjective and objective findings and imaging results:			Required or recommended
Surgical Procedure	Condition or Diagnosis	Subjective	Objective	Imaging	Non-operative care
Meniscectomy, full or partial (in a non-degenerative knee)	Acute meniscal tear in an otherwise non-degenerative knee AND Onset of symptoms within 12 weeks of injury	Discrete event associated with the acute onset of any of the following symptoms: <ul style="list-style-type: none"> • Pain • Swelling • Locking, catching, or popping 	Positive McMurray's sign OR Anatomically consistent joint line tenderness OR Effusion OR Limited range of motion OR Mechanical locking, catching, or popping Note: The combination of positive McMurray's sign with joint line tenderness has a higher predictive value than any one sign alone.	MRI shows: Non-degenerative meniscal tear AND KL score < 2 on weight bearing x-rays	Not required for locked or blocked knee If not locked or blocked, recommend: At least 6 weeks (post-injury) of: Physical therapy OR Non-narcotic medications OR Activity modification
Repeat arthroscopic meniscectomy in the absence of new injury (in a non-degenerative knee)	Knee is still symptomatic with continued disability AND At least 12 weeks has passed since meniscectomy for original acute tear	Continued symptoms of: <ul style="list-style-type: none"> • Pain • Swelling • Locking, catching, or popping 	Positive McMurray's sign OR Anatomically consistent joint line tenderness OR Effusion OR Limited range of motion OR Mechanical locking, catching, or popping Note: The combination of positive McMurray's sign	A NEW MRI shows: Meniscal tear AND KL score < 2 on weight-bearing x-rays	<u>Recommended:</u> Physical therapy during 12 weeks post-op period after initial injury as long as there is no mechanical locking

A request may be appropriate for	If the patient has	AND the diagnosis is supported by all the following subjective and objective findings and imaging results:			Required or recommended
Surgical Procedure	Condition or Diagnosis	Subjective	Objective	Imaging	Non-operative care
			with joint line tenderness has a higher predictive value than any one sign alone		
Meniscectomy, full or partial (in a degenerative knee)	Acute or chronic Meniscal tear in a degenerative knee	History of locking of the knee	Mechanical locking OR Effusion OR Restricted motion	MRI shows: Large meniscal flap or fragment AND KL score ≥ 2 on weight-bearing x-rays	Not required
Repeat arthroscopic meniscectomy in the absence of new injury (in a degenerative knee)	Acute or chronic Meniscal tear in a degenerative knee	History of locking of the knee	Mechanical locking	A NEW MRI shows: large meniscal flap or fragment AND KL score ≥ 2 on weight-bearing x-rays	Not required
Meniscal Allograft Transplantation (MAT)	A previous acute, work-related event that caused the need for a meniscectomy	Knee pain that has not responded to conservative treatment	Previous meniscectomy with at least 2/3 of the meniscus removed AND Stable knee with intact ligaments, or intent to repair torn ligament; with normal alignment or intent to realign, and normal joint space; has sufficient articular cartilage in the affected compartment to ensure the continued integrity of	MRI demonstrates absence of meniscus- AND Posteriolateral-Weight bearing AP and lateral x-rays with or without notch view show a KL score < 2 AND/OR Chondrosis meeting Modified Outerbridge Scale, Grade I or II OR Grade III with evidence	<u>Recommended:</u> Physical therapy OR NSAID OR Activity modification

A request may be appropriate for	If the patient has	AND the diagnosis is supported by all the following subjective and objective findings and imaging results:			Required or recommended
Surgical Procedure	Condition or Diagnosis	Subjective	Objective	Imaging	Non-operative care
			the allograft meniscus AND Age < 50 AND BMI < 35	that articular surface is sufficiently free of irregularities to maintain integrity of transplanted meniscus. Exclusion criteria: Grade III (with or without debridement) without an articular surface capable of maintaining integrity of the transplanted meniscus OR Grade IV	
Anterior cruciate ligament (ACL) reconstruction	ACL tear resulting from an acute work-related event associated with new onset of symptoms	Instability of the knee, potentially described as “buckling or giving way” OR Pain and swelling that limits normal function Pain alone is not an indication for surgery	Positive Lachman’s sign OR Positive pivot shift OR Positive anterior drawer	MRI shows: ACL disruption	Not required for up to 3 months after acute injury If surgery is requested after 3 months, physical therapy is recommended before surgery to strengthen the surrounding muscles Bracing

A request may be appropriate for	If the patient has	AND the diagnosis is supported by all the following subjective and objective findings and imaging results:			Required or recommended
Surgical Procedure	Condition or Diagnosis	Subjective	Objective	Imaging	Non-operative care
Marrow stimulating techniques: Microfracture <i>or</i> Subchondral drilling <i>or</i> Abrasion arthroplasty	A full-thickness chondral defect resulting from a previous acute, work-related event	Joint pain AND Complaints of joint swelling	Knee is stable with intact ligaments or intention to correct ligaments AND Normal knee alignment or intention to correct alignment	MRI shows: Single chondral defect < 2.5 cm ² AND KL score ≤ 1 on weight bearing x-rays	May consider: Non-narcotic medication AND/OR Physical therapy
Osteochondral autograft/allograft transplantation (mosaicplasty or OAT procedure for the knee)	A single, focal, full thickness chondral defect resulting from a previous acute, work-related event	Joint pain AND Complaints of joint swelling	Knee is stable with intact ligaments or intention to correct ligaments AND Normal knee alignment or intention to correct alignment AND Age < 50 AND Does not have degenerative and/or inflammatory arthritis	MRI shows: Single large chondral defect AND KL score ≤ 1 on weight bearing x-rays and normal joint space	May consider: Non-narcotic medication AND/OR Physical therapy

