

TRIGGER POINTS

Drs. Janet Travell & David Simons (1993) described a trigger point as, "A highly irritable localized spot of exquisite tenderness in a nodule in a palpable taut band of (skeletal) muscle." These hyperirritable localized spots can range in size, and have been described as a 'tiny lump' and 'large lumps'; they can be felt beneath the surface embedded within the muscle fibres. If they are tender to pressure they may well be 'trigger points'. The size of a trigger point nodule varies according to the size, shape and type of muscle in which it is generated. What is consistent is that they are tender to pressure. So tender, in fact, that when they are pressed, the patient often winces from the pain; this has been called the 'jump sign'. Myofascial trigger points may well be implicated in all types of musculo-skeletal and mechanical muscular pain. Their presence has even been demonstrated in children and babies. Pain or symptoms may be directly due to active trigger points, or pain may 'build up' over time from latent or inactive trigger points. Studies and investigations in selected patient populations have been carried out on various regions of the body. These have confirmed a high prevalence of trigger point pain.

There is some evidence that myofascial trigger points may be present in babies and children (Davies, 2004); they have also been demonstrated in muscle tissue after death. Trigger points develop in the myofascia, mainly in the centre of the muscle belly where the motor end plate enters (primary or central). However, secondary or satellite trigger points often develop in a response to the primary trigger point. These satellite points often develop along fascial lines of stress. External factors such as ageing, body morphology, posture, weight gain or congenital malformation, etc., also play a crucial part in trigger point manifestation.

EVIDENCE

In 1957, Dr. Janet Travell discovered that trigger points 'generate and receive' minute electrical currents. She determined experimentally that trigger point activity could be accurately quantified by measuring these signals with an electromyogram (EMG). She went on to demonstrate that a trigger point could be accurately and reliably located by the same technique. This is due to the fact that in its resting state, electrical activity in muscles is 'silent'. When a small part of the muscle goes into contracture, as with a trigger point, it causes a small, localized spike in electrical activity. More easily, trigger points can be palpated beneath the skin in specific locations. They are localized, nodular and discrete and are characteristically painful, producing reproducible patterns of referred pain.

➤ ACTIVITY

- ✓ DEFINE ACCUPUNCTURE POINTS AND TRIGGER POINTS.**
- ✓ DIFFERENTIATE BETWEEN FIBROMYALGIA AND TRIGGER POINTS.**

Simons et al. (1999) suggested that changes in biochemical inputs might influence trigger point formation.

Factor	Influence
Allergic/hypersensitivity Hormonal	May have a potentiating effect (Brostoff, 1992) Oestrogen and thyroid deficiency may impact the endoplasmic environment leading to increased trigger point development and/or perpetuation (Lowe & Honeyman-Lowe, 1998)
Chronic viral, yeast and or parasite infection	May increase the likelihood of trigger point formation (Ferguson & Gerwin, 2004)
Vitamin C Iron deficiency	Deficiency may perpetuate trigger point longevity 10–15% of people with chronic myofascial pain syndromes may be iron deficient (Simons, 1999)
Vitamin B ₁₂ deficiency	May increase tiredness, fatigue and increase chronic trigger point formation
Folic acid	May change the internal endoplasmic environment sufficiently to increase trigger point development and/or perpetuation

Table 4: Biomechanical factors after Simons et al. (1999).

All muscles contain a blend of type 1 and type 2 fibres (Janda, 1986 and Lewit, 1999). This has a direct correlation as to how chronic symptoms might develop if left untreated.

1. Type 1 fibres are postural, and tend to respond to stress or overuse by shortening and becoming hypertonic. A trigger point in a muscle with a high percentage of type 1 fibres may take longer to respond to treatment.

2. Type 2 fibres are built for explosive, short-term activity and tend to become weak, atrophic and hypertonic under chronic or sustained endurance. A trigger point in a muscle with a high percentage of type 2 fibres may respond more rapidly to treatment.

Trigger Point Formation and Posture

Poor posture is a powerful 'activator and perpetuator' of myofascial trigger points (Simons et al. 1999) and is always worth considering in chronic trigger point syndromes.

most common postural mal-adaptations:

- Head forward;

- Round shouldered;
- Head to one side - telephone postures;
- Occupational malpositions;
- Slouched standing;
- Slouched sitting;
- Computer screen/ergonomics;
- Cross-legged sitting;
- Habitual postures;
- Driving position;
- Lifting/carrying;
- Scoliosis.

Trigger points are common in the following postural structures: upper trapezius, levator scapulae, sternocleidomastoideus, erector spinae, musculo-ligamentous apparatus of the lumbar spine, gluteus medius, gastrocnemius/soleus complex.

