

Appraisal and summary of patellofemoral pain clinical practice guideline

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Objective: *The purpose of this commentary was to critically appraise the patellofemoral pain clinical practice guideline published by the Academy of Orthopaedic Physical Therapy in 2019 and to summarize their recommendations for chiropractic practice.*

Methods: *Quality and reporting of this guideline was assessed with the Appraisal of Guidelines for Research and Evaluation II (AGREE II) instrument. Three reviewers independently scored between 1-7 (strongly disagree-strongly agree) for 23 items organized into six quality domains.*

Results: *AGREE II quality domain scores ranged between 57%-98%, with overall quality of the recommendation rated 89%. The guideline contained evidence summaries and/or recommendations for three topics: impairment/function-based diagnosis; examination; and interventions.*

Objectif : *Ces commentaires visaient à évaluer la ligne directrice relative à la prise en charge du syndrome fémoro-patellaire publiées par l'Academy of Orthopaedic Physical Therapy en 2019 et de résumer les recommandations aux chiropraticiens.*

Méthodologie : *La qualité de cette ligne directrice a été évaluée à l'aide de l'instrument Appraisal of Guidelines for Research and Evaluation II (AGREE II). Trois examinateurs, chacun de leur côté, ont attribué une cote comprise entre 1 et 7 (allant de fortement en désaccord à fortement d'accord) à 23 aspects répartis dans six domaines reliés à la qualité.*

Résultats : *Les cotes attribuées au domaine relié à la qualité AGREE II allaient de 57 à 98 % ; de façon globale, la cote de la qualité de la recommandation était de 89 %. La ligne directrice renfermait des résumés de preuves et/ou des recommandations portant sur trois points à savoir le déficit/le diagnostic fondé sur la fonction, l'examen et les interventions.*

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Conclusion: Based on its methodological quality, we recommend the use of this guideline for the examination, diagnosis, and management of patellofemoral pain in chiropractic practice. A summary of recommendations from this guideline is presented for use within the scope of chiropractic practice in Canada.

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KEY WORDS : patellofemoral pain syndrome, chiropractic, guideline, summary, appraisal

Conclusion : À la lumière de la qualité de la méthodologie, nous recommandons l'utilisation de cette ligne directrice pour pratiquer l'examen, établir un diagnostic et prendre en charge du syndrome fémoro-patellaire dans les cliniques chiropratiques. Un résumé des recommandations issues de cette ligne directrice est présenté à l'intention des chiropraticiens du Canada.

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MOTS CLÉS : syndrome fémoro-patellaire, chiropratique, ligne directrice, résumé, évaluation

Introduction

Patellofemoral pain is a musculoskeletal-related condition that is characterized by diffuse and poorly defined pain in the anterior retropatellar and/or peripatellar regions.¹ Patellofemoral pain is often described as insidious and non-traumatic anterior knee pain arising from activities that load the joint which can include squatting, jumping, running, ascending or descending stairs.² Patellofemoral pain is also common in adolescents and active adults³, with a reported annual prevalence of 28.9% in adolescents and 22.7% in the general population^{2,4}. In chiropractic practices, 2.9% of the general population sought care for knee pain.⁵ Chiropractors, like other healthcare providers, are able to provide evidence-based care for patients with patellofemoral pain by understanding the best available evidence.

Chiropractors are able to provide care for patients with patellofemoral pain by utilizing information from clinical practice guidelines (CPGs) which provide evidence-based recommendations to inform clinical practice. The guideline titled, "Patellofemoral pain: Clinical practice guidelines linked to the international classification of functioning, disability and health from the Academy of Orthopaedic Physical Therapy of the American Physical Therapy Association" (PFP-CPG) provided recommendations regarding examination, diagnosis, and management of patellofemoral pain in adolescents and adults.¹ The guideline developers searched the MEDLINE, Scopus, CINAHL, SPORTDiscus, and the Cochrane Library databases from 1960 to May 2018 retrieving 4703 articles. After screening for eligibility, 271 studies were included: 120 for diagnosis/classification, 56 for examination,

and 95 for interventions. Criteria for inclusion included 1) systematic reviews, meta-analyses, experimental and quasi-experimental, cohort, case series, and cross-sectional studies, 2) functional anatomy or tests, measures, properties of instruments for measuring PFP or pain-related outcomes, and 3) risk, diagnostic characteristics, or interventions within the scope of physical therapists.