A request may be appropriate for	If the patient has	AND the diagnosis is supported by all the following subjective and objective findings and imaging results:			Required or recommended
Surgical Procedure	Condition or Diagnosis	Subjective	Objective	Imaging	Non-operative care
Uni-compartmental Knee Arthroplasty (UKA – partial knee replacement) ⁱ	End stage osteoarthritis in only one compartment	Pain limiting activities of daily living AND Pain interfering with ability to work OR Pain limiting ambulation OR Pain interfering with sleep	BMI < 35 AND Angular deformity of < 15 degrees that is passively correctable AND A range of motion arc > 90 degrees, with < 5 degree flexion contracture	KL score of 3 or 4 in only one compartment on weight bearing x-rays	May consider any combination of: Strengthening exercises, activity modification, assistive devices, bracing, corticosteroid injections, NSAIDs or other non-narcotic medication
Total Knee Arthroplasty (TKA) ⁱⁱⁱ	End stage osteoarthritis, where one or more compartments are affected	Pain limiting activities of daily living AND Pain interfering with ability to work OR Pain limiting ambulation OR Pain interfering with sleep	BMI < 40 AND Decrease in knee range of motion OR Knee effusion	KL score of 3 or 4 in one or more compartment on weight bearing x-rays	May consider any combination of: Strengthening exercises, activity modification, assistive devices, bracing, corticosteroid injections, NSAIDs or other non-narcotic medication
ⁱ This surgical criteria is consistent with the Health Technology Clinical Committee's 2010 knee arthroplasty decision . ⁱⁱ Fasciotomy, iliotibial tenotomy (IT Band release) cannot be billed separately when done with a total knee arthroplasty.					

Figure 1: Osteoarthritis (OA) and Chondral Lesion Grading Scales

Kellgren Lawrence (KL) Scoring System	
The KL scale is one of the most widely used and accepted method of grading radiographic OA severity ^[1] .	
<ul style="list-style-type: none"> • Grade 0: No radiographic features of osteoarthritis are present • Grade 1: Doubtful narrowing of joint space and possible osteophytic lipping on anteroposterior weight-bearing radiograph • Grade 2: Definite osteophytes, definite narrowing of joint space • Grade 3: Moderate multiple osteophytes, definite narrowing of joint space, some sclerosis and possible deformity of bone contour • Grade 4: Large osteophytes, marked narrowing of joint space, severe sclerosis and definite deformity of bone contour 	
Modified Outerbridge Classification	
The Modified Outerbridge Classification is the most widely used and accepted method of classifying chondral lesions. This grading system is based on the depth of the chondral lesion. Originally the Outerbridge was based on direct visual observation in the 1960's but was later modified to reflect the medical standard of MRI use ^[2, 3] .	
<ul style="list-style-type: none"> • Grade I: Articular cartilage softening • Grade II: Chondral fissures that do not reach the subchondral bone and are < 1.5 cm in diameter • Grade III: Chondral fissures that reach the subchondral bone and are > 1.5 cm in diameter • Grade IV: Exposed subchondral bone 	

II. Introduction

This guideline reflects a best practice standard for surgical treatment of certain knee conditions sustained by injured workers treated in the Washington workers' compensation system under Title 51 Revised Code of Washington (RCW). Providers who are in the department's Medical Provider Network, are required to follow this guideline as it applies to the treatment they provide to injured workers ^a. The surgical criteria are used in the department's utilization review program, as the supporting evidence has shown these provide the best chance for injured workers to have a good surgical outcome. To help ensure that diagnosis and treatment of knee conditions are of the highest quality, this guideline emphasizes:

- Conducting a thorough assessment and making an accurate diagnosis
- Appropriately determining work-relatedness
- Making the best treatment decisions that are curative or rehabilitative ^b
- Facilitating the worker's return to health, productivity, and work

The guideline was developed in 2015-2016 by a subcommittee of the Industrial Insurance Medical Advisory Committee (IIMAC). The subcommittee was comprised of physicians of various medical specialties, including rehabilitation medicine, occupational medicine, orthopedic surgery and family medicine. The guideline recommendations are based on the weight of the best available clinical and scientific evidence from a systematic review of medical literature, and on a consensus of expert opinion when scientific evidence was insufficient or inconclusive. Visit the department's [Medical Treatment Guidelines](#) webpage for detailed information on the guideline development process.

A. Background and Prevalence

Injuries to the knee are common, with over 6.5 million visits to US emergency departments from 1999-2008, or 2.29 knee injuries per 1,000 people, and 10-60% of the general population displaying knee pain reflecting a variety of conditions ^[4, 5]. Among fulltime workers, the Bureau of Labor Statistics found that the incidence of knee injuries in 2014 was 9.6 per 10,000 workers, with knee sprains, strains, or tears accounting for nearly 50% of injuries resulting in lost work time ^[6]. Knee injuries may arise from acute trauma, work-related musculoskeletal disorders, or non-traumatic soft tissue disorders and can happen to any of the structures that make up or support the knee joint, including ligaments, cartilage, muscles and bones ^[7].

In a study of State Fund claims accepted in the Washington State workers' compensation system from 1999-2007, knee conditions accounted for 7% of work-related musculoskeletal disorders and consumed 10% of the costs, translating to nearly 25,000 knee injuries and just under \$500 million. Industries most often associated with knee injuries were construction and building contractors ^[5]. Top industries for compensable claims (i.e. wage replacement was paid) were carpenters and truck drivers for men, and nursing aides and housekeepers for women. Though the claims had overlapping diagnoses, most were sprains (~86%), meniscal/ligamentous disruption (~42%), chondromalacia patellae (~12%), and tendonitis/bursitis/enthesopathy (~11%) ^[5].

^a <http://app.leg.wa.gov/RCW/default.aspx?cite=51.36.010>

^b <http://app.leg.wa.gov/wac/default.aspx?cite=296-20-01002>

B. Establishing Work-relatedness

A knee injury sustained during the course of employment is defined in Washington State statute as “a sudden and tangible happening, of a traumatic nature, producing an immediate or prompt result, and occurring from without, and such physical conditions as result therefrom.”^c This is based on medical opinion with a more probable than not degree of medical certainty.

Occupational disease is defined in RCW 51.08.140 as a “disease or infection that arises naturally and proximately out of employment.”^d Establishing an occupational disease diagnosis requires that all of the following criteria are met:

1. **Exposure:** Workplace activities that contribute to or cause knee conditions, **and**
2. **Outcome:** Diagnosis of a knee condition that meets the diagnostic criteria in this guideline, **and**
3. **Relationship:** Documentation that, based on generally accepted scientific evidence, the work exposures created a risk of contracting or worsening the condition relative to the risks in everyday life, on a more-probable-than-not basis (*Dennis v. Dept. of Labor and Industries*, 1987). In epidemiological studies, this will usually translate to an Odds Ratio (OR) ≥ 2 .

