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ALLIED HEALTH PROFESSIONS COUNCIL OF SOUTH AFRICA

SAFETY GUIDELINES: CHIROPRACTIC AND OSTEOPATHY: DRY NEEDLING (MYOFASCIAL TRIGGER POINT THERAPY USING FINE FILAMENT NEEDLES)

SEPTEMBER 2020

The Allied Health Professions Council of South Africa (AHPCSA) is a statutory health body established in terms of the Allied Health Professions Act, 63 of 1982 ("the Act") in order to control all allied health professions, which includes Aromatherapy Ayurveda, Chinese Medicine and Acupuncture, Chiropractic, Homeopathy, Naturopathy, Osteopathy, Phytotherapy, Reflexology, Therapeutic Aromatherapy, Therapeutic Massage Therapy, Therapeutic Reflexology and Unani-Tibb.

The AHPCSA, after due consideration and in consultation with the Professional Board: Chiropractic and Osteopathy (PBCO) and taking into account sections 1(2)(a), 3, 4, 10C, and 10D of the Allied Health Professions Act, Act No 63 of 1982 ("the Act") resolved that the following SAFETY GUIDELINES: CHIROPRACTIC AND OSTEOPATHY: DRY NEEDLING (MYOFASCIAL TRIGGER POINT THERAPY USING FINE FILAMENT NEEDLES) shall be applicable to all practitioners registered in the professions of Chiropractic and Osteopathy.

Should the AHPCSA become aware of any practitioner or therapist who does not comply with the guidelines and/or practice outside his/her scope of practice, such person shall make him/her guilty of unprofessional conduct and face disciplinary action in terms of sections 23 to 30 of the Act.

DR LOUIS MULLINDER
REGISTRAR: ALLIED HEALTH PROFESSIONS COUNCIL OF SOUTH AFRICA

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PREFACE

This document is a guideline to safe dry needling practice for Chiropractors and Osteopaths using this skilled intervention in South Africa. The guideline was compiled using various international and local guidelines, journal articles and books, as referred to in the reference list.

1. INTRODUCTION

Dry needling (DN) is within the scope of practice of South African Chiropractors. It is part of the undergraduate education of South African Chiropractors at the Durban University of Technology and the University of Johannesburg, consisting of both theoretical and practical training. In the case of Osteopaths, DN is within the scope of practice, provided it has formed part of the education and training in the foreign qualification. It is a commonly-used intervention by Chiropractors and Osteopaths, locally and internationally as well as by other manual therapists such as physiotherapists.

DN is a 'skilled intervention that uses a filiform needle to penetrate the skin and stimulate underlying myofascial trigger points (MFTP), muscular and connective tissues for the management of neuromusculoskeletal pain and movement impairments' APTA Public Policy Practice and Professional Affairs Unit [1]. It is different from acupuncture [2]. DN targets nerves, muscles or connective tissues [3] and is often used to treat MFTP's. Dependant on the tissue that is been targeted during DN, the physiological impact of the treatment will vary. For example, targeting MFTPs results in a different physiological effect from targeting connective or scar tissue, fascia or muscle tension [1]. MFTP's are hyperirritable spots found in skeletal muscle associated with a taut band that is hypersensitive [4]. They may result in referred pain, tenderness, and autonomic phenomena such as local sweating, vasodilation/constriction or pilomotor activity [4, 5]. MFTPs may be active or latent and must be differentiated from tender points occurring in muscles [2].

DN is considered to be one of the fastest and most effective ways to treat MFTP's [6]. It is considered an invasive therapy [6] with a large body of scientific literature supporting its use and effectiveness [2]. The needle is inserted into the MFTP resulting in a twitch response. Although the exact mechanism is still under debate it is theorised that this results in altered motor end-plate activity and thereby brings about an analgesic effect [7]. The mechanism appears to be centrally mediated as opposed to purely peripheral in nature [8]. Various techniques of DN can be used. The practitioner may employ dynamic needling, whereby the needle is slowly moved in and out of the MFTP. Alternatively, static needling can be used whereby the needle is left *in situ,* or it can be rotated several times to engage the soft tissue [9].