The Academy of Orthopaedic Physical Therapy appointed content experts to conduct a literature review and develop a CPG for patellofemoral pain. Content experts consisted primarily of physical therapists, one medical doctor, and one patient representative.¹ Content experts evaluated relevant research published before May 2018 and independently assigned a level of evidence and grade of quality for each article. The grading system was used to develop recommendations and followed criteria adapted from the Center for Evidence-Based Medicine, Oxford, UK, for diagnostic, prospective, and therapeutic studies.^{6,7} The level of evidence was organized from 'I' (highest level – obtained from high quality studies such as randomized controlled trials) to 'V' (lowest level – expert opinion).^{6,7} Based on the grading system, the strength of the evidence supporting each recommendation was graded on a scale from 'A' (highest- strong evidence) to 'F' (lowest- expert opinion).^{6,7} The final grading of each recommendation was subjected to review from external stakeholders such as claims reviewers, medical coding experts, academic educators, clinical educators, physician specialists, and researchers. Feedback was considered by the CPG coordinator and editors and then applied to create a decision tree model for clinical decisions.

Maximum possible score = 7 (strongly agree) x 3 (items) x 3 (appraisers) Minimum possible score = 1 (strongly agree) x 3 (items) x 3 (appraisers)	
Scaled domain score	$= \frac{\text{Obtained score} - \text{Minimum possible score}}{\text{Maximum possible score} - \text{Minimum possible score}} \times 100$

Figure 1.
*AGREE II scaled domain score formula.*⁸

Physical therapists were the primary target audience for this guideline; however, the recommendations are also relevant for chiropractic practice. Chiropractors have knowledge and expertise in musculoskeletal conditions, which allows them to play a role in the management of patellofemoral pain. The purpose of this commentary is to critically appraise the abovementioned CPG for the management of patellofemoral pain published by the Academy of Orthopaedic Physical Therapy in 2019.¹ Additionally, we aim to provide a summary of the recommendations from this guideline for use within the scope of chiropractic practice and other rehabilitation professions.

Methods

The Appraisal of Guidelines for Research and Evaluation II (AGREE II) instrument was used to assess the quality of the PFP-CPG.^{1,8} The AGREE II instrument is a valid and reliable measure of quality of reporting and guideline development.^{9,10} The AGREE II manual recommends that each guideline be assessed by at least 2 appraisers, and preferably 4.⁹ Three independent reviewers who were trained by online module and practice appraisals, independently provided scoring between 1 (strongly disagree) to 7 (strongly agree) for 23 items organized into six quality domains (Scope and purpose, Stakeholder involvement, Rigour of development, Clarity of presentation, Applicability, and Editorial independence). After independent appraisal, the reviewers met to reach consensus through discussion. Reviewers considered each item independently for biases and determined the impact the bias might have on the overall quality of the guideline. Scaled domain scores were calculated according the AGREE II User Manual formula (Figure 1).⁸ The combination of the scaled domain scores and the consensus discussion informed the overall quality rating of the guideline.

Results

AGREE II item scores are rated from 1 (strongly disagree) to 7 (strongly agree). Individual item scores and scaled domain scores were used to evaluate the overall quality of the guideline. AGREE II domain scores are presented in Table 1 and ranged between 57% (Applicability) to 98% (Clarity of presentation). An overall percentage of each domain was calculated using the AGREE II scoring formula.⁸ However, the reviewers also considered each item independently for biases and determined the impact the bias might have on the overall quality of the guideline. The reviewers rated the overall quality of this guideline as 89% and recommended this guideline for use. The Applicability domain received a low score due to a lack

Table 1.
AGREE II scaled domain scores.

