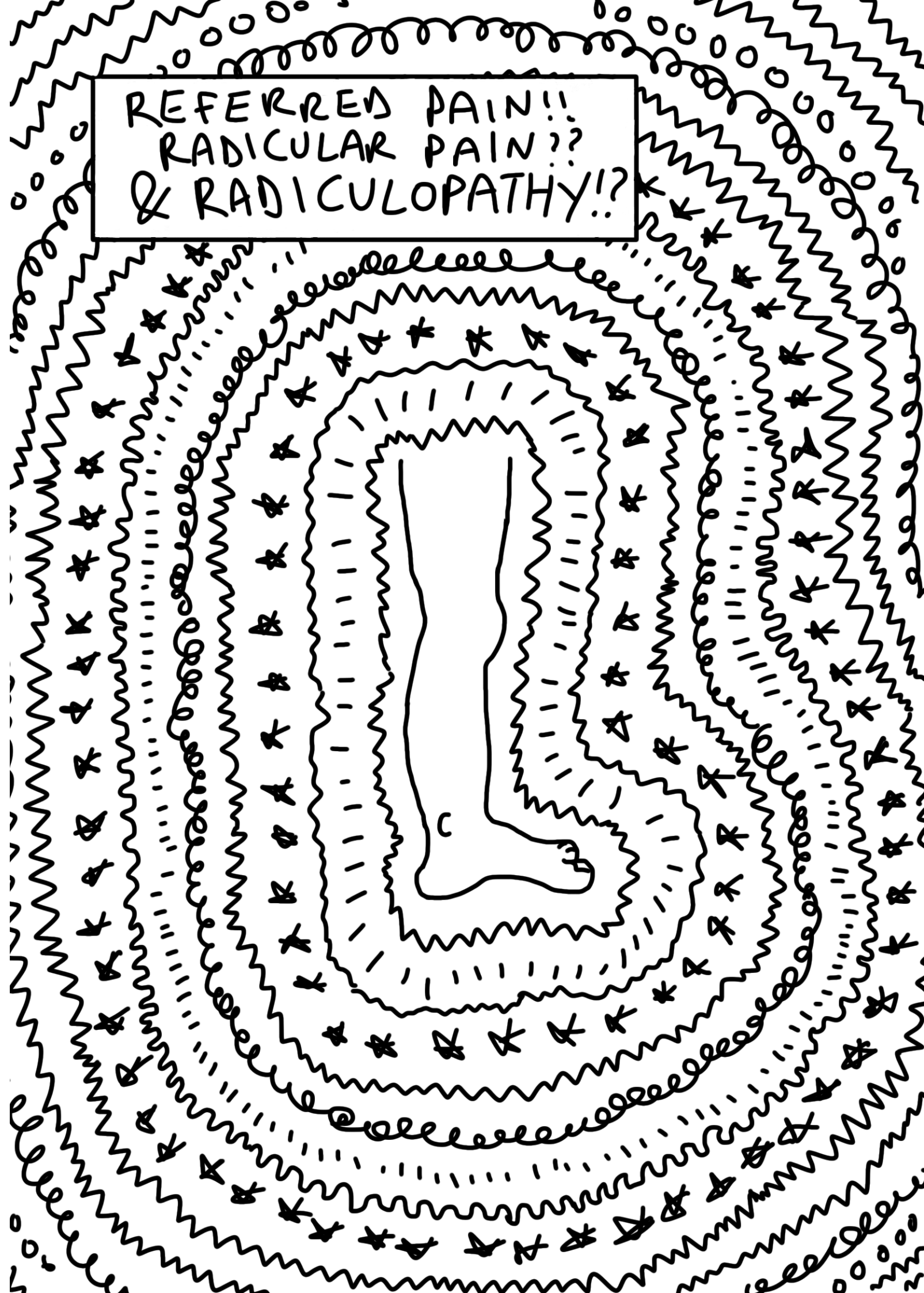


REFERRED PAIN!!  
RADICULAR PAIN??  
& RADICULOPATHY!?



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What you're reading...