2. INDICATIONS FOR DRY NEEDLING

Dry needling is used by Chiropractors and Osteopaths to treat pain and dysfunction in the neuromusculoskeletal system. This can be in the form of [10-12]:

- Muscles
- Ligaments
- Tendons
- Subcutaneous fascia
- Scar tissue
- Peripheral nerves
- Neurovascular bundles
- Myofascial trigger points

3. CONTRA-INDICATIONS TO DRY NEEDLING

Patients must be appropriately assessed for contraindications for DN. DN should not be administered in the following circumstances or only with special precaution. These recommendations stem from the following sources [2, 13, 14]:

3.1 Absolute contra-indications

3.1.1 Patients, who have needle phobia, are unwilling to have DN or are unable to give consent;
3.1.2 A patient who has had a history of abnormal reaction to DN or injection;
3.1.3 Medical emergency;
3.1.4 Use of DN on an area or limb where there is lymphoedema, due to the increased risk of infection; or
3.1.5 A patient who is currently taking anti-coagulant therapy or who has thrombocytopenia or other clotting disorder and where haemostasis by palpation cannot be performed following the needling procedure, for example psoas and tibialis posterior muscles.

3.2 Relative contra-indications

These include but are not limited to the following:

3.2.1 Abnormal bleeding tendencies. Caution should be taken when using DN in patients on anti-coagulant therapy or who have thrombocytopenia or other clotting disorder. If DN is utilised, light needling techniques must be used and followed by haemostasis applied by palpation after needle withdrawal;

3.2.2 Compromised immunity. Patients with a compromised immune system are more prone to infection, both local and systemic following DN. Thus these patient groups must be assessed for relative contra-indication to DN. Examples include immunocompromise from disease like blood borne disease, cancer, diabetes, human immunodeficiency virus (HIV) infection, acquired immune deficiency syndrome (AIDS), viral hepatitis, bacterial endocarditis, incompetent heart valves or valve replacements;

3.2.3 Vascular disease – where there is increased susceptibility to bleeding, tissue trauma and infection;

3.2.4 Lymphoedema or following lymph node removal due to increased risk of infection;

3.2.5 Diabetes mellitus – poor peripheral circulation and compromised tissue healing requires caution when considering DN. DN should be avoided in the extremities of patients with diabetic neuropathy;

3.2.6 Acute systemic infections, with or without fever, or contagious diseases;

3.2.7 Pregnancy – DN must be used with caution throughout pregnancy, especially in the first trimester due to the high incidence of spontaneous abortions that occur naturally;

3.2.8 Frail patients – ensure DN can be tolerated and that the patient does not suffer from any sensory lose in the area prior to using DN;

3.2.9 Epilepsy – the epileptic patient must be assessed and DN should be used with caution especially with unstable epilepsy. The patient must not be left unattended if DN is utilised;

3.2.10 Allergy to metals or latex – DN should be avoided due to allergic reaction, unless alternatives can be used i.e. latex free gloves;

3.2.11 Children – assent and parental/guardian consent is required. It is advisable to avoid DN in patients younger than 15 years due to their ability to understand and follow the procedure [15].

3.2.12 Skin changes – avoid DN in areas where the skin has an infection, lesion, allergic reaction or acute inflammation. Avoid DN into haematomas due to risk of infection;

3.2.13 Patients on certain prescription medications such as significant psychiatric, anticoagulant and immunosuppressive medicines;

3.2.14 DN near surgical sites within 4 months of surgery, due to increased risk of infection;

3.2.15 Anatomic considerations – extreme caution must be utilised to avoid injuring pleura, lungs, blood vessels, nerves, organs and joints. The practitioner must ensure that their anatomical knowledge in the area is sufficient;

3.2.16 Prosthetic implants and implanted electrical devices – exercise caution and the practitioner must ensure that their anatomical knowledge in the area is sufficient;

3.2.17 Paraesthesia – sensory changes indicate that DN may not be used safely in these patients, as they will not be able to give adequate feedback thus DN should be avoided;

3.2.18 Tumours – do not DN in the area of a tumour; and

3.2.19 Avoid mucous membranes, eyes and genitals.

4 ADVERSE EFFECTS

Adverse effects (AE) can occur with DN [16-18]. Most are mild however it is suggested that they are under reported and documented [19].

