# Using the MyoKinesthetic System to Treat Bilateral Chronic Knee Pain: A Case Study

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## Abstract

**Objective:** The purpose of this case study was to report the effects of the MyoKinesthetic (MYK) system on pain, functional ability, and psychosocial well-being of a 20-year-old female collegiate softball athlete diagnosed with chronic bilateral knee pain associated with osteoarthritis.

**Clinical Features:** The patient presented with bilateral chronic knee pain lasting more than 2 years. A clinical examination and radiographic imaging revealed chondromalacia and the beginning stages of osteoarthritis of the knee. No other comorbidities were noted.

**Intervention and Outcome:** The patient received 4 treatments with the MYK system over 2 weeks. Treatments 1 through 3 were directed at the S1 nerve root; the fourth treatment was directed at the L4 nerve root. Outcome measures included the Numeric Pain Scale, the Patient-Specific Functional Scale, and the Disability in the Physically Active Scale. Pain, function, and quality of life were measured collectively using the Knee Injury and Osteoarthritis Outcome Score. The patient experienced clinical improvements (minimal clinical important differences, minimal detectable changes) for all outcome measures, with the exception of the quality-of-life subscale within the Knee Injury and Osteoarthritis Outcome Score.

**Conclusions:** The patient in this case study reported a decrease in pain and an increase in function during the course of 4 treatments, which were administered over 14 days and in accordance to the MYK guidelines. Traditional treatment guidelines typically recommend 8 weeks for positive effects to manifest. Manual therapy techniques, such the MYK system, may be a viable treatment option for patients with osteoarthritis of the knee. (J Chiropr Med 2016;xx:1-5)


**Key Indexing Terms:** *Chondromalacia; Osteoarthritis; Manual Therapy; Chronic Pain; Massage therapy*

## Introduction

Osteoarthritis (OA) is widely prevalent across all demographics and is observed in both active and sedentary populations.[1] Moreover, OA of the knee is one of the largest causes of disability on a global scale.[2] Chronic joint pain is the most common symptom of OA and contributes to a wide array of physical and psychosocial disabilities.[3] Distress, dependency, anxiety, depression, and a reduced quality of life are possible side effects of coping with chronic pain.[4,5]

Treatment for OA varies, depending on the severity and progression of the disease. Vague diagnoses and a lack of knowledge of the disease's causes and progression often lead to ineffective rehabilitation and pharmacologic treatments. Although mobilization with movement techniques and a combination of joint mobilization and exercise have both been shown to decrease pain in patients with OA of the knee,[6,7] the time commitment for more conservative therapeutic exercise could be extensive and result in poorer patient compliance and higher associated medical costs.

Traditional conservative therapy may be lacking in effectiveness because pharmacologic interventions treat the symptoms without addressing the underlying cause of pain, and physical therapy mostly involves addressing deficits in range of motion and muscle strength.[8-10] In contrast, the efficacy of mobilization with movement techniques and the combination of other joint mobilizations and exercise may lie in the correction of misalignment, structural imbalances, or positional fault[6,11,12] of joint surfaces, which are thought to contribute to the development and progression of OA of the knee.[13]

The MyoKinesthetic (MYK) system, a novel intervention strategy that was designed to treat postural imbalances and compensations, may be useful for treating OA of the knee. The MYK system is based on a manual therapy technique that theoretically decreases and clears nerve nociceptor firing that occurs as a result of joint or tissue movement restrictions.[14]

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The targeted outcome of MYK treatments is to create bilateral postural balance by treating the neuromuscular system along a specific nerve root, leading to more functional and pain-free movements.[15] Treating specific muscles along the nerve root and balancing posture are theorized to decrease muscle spasms and increase range of motion; this treatment quiets nociceptive signals and decreases pain.[14]

Implementation of this system begins by selecting from a list of patient evaluation options.[15] On the basis of the results of the evaluation, a specific nerve root level is identified as the cause of the postural compensation related to the nervous system. The clinician treats the patient by massaging the muscles along the identified nerve root, bilaterally. During the treatment, the clinician moves the joint passively while massaging the involved muscles and then instructs the patient to move the joint actively while continuing to massage the same muscles.[15]

