



SMART SOLUTIONS. HEALTHY RESULTS.

# Piriformis Syndrome

<b>Diagnosis/Condition:</b>	Piriformis Syndrome
<b>Discipline:</b>	DC, ND
<b>ICD-9 Codes:</b>	355.0
<b>ICD-10 Codes:</b>	G57.00
<b>Origination Date:</b>	2000
<b>Review/Revised Date:</b>	04/2015
<b>Next Review Date:</b>	04/2017

The piriformis muscle is primarily an external rotator of the hip that has its origin on the anterior surface and lateral aspects of the sacrum and the gluteal surface of ilium at the margin of the greater sciatic notch. The muscle traverses the greater sciatic foramen to insert on the superior border of greater trochanter. The sciatic nerve is usually deep to the piriformis, but anatomical variation is fairly common.<sup>1</sup> This anatomical association has classically been thought to potentiate irritation of the sciatic nerve by dysfunction of the piriformis. A recent review of published literature indicates that the prevalence of anomalies in piriformis syndrome patients is not significantly different from what is prevalent in a normal population – piriformis anomaly may not be as important in the pathogenesis of piriformis syndrome as previously thought.<sup>2</sup> This may cause local pain deep in the buttock or radiating pain and paresthesiae in the sciatic distribution.

Entrapment and irritation of nerves in the lumbopelvic region causes a collection of recognized syndromes including intervertebral disk syndromes, central and lateral stenosis. The most uncommon extra lumbar entrapments include gynecologic conditions and piriformis syndrome.<sup>3</sup> Piriformis syndrome has remained a controversial diagnosis since its initial description in 1928.<sup>4</sup> The clinical presentation is frequently confounded with radiculitis or referred pain from the lumbar spine, bursitis of the hip as well as deep gluteal syndrome which includes all types of non-discogenic sciatic nerve entrapments in the subgluteal space which can be classified as traumatic, iatrogenic, inflammatory/infectious, vascular, gynecologic and tumors/pseudo-tumors.<sup>5</sup> Clinical tests to confirm the diagnosis are not reliable and special tests (MRI, electrodiagnostic testing) have been reported as useful. MR imaging is the diagnostic procedure of choice for assessing these conditions when they are non-responsive to conservative care and may significantly influence the management of these patients. This may include advanced techniques such as magnetic resonance neurography (MRN).<sup>5</sup> The most common clinical features are buttock pain, tenderness over the greater sciatic notch, aggravation of the pain through sitting and with maneuvers that increase piriformis muscle tension.<sup>6</sup>

## Subjective Findings and History

- Buttock pain and pain into the posterior and/or lateral thigh, which may or may not be associated with trauma.
- Deep, boring, ill-defined buttock pain or referred symptoms along the course of the sciatic nerve.
- Symptoms are often made worse by sitting, walking, climbing stairs, or performing squats or repetitive rotation on planted foot (raking, assembly line work).
- Frequently associated with joint dysfunction.
- Incidence higher in females (6:1).
- Infrequent cause of neuropathy.

## Objective Findings

- Muscle testing with resisted abduction and external rotation of hip and may increase pain (Pace test).<sup>7</sup>
- Abduction and external rotation of the hip are weaker on the affected side tested with the patient sitting and resist separating their legs.
- Passive medial rotation of hip elicits the symptoms (Freiberg test).<sup>7</sup>
- The patient lies on the uninvolved side and abducts the involved thigh upward; this activates the ipsilateral piriformis muscle causing pain (Beatty maneuver).
- Postural evaluation: look for: foot flare on involved side, overpronation, antalgic gait, leg length inequality.
- Orthopedic/neurologic examination:
  - Straight leg test (SLR) usually negative<sup>7</sup>
  - Hibb's: may be positive
  - Bonnet's Sign: positive
  - Other orthopedic tests may be positive if piriformis syndrome is superimposed on a low back condition
- Palpation for exquisite tenderness or hypertonicity in piriformis, tight hamstrings.
- Palpation may intensify radiating pain into the thigh.
- Range of motion may show decreased and painful active and passive internal hip rotation-and hip adduction, as well as painful flexion.<sup>7</sup>
- Joint play: examine motion of the entire kinetic chain from foot to spine for hypo and hypermobility.
- Rule out possible swelling due to deep venous thrombosis.

## Special Tests

- Laboratory and diagnostic imaging are rarely the first choice for diagnosis.
- MRI has been suggested to show displacement of the sciatic nerve, and is useful to rule out disc and vertebral pathology.<sup>8</sup> More recent evidence suggests MR imaging as the diagnostic procedure of choice which may include more advanced procedures such as MR neurography.<sup>5</sup> electrodiagnostic studies: Electromyography (EMG) may show

conduction deficits of the sciatic nerve and be useful in differentiating piriformis syndrome from intervertebral disc herniation.<sup>9</sup>

## Assessment

- History and physical exam
- Differentiate piriformis syndrome from lumbar disc involvement, lumbar nerve root involvement, trochanteric bursitis and SIJ dysfunction.