A thorough occupational and non-occupational exposure history is essential for determining whether a knee condition is work-related and whether it is due to an acute or chronic exposure. For chronic exposures, it is important to document where, when, and for how long they occurred, as they could span multiple employers who would then share liability for an occupational disease. Providers should submit the completed work history to the department or self-insurer as soon as possible.

Osteoarthritis

A complicating factor when trying to establish work-relatedness is the presence of osteoarthritis (OA). Osteoarthritis is a normal degenerative process and a progressive condition that results from loss or deterioration of articular cartilage. It is the most common arthritic disease, it is the most common cause of long-term disability in persons older than 65, and it is expected to become the world's 4th leading cause of disability by 2020^[8, 9]. Those with diagnosed OA have nearly double the risk of increased sick leave, with around 2% of all sick days being attributable to knee OA, and are 40-50% more likely to receive a disability pension^[10].

While osteoarthritis is considered a normal degenerative process, if certain movements such as squatting, kneeling, and heavy lifting are a regular part of one's job and are thus performed repeatedly or intensively over an extended period of time, they may contribute to the development and severity of osteoarthritis, and in these situations, may be considered work-related. Obesity is a leading independent non-work related risk factor for developing symptomatic knee osteoarthritis, with the risk increasing as BMI increases^[9, 11-13].

^c <http://app.leg.wa.gov/RCW/default.aspx?cite=51.08.100>

^d <http://app.leg.wa.gov/RCW/default.aspx?cite=51.08.140>

III. Assessment

A. History and Clinical Exam

Knee injuries may be complex, often involving more than a single tissue or anatomic element. Different knee problems can present with similar findings, such as limited and painful motion and effusion, so during the assessment process it is important to determine which compartments of the effected extremity are affected and tailor a treatment plan accordingly. Aside from the occupational history described above, taking a thorough patient history should include a precise description of the event(s) leading up to the internal derangement/condition and whether there were any prior exposures, injuries, or surgeries in the affected area. Degree, location, and nature of pain, including how it may manifest during sleep, and presence of any instability, locking, or problems with mobility and weight bearing are all important to assess. Clinical examination typically assesses and documents: range of motion, effusion, crepitus, tenderness, stability, and provocative tests e.g. McMurray's, patellar apprehension, Apley's, and Lachman's tests.

Patient-reported outcome measures (PROMs) are useful tools in the comprehensive assessment relying on a combination of patient self-report and clinical exam. The non-physical areas assessed are the patient's ability to perform activities of daily living (ADLs), engage in work or recreation, and perceived quality of life. Repeated use of these instruments allows the practitioner to trend the degree of knee related impairment.

Clinically meaningful improvement in function is an improvement in pain and function of 30% over baseline ^[14].

B. "Overuse Syndrome" and Contralateral Effects

It is sometimes contended that work-related injuries involving one part or side of a body ("ipsilateral") cause pain and impairment in a different part or opposite side ("contralateral") due to overuse, altered use, or other similar postulated mechanism. The appearance of contralateral symptoms or signs is often referred to as "overuse syndrome". There is an absence of high-grade medical literature upon which to base conclusions regarding the etiology of "overuse syndrome" in contralateral body regions following injuries, so careful assessment is critical. Additionally, it sometimes occurs that at the time of injury, a non-work-related degenerative condition is already present at the injury site, and — not uncommonly — elsewhere in the body as well. In Washington State's workers' compensation system, medical and surgical care is limited to treatment of only those conditions for which an industrial injury or occupational disease was a proximate cause. It is therefore important to identify the nature and etiology of "overuse syndromes" that are contended to be work-related, and support contentions of relatedness with careful documentation.

A contention that a condition in a contralateral body part or region has arisen as a proximate result of an occupational injury should be supported by at least the following documentation:

1. The specific contralateral condition that has been diagnosed, and the ICD-10 code for that condition;

2. Citations to medical literature that document a causal relationship between the condition(s) for which liability has been accepted in the workers' compensation claim and the contralateral condition, or a statement indicating that such medical literature could not be identified;
3. A statement as to whether the contralateral condition was present to any degree prior to the onset of the ipsilateral condition that is contented to be a cause of the contralateral condition. If the contralateral condition was present to any degree at or before the onset of the ipsilateral condition, the nature and extent of the contralateral condition at the time the ipsilateral condition arose must be documented, including, whenever possible:
 - a. The symptoms it reportedly caused;
 - b. Signs of the condition that were documented in the medical record;
 - c. Objective evidence that the condition was present, such as imaging studies, lab test results, electrodiagnostic studies, etc.;
4. A statement as to whether there is objective evidence of the development or worsening of the contralateral condition since the onset of the ipsilateral condition, and, if so, a description of the evidence of its development or worsening;
5. If the contralateral condition is degenerative in nature, the evidence supporting the contention that the present state of the contralateral condition is a proximate result of a condition for which the department has accepted liability in the claim, and not the natural progression of a degenerative disease process.

C. Diagnostic Imaging

The recommended imaging procedures for various knee surgeries are specified in the criteria table. Weight-bearing x-rays are recommended when determining the presence or extent of degenerative disease, and inclusion of Kellgren-Lawrence (K-L) scores are important for surgical consideration (see Appendix A). Magnetic resonance imaging (MRI) is most commonly used to diagnose injuries to the meniscus, ligaments or tendons. MRI is not recommended for every case of acute knee pain or for degenerative joint disease, and Labor and Industries requires prior authorization for all MRIs. Computed tomography (CT) is generally not recommended for the knee except in rare cases when MRI is contraindicated. Visit the [Advanced Imaging Guidelines](#) web page for complete information.

IV. Non-Operative Care

Many knee injuries can be treated effectively without surgery, and studies demonstrate that various conservative interventions can help reduce pain and improve function. Often a trial period of non-operative care is attempted, with the length and intensity of conservative care varying by patient specific factors.

