Clinical Policy Title: Genicular nerve block

Clinical Policy Number: 14.01.10

Effective Date: October 1, 2017
Initial Review Date: September 21, 2017
Most Recent Review Date: October 19, 2017
Next Review Date: October 2018

Related policies:

CP# 00.02.08 Intra-articular hyaluronic acid injection for osteoarthritis

ABOUT THIS POLICY: Select Health of South Carolina has developed clinical policies to assist with making coverage determinations. Select Health of South Carolina's clinical policies are based on guidelines from established industry sources, such as the Centers for Medicare & Medicaid Services (CMS), state regulatory agencies, the American Medical Association (AMA), medical specialty professional societies, and peer-reviewed professional literature. These clinical policies along with other sources, such as plan benefits and state and federal laws and regulatory requirements, including any state- or plan-specific definition of "medically necessary," and the specific facts of the particular situation are considered by Select Health of South Carolina when making coverage determinations. In the event of conflict between this clinical policy and plan benefits and/or state or federal laws and/or regulatory requirements, the plan benefits and/or state and federal laws and/or regulatory requirements shall control. Select Health of South Carolina’s clinical policies are for informational purposes only and not intended as medical advice or to direct treatment. Physicians and other health care providers are solely responsible for the treatment decisions for their patients. Select Health of South Carolina’s clinical policies are reflective of evidence-based medicine at the time of review. As medical science evolves, Select Health of South Carolina will update its clinical policies as necessary. Select Health of South Carolina’s clinical policies are not guarantees of payment.

Coverage policy

Select Health of South Carolina considers genicular nerve block by radiofrequency technique for chronic knee pain to be investigational, and therefore not clinically proven (Gupta 2017, Iannaccone 2017, Qudsi-Sinclair 2017, Bhatia 2016, Kesikburun 2016, Choi 2011).

Limitations:

None.

Alternative covered services:

- Routine patient evaluation and management by a network health care provider.

Background

Patients suffering from osteoarthritis of the knee and patients status-post total knee arthroplasty may develop refractory, disabling chronic knee pain. Chronic pain of the knee is often effectively managed
with pharmacological or non-pharmacological treatments. When conservative therapy fails, genicular nerve neurolysis may be suggested as a second-line therapy. Genicular nerve block has traditionally been achieved by local anesthetic and corticosteroid injection of the superolateral, superomedial, and inferomedial branches of the nerves around the knee joint. A number of publications have reported analgesic success of radiofrequency neurotomy of the major or periarticular nerve supply or intra-articular branches innervating the knee, but interpretation is hampered by lack of clarity regarding indications, clinical protocols, targets, and longevity of benefit from radiofrequency procedures.

**Searches**

Select Health of South Carolina searched PubMed and the databases of:
- UK National Health Services Centre for Reviews and Dissemination.
- Agency for Healthcare Research and Quality’s National Guideline Clearinghouse and other evidence-based practice centers.
- The Centers for Medicare & Medicaid Services (CMS).

We conducted searches on August 18, 2017. Search terms were: "genicular nerve," "nerve block," and "pain management."

We included:
- **Systematic reviews**, which pool results from multiple studies to achieve larger sample sizes and greater precision of effect estimation than in smaller primary studies. Systematic reviews use predetermined transparent methods to minimize bias, effectively treating the review as a scientific endeavor, and are thus rated highest in evidence-grading hierarchies.
- **Guidelines based on systematic reviews.**
- **Economic analyses**, such as cost-effectiveness, and benefit or utility studies (but not simple cost studies), reporting both costs and outcomes — sometimes referred to as efficiency studies — which also rank near the top of evidence hierarchies.

**Findings**

Radiofrequency ablation by conventional, pulsed, and cooled technique has been proposed to manage chronic knee pain in patients who have failed conservative treatment or who are not suitable candidates for surgical treatment. There is a low level of certainty to suggest a superior benefit between targeting the genicular nerve, an intra-articular approach, and targeting the larger nerves such as femoral and tibial nerves. Utilizing the strength of evidence grading, there is a low level of certainty in supporting the superiority of any specific radiofrequency procedure modality. The majority of the studies report positive patient outcomes, but the inconsistent procedural methodology, inconsistent patient assessment measures, and small study sizes limit the applicability of any specific study to clinical practice.
A systematic review (Gupta 2017) analyzed radiofrequency by conventional, pulsed, or cooled radiofrequency technique to relieve chronic knee pain. Seventeen total publications were included with most of them primarily treating the genicular nerves or alternatively employed in an intra-articular approach. Different therapeutic approaches to targeting the genicular nerve or an intra-articular approach produced no certain advantage. Different therapeutic technologies (conventional, pulsed, or cooled) to targeting the genicular nerve produced no certain advantage. Ongoing concerns on radiofrequency regarding the quality, procedural aspects, and monitoring of outcomes remain.

