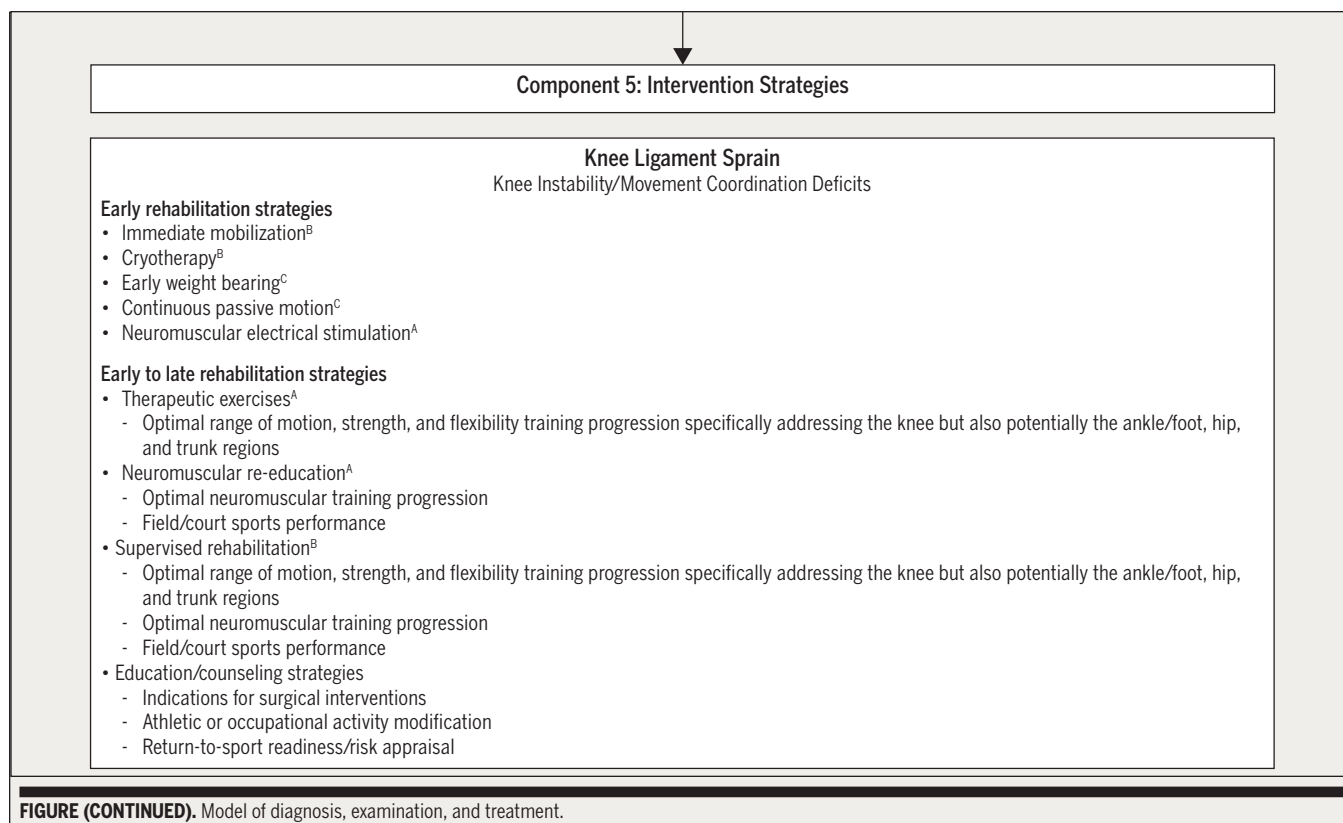


**FIGURE.** Model of diagnosis, examination, and treatment. <sup>A</sup>Guidelines based on strong evidence. <sup>B</sup>Guidelines based on moderate evidence. <sup>C</sup>Guidelines based on weak evidence.



