physiological matters

- About pain
- About polymodal receptor
- About muscle knot (band)
- About neurogenic inflammation

treatment matters

- Classification of treatments
- Magnificent futilities
- You don’t need to be Scarlett Johansson
- The direction of the solution
- Needle thickness
- Other tips

What is pain?

about skin pain

When you cut your finger with a knife, you feel instantaneously sharp pain (pricking pain) first, then dull pain follows.

The former is called “**primary pain**” caused by high threshold mechanoreceptors,

the latter is called “**second pain**” caused by polymodal receptors.

primary pain → second pain

① high threshold mechanoreceptor

② polymodal receptor

about pain in deeper tissue

It means other than skin pain

When you feel pain(sore, ache), in most cases these feelings are caused by **polymodal receptors**.

ex) muscle ache after intense exercise, slash, burn, bruise, fracture, dislocated shoulder, lower back pain, stomach ache, toothache, arthritis pain…

Other types of pain

Ex) neuropathic pain = the neuron fiber itself is damaged
chronic pain by brain(neuronal) plasticity = the brain has learned(memorized) pain by long term repetitional input

What is polymodal receptor?

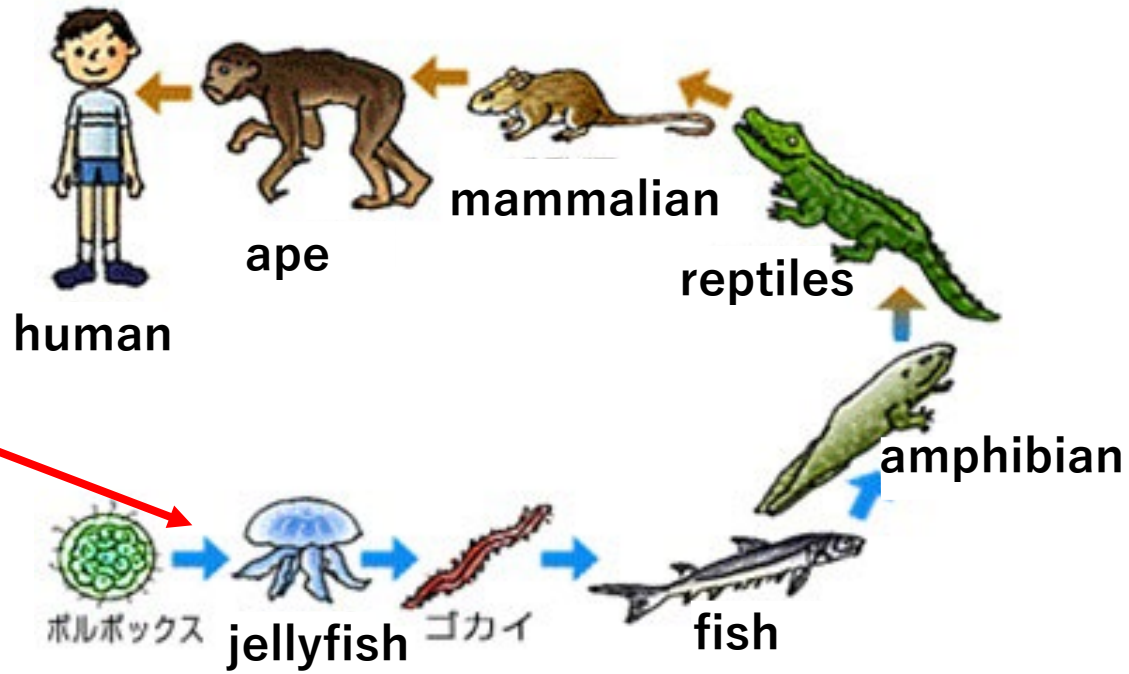
protagonist of pain

It is **the oldest sensory organ** in creature body including human body which is acquired in early evolution.

It catches the **noxious stimulus**

and notices danger to survive

as early as this stage!



*If you feel uncomfortable with the theory of evolution,
I'm sorry, please ignore this part…

polymodal receptor is so old

that it has **connections to many organs** which developed later

- autonomic nerves
- limbic system
- cerebral neocortex

that it is **undifferentiated**.

Usually, our body organs have expertise = <u>differentiated</u>

Ex)

- some type of cell of eyes response to only brightness
- other type of cell of eyes response only to color
- muscles can only contract