Symptoms related to acute knee injury may resolve following the conservative treatment acronym RICE: Rest, Ice, Compression, and Elevation. Immobilization beyond 3 days carries the risk of knee stiffness or muscle atrophy and is therefore not recommended, with the exception of fracture, dislocations or muscle/ligament rupture ^[15]. Exercise, strength training, and activity modification, should be incorporated when there is adequate range of motion and pain management. Physical therapy or a prescribed home exercise program may be needed to continue improving range of motion and function, especially with more chronic conditions.

Non-narcotic medications are usually sufficient for managing pain. Corticosteroid injections may produce a moderate short term reduction in pain and a small improvement in physical function, but the quality of the evidence is low and results are inconclusive ^[16]. If needed, these should be done with caution when other conservative measures are not successful. The worker should be advised that the injections may be of limited value and multiple injections should not be done without clinically meaningful improvement (CMI) of at least 30% in pain and function. If this has not occurred within 4 -6 weeks of conservative treatment, the worker should be referred to a specialist (see Appendix A).

V. Surgical Procedures

Under Washington's Title 51 workers' compensation, knee surgeries must be pre-authorized and are subject to the utilization review process. Review criteria for authorizing knee surgery are in the table at the beginning of this guideline. If a proposed surgery is not listed, other standard review criteria may be used. Visit the department's [Utilization Review Program](#) page for further information on the requirements.

Preoperative Planning

Preoperative planning for postoperative recovery can help minimize the risk of untoward events. It is important to discuss expectations for pain management, recovery and functional improvement. Although general surgical risks and complications are reviewed, special emphasis should be placed on tobacco cessation and use of opioids. These two areas may carry additional risk of harm and should be closely reviewed with the patient.

When using opioids, care should be taken during the preoperative period to help plan for a successful recovery. Special attention is necessary for patient populations at a higher risk for opioid related complications. Patients on chronic opioid therapy can be especially difficult to provide sufficient pain relief to, therefore creating a plan prior to surgery will set expectations for the patient and practitioner. It is important to educate patients that opioids are intended to be one part of a multimodal pain reduction strategy. For a more detailed resource in pain management, please review www.agencymeddirectors.wa.gov.

Tobacco use has been shown to increase surgical complications and is linked to poor surgical outcomes. In patients who received tobacco cessation treatment before surgery, the risk of complications can be reduced by one-half to two-thirds. These complications are related to wound healing, cardiopulmonary events, and the need for postoperative intensive care ^[17, 18]. Tobacco cessation treatment, if pre-authorized, may be covered as a temporary aid to recovery for planned surgical procedures [will add link].

A. Marrow Stimulation Procedures

Articular cartilage has little or no capacity to regenerate and repair itself due to its avascularity. By penetrating subchondral bone to expose the underlying vascular cancellous bone, mesenchymal stem cells can be stimulated to produce fibrocartilage. Though inferior to hyaline cartilage, fibrocartilage can have a therapeutic and healing effect ^[19]. One of three techniques may be used: drilling, abrasion (using a motorized burr), or microfracture (making microperforations with a pick or awl). Studies suggest that

microfracture is the preferred technique, especially for lesions less than 2.5cm², and has the advantage of not removing bone ^[19-21].

Marrow stimulating procedures are usually reserved for patients with small full thickness chondral defects on the weight bearing portion of the medial or lateral femoral condyle. The knee should be stable and intact with fully functional menisci and ligaments, normal knee alignment, and normal joint space ^[19, 20, 22]. Several studies have shown the repaired tissue does not last and up to a third result in subchondral bone thickening, bone overgrowth (spurs) and subchondral cysts ^[23]. In addition patients with multiple or bipolar lesions and those with large nonfocal chondral lesions are less likely to achieve long-term benefit ^[24, 25].

B. Autologous Chondrocyte Implantation

Autologous chondrocyte implantation (ACI) is a two-stage technique done to treat localized cartilage defects in the femoral condyle, trochlea, or patella. The first stage is the harvesting and culturing of cartilage cells. In the second stage, these cells are implanted into the area of cartilage defect, with the goal of stimulating generation of cartilage in hopes of preventing or slowing the onset of osteoarthritis. For Washington's injured workers, ACI is not a covered procedure for the following reasons:

1. ACI is a secondary or "last resort" procedure that is only done after previous attempts to repair cartilage have failed, yet studies show that these previous repair attempts increase the failure rate of ACI itself. One cohort study found that patients undergoing marrow stimulation prior to ACI had a 3-fold increase in failure rate, with another study showing a 25% failure rate compared to a 3.6% failure rate in patients who had not previously undergone microfracture ^[23, 26]. Previous bone marrow stimulation was found to be significantly associated with reintervention surgery following ACI ^[27].
2. Current literature demonstrates that other procedures such as OAT and marrow stimulation procedures (e.g. microfracture, subchondral drilling, or abrasion arthroplasty) may be more effective. In five randomized controlled trials comparing ACI with marrow stimulation procedures, pooled analysis showed no significant difference in pain score outcomes at 24 months. In three trials comparing ACI with OAT, two studies found the techniques yield comparable functional outcomes, while one study found OAT demonstrated superior outcomes at 24 months ^[28].

C. Patellar Tendon Realignment Procedure

Treatment for a recurrent patellar dislocation or patellar instability that is not due to an industrial injury is not covered, and it is not the intent of the department to accept treatment for recurrent patellar instability that predates the industrial injury, unless the performance of the job is clearly contributing to recurrent dislocations. If, however, an industrial accident results in acute trauma to a knee that subsequently results in persistent patellar instability, a realignment procedure may be approved with or without a lateral retinacular release procedure. In general, it is typically recommended that nonoperative management be attempted for initial dislocations as there is a paucity of data to suggest that surgery is superior to nonoperative management ^[29].