**FIGURE (CONTINUED).** Model of diagnosis, examination, and treatment.

### Decision Tree Model

A pathoanatomical/medical diagnosis of ligament sprain can provide valuable information in describing tissue pathology and may assist in preoperative planning and predicting prognosis. The proposed model for examination, diagnosis, and treatment planning for patients with knee stability and movement coordination impairments associated with knee ligament sprain uses the following components: (1) medical screening, (2) classification of 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, (4) determination of evaluative outcome measure instruments, and (5) intervention strategies for patients with ligament sprain. 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. The Ottawa knee rules, discussed earlier, are an example of tools that may be helpful in this decision-making process. In addition to these conditions, clinicians should screen for the presence of psychosocial issues that may affect prognostication and treatment decision making for rehabilitation. Psychological stress negatively in-

fluences recovery. Fear of reinjury is a frequently cited reason why athletes do not return to sport or reduce their level of physical activity.<sup>5,6</sup> Low internal health locus of control (the belief in one's ability to control one's life), lower self-efficacy, and depressive symptoms prior to surgery result in worse outcomes after ACL reconstruction.<sup>32,114</sup> Athletes who did not return to sport after ACL reconstruction had significantly lower preoperative motivation and more negative psychological response than those who did return.<sup>9</sup> Accordingly, identifying cognitive behavioral tendencies during the patient's evaluation can direct the therapist to employ specific patient education strategies to optimize patient outcomes after physical therapy interventions and potentially provide indications for referring the patient for consultation with another medical or mental health practitioner.<sup>13</sup>

#### Component 2

Differential evaluation of musculoskeletal clinical findings is used to determine the most relevant physical impairments associated with the patient's reported activity limitations and medical diagnosis.<sup>59</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 ICD-10 and primary and secondary ICF codes associated with ligament sprain are provided in the 2010 ICF-based ligament sprain

CPG.<sup>70</sup> These impairment patterns are useful in driving the interventions, which focus on normalizing the key impairments of body function, which in turn improves the movement and function of the patient and lessens or alleviates the activity limitations commonly reported by the patients who meet the diagnostic criteria of that specific pattern. Key clinical findings to rule in and rule out the common impairment patterns, and their associated medical conditions, are shown in the **FIGURE**. 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>59</sup> However, it is important for clinicians to understand that the impairment pattern and 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 the optimal interventions throughout the patient's episode of care.<sup>14</sup>

### Component 3

*Irritability* is a term used by rehabilitation practitioners to reflect the tissue's ability to handle physical stress,<sup>80</sup> and is presumably related to physical status and the extent of inflammatory activity that is present. There are cases where the alignment of irritability and the duration of symptoms does not match, requiring clinicians to make judgments when applying time-based research results on a patient-by-patient basis.<sup>14</sup> Diagnosis of tissue irritability is important for guiding the 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>14,59</sup> There are other biopsychosocial elements that may relate to staging of the condition, including, but not limited to, the level of disability reported by the patient and activity avoidance.<sup>20</sup>

### Component 4

Outcome measure instruments are standardized instruments for measuring a specific end point, whether it is a body structure or function, activity limitation, or participation restriction. They are important in direct management of individual patient care and because they can collectively compare care and determine effectiveness through the repeated application of 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 upon the health of the patient and society. Outcome measurement 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 measure instruments can be classified as PRO measures, physical performance measures, and physical impairment measures.

### Component 5

Interventions are listed by phase of rehabilitation (early, early to late). 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>14,59</sup> Additionally, clinicians should attend to influences from psychosocial factors<sup>5,6,9</sup> in patients with conditions in all stages of recovery.



Løgerstedt DS, Scalzitti D, Risberg MA, et al. Knee stability and movement coordination impairments: knee ligament sprain revision 2017: clinical practice guidelines linked to the International Classification of Functioning, Disability, and Health from the Orthopaedic Section of the American Physical Therapy Association. *J Orthop Sports Phys Ther.* 2017;47:A1-A47. <https://doi.org/10.2519/jospt.2017.0303>