A retrospective review (Iannaccone 2017) of radiofrequency for chronic knee pain from osteoarthritis noted that at three-month follow-up, the average pain relief was 67% improved from baseline knee pain, and average 0–10 pain score was 2.9. At six-month follow-up, of those who described pain relief at three months, 95% still described pain relief. This group's average percent pain relief was 64% and average day's 0–10 pain score 3.3. The authors concluded that radiofrequency of genicular nerves can provide greater than 60% pain relief for as long as six months.

A double-blind, randomized clinical study (Qudsi-Sinclair 2017) compared neurolysis using traditional radiofrequency to local anesthetic and corticosteroid block of the superolateral, superomedial, and inferomedial branches of the knee genicular nerves in patients who had total knee arthroplasty but still experienced pain. Twenty-eight patients, 14 on each treatment arm, were followed for over a one-year period. A reduction in pain and significant joint function improvement during the first three to six months was shown, with similar results using both techniques.

A systematic review (Bhatia 2016) noted 13 reports on ablative or pulsed radiofrequency treatments of innervation of the knee joint. A high success rate of these procedures in relieving chronic pain of the knee joint was reported at 1 to 12 months after the procedures; however, only two of the publications were randomized controlled trials. There was evidence for improvement in function and a lack of serious adverse events of RF treatments. Randomized controlled trials of high methodological quality are required to further elaborate role of these interventions in this population.

A clinical trial (Keskiburn 2016) evaluated repeat ultrasound-guided genicular nerve pulsed radiofrequency treatment on chronic knee pain and function in patients (n=29) with knee osteoarthritis. All patients had undergone genicular nerve block in the previous six months. Patients with at least 50% reduction in the visual analog scale score after genicular nerve block and with no ongoing pain relief were selected for the study. Ultrasound-guided genicular nerve pulsed radiofrequency was applied to 15 knees of nine patients. A significant reduction in visual analog scale score was detected over time after the pulsed radiofrequency procedure (f: 69.24, P 0.01). There was a significant improvement in functional scores (f: 539.68, P 0.01).

A randomized controlled trial (Choi 2011) investigated whether radiofrequency neurotomy applied to genicular nerve branches was effective in providing relief to patients (n=38) from chronic osteoarthritis knee joint pain. Patients were randomly assigned to receive percutaneous radiofrequency genicular neurotomy under fluoroscopic guidance (radiofrequency group; n=19) or the same procedure without
effective neurotomy (control group; n=19). Visual analog scale scores showed that the radiofrequency group had less knee joint pain at 4 (p 0.001) and 12 (p 0.001) weeks compared with the control group. Oxford knee scores showed similar findings (p 0.001). In the radiofrequency group, 10/17 (59%), 11/17 (65%), and 10/17 (59%) achieved at least 50% knee pain relief at 1, 4, and 12 weeks, respectively.

Summary of clinical evidence:

<table>
<thead>
<tr>
<th>Citation</th>
<th>Content, Methods, Recommendations</th>
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<tbody>
<tr>
<td>Gupta (2017)</td>
<td><strong>Key points:</strong></td>
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</tbody>
</table>
| Review of Cooled Versus Pulsed Radiofrequency Ablation for the Treatment of Knee Osteoarthritis: A Systematic Review | • A systematic review analyzed radiofrequency by conventional, pulsed, or cooled radiofrequency technique to relieve chronic knee pain.  
• Seventeen total publications were included with most of them primarily treating the genicular nerves or alternatively employed in an intra-articular approach.  
• Different therapeutic approaches to targeting the genicular nerve or an intra-articular approach produced no certain advantage.  
• Different therapeutic technologies (conventional, pulsed, or cooled) to targeting the genicular nerve produced no certain advantage.  
• Ongoing concerns on radiofrequency regarding the quality, procedural aspects, and monitoring of outcomes remain. |
| Iannaccone (2017)               | **Key points:**                   |
| A Review of Long-Term Pain Relief after Genicular Nerve Radiofrequency Ablation in Chronic Knee Osteoarthritis | • A retrospective review of radiofrequency for chronic knee pain from osteoarthritis noted that at three-month follow-up, the average pain relief was 67% improved from baseline knee pain, and average 0–10 pain score was 2.9.  
• At six-month follow-up, of those who described pain relief at three months, 95% still described pain relief.  
• This group's average percent pain relief was 64% and average day's 0–10 pain score 3.3.  
• The authors concluded that radiofrequency of genicular nerves can provide greater than 60% pain relief for as long as six months. |
| Qudsi-Sinclair (2017)            | **Key points:**                   |
| A Comparison of Genicular Nerve Treatment Using Either Radiofrequency or Analgesic Block with Corticosteroid for Pain after a Total Knee Arthroplasty: A Double-Blind, Randomized Clinical Study | • A double-blind, randomized clinical study compared neurolysis using traditional radiofrequency to local anesthetic and corticosteroid block of the superolateral, superomedial, and inferomedial branches of the knee genicular nerves in patients who had total knee arthroplasty but still experienced pain.  
• Twenty-eight patients, 14 on each treatment arm, were followed for over a one-year period.  
• A reduction in pain and significant joint function improvement during the first three to six months was shown, with similar results using both techniques. |
<p>| Bhatia (2016)                   | <strong>Key points:</strong>                   |
| Radiofrequency Procedures to Relieve Chronic Knee Pain | • A systematic review noted 13 reports on ablative or pulsed radiofrequency treatments of innervation of the knee joint. |</p>
<table>
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| Pain: An Evidence-Based Narrative Review | - A high success rate of these procedures in relieving chronic pain of the knee joint was reported at 1 to 12 months after the procedures; however, only two of the publications were randomized controlled trials.  
- There was evidence for improvement in function and a lack of serious adverse events of RF treatments.  
- Randomized controlled trials of high methodological quality are required to further elaborate role of these interventions in this population. |
| Kesikburun (2016) | **Key points:**  
- A clinical trial evaluated repeat ultrasound-guided genicular nerve pulsed radiofrequency treatment on chronic knee pain and function in patients (n=29) with knee osteoarthritis.  
- All patients had undergone genicular nerve block in the previous six months.  
- Patients with at least 50% reduction in the visual analog scale score after genicular nerve block and with no ongoing pain relief were selected for the study.  
- Ultrasound-guided genicular nerve pulsed radiofrequency was applied to 15 knees of nine patients.  
- A significant reduction in visual analog scale score was detected over time after the pulsed radiofrequency procedure (f: 69.24, P 0.01).  
- There was a significant improvement in functional scores (f: 539.68 , P 0.01). |
| Choi (2011) | **Key points:**  
- A randomized controlled trial investigated whether radiofrequency neurotomy applied to genicular nerve branches was effective in providing relief to patients (n=38) from chronic osteoarthritis knee joint pain.  
- Patients were randomly assigned to receive percutaneous radiofrequency genicular neurotomy under fluoroscopic guidance (radiofrequency group; n=19) or the same procedure without effective neurotomy (control group; n=19).  
- Visual analog scale scores showed that the radiofrequency group had less knee joint pain at 4 (p 0.001) and 12 (p 0.001) weeks compared with the control group.  
- Oxford knee scores showed similar findings (p 0.001).  
- In the radiofrequency group, 10/17 (59%), 11/17 (65%), and 10/17 (59%) achieved at least 50% knee pain relief at 1, 4, and 12 weeks, respectively. |

**References**

**Professional society guidelines/other:**

None.

**Peer-reviewed references:**


**CMS National Coverage Determinations (NCDs):**

No NCDs identified as of the writing of this policy.

**Local Coverage Determinations (LCDs):**


**Commonly submitted codes**

Below are the most commonly submitted codes for the service(s)/item(s) subject to this policy. This is not an exhaustive list of codes. Providers are expected to consult the appropriate coding manuals and bill accordingly.
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