Postural Trigger Points and 'Cross Patternation'

Upper Crossed Pattern Syndrome This can be observed in the 'round-shouldered, chin-poking, slumped posture', which also compromises normal breathing (see figure 2.2). In such cases, pain is often reported in the neck, shoulder, chest and thoracic spine (these areas are often restricted). An oblique cross can be drawn through the glenohumeral joint, indicating the functional 'crossover' changes in muscular relationships. The main muscles in the upper cross pattern affected are:

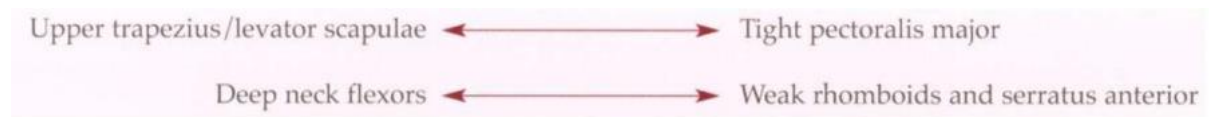
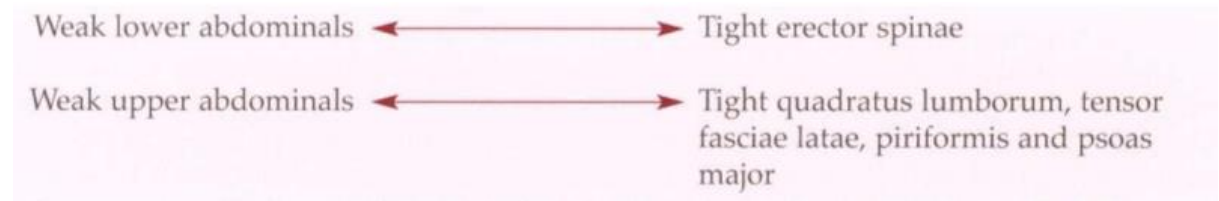


Figure 2.2: Upper crossed pattern syndrome.

Lower Crossed Pattern Syndrome This can be observed in the 'sway back' posture, with weak abdominals and gluteals muscle and overtight erector spinae, quadratus lumborum, tensor fasciae latae, piriformis and psoas major.



Trigger Point Classification

Central (or Primary) Trigger Points These are the most well-established and 'florid' when they are active, and are usually what people refer to when they talk about trigger points. The central trigger points always exist in the centre of the muscle belly, where the motor end plate enters the muscle. For example, in multipennate muscles, there may be several central points. Also, if muscle fibres run diagonally, this may lead to variations in trigger point location.

Satellite (or Secondary) Trigger Points Secondary trigger points may be 'created' as a response to the central trigger point in neighbouring muscles that lie within the referred pain zone. In such cases, the primary trigger point is still the key to therapeutic intervention and the satellite trigger points often resolve once the primary point has been effectively rendered inactive. The case in the para-spinal and/or abdominal muscles.

Attachment Trigger Points

the area where the tendon inserts into the bone (tendino-osseous) is often 'exquisitely' tender. (Travell & Simons, 1999; Davies, 2004). It has been also suggested (ibid) that this may result from an associated chronic, active myofascial trigger point. This is because the tenderness has been demonstrated to reduce once the primary central trigger point has been treated; in such cases, the point is described as an attachment trigger point. Furthermore, it has been suggested that if a chronic situation occurs where the primary and attachment trigger points remain untreated, 'degenerative changes' within the joint may be precipitated and accelerated.

Diffuse Trigger Points

Trigger points can sometimes occur where multiple satellite trigger points exist secondary to multiple central trigger points. This is often the case when there is a severe postural deformity such as a scoliosis, and an entire quadrant of the body is involved. In this scenario, the secondary points are said to be diffuse. These diffuse trigger points often develop along lines of altered stress and/or strain patterns.

Inactive (or Latent) Trigger Points This applies to lumps and nodules that feel like trigger points. These can develop anywhere in the body; and are often secondary. However, these trigger points are not painful, and do not elicit a referred pain pathway. The presence of inactive trigger points within muscles may lead to increased muscular stiffness. It has been suggested that these points are more common in those who live a sedentary lifestyle. (Starlanyl, 2000). It is worth noting that these points may re-activate if the central or primary trigger point is (re)stimulated, or following trauma and injury.

Active Trigger Points This can apply to central and satellite trigger points. A variety of stimulants can activate an in-active trigger point such as forcing muscular activity through pain. This situation is common when increasing activity post road traffic accident (RTA), where multiple and diffuse trigger points may have developed. The term denotes that the trigger point is both tender to palpation and elicits a referred pain pattern.

Trigger Point Symptoms

referred pain is the defining symptom of a myofascial trigger point.

Patients describe referred pain in this map as having a deep, aching quality; movement may sometimes exacerbate symptoms, making the pain sharper. An example of this might be a headache. The patient often describes a pattern of pain, or ache, which can sometimes be aggravated and made sharper by moving the head and neck. The intensity of pain will vary according to the following factors

- Location (attachment points are more sensitive);
- Degree of trigger point irritability;
- Active or latent trigger points;
- Primary or satellite trigger points;
- Site of trigger point (some areas are more sensitive);
- Associated tissue damage;
- Location/host tissue stiffness or flexibility;
- Ageing;
- Chronicity of trigger point.

Physical Findings

- Small nodules the size of a pinhead;
- Pea sized nodules;
- Large lumps;
- Several large lumps next to each other;
- Tender spots embedded in taut bands of semi-hard muscle that feels like a cord;
- Rope-like bands lying next to each other like partially cooked spaghetti;
- The skin over a trigger point is often slightly warmer than the surrounding skin due to increased metabolic/autonomic activity.