

Massage Therapy for Your Quads

Perfect Spot No. 8, another one for runners, the distal vastus lateralis of the quadriceps group

Paul Ingraham • Oct 2, 2012 • 9m read



Trigger points (*TrPs*), or muscle “knots,” are a common cause of stubborn & strange aches & pains, and yet they are under-diagnosed. The 14 Perfect Spots ([jump to list below](#)) are trigger points that are common & yet fairly easy to self-treat with massage — the most satisfying & useful places to apply pressure to muscle. For tough cases, see the [advanced trigger point therapy guide](#).

Pain Location	Problems	Related Muscles
in the lower half of the thigh, knee	runner’s knee	quadriceps (vastus lateralis, vastus intermedius, vastus medialis, rectus femoris)

“Big Red Books” Reference: Volume 2, Chapter 14

see [chart of all spots below](#)

Your “quads” are muscles that people *think* they know — everyone knows where the quadriceps are, what they’re about, and how to stretch them ... right? Actually, they often *don’t*. The most common misunderstanding concerns stretching. Did you know that it’s actually *anatomically impossible* to stretch most of the quadriceps? ¹ Read on to find out why.

A lot of quadriceps aching, stiffness and fatigue emanates from an epicentre of “knotted” muscle in the lower third of the thigh, in the *vastus lateralis*, a huge muscle — one of your biggest — that dominates the lateral part of the leg. Stretching it is effectively impossible, but massage is an option: although often shockingly sensitive, Perfect Spot No. 8 can also be quite *satisfying*. It also often complicates or contributes to other problems in the area, especially runner’s knee (iliotibial band syndrome).

A little quadriceps anatomy

Your quadriceps “muscle” is actually a group of three large muscles and one smaller one that merge just above the knee. They are:

1. *vastus lateralis* on the outside of the thigh
2. *vastus medialis* on the inside
3. the relatively skinny and insubstantial *rectus femoris* lying on top, right at the front of the thigh (it is drawn a little too thick and beefy in the diagram here)
4. *vastus intermedius* in the center (hidden underneath the *rectus femoris*)

The smaller *rectus femoris* is the only one of the group that crosses *both* the hip joint *and* the knee. It powers both of those big joints, whereas the larger three members of the group — the three *vasti* — only cross the knee and therefore they can only move the knee. One of the most important implications of this (and also one of the best ways to visualize it) is that there is a problem with stretching your quadriceps.



The quadriceps are a huge muscle group. The blue circle marks Perfect Spot 8.

The surprising quadriceps stretching debacle

The traditional quadriceps stretch, which people often call the “runner’s stretch,” stretches *only* the smaller *rectus femoris* part of the quadriceps, because that’s the only part of the quadriceps that crosses the hip, which represents roughly 10% of the muscle tissue in the group. Yep, that’s right: probably the most familiar and popular of all stretches is simply *missing* 90% of the quadriceps muscle mass!

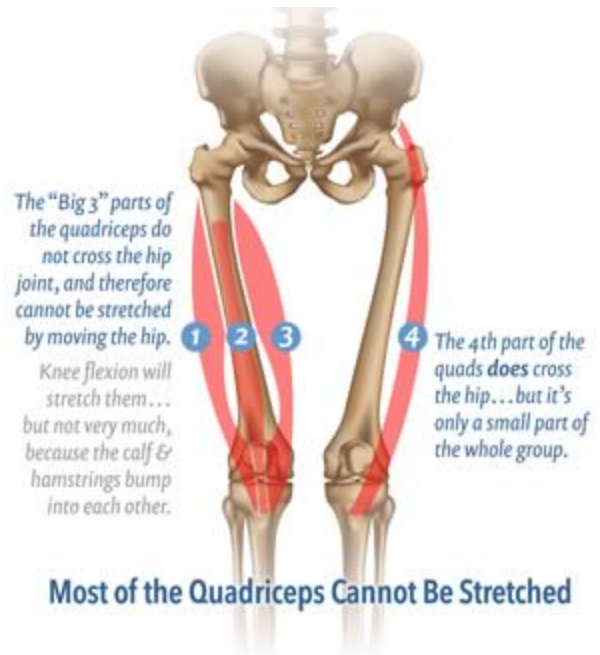
The big underlying trio of *vasti* muscles is anatomically impossible to stretch strongly, because they elongate only with knee flexion, and knee flexion is strictly limited — you can only flex your knee so far, because the hamstrings are in the way. When you flex your knee, the *vasti* obviously do elongate — but they don’t elongate much. You will never feel anything like a strong stretch in your thigh by bending your knee ... *unless* you add hip extension into the mix.