Table 1: Adverse events from dry needling [20] [14, 21]

Adverse event	Comment
Pain	Occurring during DN: if the pain is unexpected (i.e. not the pain of trigger point referral) the needle should be removed. If the pain persists after the treatment the patient can use heat or ice over the area. Post-needling soreness: this is the most common AE (Simons, 1999b). Patients should be warned that they may experience post-needling soreness and that they can apply ice or heat to the area to decrease the pain.
Haematoma	Avoidance of blood vessels when DN is necessary. It is good practice to apply haemostasis to the area, using a cotton wool swab, on removing the needle. If bleeding continues, apply further pressure and ice the area to minimize the bruising.
Fainting or autonomic response	This may occur as a result of excessive needle stimulation, pain, psychological stress, fatigue, incorrect patient positioning or in a patient who is autonomically labile. It is necessary to explain the DN procedure prior to its application, preferably place the patient in the lying position during needling and avoid over needling on first treatment. Should the patient faint remove all needles, lie the patient down - if they are not already lying – and raise their legs. Offer water or something sweet and possibly something to eat. Reassure the patient and monitor. With time the symptoms should terminate, however if there are concerns a medical assessment should be sought.
Needle issues	Stuck needle: A muscle may spasm around the needle making it difficult to move, twisting the needling too much or only moving the needle in one direction. To release it leave the needle for a short time, turn it in opposite direction, use massage or ice on the muscle to encourage release. Bent needle: this may occur from the needle hitting a bone or a strong muscle contraction bending the needle. When removing follow the path of the bend in the needle. Patient must remain still and muscle can be encouraged to relax as described above. Broken needle: this is very unlikely to occur when using disposable needles however should it happen the patient must be instructed to not move. If the broken needle is visible use tweezers to remove the needle. If it is not visible, gently depress the skin around the needle to expose the needle and remove

	with tweezers. If the needle cannot be reached, medical attention must be sought for surgical removal. Mark the area of the needle to facilitate further treatment.
Infection	To prevent infection the area to be DN should be cleaned with alcohol prior to treatment and aseptic techniques must be utilised. Avoid needling skin that shows signs of infection.
Excessive drowsiness	Should the patient report feeling drowsy or excessively relaxed they should refrain from driving until returned to an awake state. For future treatments, avoid excessive stimulation or needle time.
Pneumothorax	Only clinicians with adequate training may needle the thorax. Symptoms include: - Shortness of breath – may only occur on exertion - Chest pain - Dry cough - Decreased breath sounds on auscultation These may be immediate or delayed. Special caution must be taken in patients who will be undergoing altitude changes e.g. flying or scuba diving. Immediate referral to an accident and emergency department for further assessment is necessary. Please see anatomical considerations for further detail.
Trauma to internal organs	This may occur via a haematoma or due a needle penetrating the gastrointestinal tract or bladder. Symptoms are variable. The patient must be assessed for shock. If it is suspected that a hollow organ has been penetrated, sepsis and peritonitis may ensue and requires immediate appropriate referral to an accident and emergency department.
Nerve injury [21]	DN may cause nerve injury either through direct trauma or indirectly via a hematoma. Most commonly neuropraxia results, however axonotmesis may also occur, but rarely neurotmesis. Neuropraxia: When the axon is intact but the myelin sheath is damaged this may cause interruption of nerve conduction with temporary loss of function, which is normally restored within hours to months (approximately 6-9 weeks). Axonotmesis: Where the axon is damaged, but the epineurium is maintained. This can result in motor, sensory and autonomic paralysis. Prognosis is good but rehabilitation may take months. Neurotmesis: When the nerve sustains injury from contusion, stretch or laceration, the axon and the connective tissue around the nerve is damaged and continuity is lost. Nerve reinnervation occurs at 1 mm per day, thus the patient should be adequately informed about prognosis.
Needle stick injury	Should the clinician sustain a needle stick injury the area must immediately be washed with warm water, soap and disinfected with 70% alcohol. Allow the area to bleed, do not suck the site. The patient and the clinician should be tested for HIV/AIDS, Hepatitis B and C (if the status is not already known). Immediate

	referral to an accident and emergency department for post-exposure prophylaxis (PEP) is required. It is good practice for a clinician to know their own status regarding HIV/AIDS and to have Hepatitis B immunization.