* A quality score was calculated for each domain according to the AGREE II formula and were reported as percentages.

Domain	Scaled domain score (%)*
► Scope and purpose	83
► Stakeholder involvement	85
► Rigour of development	91
► Clarity of presentation	98
► Applicability	57
► Editorial independence	92
► Overall guideline assessment	89
► Overall guideline recommendation	Yes

of reporting on facilitators and barriers to guideline application and measuring the impact of guideline recommendations. All other domain scores were rated above 83% and the overall assessment by reviewers suggest that the guideline was well organized, easy to follow, and demonstrates a rigorous review of the available research.

Discussion

Recommendations

The target audience for this guideline was orthopedic physical therapists; therefore, it was important to ensure the guideline recommendations were relevant to chiropractors. The guideline quality was acceptable, as per our appraisal and does not need to be modified or adapted for use with the chiropractic population. The guideline recommendations which consist of assessment of risk factors, prognosis, diagnosis, examination, and interventions are mostly congruent with the scope of chiropractic practice in Canada. Recommendations relevant to chiropractic practice have been adopted and discussed below. These recommendations were also used to inform a clinical algorithm created by the authors of this commentary (Figure 2).

1. Impairment/Function-Based Diagnosis.

Based on level I-II evidence, longer duration of symptoms, higher baseline pain severity, and poorer function were identified as prognostic factors more likely associated with negative outcomes or unfavourable recovery. Risk factors may play a role in the development of patellofemoral pain. Women are more likely to develop patellofemoral pain than men and young female athletes participating in a single sport have a higher incidence of injury in comparison to those participating in multiple sports. Individuals with isometric knee extensor weakness have a higher incidence of patellofemoral pain.

Clinicians should use reproduction of retropatellar or peripatellar pain during squatting as a diagnostic test for patellofemoral pain, as well as performance or other functional activities that load the patellofemoral joint in a flexed position, such as stair climbing or descent (Grade A recommendation).

The diagnosis of patellofemoral pain should be made based on the following criteria: (1) presence of retropatellar or peripatellar pain; AND (2) reproduction of retropa-

tellar or peripatellar pain with squatting, stair climbing, prolonged sitting, or other functional activities loading the patellofemoral joint in a flexed position; AND (3) exclusion of all other conditions that may cause anterior knee pain (Grade B recommendation). Additionally, clinicians may use the patellar tilt test with the presence of hypomobility to support the diagnosis of patellofemoral pain (Grade C recommendation).

Clinicians should consider differential diagnoses associated with serious medical conditions (red flags), other musculoskeletal conditions, and/or psychosocial factors (yellow flags) particularly when a patient's activity limitations or impairments of body function and structure are not consistent with those presented in this guideline or if symptoms are not resolving with the use of interventions presented in this guideline. If necessary, clinicians should refer patients to the appropriate health care provider and co-manage when appropriate. Most differential diagnoses are applicable to both adults and adolescents, such as tumors, infection, and fracture. However, clinicians should consider referral from slipped capital femoral epiphysis in adolescents as a possible cause of knee pain.

2. Examination

The guideline recommends the use of the Anterior Knee Pain Scale (AKPS), Knee injury and Osteoarthritis Outcome Score – Patellofemoral subscale (KOOS-PF), and the Visual Analogue Scale (VAS) for activity (also known as the EPQ) to measure pain and function based on evidence of validity, reliability, and responsiveness (Grade A recommendation). Clinical and field tests that reproduce pain and assess lower-limb movement coordination, such as squatting, step-down, and single-leg squat should be used to assess activity limitations (Grade B recommendation). Clinicians may assess body structure and function with measures of patellar provocation, patellar mobility, foot position, hip and thigh muscle strength, and muscle length (Grade C recommendation).

