

## PATELLOFEMORAL PAIN: CLINICAL PRACTICE GUIDELINES

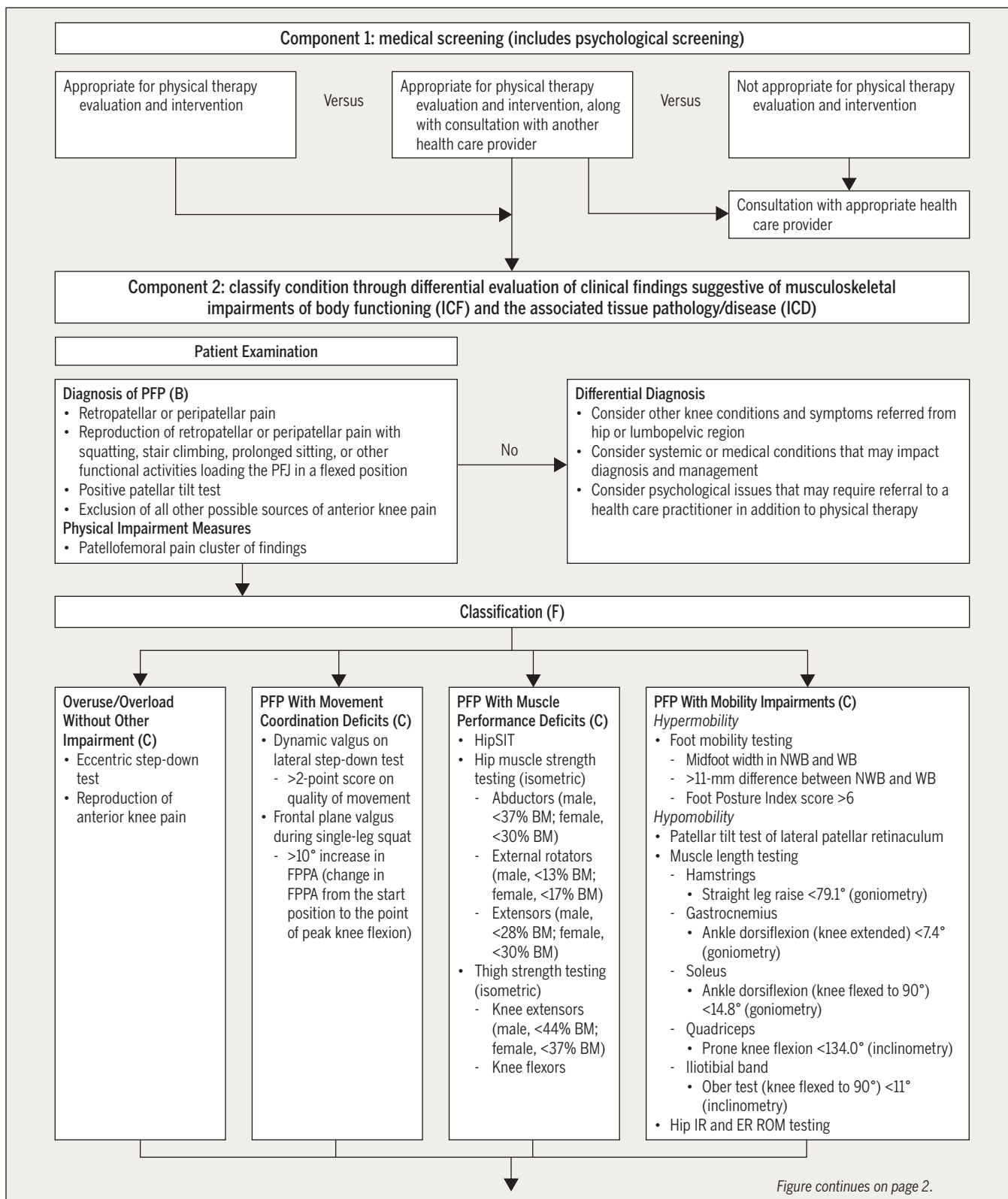
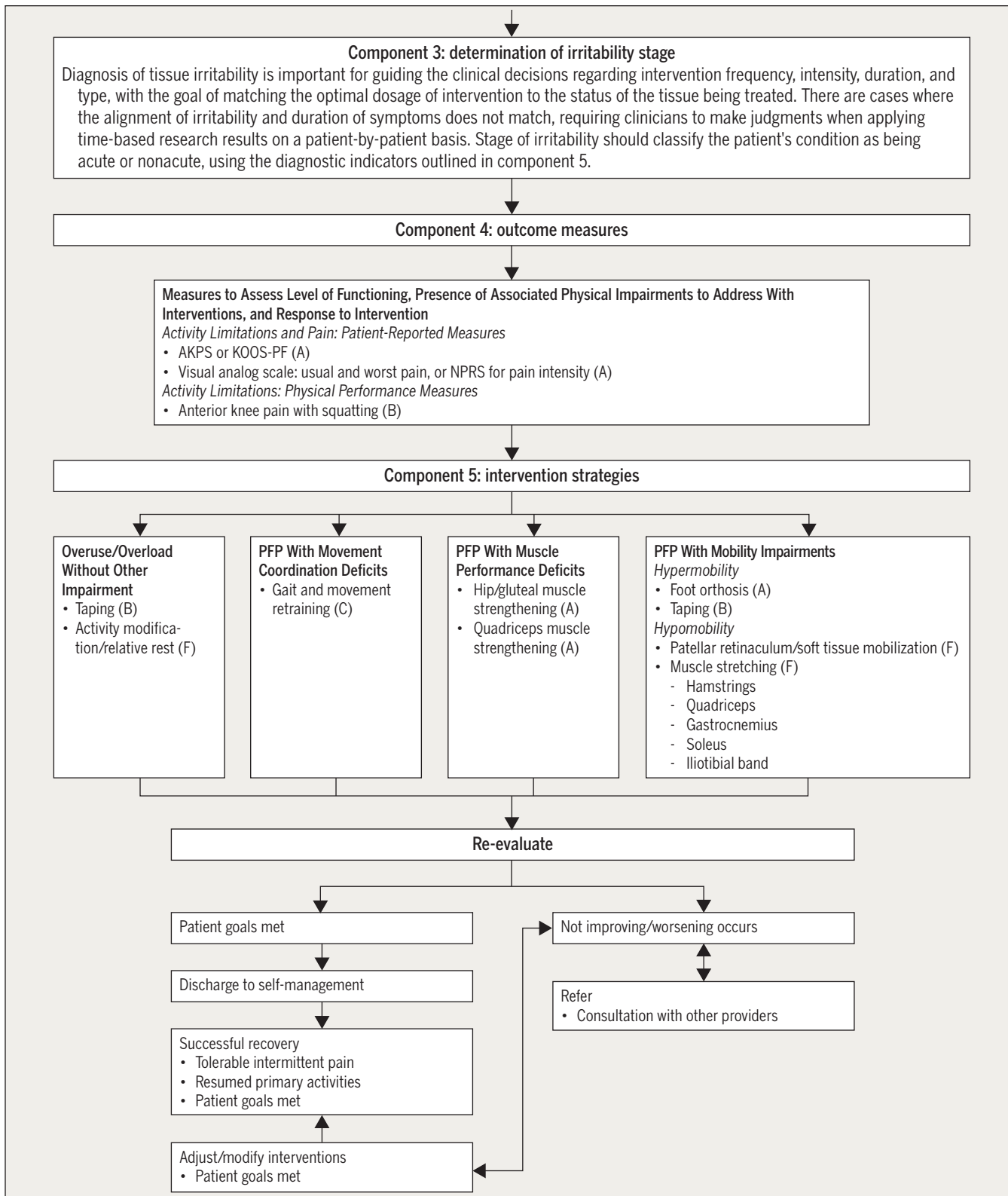