D. Meniscal Disorders

The menisci are two semilunar fibrocartilaginous pads between the femoral condyles and tibial plateau. The lateral meniscus is “C” shaped covering approximately 80% of the compartment. The medial meniscus is “U” shaped and covers approximately 60% of the compartment. The main meniscal functions are tibiofemoral load distribution, shock absorption, lubrication, and stabilizing the knee during rotation. Common mechanisms of injury include rotation of the flexed knee during sports, cutting, decelerating, or landing from a jump. Tear patterns include vertical (longitudinal and radial), oblique, complex (or degenerative), or horizontal ^[30]. Small meniscal tears may cause only temporary pain and dysfunction, and except in the case of severe movement limitation, non-operative treatment of at least six weeks is recommended ^[31].

Studies have demonstrated a strong association between meniscal damage and knee osteoarthritis, including degenerative meniscal damage being a possible signal for early osteoarthritis ^[32-34]. Studies have also demonstrated that meniscal tears or destruction may be present in asymptomatic knees ^[35, 36].

There is mounting evidence that surgery for meniscal tears in arthritic knees does not improve symptoms and should be avoided unless the tear results in clearly documented mechanical locking of the knee ^[37, 38]. Even in knees with mild or no concurrent osteoarthritis the surgical treatment of degenerative meniscal tears is not always superior to nonoperative management ^[39, 40]. In individuals with symptomatic knee pain, a meniscal tear, and mild knee osteoarthritis (KL score ≤ 2) arthroscopic meniscectomy and total knee arthroplasty do not have predictable results.

Meniscectomy

A meniscectomy can be full or partial excision where a torn flap or damaged area of the meniscus is removed leaving the intact meniscus stable and smooth. The indication for a meniscectomy depends on the level of arthrosis in the knee, e.g. the degree of degenerative changes, usually indicated by KL scores. In cases of severe meniscal injury with a locked or blocked knee, surgery should be done promptly.

Repeat Meniscectomy

Repeat meniscectomy should only be done in rare instances, such as when there is locking of the knee and new MRI confirms that an additional meniscal tear is present. In a non-degenerative knee, repeat surgery should only be performed after a minimum of 12 weeks has passed since the initial surgery and a course of physical therapy has been completed. This is to allow time for the initial surgery to heal before reoperation.

Meniscal Repair

Repairing the meniscus is usually indicated for young and healthy patients, typically athletes. Rather than excising the torn tissue, the surgeon attempts to secure it arthroscopically. Repairs are only feasible when done on the outer edge of the meniscus due to the vasculature within the meniscus.

Meniscal Allograft Transplantation

Meniscal allograft transplantation (MAT) involves surgically replacing the meniscus with a properly sized donor graft. This is an uncommon procedure, the incidence of which did not change from 2007-2011 and

is more common in men <35 years of age ^[41]. The articular cartilage must be free of irregularities prior to the surgery in order to create an environment suitable for the transplanted tissue.

This surgery is very technically demanding and requires an extensive rehabilitation period ^[42]. It should be considered only as a salvage procedure for patients who have undergone meniscal repair and meniscectomy, but who are not yet old enough for a total knee replacement. Patients should be advised that MAT is not a long term solution, and that more surgery is likely to follow if MAT is done ^[43]. Existing systematic reviews of MAT literature find failure rates of the procedure range from 10% to 29%, along with a tendency of the measured functional improvements to decline over time ^[44, 45].

E. Anterior Cruciate Ligament Reconstruction (ACL)

Reconstruction of the anterior cruciate ligament (ACL) involves the use of an anatomically positioned autograft or allograft to restore function to a torn or ruptured ligament. The ACL functions to prevent the tibia from sliding forward relative to the femur. It also prevents excessive knee extension, varus & valgus movements, and tibial rotation. An intact ACL protects the menisci from sheering forces during movements such as landing from a jump, pivoting, or decelerating from a run ^[46]. Injuries to the ACL most often occur during twisting or pivoting in sports or high intensity activities that do not involve contact ^[47].

ACL reconstruction (usually done arthroscopically) is a covered surgical procedure when all the following criteria are met:

1. Patient reports a feeling of instability or “giving way” OR
2. Pain and effusion that limits normal function AND
3. Positive Lachman’s sign OR
4. Positive pivot shift OR
5. Positive anterior drawer

Please note: pain alone is not an indication for surgery.

Treatment strategy should consider the injured worker’s age, occupation, desired level of activity, and willingness to undergo an extensive rehabilitation program. Adults can often tolerate the absence of an ACL if they do not engage in pivoting, cutting or twisting activities. Non operative care is only considered in older populations with sedentary occupations and less active lifestyles ^[48]. This type of treatment is for people with a low risk of injury consequences to menisci, articular cartilage or re-injury of the ACL. The plan includes:

1. Physical therapy
2. Functional Bracing
3. Activity modification

A torn ACL will not heal independently, leaving the patient with a permanent patholaxity. Chronic instability leads to a higher rate of late meniscal tears. Approximately half of all ACL injuries have concomitant damage to menisci or articular cartilage ^[49, 50]. Surgery for meniscal injury is increased with non-operative patients who choose to return to high level activity ^[51]. Among younger patients who were

treated with non-operative care and returned to high level activity, 51% sustained significant re-injury at 1 year and only 36% were able to continue high level activity at 5.5 years ^[52]. With appropriate indications and surgical technique, the success rate for ACL reconstruction is 90-95% ^[53].

The Posterior Cruciate Ligament (PCL) functions as the primary restraint to posterior translation of the tibia relative to the femur. PCL injuries are uncommon, may be partial or complete, and rarely occur alone. Most often the treatment plan is non-operative ^[53].

Medial Cruciate Ligament (MCL) injuries usually occur from valgus stress on the knee and when combined with external rotation, can cause a deep injury. This type of injury is often associated with ACL injuries. Medial collateral and anterior cruciate ligament tears are most frequently seen in very active people, with ligament injuries accounting for 40% of all knee injuries for those engaged in sports. Acute MCL injuries alone are usually treated with non-operative care ^[53].

F. Osteochondral Autograft/Allograft Transplantation

Osteochondral grafting procedures are done to repair a damaged articular surface with the goal of reducing pain and improving function of the knee joint. Two techniques may be used: autograft (where the graft comes from the patient's own tissue) and allograft (where the graft is harvested from another source). Both procedures require that the knee be stable and have normal or correctable alignment (before or during surgery) ^[54]. Osteochondral Autograft (OAT) and Allograft Transplantation are covered surgical procedures for injured workers. Studies suggest there is no significant difference in outcome improvement between autografts and allografts although the indications for the procedures differ ^[55].