This little 'zine' explains the difference between three commonly-confused phrases: REFERRED PAIN, RADICULAR PAIN, and RADICULOPATHY

Here's the contents:

- Anatomy
- ↓
- Referred pain
- ↓
- Radicular pain

→ Radiculopathy

- ↓
- Summary
- ↓
- Causes

Oh, and I invented this weird character. He pops up throughout the zine... he's supposed to be a DORSAL ROOT GANGLION.



◦ To be Continued....?

# ANATOMY

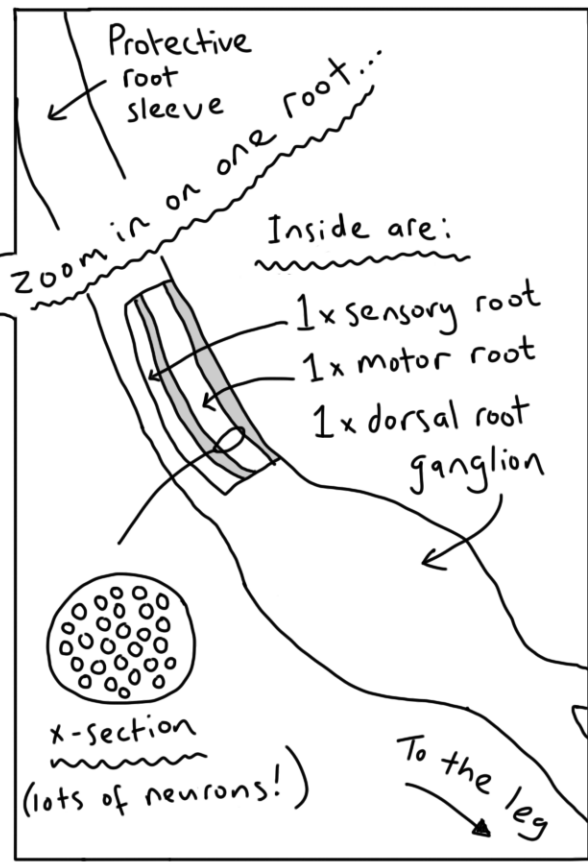
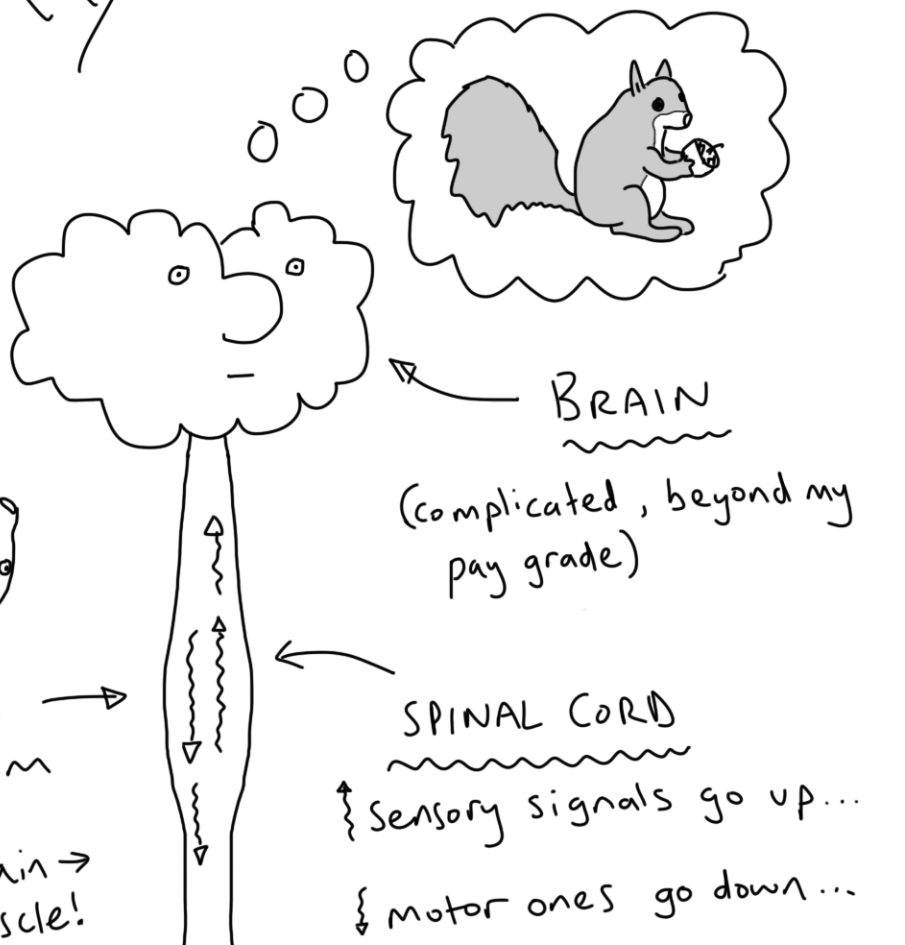
YOU'LL WANT TO KNOW

