“Jumper’s knee” is the term usually applied in sports medicine to a variety of conditions involving the patellar tendon at its attachments to the patella and the tibial tuberosity. Most commonly associated with overuse or repetitive stress in sports that emphasize repetitive jumping (basketball, volleyball, or high or long jumping), but also seen in athletes involved in running and kicking sports. The extrinsic overloading of the tendon results in microtears which fail to heal properly and can develop into a chronic tendinitis or uncommonly, a rupture.1 It is more common in athletes with a pronated foot posture1 or low ankle dorsiflexion2. This condition has also been associated with single-event, blunt trauma.1, 3

Histological study does not identify inflammatory infiltrates, so “tendinitis” is probably not accurate. Current terminology favors patellar tendinosis (PT) to characterize this disorder. Immunohistochemical examination has shown a prevalence of mast cells that may mediate hypervascularity.4 Doppler ultrasound examination reveals neovascularization in 60% of PT patients. Having abandoned inflammation as the primary model of this painful condition, a clear model of pathophysiology of chronic tendinopathy is not fully understood but does involve a degenerative component. This limits our capacity to establish effective treatment approaches and in some ways explains the wide variety of treatment approaches used.21 The majority of current evidence supports the first line treatment option for this condition as exercise, specifically eccentric, or some version of eccentric-concentric, to improve the capacity of the tendon to manage the strain/load of the aggravating activity.18,19,20,21,22,23,24,25,26

**Subjective Findings and History**

- Often in athletes with jumping activity or sprints
- Usually insidious, rarely a result of acute trauma
- Anterior knee pain, often described as achy, at the pole(s) of the patella or tibial tuberosity
- General, diffuse knee tenderness
- Knee stiffness
- Occurs usually in skeletally mature adults, age range 16 to 40 years, males slightly > females
- Excessive foot pronation and running hills can exacerbate these symptoms
- Hard playing surface, high number of training sessions

*Jumper’s knee can be classified into 1 of 4 stages:*

- Stage 1 - Pain only after activity, without functional impairment
- Stage 2 - Pain during and after activity, although the patient is still able to perform satisfactorily in his or her sport
• Stage 3 - Prolonged pain during and after activity, with increasing difficulty in performing at a satisfactory level
• Stage 4 - Complete tendon tear requiring surgical repair

Objective Findings
• Examine with knee in extension
• Tenderness at the insertion sites (tenderness at the inferior pole of the patella has high sensitivity and moderate specificity for diagnosing patellar tendinopathy)
• Resisted extension often painful
• Hamstrings and quadriceps tightness
• Catching and/or locking may be demonstrated
• Localized swelling over the involved tendon attachment
• Palpatory heat
• Bassett Sign:
  o Tenderness to palpation with knee at full extension and patellar tendon relaxed
  o Non-tender with knee in flexion and patellar tendon taut
• Normal ligamentous stability of the knee during testing, range of motion, neurovascular examination, hip and ankle examination
• Laboratory and imaging are rarely required for diagnosis but may be appropriate for excluding other conditions
• Observation, palpation or X-ray may show residual of Osgood-Schlatter disease or avulsion injury
• Evaluate kinetic chain and spine for joint dysfunction
• Leg length difference

Assessment
The clinical impression should indicate the specific anatomical structures involved and clinically correlate with mechanism of injury, history, subjective complaints, and objective findings

Other problems to be considered include infrapatellar bursitis, pes anserine bursitis, tibial plateau fracture, infrapatellar fat pad syndrome, Sinding-Larsen-Johansson syndrome, Osgood-Schlatter disease (in adolescents) tumor, knee-joint infection.

Plan
Passive Care:
• Rest, ice, stretch especially in the acute phase.
• NSAIDS recommendations range from limited to none based on the fact that this is not an inflammatory based condition and NSAIDS have been demonstrated to not be effective in the long run
• Analgesics for acute symptoms
• There is limited evidence of the benefit of manipulation and mobilization of the knee in the treatment of tendinopathy
• There is anecdotal evidence that suggests correction of biomechanical faults in the kinetic chain of adjacent structures may help
• Limited evidence exists to support the use of, the following therapies: friction massage, acupuncture, laser therapy, use of bracing, orthotics, cryotherapy, steroid injections, sclerosing injections, extracorporeal shock wave therapy, prolotherapy, topical nitroglycerin, ionic and phonophoresis, therapeutic ultrasound, low level laser, Platelet Rich Plasma autologous blood injections. Many of these are considered second-line alternatives to surgery for patients who have persistent pain despite having complied with an appropriate rehabilitative exercise program.
• Fascial manipulation of the quadriceps
• Knee brace or strap for patellar tendinitis, e.g. Cho-Pat brace
• Supplementation
• Lower extremity and spinal manipulation to correct joint dysfunction

Active Care:
• Some isometric exercises may be started in the acute stages and, as the patient progresses, gradual eccentric and/or eccentric-concentric exercises to improve strength, range of motion, and function. Review of recent literature suggests that eccentric, and in some studies a combination of eccentric-concentric training, is the first-line treatment of choice for this condition. There are some models of protocols for these exercises but the ability to recommend a specific protocol is limited. The studies available indicate that the treatment program should include a decline board of 25 degrees (decline improves the specificity of the squat by decreasing the contribution of the calf muscles and passive ankle structure to controlling the squat) and should be performed with some level of discomfort. There is also evidence that suggests that athletes who are participating in an eccentric exercise protocol do not have better outcomes when they are withdrawn from sport.
• Training in proper mechanics of joint protection and exercises
• Activities/work restrictions: Limit activity depending upon diagnosis, degree of symptoms, and type of daily activities.

Length of Treatment
• The treatment of jumper’s knee is often specific to the degree of involvement, clinical Stages I-IV (see Hyman article below).
• Up to 12 weeks for patellar tendinosis.
• Two weeks to 4 months for bursitis.

Referral Criteria
• Eccentric training should be tried for twelve weeks before open tenotomy is considered for the treatment of patellar tendinopathy. Some sources recommend 6-12 months of conservative treatment prior to consideration of surgery and in some cases only for those in Stages 3 and 4.
• Referral to orthopedist for complete rupture, refractory tendinosis and septic bursitis, progressive loss of range of motion or strength. However, considering the heterogeneity of surgical procedures and the absence of randomised studies, no conclusive evidence can be drawn from the literature regarding the effectiveness of surgical treatment for patellar tendinopathy.
• Referral to physical therapy if not available in your office.
• Failure to respond to care.

**Resources for Clinicians**
Wheeless’ Textbook of Orthopedics. “Jumper’s Knee” WheelessOnline.com is published by Duke University Medical Center’s Division of Orthopaedic Surgery, in conjunction with Data Trace Internet Publishing, LLC. This is the most comprehensive, unparalleled, dynamic online medical textbook in existence.

Hyman G. Jumper’s Knee. eMedicine is the original open access comprehensive medical textbook for all clinical fields

Tendinosis.org. The Tendinosis Injury. Tendinosis.org supplies research into tendinosis (commonly known as tendinitis) and other chronic tendon injuries.
http://www.tendinosis.org/injury.html

**Resources for Patient**
Patellar Tendonitis. MayoClinic.com. Manage your health with useful and up-to-date information in more than 35 disease and lifestyle categories.

Shealey G. What is Jumper’s Knee?

**References**


Clinical Pathway Feedback
CHP desires to keep our clinical pathways customarily updated. If you wish to provide additional input, please use the e-mail address listed below and identify which clinical pathway you are referencing. Thank you for taking the time to give us your comments.

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