The evidence that postural and biomechanical dysfunctions can lead to OA of the knee,[3,10,12,16] combined with the theoretical design of the MYK system, suggests that use of this system as an evaluation and intervention paradigm may correct postural dysfunctions,[15,17] reduce pain, and improve function and psychosocial well-being in patients with OA of the knee. However, there is currently a paucity of evidence regarding the use of the MYK system. Therefore, the purpose of this case study was to report the effects of the MYK system on a patient diagnosed with chronic bilateral knee pain associated with OA.

## Case Description

A 20-year-old collegiate softball pitcher presented with chronic bilateral knee pain, although her primary complaint was pain and dysfunction in the right knee. No specific mechanism of injury was reported. The pain was described as constant and gradually worsening over the past 2 years. An initial clinical orthopedic examination was performed to rule out other injuries; positive results of tests for a possible torn meniscus required referral to an orthopedic surgeon.

Magnetic resonance imaging on the right knee did not detect a meniscus tear. The physician's orthopedic examination concluded with a diagnosis of chondromalacia and the beginning stages of OA based on patient history, clinical examination results, knee joint space narrowing, and a tibial plateau bone spur formation noted on radiographic imaging (Fig 1). The physician recommended an initial interarticular corticosteroid injection, along with 8 weeks of a therapeutic exercise program (Table 1), and 420 mg of naproxen sodium twice daily or as needed for 2 weeks; however, the patient did not experience any notable improvements. Because of the ineffectiveness of conservative traditional therapies, the MYK system was considered to be a possible solution.

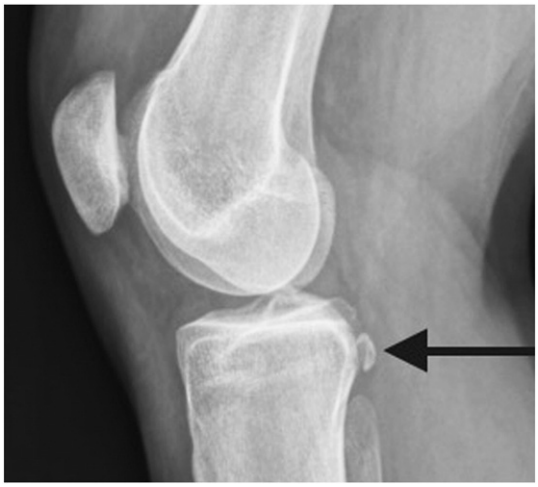

**Fig 1.** *Tibial plateau bone spur.*

## Intervention

Patient-reported outcome measures (the Numeric Pain Scale [NPS] score, the Patient-Specific Functional Scale [PSFS] score, the Knee Injury and Osteoarthritis Outcome Score [KOOS], and the Disablement in the Physically Active Scale score) were collected prior to the postural assessment with the MYK system (Table 2). The MYK postural assessment was completed, and S1 nerve root treatment was indicated for the first treatment. Each subsequent visit required an additional postural assessment to determine the appropriate nerve root level to treat.

During treatment, the muscles were massaged as the joint was moved passively for 8 repetitions and then actively for 10 repetitions. The treatment was performed bilaterally as indicated by the procedure application of the MYK system. The MYK postural assessment on the second and third visits indicated that the patient also needed treatment of the S1; on the final visit, treatment of the L3 was needed. The L3 treatment repetitions were the same as for the S1 treatment. The Texas Woman's University institutional review board approval was obtained prior to collection of data on patient outcome, and the patient gave written consent for the publication of personal health information through de-identified patient data and for the publication of this report.

## Outcomes

The patient experienced clinical improvement (ie, minimal clinically important difference[18]) in pain after the first treatment. At her second visit, the patient reported further improvement in pain (1 of 10) and clinically significant improvement (ie, minimal detectable change[19]) in function (8 of 10). The second treatment resulted in no immediate changes in pain or function, and the patient did