ACTION POTENTIALS  
Sensory signals go from tissue → brain  
Motor signals from brain → muscle!

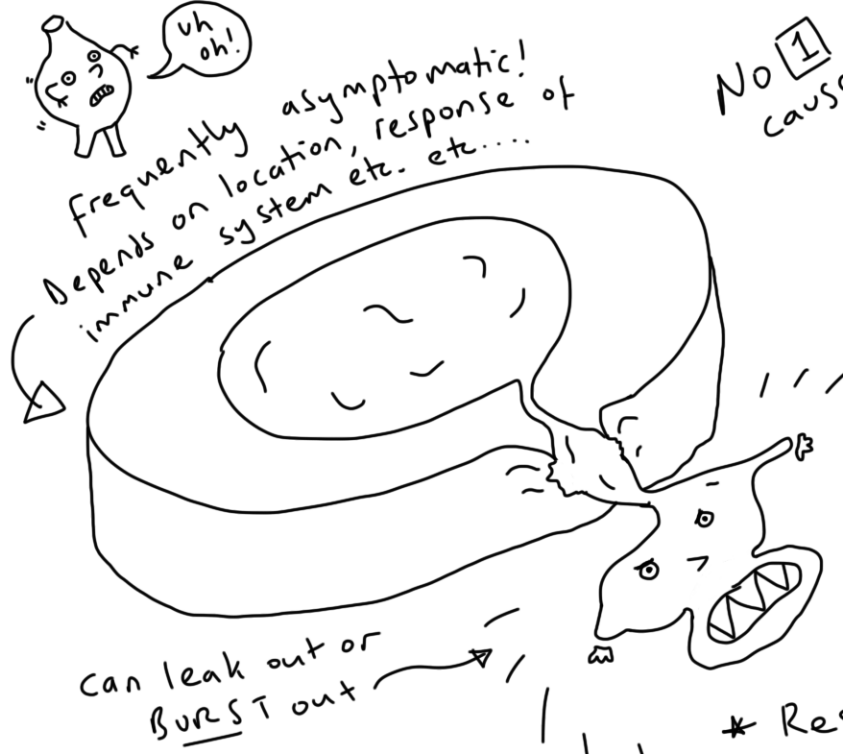
NERVE ROOTS  
Kind of like slip roads that connect the spinal cord to the peripheral nervous system

CAUDA EQUINA  
(Bundle of lumbar + sacral nerve roots)