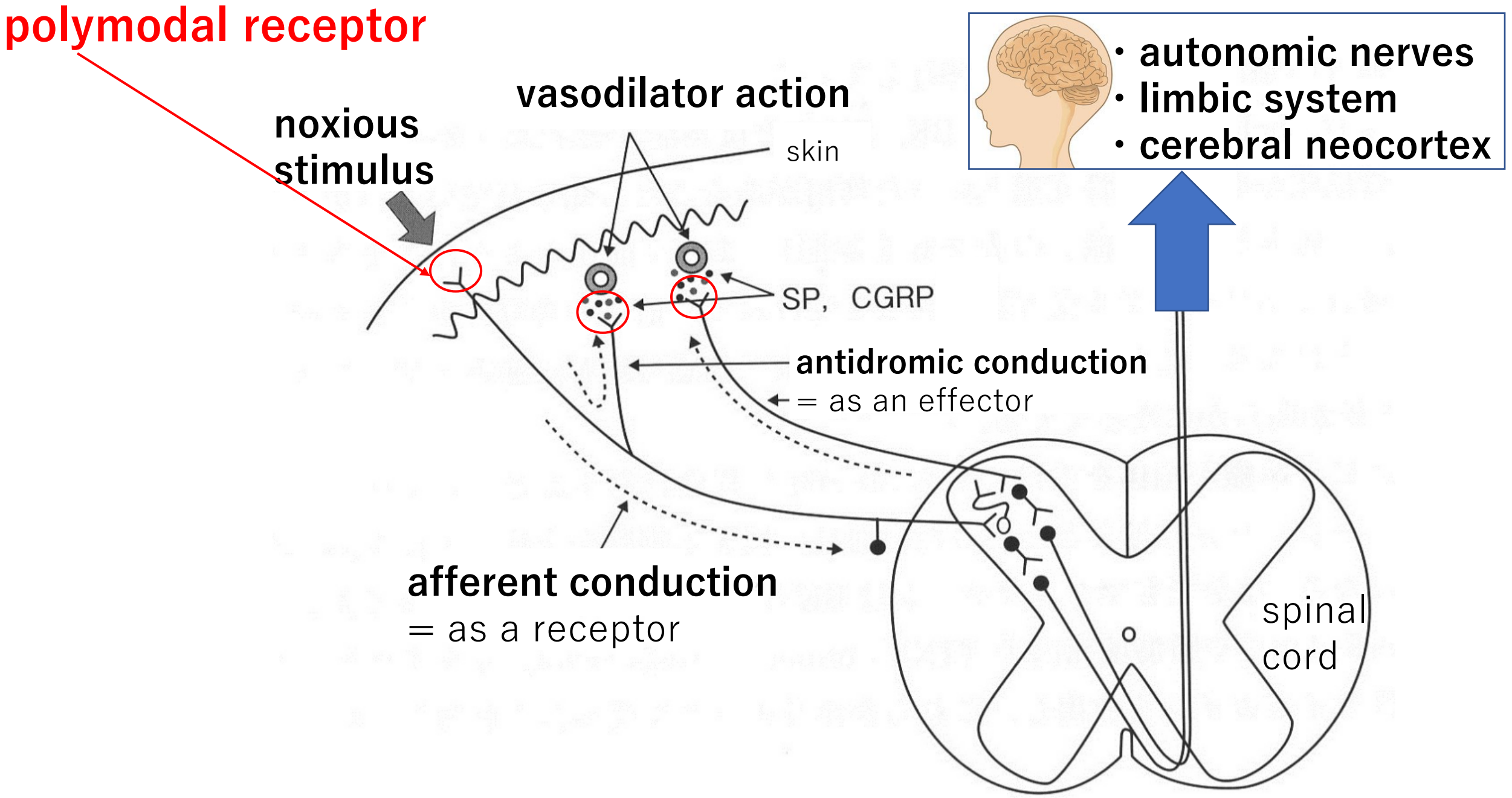
polymodal receptors have strange characteristics

because it is **undifferentiated**

Response to multiple type of (noxious) stimulus — physical, chemical, thermal stimulus

Sensitivity is **changed** easily — depending on the situation. the worse the tissue is, the more sensitive polymodal receptor becomes.

Not only **receptor**, but also **effector** — It release some substances (they induce inflammation = called **neurogenic inflammation**)


polymodal receptor
noxious stimulus
vasodilator action
skin
SP, CGRP
antidromic conduction
= as an effector
afferent conduction
= as a receptor
spinal cord
・autonomic nerves
・limbic system
・cerebral neocortex

What is neurogenic inflammation?

It is a **defensive reaction** to protect the body
and **healing process**

in short (acute)inflammation is a **good** thing. (not bad thing at all)

Chronic inflammation is bad

To summarize

In almost all cases in daily life → pain = polymodal receptor

polymodal receptor is so old → It has many connections with many systems and has very strange characteristics