Figure continues on page 2.

**FIGURE.** Decision tree model. \*Letters in parentheses reflect the grade of evidence on which the recommendation for each item is based: (A) strong evidence, (B) moderate evidence, (C) weak evidence, (D) conflicting evidence, (E) theoretical/foundational evidence, and (F) expert opinion. Abbreviations: AKPS, Anterior Knee Pain Scale; BM, body mass; ER, external rotation; FPPA, frontal plane projection angle; HipSIT, Hip Stability Isometric Test; IR, internal rotation; KOOS-PF, Knee injury and Osteoarthritis Outcome Score-patellofemoral pain and osteoarthritis subscale; NPRS, numeric pain-rating scale; NWB, non-weight bearing; PFJ, patellofemoral joint; PFP, patellofemoral pain; ROM, range of motion; WB, weight bearing.

**PATELLOFEMORAL PAIN: CLINICAL PRACTICE GUIDELINES**



**FIGURE (CONTINUED).** Decision tree model. \*Letters in parentheses reflect the grade of evidence on which the recommendation for each item is based: (A) strong evidence, (B) moderate evidence, (C) weak evidence, (D) conflicting evidence, (E) theoretical/foundational evidence, and (F) expert opinion. Abbreviations: AKPS, Anterior Knee Pain Scale; BM, body mass; ER, external rotation; FPPA, frontal plane projection angle; HipSIT, Hip Stability Isometric Test; IR, internal rotation; KOOS-PF, Knee Injury and Osteoarthritis Outcome Score-patellofemoral pain and osteoarthritis subscale; NPRS, numeric pain-rating scale; NWB, non-weight bearing; PFJ, patellofemoral joint; PFP, patellofemoral pain; ROM, range of motion; WB, weight bearing.

## DECISION TREE MODEL

A pathoanatomical/medical diagnosis of PFP can provide valuable information in describing tissue pathology and may assist in nonoperative planning and prognosis. The proposed model for examination, diagnosis, and treatment planning for patients with PFP uses the following components: (1) medical screening, (2) classification of the condition through evaluation of clinical findings suggestive of musculoskeletal impairments of body functioning (ICF) and associated tissue pathology/disease (ICD), (3) determination of irritability stage and psychosocial factors that may impact treatment, (4) evaluative outcome measures, and (5) nonoperative intervention strategies. This model is depicted in the **FIGURE**.