Osteochondral autograft transfer (OAT) and mosaicplasty

OAT is an arthroscopic surgery where cylinders or "plugs" of healthy cartilage are harvested from a non-weight bearing location in the same joint and press-fit into same length holes prepared on the damaged cartilage lesion. When multiple plugs are transferred into the same region it is called a mosaicplasty. The goal is to restore bone contour and the articular surface. This surgery is indicated for single, full thickness articular cartilage defects ^[53].

Ideal candidates for OAT therapy are young active individuals who want to delay or prevent a total knee replacement. Recovery typically consists of 6 weeks non weightbearing followed with 2-4 weeks of toe-touch weight bearing. Passive and active ranges of motion are encouraged.

Allograft Cartilage Transplantation

Allograft transplantation is an open surgical grafting procedure where cartilage and bone, procured from a cadaver, is inserted into a prepared area of drilled bone. This surgery is indicated for patients with large, full thickness chondral or osteochondral defects where other interventions like microfracture, OAT and ACI are inadequate due to lesion size ^[56]. This procedure is suitable for the revision of failed cartilage repair strategies ^[57].

Higher rates of successful allograft transplantation are observed in younger patients, unipolar lesions, normal or corrected alignment, and defects that are treated within 12 months of symptom onset ^[56]. At a five year follow up, 86% of patients report a high satisfaction score and a low, 2.4% short term complication rate ^[58]. Studies indicate worse results in patients with increased age ^[59].

Recovery typically consists of 6 weeks toe touch in a range of motion brace. A return to low impact activities is possible 4-6 months after surgery when full range of motion returns with minimal effusion.

G. Arthroplasty

Uni-compartmental Arthroplasty

Uni-compartmental Knee Arthroplasty (UKA) is a partial knee replacement. The goal is reducing pain related to end-stage osteoarthritis (OA) when it is predominantly confined to a single compartment. This procedure is generally performed in the medial compartment and less often in the lateral compartment. Literature suggests an ACL deficient knee that is unstable is a relative contraindication to a UKA ^[60]. Any existing varus or valgus deformity should be corrected as close to neutral as possible ^[61]. Advantages to the procedure include ^[62]:

- Preservation of uninvolved tissue and bone
- Reduced operative time and easier recovery than total knee replacement
- Reduced blood loss during surgery
- Improved postoperative range of motion
- Increased patient satisfaction

UKA is a covered procedure for end stage osteoarthritis in only one compartment. Subjective examination should demonstrate pain that limits activities of daily living and interferes with the ability to work, limits ambulation, or pain that interferes with sleep.

To qualify for a UKA the following must be present:

1. Angular deformity of less than 15 degrees that is passively correctable
2. Range of motion arc greater than 90 degrees with less than 5 degrees flexion contracture
3. Weight bearing x-rays showing a KL score of 3 or 4 in only one compartment
4. BMI less than 35

Evidence strongly suggests that, in general, the risk of post-op infection and surgical complications increase as BMI increases ^[63-67]. This guideline recommends a preoperative BMI less than 35 as an appropriate cutoff for surgical consideration. Additionally, consideration should be given to the age of the patient, as evidence suggests that an age of < 60 is a relative contraindication for a UKA ^[62, 68].

Major surgical considerations for risk or harm include correction of malalignment prior to or during surgery. Without correction, abnormal wear can occur on the prosthesis or the opposite compartment, likely leading to failure ^[59]. This operation restores ligament tension to normal, enabling the alignment and function to be returned to pre-disease state. Therefore, the absence of the anterior cruciate ligament is a contraindication; the ACL makes the combined rolling and sliding at the meniscal femoral and meniscal tibial interfaces possible, which may yield near-normal joint kinematics and mechanics ^[69].

Total Arthroplasty

Total Knee Arthroplasty (TKA) is replacement of the distal ends of the femoral condyles and proximal tibia with prosthetic components. The patellofemoral articular surface may or may not be replaced. More than 97% of TKAs are performed for osteoarthritis (OA), with over 450,000 TKAs done in the USA in

2004^[70, 71]. TKA is well accepted as a reliable and suitable surgical procedure to return patients experiencing end-stage OA to a higher level of function and improved health-related quality of life.

TKA is indicated for patients who present with pain that limits their mobility, activities of daily living, work, ambulation, or sleep. The degree of disability should be evaluated using a validated functional assessment tool, along with the patient self-reporting a loss of ability to fully function. Unless highly disabling OA is evident at the time the patient first seeks medical attention, a trial of non-operative therapy is appropriate.

TKA is a covered procedure when the following objective criteria are met:

1. Physical examination demonstrates a decreased range of motion or knee effusion
2. Weight-bearing x-rays demonstrate a KL score of 3 or 4 in one or more compartments
3. BMI less than 40

There is strong evidence of an association between increased BMI and increased risk of surgical complications from TKA such as infection, need for surgical revision, and inferior long term outcomes compared to patients with a lower BMI^[72]. This guideline recommends a preoperative BMI below 40 as an appropriate cutoff for surgical consideration based on the best available clinical evidence.

Replacing the entire knee joint is a major undertaking and can be a difficult experience; and despite the majority of patients reporting profound improvements in physical activity after surgery, most do not reach the same physical activity level as their peers with healthy knees. Postoperative activity level is influenced by the level individuals had prior to surgery, so the more fit a person is before a TKA, the better their chances of having a good result afterward^[73]. The Bree Collaborative (see Appendix B) has issued a set of minimal standards for evaluating an individual's "Fitness for Surgery," and it is strongly recommended that providers follow these. This can help ensure a patient's safety and commitment to actively participate in their recovery and return to function.

VI. Rehabilitation, and Return to Work

Recovery and return to work is expected after most occupational knee injuries. Length of disability or time off work depends on many factors such as the severity of the injury, type of treatment, and comorbid conditions. Ergonomic interventions such as work station and/or work flow modification appear to be helpful in sustaining return to work. In general, mild conditions such as knee sprain and bursitis may not require any time off work. Someone having an arthroscopic meniscectomy is expected to return to work in 2-6 weeks. Reconstructive surgery of the ACL requires a longer rehabilitation time, as much as 4-6 months, although return to modified duties may be possible within 6 weeks. For total knee arthroplasty, time to return to work can be as short as 6 weeks, although patients who do very heavy physical work may not be able to go back to those jobs, or at the least will require modified duties.