Especially important characteristics

As a receptor

Ex) lack of blood flow (oxygen), injury …

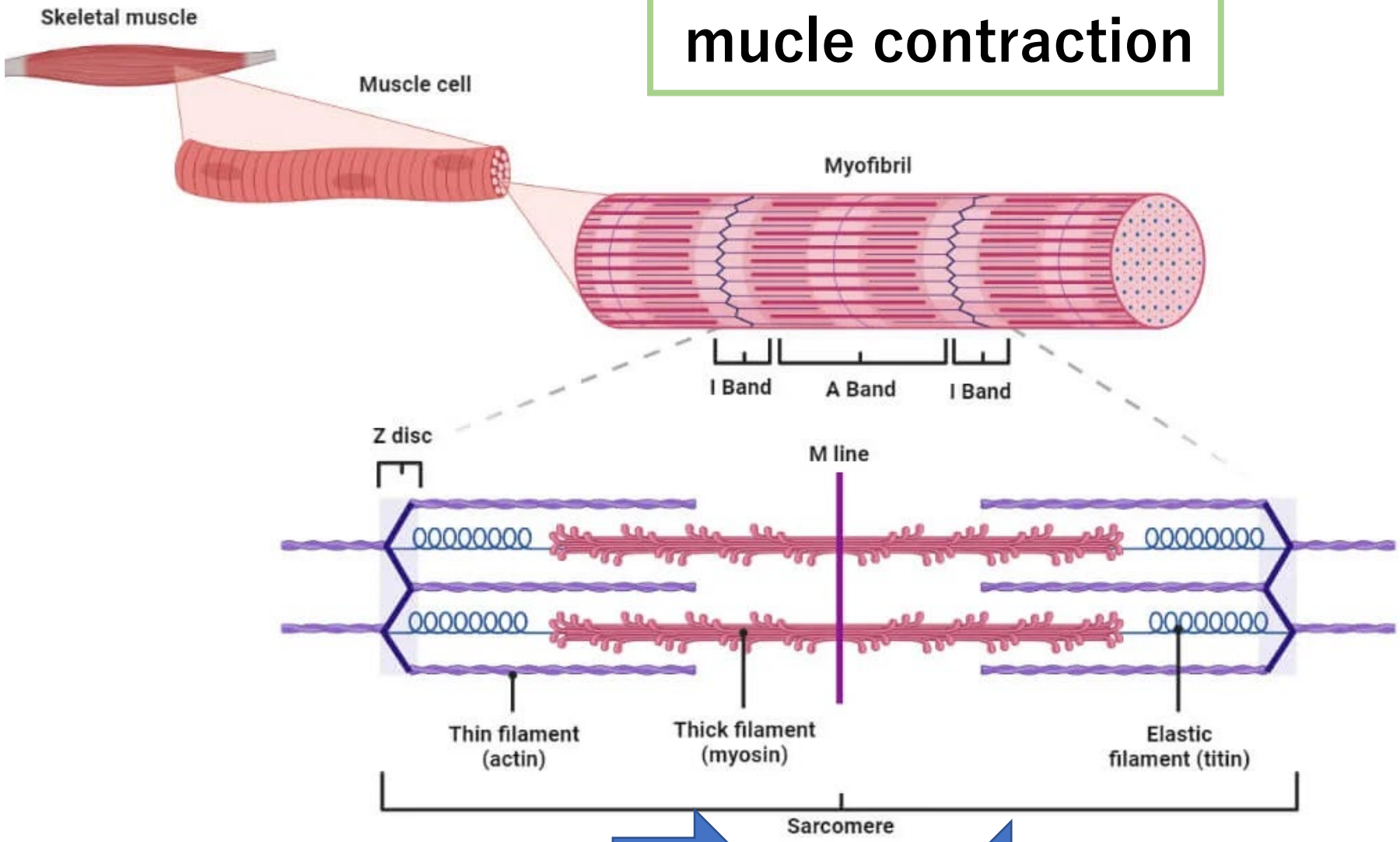
where there is an **abnormality** in a body part, polymodal receptor becomes **very active(sensitive)** → we easily feel pain