## Plan

### Passive Care:

- Manual therapy: myofascial therapy, massage, PNF/stretching of piriformis muscle.
- Hip muscle strengthening and re-education.<sup>10</sup>
- Kinetic chain manipulation from foot to spine.
- Physical therapy modalities to control inflammation and pain (including ultrasound and iontophoresis).<sup>11</sup>
- Massage therapy.
- Ice and hydrotherapy.
- Nutritional supplementation (Vitamin C, manganese, magnesium, calcium, glucosamine sulfate, chondroitin, methylsulfonylmethane, bromelain and essential fatty acids).
- Botanical supplementation to reduce inflammation (*Curcuma longa* (turmeric), *Capsicum annuum* (cayenne), *Arnica montana* (arnica), *Ruta graveolens* (rue), *Hypericum perforatum* (St. John's wort), and *Gaultheria procumbens* (wintergreen)).
- Topical treatments (e.g. comfrey poultice, hypericum, arnica, wintergreen).
- Medications: nonsteroidal anti-inflammatory drugs (NSAIDS), muscle relaxants.
- Correct overpronation and leg length inequality.
- Trigger point injection (lidocaine hydrochloride,<sup>12</sup> steroids, or botulinum toxin type A (BTX-A)<sup>13,14</sup> or prolotherapy.<sup>15</sup>
- Acupuncture.

### Active Care:

- Home exercises: to stretch or strengthen piriformis and thigh muscles.<sup>16</sup>
- Lifestyle changes: decrease sitting time, change sitting or standing position, add padding/pillow, remove wallet from hip pocket, avoid pivoting on planted foot.

## Length of Treatment

- Conservative therapy: 1-2 months, done as early as possible after symptoms occur.<sup>17</sup>

## Referral Criteria

- Referral after 1 month of care without symptomatic or functional improvement for other treatment or surgical decompression in chronic cases.<sup>13</sup>
- Although it may take longer to ~~heal~~ resolve, with treatment, improvement is often seen within 2 weeks.

## Resources for Clinicians

University of Washington Radiology

<http://www.rad.washington.edu/academics/academic-sections/msk/muscle-atlas/lower-body/piriformis>

M Klein. Piriformis Syndrome. eMedicine.com

<http://www.emedicine.com/pmr/TOPIC106.HTM>

## Resources for Patients

Maggs T. Piriformis syndrome. Spineuniverse.com.

<http://www.spineuniverse.com/displayarticle.php/article130.html>

## The Evidence

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## 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.

Clinical Services Department: [providers@chpgroup.com](mailto:providers@chpgroup.com)

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<sup>1</sup> [Adibatti M, V S.](#) Study on variant anatomy of sciatic nerve. *J Clin Diagn Res.* 2014 Aug;8(8):AC07-9. doi: 10.7860/JCDR/2014/9116.4725. Epub 2014 Aug 20.

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<sup>4</sup> Halpin RJ, Ganju A. Piriformis syndrome: a real pain in the buttock? *Neurosurgery.* 2009 Oct;65(4 Suppl):A197-202.

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<sup>7</sup> [Cass SP.](#) Piriformis syndrome: a cause of nondiscogenic sciatica. *Curr Sports Med Rep.* 2015 Jan;14(1):41-4. doi: 10.1249/JSR.0000000000000110.

<sup>8</sup> Benzon HT, Katz JA, Benzon HA, Iqbal MS. Piriformis syndrome: anatomic considerations, a new injection technique, and a review of the literature. *Anesthesiology.* 2003;98:1442-1448.

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<sup>11</sup> Boyajian-O'Neill LA, et al. Management of Piriformis Syndrome. *The Journal of the American Osteopathic Association.* November 2008; 108 (11): 657-664.

<sup>12</sup> Misirlioglu TO, Akgun K, Palamar D, Erden MG, Erbilir T. Piriformis syndrome: comparison of the effectiveness of local anesthetic and corticosteroid injections: a double-blinded, randomized controlled study. *Pain Physician.* 2015;18(2):163-71.

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<sup>14</sup> De Andres J, Cerda-Olmedo G, Valia JC, Monsalve V, Lopez-Alarcon, Minguez A. Use of botulinum toxin in the treatment of chronic myofascial pain. *Clin J Pain.* 2003;19:269-275.

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- <sup>15</sup> Yelland MJ, Mar C, Pirozzo S, Schoene ML, Vercoe P. Prolotherapy injections for chronic low-back pain [review]. *Cochrane Database Syst Rev.* 2004(2).
- <sup>16</sup> Prather H. Sacroiliac joint pain: practical management. *Clin J Sport Med.* 2003;13:252-255.
- <sup>17</sup> Fishman LM, Dombi GW, Michaelsen C, et al. Piriformis syndrome: diagnosis, treatment, and outcome—a 10-year study [review]. *Arch Phys Med Rehabil.* 2002;83:295-301.