VII. Appendices

Appendix A - Assessment Tools

An example of a widely used knee impairment scoring tool is the Knee injury and Osteoarthritis Outcome Score (KOOS). The scale can be used for acute and long term care management. Meaningful functional improvement is an increase of 8-23 points in all subscale scores of the KOOS ^[74]. Detailed information about the KOOS scale is freely available www.koos.nu.

The KOOS was designed to measure five specific patient centered outcomes:

1. Pain frequency and severity
2. Other symptoms: edema, decreased ROM and mechanical symptoms
3. Difficulty experienced with daily activities
4. Difficulty experienced with sport or recreational activities
5. Knee related quality of life, mental and social aspects ^[75]

Additional functional assessment tools that are widely used and validated for the knee can be found at <http://www.orthopaedicscores.com/>

Validated assessment tools for measuring clinically meaningful improvement in pain and function along with responsible opioid prescribing recommendations can be accessed at www.agencymeddirectors.wa.gov

- PEG Assessment Scale- A tool to assess pain intensity, interference with enjoyment of life, and interference with general activity ^[76].

1. What number best describes your pain on average in the past week:										
0	1	2	3	4	5	6	7	8	9	10
No pain					Pain as bad as you can imagine					
2. What number best describes how, during the past week, pain has interfered with your enjoyment of life?										
0	1	2	3	4	5	6	7	8	9	10
Does not interfere					Completely interferes					
3. What number best describes how, during the past week, pain has interfered with your general activity?										
0	1	2	3	4	5	6	7	8	9	10
Does not interfere					Completely interferes					

- Graded Chronic Pain Scale- A tool to assess pain intensity and pain interference ^[77].

Graded chronic pain scale: a two-item tool to assess pain intensity and pain interference										
In the last month , on average, how would you rate your pain? Use a scale from 0 to 10, where 0 is "no pain" and 10 is "pain as bad as could be"? [<i>That is, your usual pain at times you were in pain.</i>]										
No pain		Pain as bad as could be								
0	1	2	3	4	5	6	7	8	9	10
In the last month , how much has pain interfered with your daily activities? Use a scale from 0 to 10, where 0 is "no interference" and 10 is "unable to carry on any activities."										
No interference		Unable to carry on any activities								
0	1	2	3	4	5	6	7	8	9	10

Appendix B – The Bree Collaborative

In 2013, the Bree Collaborative (see sidebar) developed a set of recommendations for total knee replacement surgery that pertain to perioperative care. Their “Fitness for Surgery” recommendations are referenced in this guideline for a total knee arthroplasty because they establish minimal standards to ensure patients’ safety and active participation in returning to function. This is consistent with L&I’s mission to help injured workers heal and return to work.

Over time, these recommendations will be revisited and possibly revised, so be sure to visit http://www.breecollaborative.org/wp-content/uploads/tkrthr_bundle.pdf for their most recent and complete description.

What is the Bree Collaborative?

“In 2011, the Washington State Legislature established the Dr. Robert Bree Collaborative so that public and private health care stakeholders would have the opportunity to identify specific ways to improve health care quality, outcomes, and affordability in Washington State. These stakeholders are appointed by the Governor as Collaborative members and represent public health care purchasers for Washington State, private health care purchasers (employers and union trusts), health plans, physicians and other health care providers, hospitals, and quality improvement organizations.” To learn more, visit <http://www.breecollaborative.org/>.

Bree issues recommendations that are implemented in health plans administered by the Health Care Authority, which include those for Medicaid recipients, public employees, and others. Although Bree recommendations are not legally binding, RCW 41.05.013 requires state health care agencies to coordinate their purchasing, programs, and policies. By L&I endorsing Bree recommendations, there is greater consistency in the health care purchased for Washington citizens.

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Comment Source: name, date, route	Comment	L&I Draft Response	Change Made
Margaret Baker MD, 3/25/16, email	On page 4 of the guideline draft for MAT, under Imaging I would delete “posterolateral” radiographs and substitute “AP, notch and lateral weight-bearing radiographs”. Thanks for all the work everyone put in on the new Guidelines to date!	The 'posterolateral radiographs' was an error and it will be changed	Language changed to: Weight bearing AP and lateral; with or without notch view
Fred Huang MD, 3/29/16, email	1. On page 2 in regards to 1st time patellar dislocations, there should be an option for surgical treatment IF there is a chondral or osteochondral loose body present on x-ray or MRI. There is debate about whether or not the surgery should be a loose body removal or fragment ORIF only, or if patellar re-alignment surgery should be done concomitantly, but at the least the surgeon should be allowed to intervene for the loose body without having to try PT or non-operative care first.	1. Agree that osteochondral injuries are common with first-time patellar dislocation and surgical treatment may be needed.	1. Changed non-operative care section to: 6 weeks of physical therapy is <u>required</u> for first time dislocation; physical therapy is not required for recurrent dislocations or if loose osteochondral body is confirmed by MRI or x-ray and needs to be surgically addressed.
	2. On page 3, I would suggest changing the criteria for an acute meniscal tear to involve knees that are KL grade 0,1 OR 2 based on films rather than just 0 or 1. the other option would be to expand the subjective criteria for an acute meniscal tear in a "degenerative" knee to more than just locking (i.e. add swelling, painful catching, and stiffness to the subjective column for acute meniscal tear in a "degenerative" knee to cover KL grade 2 knees)	2. There is insufficient evidence in the medical literature to support this.	2. No action or change
	3. On page 4 for meniscal allografts the x-ray section says "posterolateral radiographs" which doesn't really make sense. Maybe they meant standing AP and lateral radiographs? Also in the same section it talks about Outerbridge scoring but they don't mention MRI as a requisite test and in general radiologists don't always specify what the Outerbridge score is in their knee MRI reports. May be better to change their Outerbridge score to KL instead for that section?	3. Agree that adding KL score language will add clarity.	3. Language added: radiographs show: KL score < 2