As an effector

CGRP, substance P //

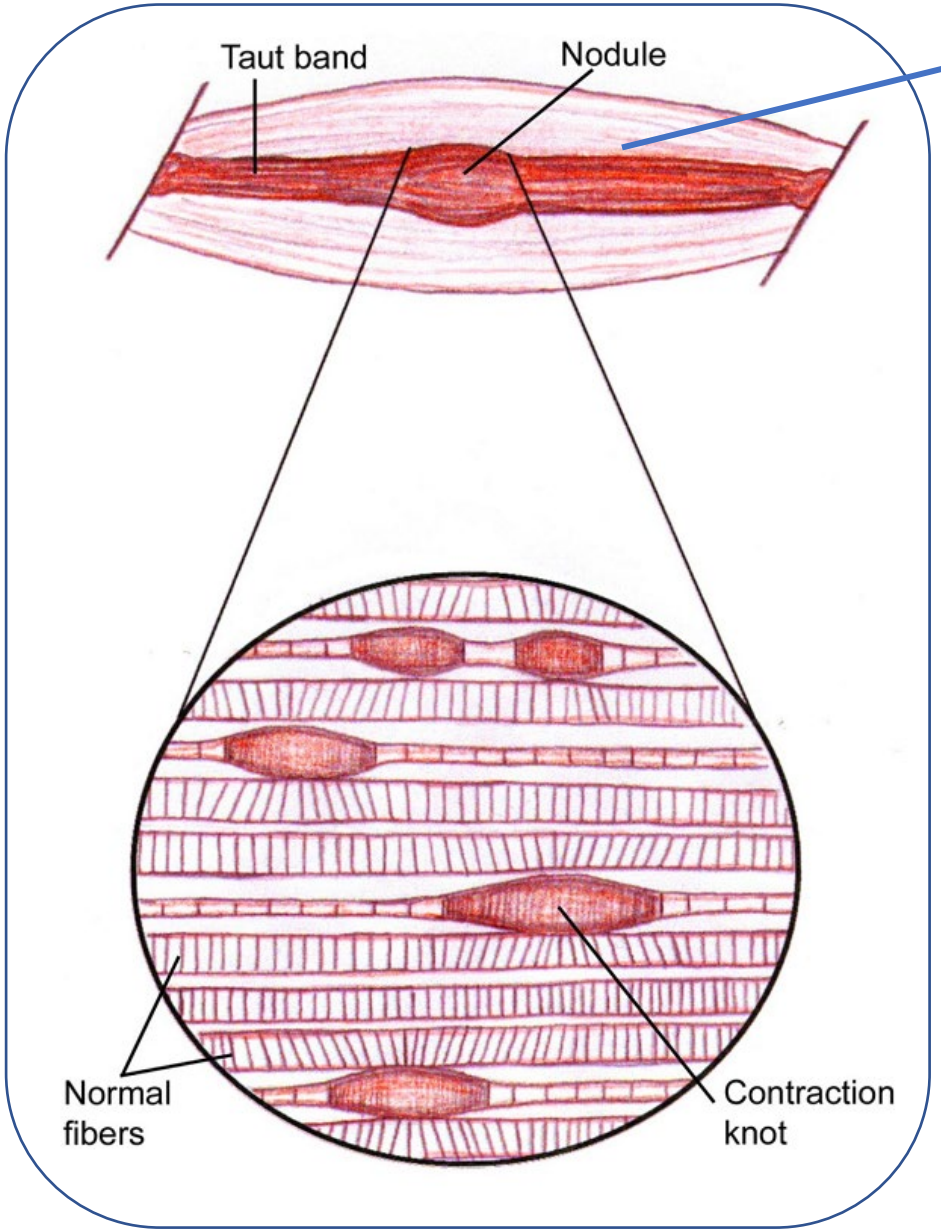
If it is stimulated, it **releases** some chemical substances → induce **neurogenic inflammation**

mucle contraction



muscle contraction

What is a muscle band(knot)?



muscle fibers keep contracting here
it's "locked" state

ATP, Ca^{+2}

* Muscle fibers need energy to unlock (= to relax). These are carried in blood.

This means muscles need blood flow to relax the contraction.

ex) over use, Injury, aging

But a lack of blood flow for some reason make muscle band(knot)

||

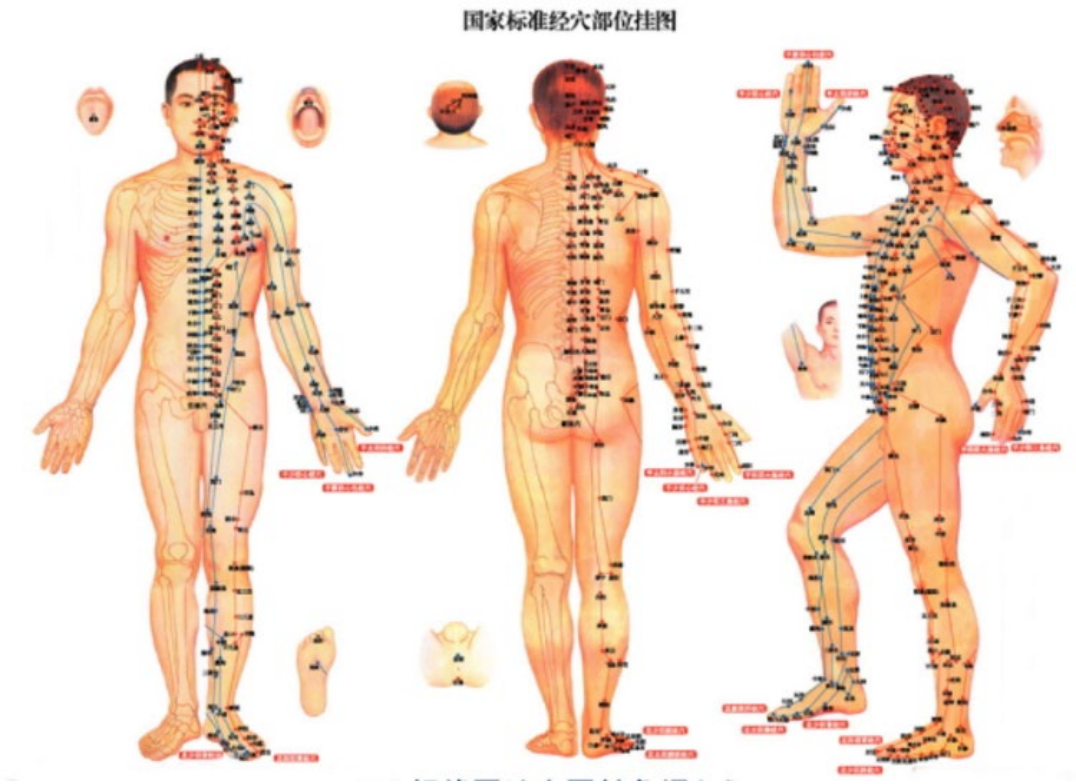
abnormal state ➡ polymodal receptor ➡ pain