5 ANATOMICAL CONSIDERATIONS

The following areas require caution:

5.1 Thorax

When using DN on the thorax, penetration of the lung resulting in pneumothorax must be avoided. The incidence of pneumothorax due to DN has been reported to be low, less than one in 100 000 ([22]. This study included patients receiving acupuncture to various body regions and not just the thorax, thus the incidence rate may be higher [19]. It is a serious adverse effect and has been reported following DN [17, 22] and can become a medical emergency [19].

The clinician should be aware that the presentation of pneumothorax following DN can vary with some patients experiencing severe pain immediately, while others may have aching pain, which may or may not be associated with immediate breathing difficulty or shortness of breath. These symptoms may present later and depend on the degree of lung involvement [17, 19, 23].

For a pneumothorax to occur the needle must penetrate through the skin, fascia, muscles, endothoracic fascia, parietal and visceral pleura [24]. Thus consideration for patient body type must be made when deciding on needle length [19]. A needle length of 3.1cm has been documented to reach lung tissue and in cadavers the average distance to the lung field at the angle of the neck was 3.3cm [25]. Thus, the choice of needle length, angle and place of insertion are important decisions that need to be made prior to embarking on DN in the thorax. The needle must always be directed away from underlying lung tissue [20]. Where possible use pincer palpation and needle tangentially to avoid penetration into the thoracic cage. Avoid DN on both sides of the thorax to prevent a bilateral pneumothorax from occurring [21]

In an attempt to minimise pneumothorax a ‘bracketing technique’ must be employed, by the practitioner placing the MFTP to be needled over a bone to prevent the needle penetrating the pleural cavity. This can decrease the chance of an adverse effect but it has., however, been documented that the needle may bypass the bone and pierce the pleural lining resulting in a pneumothorax [16, 22].

In addition, the borders of the lung must be noted. Superiorly the apex of the lung can extend 2 to 3 cm above the clavicle [16, 25] meaning that using DN in the area of the angle of the neck must be conducted with caution, for example, when treating the upper trapezius, levator scapulae, cervical paraspinals and supraspinatus MFTP’s. Inferiorly the lung can extend to the 12th rib [24] and care must be taken when needling

muscles in the lower thoracic and upper lumbar regions, for example the quadratus lumborum and paraspinal muscles.

In addition, precautions are necessary for the following muscles:

1) Trapezius
   Upper fibres - patient is side lying or prone. Using pincer palpation the needle is inserted perpendicular to the skin towards the practitioner's finger. The needle can be inserted from anterior to posterior or from posterior to anterior [26]. The needle must not be left in situ without the lumbrical grip at all times until needle is removed ([27].

   Middle fibres – patient lying prone, block MFTP over rib using bracketing technique, aim toward the bracketed rib and use 0.25x25mm needle [27].

   Lower fibres – patient side lying, using a pincer grip, direct the needle towards the spinous process one level above, use a 0.25x25mm needle[27].

2) Levator scapulae
   Patient should be side lying, using a pincer grip, direct the needle in an antero-posterior direction towards the practitioner's finger. Do not let go of pincer grip till needle is removed [27].

3) Lower cervical paraspinal muscles
   It is recommended that one needles close to the midline and not beyond the transverse process [19].

4) Pectoralis
   Major - bracketing of the MFTP over a rib to act as a backstop, there is potential for the needle to bypass the rib. In addition, this is a gender sensitive area and often the muscle lies deep to breast tissue making it difficult to gauge needle depth. If necessary preferably needle the lateral aspect of the muscle and direct needle obliquely [19]. Alternatively use pincer grip and a 0.25x25mm needle directed towards the practitioner's finger [27].

   Minor – Modified pincer grip, 0.3x40mm aimed antero-medial toward the practitioner's finger [27].

5) Supraspinatus
   Care must be taken that the needle does not go past the supraspinatus fossa into the lung [19]. Patient should be placed in the side lying position, angle the needle towards the spine of the scapulae and use a 0.25x40mm size needle [27].