But when you add hip extension, you have absolutely no effect whatsoever — zip, zero, zilch — on the *vasti*, because they simply do not cross the hip, and cannot therefore be affected in the slightest way by hip movements. However, the *rectus femoris* *does* cross the hip, and it is already stretched out a bit if your knee is flexed. So, when you extend the

hip — as you do in the classic runner's quads stretch — *now* you feel a stretch, but the only thing you're feeling is the rectus femoris.

The bigger quadriceps muscles, with 90% of the quadriceps muscle mass, remain exactly as they were before you added hip extension: they stay modestly elongated by knee flexion, prevented by stretching any further by the collision of your calf with your hamstrings. There is no getting around this! There is no "better" quadriceps stretch that can somehow elongate those vasti muscles. It's just simple biomechanics — there is simply *no such thing* as a strong quadriceps stretch.

This quirk of anatomy (which hardly anyone knows about) is just one more reason why I think generic stretching is generally over-rated as a form of exercise. There are too many misconceptions of this type out there!



Where is the perfect quadriceps spot?

Due to its size, the quadriceps group seems to be able to take a licking and keep on ticking. Even when significantly "polluted" by trigger points, ² the quadriceps muscles often still feel mostly fine and functional, and perform as well as needed by the average person, or even by most athletes. This is only true *relative* to other muscles. Don't get me wrong — the quadriceps can still be laid low. But seemingly less easily than smaller muscles.

Even when they keep on ticking, a surprising amount of sensitivity to pressure can be lurking in those thick tissues, particularly in the big vastus lateralis muscle. There is a common trigger point there. One of the things that makes Spot No. 8 "perfect" is the tendency it has to be strongly "latent" — that is, to hide in your tissue, unbeknownst to you, *until you press on it*.

Even when they are polluted by trigger points, the quadriceps muscle often still feel mostly fine & functional.

Perfect Spot No. 8 is somewhere in the bottom half of the vastus lateralis muscle, several centimetres from the knee. It's not on the side of the thigh and not on the top, but between the two — facing forward and out.

In that location, the vastus lateralis can be pressed against the bone underneath. While pressure at virtually any location in the vastus lateralis is likely to feel potent, Perfect Spot No. 8 is a sure thing: with anything more than mild pressure, it is virtually guaranteed to generate that classic “sweet ache” that makes us seek out massage.

Since it isn’t actually possible to stimulate most of the quadriceps muscle group with any kind of stretch, massage is a bit more important.

Does Spot #8 have anything to do with knee problems like IT band syndrome and patellar pain?

The clinical connections between quadriceps trigger points and the “big two” runner’s knee injuries — **iliotibial band syndrome (ITBS)** and **patellofemoral syndrome (PFPS)** — are probably *limited*. Those conditions are primarily caused by tissue fatigue at the location of pain. When the tissues are irritated, *everything* bothers them. When they aren’t inflamed, they can put up with practically anything.

In short, biomechanical factors like grumpy and dysfunctional quadriceps muscles are undoubtedly a factor in these conditions, but they are almost certainly not a *major* factor.

However, that’s not the conventional wisdom.

The conventional wisdom is pretty sure of itself, and it will tell you that trigger points in the quadriceps matter *a lot* when it comes to your knee problems. It will tell you that your vastus lateralis is too tight (or your vastus medialis is too weak), which is pulling your kneecap out of whack — a patellar tracking problem — and that’s why you have patellofemoral pain. And it will tell you that your ITB is too “tight” and needs to be “loosened,” and somehow quadriceps massage is going to do that — which is particularly odd, because the quadriceps have no mechanical connection whatsoever to the IT band, so how, exactly, does quadriceps massage loosen the IT band? Hmmm. (Stretching the IT band makes more sense on the surface, and it’s super popular, but doesn’t work well either.)