About Treatment

general remarks on acupuncture (dry needling)

	needle thickness target
Japanese style based on **traditional** medicine	relatively thin needle skin
Chinese style based on **traditional** medicine	very thick needle skin, muscle
needling based on **western** medicine (Europe and USA)	thick needle muscle

Japanese style based on traditional medicine



Traditional medicine

: they believe there are magical spots in(on) the skin, so only sharrow stimulation to the skin tissue is everything needed to cure every illness including muscular problems, joint problems.. and so on, but they mostly care about visceral disease.

Chinese style based on traditional medicine

They believe there are magical spots in(on) the skin tissue, but because of their unusual aggression, very thick needles are used and their targets are not limited to skin tissue.

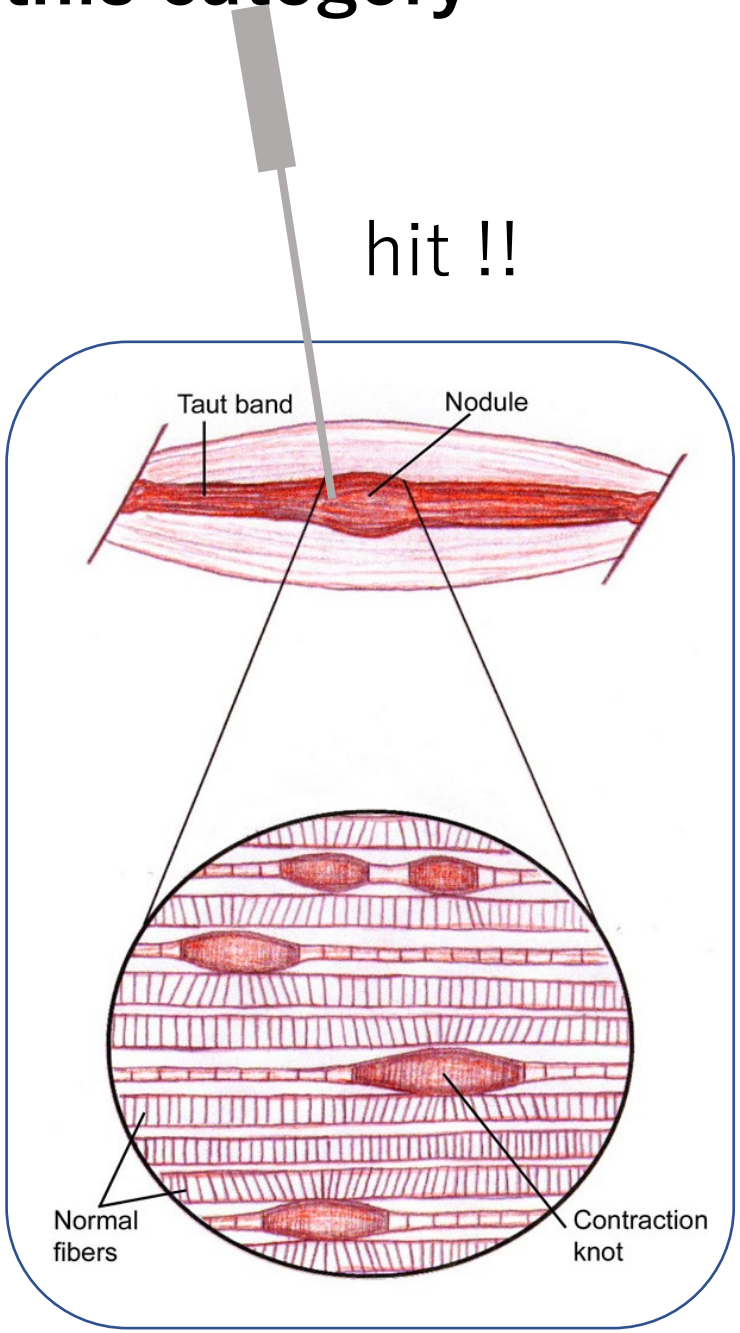
My clinic belongs to this category

needling based on western medicine

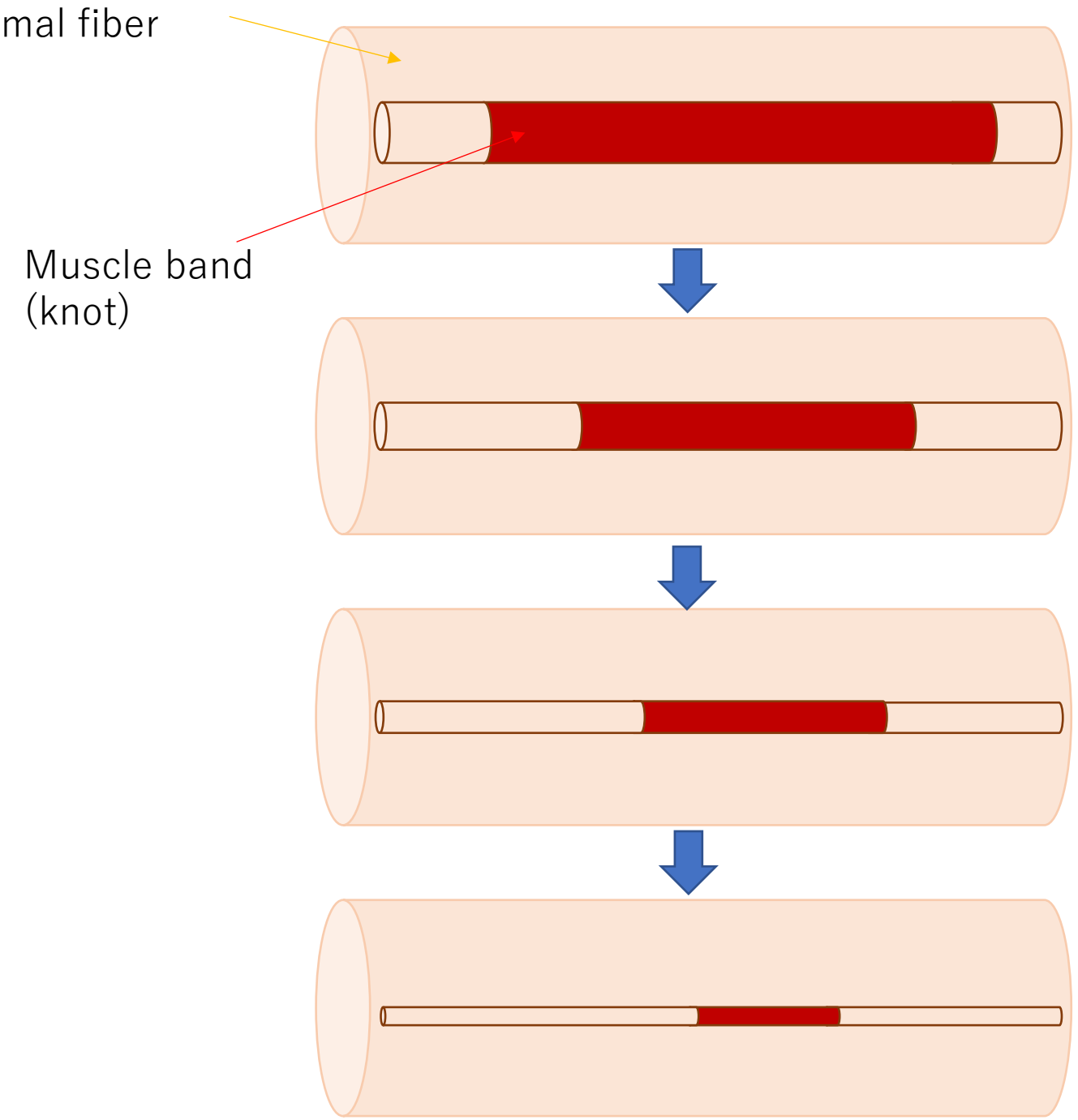
Their target is mainly deeper tissue other than skin.

Ex) muscles, myofascia (=membrane of muscles), tendons, articular capsule, ligaments,

The problem is … it is very hard to hit the muscle knots accurately. So most of them use very thick needles.
→sharp pain in the skin, internal bleeding problems