LEG  
(hands are too hard to draw)  
Sensory input starts an action potential



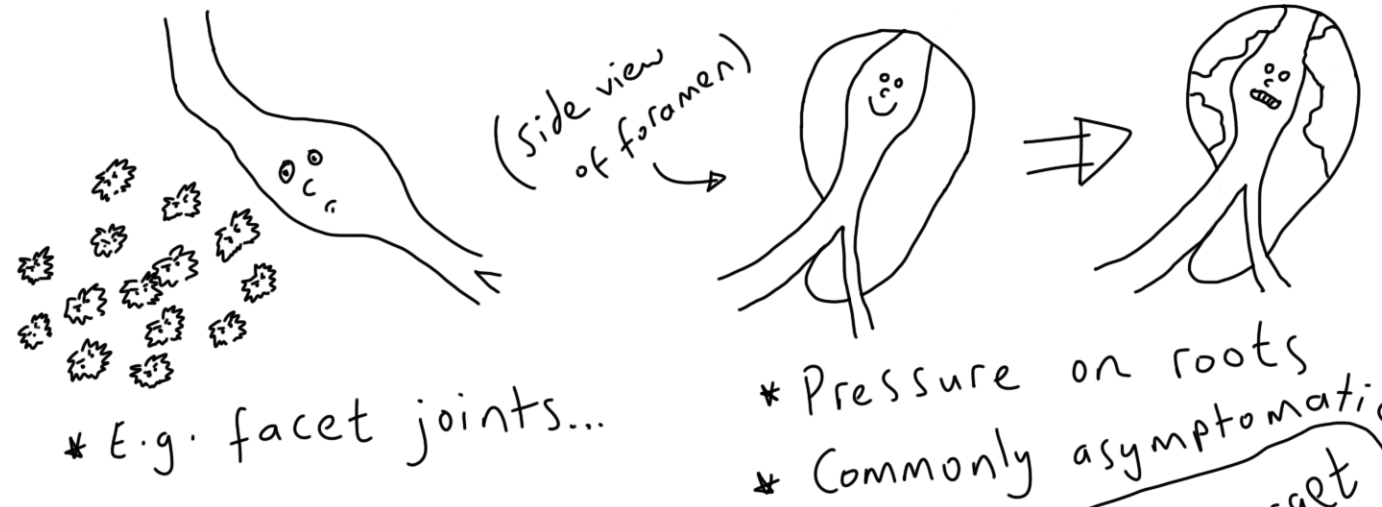
# CAUSES OF RADICULOPATHY / CULAR PAIN



- Disc herniations
- \* Source of pressure on roots
  - \* Source of inflammation, too (contain nasty chemicals)
  - \* Frequently asymptomatic if they are e.g. not near root, or occur slowly
  - \* Resorbed by macrophages over time, especially big herniations

Inflammation from nearby stuff


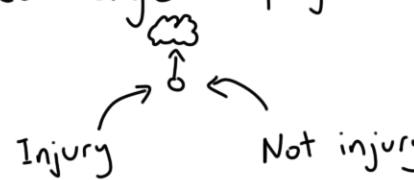

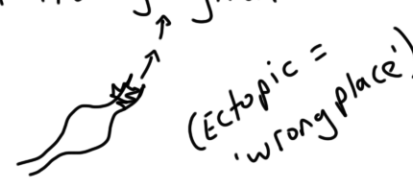

Foraminal Stenosis



- Rare but there:
- \* Shingles! (esp. thoracic.)
  - \* Aneurysms
  - \* Metastatic tumours
  - \* Benign lumps + bumps

And don't forget cauda equina syndrome. for more on that, see [www.theCESbook.com!](http://www.theCESbook.com!)

In summary ...

|                | Symptoms/signs   | Mechanism  |
|----------------|--|--|
| Referred Pain  | Dull, aching, difficult to localize                                   | "Convergence-projection"<br>                   |
| Radicular Pain | Lancinating, shocking, electrical, often in a dermatome (fish) band,  | "Ectopic" impulses from root +/or ganglion<br> |
| Radiculopathy  | Objective neuro Signs: ↓ reflexes<br>↓ power<br>↓ sensation  | Conduction block at nerve root<br>             |

# REFERRED PAIN

A well-known example is a heart attack  
 Problem =   
 Pain = 



And we see referred pain all the time in MSK... @thomas-jesson



It's just pain felt in a place other than the 'source' of pain.

(what a know-it-all...)

Of course, it's sometimes not that simple. For example, all three often co-occur

Like this:



And there's also that tugging nerve "tightness" called mechanosensitivity.