Perhaps you detect a note of exasperation in my “voice.” All of this conventional wisdom largely ignores the last couple decades of scientific research.

There is a lot of “recent” (up to 20 years old) evidence that all of this conventional wisdom is either wrong or at the least debatable and oversimplified. For instance, researchers have found that people with ITBS don’t have tighter IT bands than anyone else, ³ and that therapists and doctors can’t reliably diagnose the existence of a so-called “patellar tracking syndrome,” let alone reliably treat it by any method. ⁴

So, I really wouldn’t make too much of the clinical importance of trigger points when it comes to knee problems. Massage this Perfect Spot (and the rest of your quadriceps) for

other

reasons

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Researchers have found that people with ITBS don't have tighter IT bands than anyone else.

because it feels good, because it relieves a feeling of tension and fatigue in the region. And, hey, the conventional wisdom might not be *completely* wrong.

Gentle pounding with your fists — the classic Swedish massage technique of *tapotement* — is also a pretty great way of working this big, meaty muscle group.

More information about knee pain ... much more. All of these ideas about runner's knee are covered in great detail in two of PainScience.com's big tutorials, one about [iliotibial band syndrome](#) and one about [patellofemoral pain syndrome](#). See those tutorials for as much information about it as you can stand! They are pretty much the ultimate in evidence-based information for patients and professionals about those conditions.

About Paul Ingraham



Headshot
of Paul
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I am a science writer in Vancouver, Canada. I was a Registered Massage Therapist for a decade and the assistant editor of ScienceBasedMedicine.org for several years. I've had many injuries as a runner and ultimate player, and I've been a [chronic pain patient myself](#) since 2015. [Full bio](#). See you on [Facebook](#) or [Twitter](#), or subscribe:

Appendix A: Is trigger point therapy too good to be true?

Trigger point therapy isn't too good to be true: it's just ordinary good. It can probably relieve some pain cheaply and safely in many cases. Good bang for buck, and little risk. In the world of pain treatments, that's a good mix.

But pain is difficult and complex, no treatment is perfect, and there is [legitimate controversy about the science of trigger points](#). Their nature remains somewhat puzzling, and the classic image of a tightly "contracted patch" of muscle tissue may well be wrong. What we do know is that people hurt, and it can often be helped.

The Perfect Spots are based on a decade of my own clinical experience as a massage therapist, and years of extensive science journalism on the topic. Want to know more? This is the tip of the iceberg. I've written [a whole book about it](#) ...

Appendix B: Quick Reference Guide to the Perfect Spots

This index is also available [on its own page](#).

1 For headache, neck pain

Under the back of the skull must be the single most pleasing and popular target for massage in the human body. No other patch of muscle gets such rave reviews. It has everything: deeply relaxing and satisfying sensations, and a dramatic therapeutic relevance to one of the most common of all human pains, the common tension headache. And no wonder: without these muscles, your head would fall off. They feel just as important as they are. (Click/tap heading to read more.)

for pain: almost anywhere in the head, face and neck, but especially the side of the head, behind the ear, the temples and forehead

muscle(s): suboccipital muscles (recti capitis posteriores major and minor, obliqui inferior and superior)

2 For low back pain

This Perfect Spot lives in the “thoracolumbar corner,” a nook between your lowest rib and your spine — right where the stability of the rib cage and thoracic vertebrae gives way to the relative instability of the lumbar spine. It consists of trigger points in the upper-central corner of the quadratus (square) lumborum muscle and in the thick column of muscle that braces the spine, the erector spinae. (Click/tap heading to read more.)