Every time the needle hits muscle band,
it becomes smaller

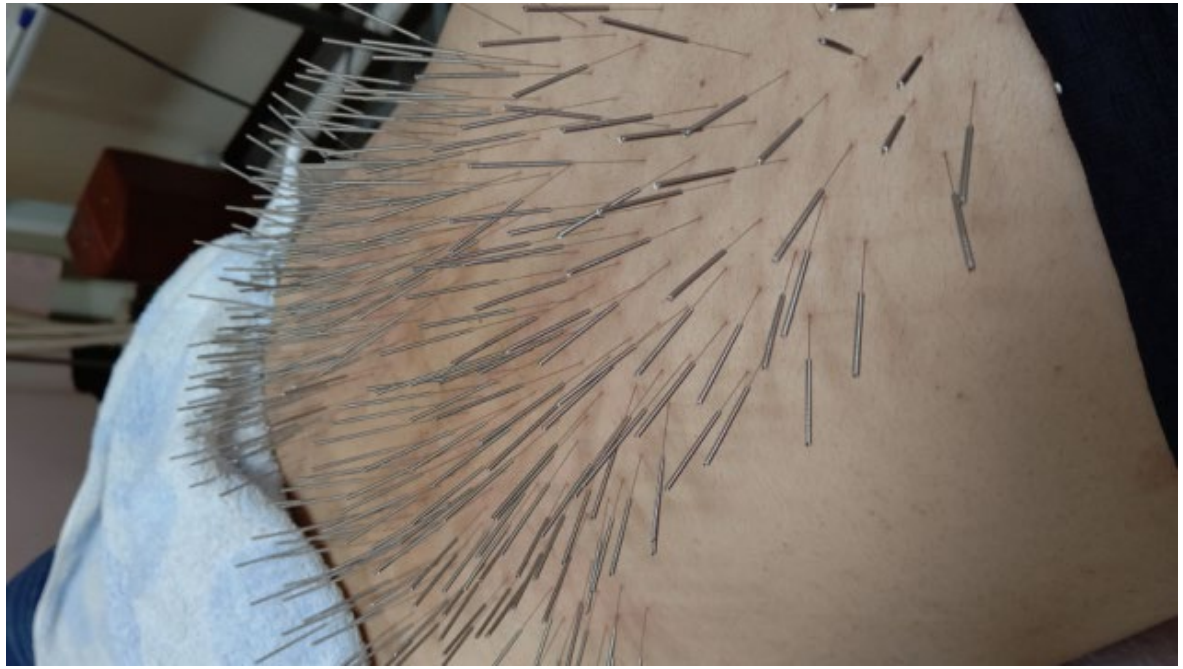


Mugnificent futilities

Too many thick needles... will never solve the problem

The funny thing is that needling in such way hardly hits the muscle knots acutually.

You can easily find these scaring images by Googling “鍼”（はり, hari）=acupuncture



You don’t need to be Scarlett Johansson

to make muscles be released

The direction of the solution

The key is “polymodal receptor”

which is the **real identity of pain**

Which **becomes very sensitive at bad part**

Which starts **neural inflammation** when it is stimulated

→ **We can say that a manual therapy is to cure the bad part of body by giving noxious stimulus.**

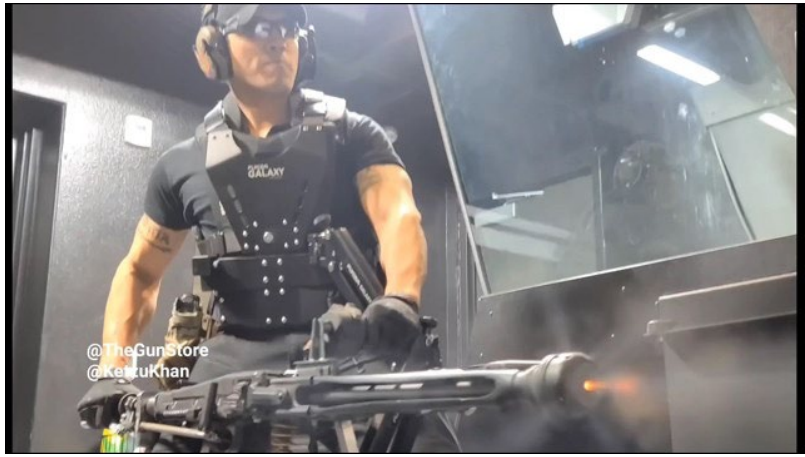
→ **All we need is to find out where a bad part is and to stimulate it very accurately.**

We can say that a manual therapy is to cure the bad part by giving noxious stimulus.

→ Any Polymodal receptors will be activated when thick needles are used whether they hit knots or not, because thick needles themselves are exactly noxious stimulus.