### Component 1

Medical screening incorporates the findings of the history and physical examination to determine whether the patient's symptoms originate from a condition that requires referral to another health care provider. Prior to diagnosing a person with PFP, it is necessary to rule out all other possible medical conditions that may cause AKP. Clinicians should recognize the key signs and symptoms associated with serious pathological knee conditions, continually screen for the presence of these conditions throughout treatment, and immediately initiate referral to the appropriate medical practitioner when a potentially serious medical condition is suspected (Guide to Physical Therapist Practice 3.0; <http://guidetoptpractice.apta.org/>). Medical conditions for which physical therapy is not indicated must be considered as possible etiologies of a patient's symptoms.

### Component 2

Differential evaluation of musculoskeletal clinical findings determines the most relevant physical impairments associated with the patient's reported activity limitations and medical diagnosis.<sup>157</sup> Clusters of these clinical findings are described as impairment patterns in the physical therapy literature, and are labeled according to the key impairment(s) of body function associated with that cluster. The authors propose a classification system for PFP, with subcategories named according to the primary impairments. These impairment-pattern subcategories for PFP are described in the Diagnosis and Classification sections of this CPG. The ICD-10 and primary and secondary ICF codes associated with PFP are provided in the Methods section of this CPG. These impairment patterns impact the selection of interventions, which focus on normalizing the key impairments of body function, which in turn should improve the movement and function of the patient and lessen or alleviate the activity limitations commonly reported by the patients who meet the diagnostic criteria of that specific pattern. The **FIGURE** lists the key clinical findings used to rule in or rule out the common impairment patterns

and their associated medical conditions. Impairment-based classification is critical for matching the intervention strategy that is most likely to provide the optimal outcome for a patient's clinical findings.<sup>157</sup> However, it is important for clinicians to understand that the impairment pattern, the most relevant impairments of body function, and the associated intervention strategies often change during the patient's episode of care. Thus, continual re-evaluation of the patient's response to treatment and the patient's emerging clinical findings is important for providing optimal interventions throughout the patient's episode of care.<sup>28</sup>

### Component 3

*Irritability* is a term used by rehabilitation practitioners to reflect the tissue's ability to handle physical stress,<sup>190,200</sup> and is presumably related to physical status and the extent of injury and inflammatory activity that is present. McClure and Michener<sup>190</sup> proposed operational definitions for tissue irritability for persons with shoulder pain that could be used to guide intensity and selection of interventions. These include high, moderate, and low irritability levels, which are characterized by pain intensity and disability level, as well as provocation of pain with ROM.<sup>190</sup> Because irritability level and the duration of symptoms do not always match, clinicians may be required to make judgments when applying time-based research results to individual patients.<sup>28</sup> Diagnosis of tissue irritability is important for guiding clinical decisions regarding treatment frequency, intensity, duration, and type, with the goal of matching the optimal dosage of treatment to the status of the tissue being treated.<sup>28,157</sup> Using an approach similar to that proposed by McClure and Michener,<sup>190</sup> clinicians should use tissue irritability as a factor to consider when determining intervention type and intensity. Patients with PFP with high irritability (fairly constant pain greater than 5/10 that fluctuates related to activity) may benefit from interventions to reduce physical stress to the knee structures (eg, patellar taping). Those patients with low irritability (intermittent low-level pain less than 3/10 not easily aggravated) may benefit from interventions that apply more physical stress to the tissues of the knee, such as weight-bearing strengthening exercises, and thus provide appropriate stress to result in adaptation of structures to increased load.<sup>200</sup>

### Component 4

Outcome measures are standardized tools used for measuring a specific domain, whether it is a body structure or function, activity limitation, or participation restriction, or for determining a specific end point. They are important in direct management of individual patient care, and they provide the opportunity to collectively compare care and determine effectiveness through the repeated application of a standardized measurement. Outcomes in clinical practice provide the mechanism by which the health care provider, the patient,

the public, and the payer are able to assess the end results of care and its effect on the health of the patient and society. Outcome measurements can identify baseline pain, function, and disability, assess global knee function, determine readiness to return to activities, and monitor changes in status throughout treatment. Outcome measures can be classified as PROMs, physical performance measures, and physical impairment measures. Information for outcome measures is detailed in this CPG's Examination section.

#### Component 5

Clinical signs and symptoms have typically guided the

clinical decision making of treatment interventions. These clinical signs and symptoms guide the clinician to classify the patient with one of the proposed impairment-based categories of PFP. Interventions targeting the patient's impairments are listed in the **FIGURE** according to the PFP category. Because irritability level often reflects the tissue's ability to accept physical stress, clinicians should match the most appropriate intervention strategies to the irritability level of the patient's condition.<sup>28,157</sup> Additionally, clinicians should consider influences from psychosocial factors<sup>9-11,186,187</sup> in patients with conditions in all stages of recovery.