3. Interventions

Clinicians should prescribe exercise therapy with combined hip- and knee-targeted exercises to reduce pain and improve patient-reported outcomes and functional performance (Grade A recommendation). Hip-targeted exercise therapy should target the posterolateral hip musculature. Knee-targeted exercise therapy includes either

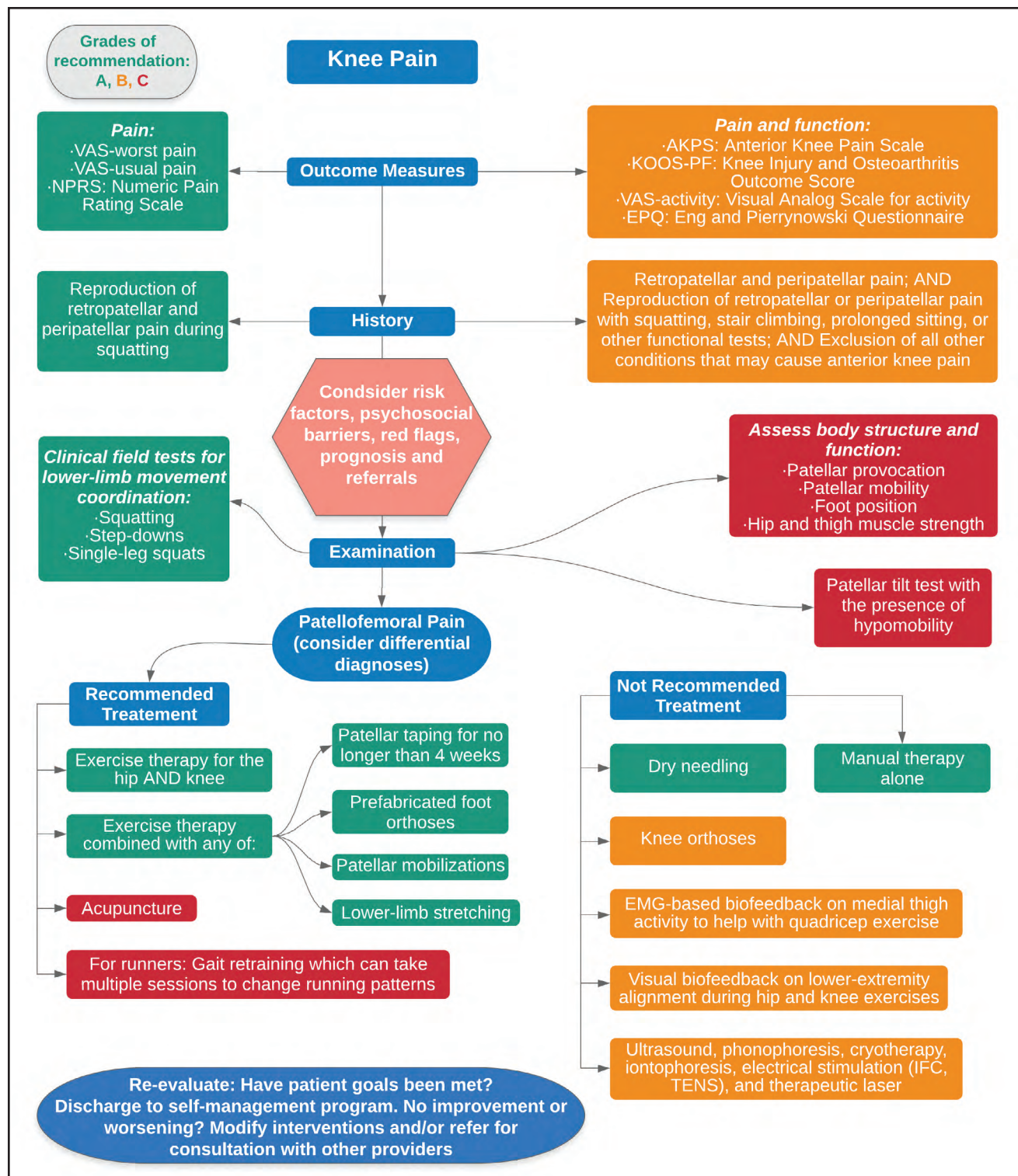


Figure 2.
Patellofemoral Pain Clinical Algorithm.

weight-bearing (resisted squats) or non-weight-bearing (resisted knee extension) exercise.