for pain: anywhere in the low back, tailbone, lower buttock, abdomen, groin, side of the hip

muscle(s): quadratus lumborum, erector spinae

3 For shin splints

Perfect Spot No. 3 is in your shins — seemingly an unlikely place for muscle knots! But there is meat there, and if you've ever had shin splints then you know just how vulnerable that meat can be. Even if you've never suffered so painfully, your shins probably still suffer in silence — latent trigger points in the upper third of the shin that don't cause symptoms, but are plenty sensitive if you press on them. (Click/tap heading to read more.)

for pain: in the shin, top of the foot, and the big toe

muscle(s): tibialis anterior

4 For thoracic outlet syndrome, throat pain and tightness, chest pain

Deep within the Anatomical Bermuda Triangle, a triangular region on the side of the neck, is the cantankerous scalene muscle group. Massage therapists have vanished while working in this mysterious area, never to be seen again. The region and its muscles are complex and peculiar, and many lesser-trained massage therapists have low confidence working with them. (Click / tap heading to read more.)

for pain: in the upper back (especially inner edge of the shoulder blade), neck, side of the face, upper chest, shoulder, arm, hand **muscle(s):** scalenes (anterior, middle, posterior)

5 For carpal tunnel syndrome, tennis elbow

Just beyond your elbow, all the muscles on the back of your forearm converge into a single thick tendon, the common extensor tendon. At the point where the muscles converge, in the muscles that extend the wrist and fingers, lies one of the more inevitable trigger points in the body: Perfect Spot No. 5. It is constantly provoked both by computer usage today, and more often by the use of a pen in simpler times — and by the occasional tennis match, then and now, or maybe crocheting. (Click / tap heading to read more.)

for pain: in the elbow, arm, wrist, and hand **muscle(s):** extensor muscles of the forearm, mobile wad (brachioradialis, extensor carpi radialis longus and brevis), extensor digitorum, extensor carpi ulnaris

6 For gluteal and hip pain, sciatica, bursitis, low back pain

When you have back pain, buttock pain, hip pain, or leg pain, much or even all of your trouble may well be caused by trigger points in the obscure gluteus medius and minimus muscles, a pair of pizza-slice shaped muscles a little forward of your hip pocket. Other muscles in the region are usually involved as well, such as the gluteus maximus, piriformis, and the lumbar paraspinal muscles. However, the gluteus medius and minimus are a bit special: their contribution to pain in this area is particularly significant, and yet people who have buttock and leg pain rarely suspect that much of it is coming from muscle knots so high and far out on the side of the hip. (Click / tap heading to read more.)

for pain: in the low back, hip, buttocks (especially immediately under the buttocks), side of the thigh, hamstrings **muscle(s):** gluteus medius and minimus

7 For jaw pain, bruxism, headache

Your masseter muscle is your primary chewing muscle — not the only one, but the main one — and it covers the sides of the jaw just behind the cheeks. It's also the main muscle that clenches your jaw and grinds your teeth, unfortunately, and it's one of the most common locations for trigger points in the human body. It is probably an accomplice in most cases of bruxism (that's Latin for "grinding your teeth") and temporomandibular joint syndrome (jaw

joint pain), plus other unexplained painful problems in the area. (Click / tap heading to read more.)

for pain: in the side of the face, jaw, teeth (rarely)

muscle(s): masseter

8 For runner's knee

A lot of quadriceps aching, stiffness and fatigue emanates from an epicentre of “knotted” muscle in the lower third of the thigh, in the *vastus lateralis*, a huge muscle — one of your biggest — that dominates the lateral part of the leg. Stretching it is effectively impossible, but massage is an option: although often shockingly sensitive, Perfect Spot No. 8 can also be quite *satisfying*. It also often complicates or contributes to other problems in the area, especially runner's knee (iliotibial band syndrome). (Click / tap heading to read more.)

for pain: in the lower half of the thigh, knee

muscle(s): quadriceps (vastus lateralis, vastus intermedius, vastus medialis, rectus femoris)

9 For chest pain & tightness

The “pecs” are popular: of 700+ muscles, the *pectoralis major* is one of just a dozen or so that most people can name and point to. It also harbours one of the most commonly-encountered and significant trigger points in the human body, and can produce pain much like a heart attack in both quality and intensity. (Click / tap heading to read more.)