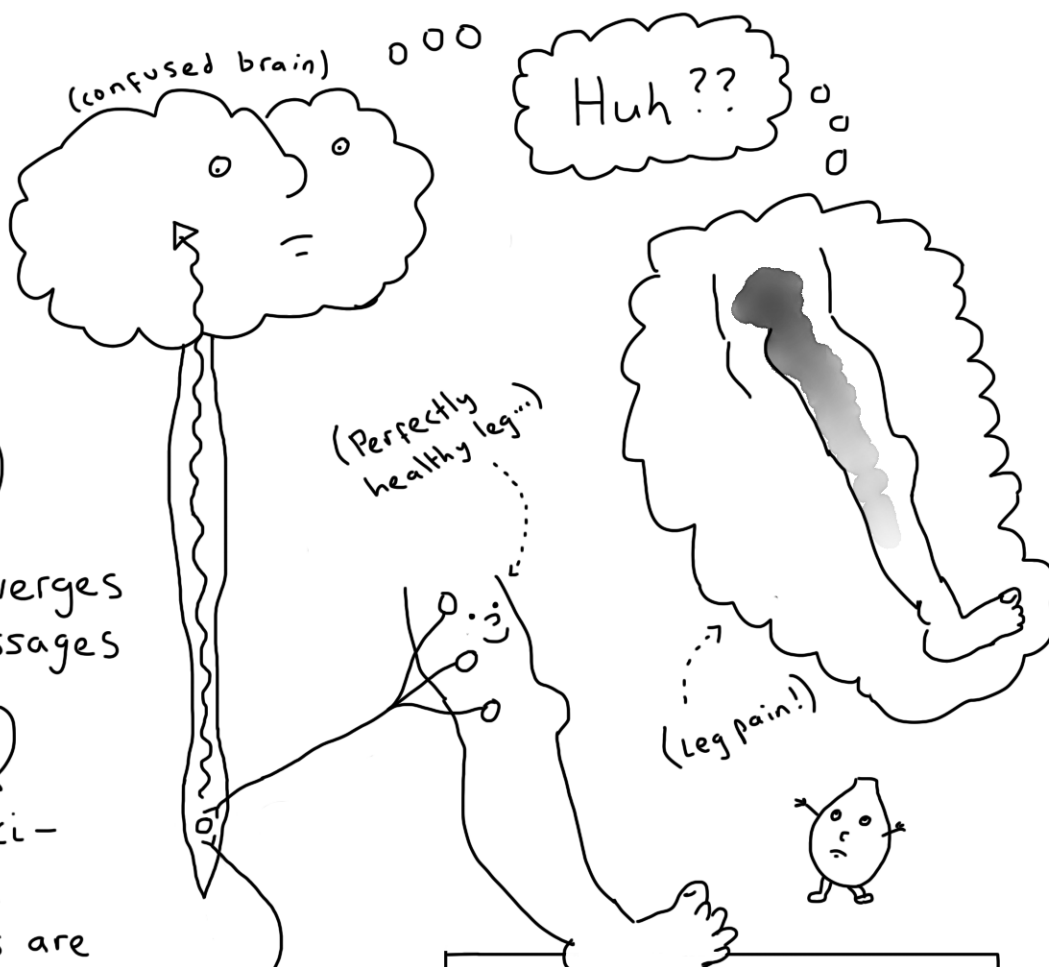


And radicular pain often deviates from the "expected" dermatome



How it works...

- ① Nociception from the spine is sent to the spinal cord...
- ② Where it converges with normal messages from the limb.
- ③ Both the nociception and the normal messages are projected up the spinal cord together...
- ④ To the brain, which can't tell the two apart, so it 'feels' the pain in the wrong place



REFERRED PAIN IS...

- Dull, aching
- Deep (not superficial)
- Hard to localise
- Worse closer to the 'source', easing distally. (Generally...)

4

# RADICULAR PAIN ⚡

Usually a sharp, shooting pain

Sometimes with a background ache/burn

Often accompanied by extra, "nervey" sensations

pins & needles  
cold  
crawling  
itch  
prickling

# RADICULOPATHY

If you press on a nerve...