Clinicians should prescribe prefabricated foot orthoses combined with an exercise therapy program for those with greater than normal pronation to reduce pain in individuals with patellofemoral pain, but only in the short term (up to 6 weeks) (Grade A recommendation).

Clinicians should combine physical therapy interventions for the treatment of individuals with patellofemoral pain. Interventions to consider combining with exercise therapy include foot orthoses, patellar taping, patellar mobilizations, and lower-limb stretching (Grade A recommendation).

Clinicians may use tailored patellar taping in combination with exercise therapy to assist in immediate pain reduction, and to enhance outcomes of exercise therapy in the short term (4 weeks) (Grade B recommendation).

For runners with patellofemoral pain, clinicians may use gait retraining consisting of multiple sessions of cuing to adopt a forefoot-strike pattern (for rearfoot-strike runners), cuing to increase running cadence, or cuing to reduce peak hip adduction while running (Grade C recommendation).

Clinicians may use acupuncture to reduce pain; however, the superiority of acupuncture over placebo or sham treatments is currently unknown (Grade C recommendation).

The following interventions should not be used based on evidence of no effectiveness: dry needling (Grade A recommendation); manual therapy including lumbar, knee, or patellofemoral manipulation/mobilization, in isolation (Grade A recommendation); patellofemoral knee orthoses, including braces, sleeves, or straps (Grade B recommendation); EMG-based biofeedback on medial vastii activity to augment knee-targeted (quadriceps) exercise therapy (Grade B recommendation); visual biofeedback on lower extremity alignment during hip- and knee-targeted exercises (Grade B recommendation); and biophysical agents, including ultrasound, cryotherapy, phonophoresis, iontophoresis, electrical stimulation, and therapeutic laser (Grade B recommendation).

How chiropractors can help

With expertise in diagnosis, chiropractors are able to conduct a thorough examination in order to rule out possible medical conditions which may relate to a patient's anterior

ior knee pain. Through recognizing serious pathology or psychosocial barriers, the appropriate referral to other healthcare providers can be facilitated. Additionally, this guideline offers evidence-based recommendations for the assessment of patellofemoral pain using outcome measures for pain and function, as well as examination procedures to assess for physical performance, impairment, and function. Patellofemoral pain has historically been a diagnosis of exclusion but recommendations for impairment/function-based diagnosis provide clear criteria that chiropractors can use in practice.¹¹ This guideline recommends treatment interventions based on the current best available evidence and supports a shift in treatment focus to active treatments such as exercise therapy, which are within the scope of practice and expertise of chiropractors.

Knowledge dissemination strategies will be implemented to share CPG recommendations with chiropractors and their patients. A patient handout on patellofemoral pain will be posted on the Canadian Chiropractic Guideline Initiative (CCGI) website and distributed via social media channels directed at Canadian Chiropractors. Chiropractors will also have access to a summary of this guideline on the CCGI website.

Limitations

We did not perform inter-examiner agreement testing or pilot testing before appraising the CPG. The guideline recommendations have been adopted due to the acceptability of AGREE II consensus scores. Therefore, we did not make significant changes to the recommendations as they were already relevant for chiropractic practice.

Conclusion

Patellofemoral pain is a musculoskeletal-related condition that presents to chiropractic offices. The guideline titled, "Patellofemoral pain: Clinical practice guidelines linked to the international classification of functioning, disability and health from the Academy of Orthopaedic Physical Therapy of the American Physical Therapy Association" provided recommendations for physical therapists.¹ Based on its methodological quality, we recommend the use of this guideline for the examination, diagnosis, and management of patellofemoral pain in chiropractic practice. A summary of recommendations from this guideline is presented for use amongst Canadian chiropractors.

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