



# PHYSIOTHERAPISTS AND THEIR NEEDLES!

*Text: Andri Smuts Image: Reg Caldecott*

## What is dry needling therapy?

Unlike some of you would think it is not just a medieval way of torturing unsuspected patients just because we can, it actually has real scientifically proven effects to relieve painful trigger points.

When physiotherapists use dry needling, a thin, sterile acupuncture-type needle is tapped into the skin or muscles and is used for deactivation and desensitization of a myofascial trigger point (MTrP) which should stimulate a healing response in that tissue.

## Firstly, what is a myofascial trigger point?

Myofascial trigger points (mtrp) may develop in muscles that are either acutely or chronically strained. With an acute strain there is some degree of tissue damage causing a release of stored calcium, and the calcium can also not be removed due to the tissue damage. This extra calcium in the presence of atp (molecule causing energy release) results in a sustained contraction of the muscle fibers and cause muscle fatigue. This sustained contraction produces the palpable taut band associated with trigger points, and due to the depletion of atp in the muscle, the muscle cannot return to their resting state as well as contract properly. This results in reduction of blood flow and an increase in autonomic nervous system activity causing a local muscle condition, which is painful, resists stretching and results in decrease range of motion and general disability.

## What is the mechanism of dry needling?

### Mechanical Effects

Dry needling of an MTrP may mechanically disrupt the integrity of the dysfunctional muscle fiber. From a

mechanical point of view, needling of MTrPs may be related to the extremely shortened muscle fiber. It is possible that an accurately placed needle provides a localized stretch to the contracted (injured) muscle fiber, which may disentangle or help relax the contracted muscle fiber. This would allow the muscle fiber to resume its resting length. If indeed a needle can mechanically stretch the local muscle fiber; it would be beneficial to rotate the needle during insertion. Rotating the needle results in winding of connective tissue around the needle, which clinically is experienced as a 'needle grasp.' Comparisons between the orientation of collagen following needle insertions with and without needle rotation demonstrated that the collagen bundles were straighter and more nearly parallel to each other after needle rotation.

Moving the needle up and down as is done with needling of an MTrP may be sufficient to cause a needle grasp and a resultant LTR or local twitch response (muscle twitch experienced when needling a trigger point).

Dry needling an MTrP is most effective, when local twitch responses (LTR) are elicited. A LTR is an involuntary spinal cord reflex in which the muscle fibers in the taut band of muscle contract. The LTR indicates the proper placement of the needle in a trigger point. Research has indicated that dry needling that elicits LTRs improves treatment outcomes. Patients commonly describe an immediate reduction or elimination of the pain complaint after eliciting LTRs. The mechanical pressure exerted via the needle also may electrically polarize the connective tissue and muscle.

### Neurophysiologic Effects

It is argued that the effects of dry needling stimulated certain muscle fibers which in turn activate the release of neurons that causes opioid mediated pain

suppression, thus causing a pain “block”.

### Chemical Effects

Some studies demonstrated that the increased levels of various chemicals at MTrPs are immediately corrected by eliciting a LTR with an acupuncture needle. Although it is not known what happens to these chemicals when a needle is inserted into the MTrP, there is now strong unpublished data that suggest that eliciting a LTR is essential.

Once the pain is reduced, patients can start active stretching, strengthening, and stabilization programmes. Eliciting a LTR with dry needling is usually a rather painful procedure. Post-needling soreness may last for 1 to 2 days, but can easily be distinguished from the original pain complaint. Patients with chronic pain frequently report to have received previous trigger point injections; however, many state that they never experienced LTRs. Accurate needling requires clinical familiarity with MTrPs and excellent palpation skills.

### What are the needles made of?

It is believed that the earliest acupuncture instruments were sharp pieces of bone or flint called Bian stones. During the Iron and Bronze ages, metal acupuncture needles began to be developed. Early needles were made from iron, copper, bronze, and even silver and gold.

Modern acupuncture needles are made out of stainless

steel and come in various lengths and gauges of width. These acupuncture needles consist of a stainless steel shaft, with a handle made out of copper or steel. Some Japanese needles have a color-coded plastic handle. Unlike standard needles used for intramuscular injections, or for drawing blood, acupuncture needles are solid, not hollow, and have a finely tapered point, as opposed to a beveled cutting-edge point. In fact, acupuncture needles are so thin that an acupuncture needle can actually fit within the hollow of a standard blood-drawing needle.

Acupuncture is essentially painless. Although some people may experience a slight pinch as the needle is inserted, many feel nothing at all. Because modern acupuncture needles are disposable and used only once, there is no risk of transmitting infections from one person to another.

### Thus to summaries:

The way dry needling work is through complex neural pathways and chemical releases in the body. A simplified explanation is three-fold:

- A local flow of blood is promoted to the injured part for healing.
- The neural pathway that causes pain is inhibited or 'blocked' to some extent.
- Endorphins (the body's natural painkillers) are released to ease the pain and inhibit the pain/inflammatory cycle 🌈

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