You reduce its blood supply and it stops working!!

numb, limp foot

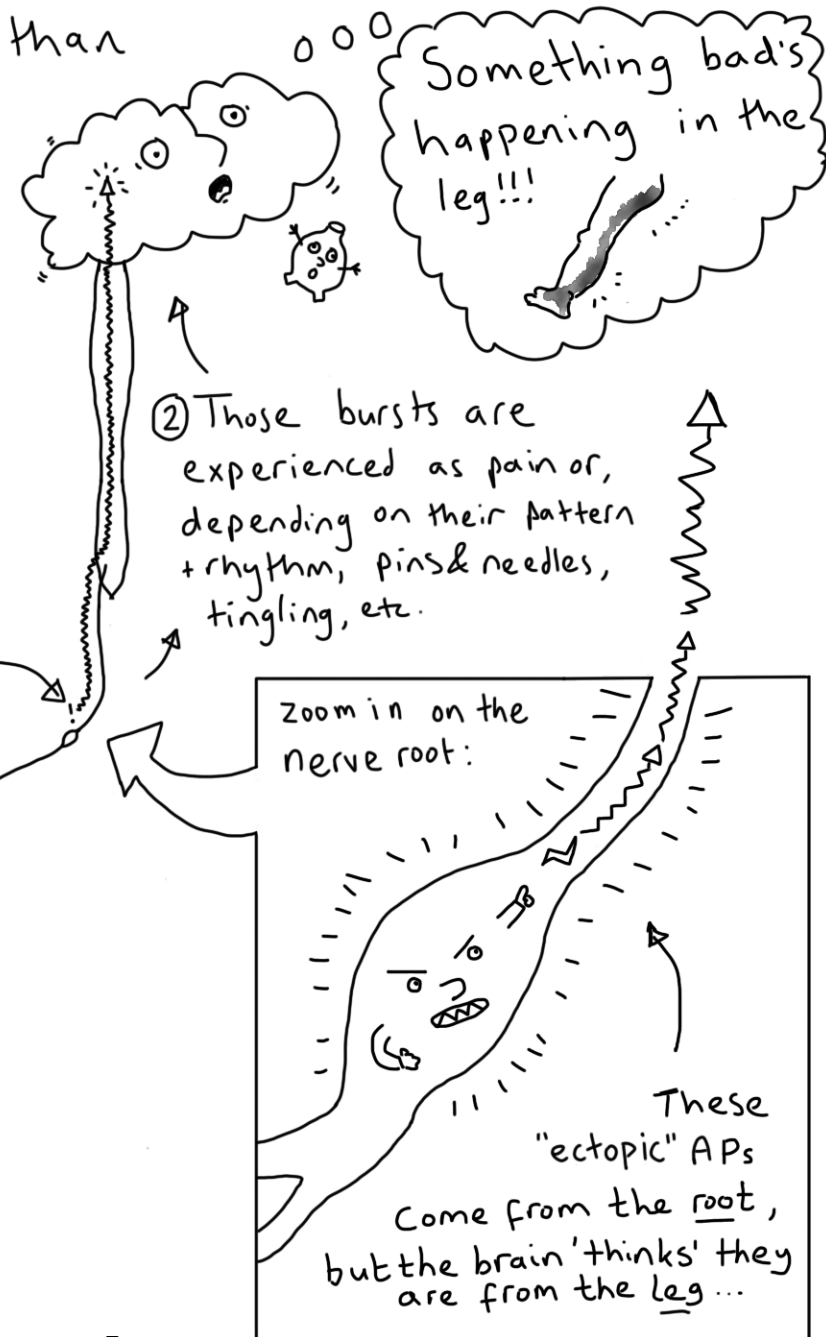
Radiculopathy isn't too different...

Pressure +/- inflammation = CONDUCTION BLOCK!

- Often worse distally than proximally
- Can be SEVERE

How IT WORKS

① An irritated nerve root + ganglion send BURSTS of action potentials up to the brain



Nothing wrong down here in the leg... all quiet...

Radiculopathy is:

- Often quite mild, b/c roots share work
- NOT a pain condition, technically!

How it works...

Sensory action potentials travel up from the tissues, and motor action potentials travel down from the brain... like normal... But a conduction block at an injured root stops them from passing!!

Of course, this picture shows the sensory side only