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Physical Therapy Association of Washington (PTWA) Erik Moen, PT, DPT, President 4/11/16 email	PTWA supports recommendation of physical therapist interventions for the following: <ul style="list-style-type: none">• <i>Patellar tendon realignment procedure with or without lateral retinacular release</i>• <i>Repeat arthroscopic meniscectomy in the absence of new injury (in a non-degenerative knee)</i>• <i>Anterior cruciate ligament (ACL) reconstruction</i>	Comment supports guideline	No action or change
	PTWA recommends <u>requiring</u> at least 6 weeks of physical therapist interventions before surgery and not be listed as an option for the following: <ul style="list-style-type: none">• <i>Meniscectomy, full or partial (in a non-degenerative knee)</i>• <i>Meniscal allograft transplantation</i>• <i>Marrow stimulating techniques: microfracture or subchondral drilling or abrasion arthroplasty</i>• <i>Osteochondral autograft/allograft transplantation (mosaicplasty or OAT procedure for the knee)</i>	Physical therapy needs can vary with each patient and the benefits are not consistent or conclusive. We prefer to leave it to the physician's discretion to order physical therapy on a case by case basis.	No action or change
	PTWA recommends <u>requiring</u> at least 6 weeks of physical therapist interventions before surgery for the following: <ul style="list-style-type: none">• <i>Uni-compartment knee arthroplasty (UKA-partial knee replacement)</i>• <i>Total Knee Arthroplasty (TKA)</i>	Physical therapy needs can vary with each patient and the benefits are not consistent or conclusive. We prefer to leave it to the physician's discretion to order physical therapy on a case by case basis.	No action or change
	PTWA supports including and defining "clinically meaningful improvement in function" measures as a way to identify conservative therapy outcomes. Often the baseline measures are reported without follow-up, so no assessment can be made regarding improvement or lack of improvement. Requiring documentation of a 30% improvement over baseline can help reduce costs by denying authorization and payment for continued conservative intervention for lack of progress or by reducing the number surgical interventions.	Comment supports guideline	No action or change



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	P. 12 C. <i>Non-operative care</i> . PTWA recommends <u>requiring</u> a trial of physical therapist interventions as a prerequisite to surgical care for the knee. In addition, PTWA recommends <u>requiring</u> that exercise, strength training, activity modification and a prescribed home exercise program be provided by a physical therapist.	Physical therapy needs can vary with each patient and the benefits are not consistent or conclusive. We prefer to leave it to the physician's discretion to order physical therapy on a case by case basis.	No action or change
	P. 15 D. <i>Meniscal disorders. Repeat Meniscectomy</i> . PTWA supports requiring physical therapist intervention for a minimum of 12 weeks post-initial surgery before a repeat surgery.	Comment supports guideline	No action or change
	P. 15-16 D. <i>Meniscal disorders. Meniscal allograft transplantation</i> . PTWA recommends <u>requiring</u> physical therapist intervention for the extensive rehabilitation period.	Physical therapy needs can vary with each patient and the benefits are not consistent or conclusive. We prefer to leave it to the physician's discretion to order physical therapy on a case by case basis.	No action or change
	P. 19. G. <i>Arthroplasty. Uni-compartment arthroplasty and total arthroplasty</i> . PTWA recommends <u>requiring</u> physical therapist intervention pre-operatively based on the Bree document for total knee and total hip replacement surgery (Bundle) recommendations: 1. Conservative therapy for at least 3 months and 2. Fitness for surgery: obtain relevant consultations; consult physical therapy.	L&I strongly endorses the Bree Collaborative recommendations included in the Total Knee and Hip Replacement Bundle. The Bree Collaborative recommends conservative care and relevant consultations to provide customized patient care, which can only be achieved by the physician's discretion.	No action or change



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	PTWA recommends <u>requiring</u> physical therapist intervention after all knee surgeries. The Bree document for total knee and total hip replacement surgery (Bundle) recommends physical therapist intervention starting on the day of surgery. LNI Guidelines should be consistent with the Bree Collaborative guidelines to ensure that state health care policies are consistent and do not conflict	L&I strongly endorses the Bree Collaborative recommendations included in the Total Knee and Hip Replacement Bundle. The Bree Collaborative recommends conservative care and relevant consultations to provide customized patient care, which can only be achieved by the physician's discretion.	No action or change
	Finally, to be clear the term "physical therapy" is not generic. By law, "physical therapy" means the care and services provided by or under the direction and supervision of a physical therapist (RCW 18.74.010(9)). Hence, our PTWA recommendation is to change the language in the draft from "physical therapy" or "PT" to physical therapist intervention.	The current guideline language does not conflict with state law. By using term "Physical Therapy," the option to use physical therapy assistants and aids is preserved.	No action or change
Jonah Hulst, MD on behalf of Proliance Orthopaedics & Sports Medicine Partners, 4/11/16, email	<p>With regard to Section G: Arthroplasty, specifically Uni-compartmental Knee Arthroplasty (UKA), this document suggests a relative contraindication in patients that are younger than 60 years of age.</p> <p>Two papers are referenced with this guideline. The first, 68, <i>Unicompartmental knee arthroplasty, a 4.5-6 year follow-up study with a metal-backed tibial component</i>. This study was published in 1989, does not represent current practice and references an outdated implant. The second, 62, <i>Unicompartmental Knee Arthroplasty: Past, Present, and Future</i> is from 2012, and when reviewed closely, suggests an expanded indication for UKA to patients older than 40 years of age.</p>	The age is listed in the narrative section as a relative contraindication; we decided not to list it as a criterion for approving surgery.	No action or change



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	<p>Additionally, isolated medial compartment arthrosis can be common after meniscal injury. Patients between 40 and 60 years of age are often excellent candidates for this procedure for the very reasons outlined by Labor & Industries: better kinematics, less invasive, and the like.</p> <p>Proliance Orthopaedics & Sports Medicine supports an expanded age range for UKA. We strongly encourage Washington State Department of Labor and Industries to consider allowing UKA to patients older than 40 years of age.</p>		
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