for pain: anywhere in the chest, upper arm

muscle(s): pectoralis major

10 For plantar fasciitis

The tenth of the Perfect Spots is one of the most popular of the lot, and right under your feet — literally. It lies in the center of the arch muscles of the foot. This is one of the Perfect Spots that everyone knows about. No massage is complete without a foot massage! (Click / tap heading to read more.)

for pain: in the bottom of the foot

muscle(s): arch muscles

11 For upper back pain

This “spot” is too large to really be called a “spot” — it's more of an area. The thick columns of muscle beside the spine are often littered with muscle knots from top to bottom. Nevertheless, there is one section of the group where massage is particularly appreciated: from the thick muscle at the base of the neck, down through the region between the shoulder blades, tapering off around their lower tips. There is no doubt that this part of a back massage feels even better than the rest — even the low back, despite its own quite perfect spots, cannot compete. (Click / tap heading to read more.)

for pain: anywhere in the upper back, mainly between the shoulder blades

muscle(s): erector spinae muscle group

12 For low back and gluteal pain, sciatica

At the top of the buttocks lies a Perfect Spot for massage: a sneaky but trouble-making brute of a trigger point that commonly forms in the roots of the gluteus maximus muscle. It's *below* the lowest part of the low back, but it often *feels* like low back pain. This is the kind of spot that the Perfect Spots series is all about: not only does it tend to produce a profound, sweet ache when massaged, but the extent of the pain that spreads out around it is almost always a *surprise*. It feels like a key to much more than expected. (Click/tap heading to read more.)

for pain: in the lower back, buttocks, hip, hamstrings

muscle(s): gluteus maximus

13 For low back pain, sciatica

Some of the Perfect Spots are perfect because they are “surprising” — it’s delightful to find a place to massage that feels highly relevant your pain in an unexpected location. Others are perfect because they are *exactly* where you expect them to be — and what a relief it is to be able to treat them. Perfect Spot No. 13 is perhaps the ultimate, the quintessential example of a trigger point that is usually “right where I thought the problem was”: in the “pit” of the low back, at the bottom of the thick columns of back muscle beside the spine. (Click/tap heading to read more.)

for pain: in the low back, buttocks, hamstrings

muscle(s): erector spinae muscle group at L5

14 For shoulder pain

I avoided adding Spot 14 to this series for many years, because it’s a bit tricky to find. But precision is not required: although there is one specific spot that’s especially good, nearly anywhere under the ridge of bone on the shoulder blade is worthwhile, and often a surprising key to pain and stiffness everywhere else in the shoulder, *especially* all the way around on the other side, facing forward. (Click/tap heading to read more.)

for pain: any part of the shoulder, and upper arm

muscle(s): infraspinatus, teres minor

Related Reading

- [Patellofemoral Pain & the Vastus Medialis Myth](#) — Can just one quarter of the quadriceps be the key to anterior knee pain?

- **Patellofemoral Tracking Syndrome** — The beating heart of the conventional wisdom about patellofemoral pain is mostly nonsense
- **Does Hip Strengthening Work for IT Band Syndrome?** — The popular “weak hips” theory is itself weak

Notes

1. And it's not alone. There are actually quite a few important muscles in the human body that are virtually impossible to stretch. I call them: [The Unstretchables](#).
2. Which is a reasonable way of looking at it, as there is intriguing evidence that trigger points are full of waste metabolites: see [Toxic Muscle Knots](#)
3. Devan MR, Pescatello LS, Faghri P, Anderson J. [A Prospective Study of Overuse Knee Injuries Among Female Athletes With Muscle Imbalances and Structural Abnormalities](#). J Athl Train. 2004;39:263–267. PubMed 15496997 [□ PainSci Bibliography 56601 □](#) For a more detailed analysis of this research, see [The Causes of Runner's Knee Are Rarely Obvious](#).
4. That statement is harder to back up with a single reference, but you can read about it in detail in [The Complete Guide to Patellofemoral Pain Syndrome](#).

Permalinks

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