

# Knee-cap Pain

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## Latest Research on Treatment

Pain related to the knee-cap (patella) is known as 'patello-femoral pain syndrome' (PFPS), and is one of the most common musculoskeletal conditions seen in our practice. It accounts for 25-40% of all knee problems seen in sports medicine, and may have a prevalence of around 25% in the general adult population. Below is a summary of the most up-to-date research on treatments for PFPS.

### **Taping**

There is good research evidence that taping for the patella improves symptoms, and sometimes helps to control pain very effectively. It possibly does this by a subtle improvement in joint alignment, which reduces joint stress (11,20).

### **VMO retraining**

In the past, people being treated for PFPS would have been taught 'VMO' exercises. The VMO is the quadriceps muscle on the inside of the knee. However research shows that quadriceps weakness is not confined to the VMO. General quadriceps strength programmes have proven beneficial in improving symptoms (6).

### **Hip strengthening**

There is increasing evidence that hip strength may be of equal or greater importance than quads strength for effective management of PFPS (22). There is research that shows females with PFPS have significantly increased femoral 'adduction' (knee inward bend) compared to controls, when running or performing a single leg squat (18,22). Both males and females with PFPS had increased pelvic drop on the opposite side to the standing leg (18).

There is evidence that some subjects with PFPS have relative weakness of their gluts and hip external rotators (1,7). Rehab programmes specifically

targeting hip rather than quads strengthening have demonstrated benefits over the short to medium term (7,21).

### **Biomechanical interventions**

Recently there has been interest in the role of movement retraining in reducing PFPS. Video biofeedback, mirror imaging & verbal cueing has been used successfully to assist runners with PFPS to reduce over-striding, pelvic drop and inward knee bend, thus improving control and getting the knees in better alignment during running (3,17,18,19).

### **Pain control and central mechanisms**

With many persistent painful joint conditions, there is mounting evidence of central nervous system over-activity that further maintains pain and dysfunction. In PFPS, this makes it hard to strengthen the knee, because in effect the brain is working against the body. There has been recent interest in treatments that 'dis-inhibit' the central nervous system, helping to make strengthening more effective (4).

### **Orthotics**

Studies have shown inconsistent results for the benefits of foot orthoses for treating PFPS. Some studies have shown short-term benefit (16). There is most likely a sub-group of individuals who will benefit from this intervention (2,16).

For more information on physiotherapy treatment of this condition, see:

<http://www.cssphysio.com.au/pdfs/0-Rehabilitation.pdf>

### **References:**

1. Barton, C et al (2012). Gluteal muscle activity and PFPS: a systematic review. *BJSM*, 47, 4. 207-214.

2. Barton, C et al (2011). Greater peak rearfoot eversion predicts foot orthosis efficacy in individuals with PFPS. *BJSM*, *45*, 697-701.
3. Cheung, R & Davis, I (2011). Landing pattern modification to improve patellofemoral pain in runners. *JOSPT*, *41*, 12, 914-919.
4. Harkey, M et al (2014). Disinhibitory interventions and voluntary quadriceps activation: a systematic review. *Journal of Athletic Training*, *49*, 1, Epub.
5. McConnell, J (1996). Management of patellofemoral problems. *Manual Therapy*, *1*, 60-66.
6. Natri, A et al (1998). Which factors predict long-term outcome in chronic patellofemoral pain syndrome. A 7-year prospective follow-up study. *Medicine and Science in Sports and Exercise*, *30*, 11, 1572-1577.
7. Noehren, B (2012). Proximal and distal kinematics in female runners with patellofemoral pain. *Clinical Biomechanics*, *27*, 4, 366-371.
8. Pattyn, E et al (2011). VMO atrophy: does it exist in PFPS? *AJSM*, *39*, 7, 1450-145.
9. Peters J & Tyson, N (2013). Proximal exercises are effective in treating patellofemoral pain syndrome: a systematic review. *International Journal of Sports Physical Therapy*, *8*, 5, 689-700
10. Powers, C (2003). The influence of altered lower-extremity kinematics on patellofemoral joint dysfunction. *JOSPT*, *33*, 11, 639-646.
11. Powers, C et al (1997). The effects of patellar taping on stride characteristics and joint motion in subjects with patellofemoral pain. *JOSPT*, *26*, 6, 286-291.
12. Souza R et al (2010). Femur rotation and patellofemoral joint kinematics: a weight-bearing magnetic resonance imaging analysis. *JOSPT*, *40*, 5, 277-285.
13. Stathopulu E & Baildam, E (2003). Anterior knee pain: a long-term follow-up. *Rheumatology*, *42*, 2, 380-382.
14. Thomas, M et al (2010). Anterior knee pain in young adults as a precursor to subsequent patellofemoral arthritis. *BMC Musculoskeletal Disorders*, *11*, 9, 201
15. Van Tiggelen, D et al (2009) Delayed VMO to VL onset timing contributes to the development of patellofemoral pain in previously healthy men. *AJSM*, *37*, 6, 1099-1105.
16. Vincenzino, B et al (2010). A clinical prediction rule for identifying patients with PFP who are likely to benefit from foot orthoses. *BJSM*, *44*, 12, 862-866.
17. Willey, R et al (2012). Mirror gait retraining for the treatment of patellofemoral pain in female runners. *Clinical Biomechanics*, *27*, 10, 1045-1051.
18. Willey R et al (2012). Are mechanics different between male and female runners with patellofemoral pain. *Medicine and Science in Sports and Exercise*, *44*, 11, 2165-2171.
19. Willson, J et al (2013) Effect of step length on patellofemoral joint stress in female runners with and without patellofemoral pain. *Clinical Biomechanics*, *29*, 3, 243-247.
20. Wilson, T et al (2003). A multi-centre single-masked study of medial, neutral and lateral patellar taping in individuals with PFPS. *JOSPT*, *33*, 8, 437-443.
21. Witvrouw, E et al (2013). Patellofemoral pain: consensus statement from the 3<sup>rd</sup> International Research Retreat. *BJSM*, *48*, 3, 411-414.
22. Noehren, B et al (2013). Prospective evidence for a hip etiology in patellofemoral pain. *Medicine and Science in Sport and Exercise*, *45*, 1120-1124.

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