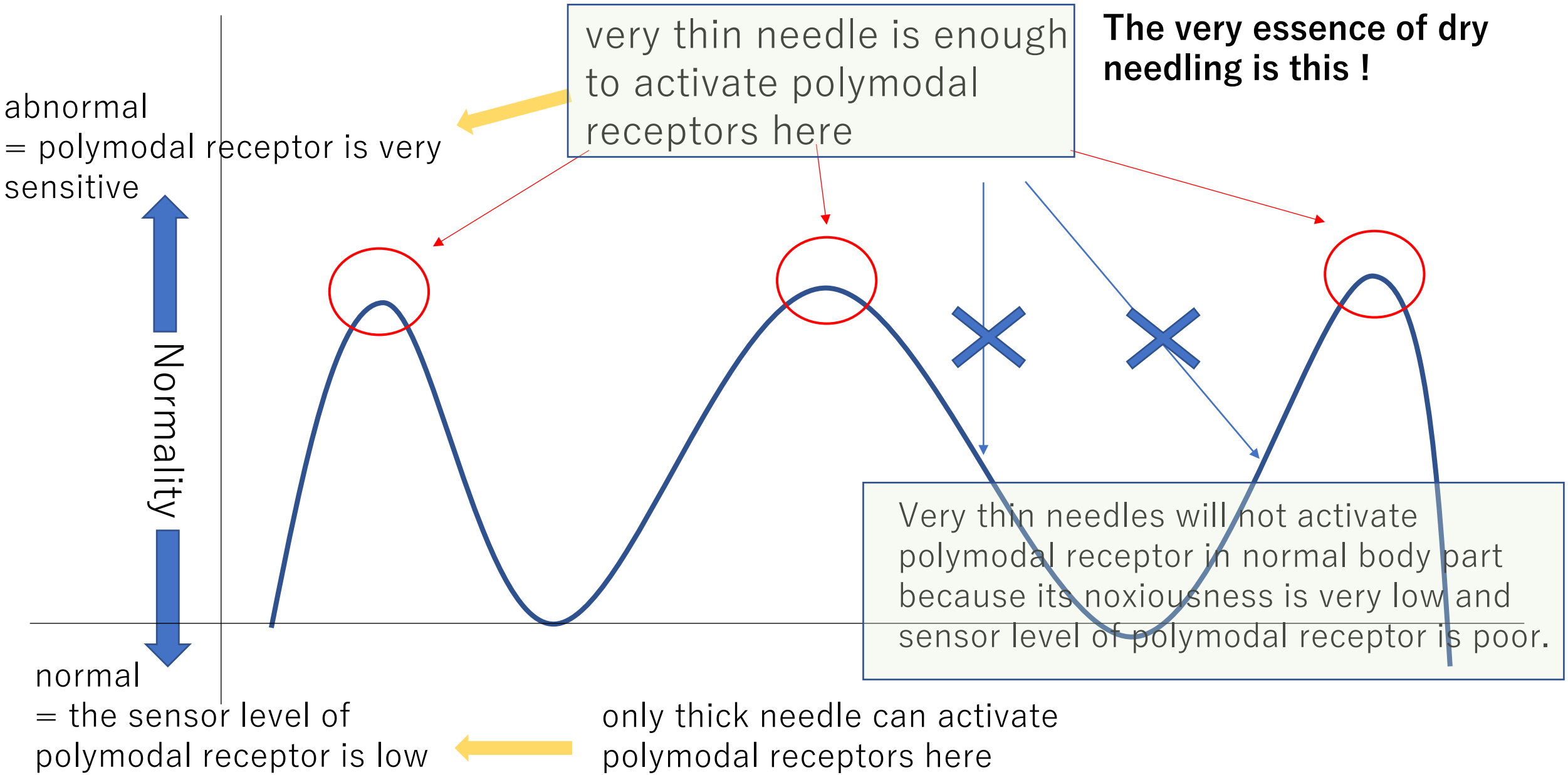
Even polymodal receptors in normal part

But that hedgehog or porcupine style is not beautiful at all as an human work



In fact, mass shooting style hardly hits the muscle knots

All we need is to find out where the exactly bad spots are
and to stimulate them very precisely and accurately.



needle thickness

0.12mm needles are mainly used in my clinic
This is very unique.

millimeters	番手	gauge size
0.12mm	02番	
0.14mm	01番	
0.16mm	1番	
0.18mm	2番	
0.20mm	3番	
0.23mm	4番	
0.25mm	5番	
0.30mm	8番	30
0.33mm	9番（0.32）	29
0.36mm	10番（0.34）	28
0.40mm		27
0.45mm		26
0.50mm		25
0.55mm		24
0.60mm		23
0.70mm		22
0.80mm		21
0.90mm		20
1.10mm		19
1.20mm		18
1.30mm		17
1.60mm		16
1.80mm		15
2.10mm		14

my clinic

Japanese acupuncture

Chinese acupuncture, Europe and America

Injection needle

Thin neelde advantege

Low risk of primary pain

Low risk of internal bleeding

Low risk of nerve damege

My clinic is aiming for “one shot , one kill” style

Other tips

Stomach rumbling ?

→polymodal receptor connect to autonomic nerve

About the feeling of flow of relaxation caused when the needle hits muscle knots (fascia)

→This strange feeling (not only painful but also some kind of comfortable, pleasant feeling) occurs when a needle hits polymodal receptors. This is because of its connection to limbic system which are involved in **emotion**.

Japanese traditional style (stimulation to the skin)

→Yes, effective to some people who are genetically sensitive persons, but not to many persons. Even if it works, it is not long lasting effect , just suppressing pain temporarily, muscle knots still remain.

Massage or dryneedling?

→polymodal receptors response to physical stimulations. Pressure by a finger and needling are both the physical stimulation, so basically the same.
* qualitatively the same but quantitatively different.

Muscle soreness after dryneedling (massage)

→This is because of neurogenic inflammation induced by stimulation to polymodal receptors,

meaning in the middle of healing process just like muscle soreness after weight training.

The soreness will last for a few to couple of hours usually.

As I explained up to here, the rea l identity of the pain is the polymodal receptor, and the polymodal receptor also acts as an effector to start the healing process.
This is a **physiological fact**.

I think a treatment based on a “theory” is weak.
(ex: traditional medicine, trigger point therapy…)

Because the human body is still a black box, perfect theory can’t be constructed as a logical conclusion.

So I think I should do treatment based on a “fact”.
Behavior of the polymodal receptor is a physiological fact when it is in a bad environment and when it is hit by a needle. So **reproducible** if finger operation is accurate enough.