6) Infraspinatus
   The clinician must map out the boarder of the scapula, needle tangentially, avoiding lung tissue. A rare congenital foramina (incidence of 0.5 to 5.8%) has been reported in the infraspinatus fossa [16], therefore one must not rely on the scapulae bone to stop the progression of a needle [19].

7) Rhomboid major and minor
Patient lies prone, trigger point is secured over a rib, with the middle and index fingers in the intercostal spaces on either side. Insert needle tangentially towards rib [28]. Needle size 0.25x25mm.

8) Serratus anterior
Bracketing techniques over ribs is essential [19] with patient side lying, aim towards the rib and use a 0.25x25mm needle [27].

9) Iliocostalis
Ensure that rib bracketing is used and limit the length of the needle, as it has been reported that the rib contact can occur at a depth of 10 -15 mm. Consideration of adiposity and needle penetration specificity must be given [19].

10) Intercostal muscles
Never to be needled under any circumstances [27].

11) Serratus posterior superior
Patient must be prone, using the rib bracketing technique, with middle and index finger in the intercostal spaces either side of the trigger point. Insert needle perpendicular to the skin and then tangentially towards the rib [28]. Needle size 0.25x25mm.

5.2 Lower back region

1) Longissimus thoracis and Iliocostalis thoracis
Patient should be positioned prone, MFTP bracketed against a rib and needle directed towards rib using a 0.25x25mm needle [27].

2) Multifidus and other paraspinal muscles
The patient must be side lying, the needle should be directed inferomedially to the lamina of the vertebra below and using a 0.25x25mm needle [27].

3) Abdominal muscles
For the muscle where it overlies the ribs use the bracketing technique and short needles (0.25x13mm) [27]. The rest of the abdominals should only be DN if a pincer grasp can be used to draw the muscle away from the peritoneal cavity to protect the organs [21].

4) Latissimus dorsi
Patient must be placed side lying, while using a 0.25x25mm needle size and pincer grip [27] needle away from the thorax.

5) Quadratus lumborum

The insertion of this muscle onto the 12th rib must not be needled [27]. Care must be taken to avoid penetrating the kidney, this muscle is deep and the clinician must be familiar with the local anatomy [29].

5.3 Areas requiring specialist knowledge

Do not DN these areas unless sufficiently trained and an expert [27, 29].

- Muscles around the temporomandibular joint
- Sub occipitals
- Subclavius
- Scalenes

If not mentioned the DN technique should be described in a peer-reviewed publication.

5.4 Blood vessels, nerves and organs

It is imperative that the clinician has a good anatomical knowledge of the area being DN to be able to identify blood vessels, nerves and organs in the area. Where possible an arterial pulse should be palpated to avoid injuring the blood vessels. Map out the blood vessels and nerves where possible. Use pincer palpation, if possible, to bring the muscle away from the blood vessel or nerve. Slowly insert the needle and withdraw it immediately if the patient reports a stinging and/or burning pain possibly indicating penetration of a blood vessel or a shooting, stinging and/or burning pain in the case of a nerve [21]. Special care must be taken around the spine and suboccipital area to avoid penetrating the brain stem or the spinal meninges. Needle length must always be considered to avoid deep penetration and potential puncturing into the peritoneal cavity [14]

5.5 Lymph nodes

Do not DN in areas of enlarged or painful lymph nodes with care to differentiate a lymph node from a MFTP and if in doubt avoid needling [21].

5.6 Joints

Avoid needling in the area of a joint that has an articular infection due to possible penetration of the joint capsule. Use pincer palpation to lift the muscle away from the joint to minimise this [21].

6 PRINCIPLES FOR SAFE DRY NEEDLING PRACTICE

When performing DN the chiropractor/osteopath must ensure the welfare of the patient, him or herself and the third party. Professional judgement must be applied when selecting DN treatments.

DN should be applied within the scope of practice of a Chiropractor in South Africa, with consideration of their training and experience.

The chiropractor should ensure that their skills are appropriate and confined to the areas in which they have received training. Should they wish to extend these skills additional training must be sought.

DN should only be utilised once a comprehensive chiropractic examination of the patient has been undertaken, and it has been established that it is a suitable treatment for the patient and the condition.

Informed consent must be obtained prior to using DN techniques. The patient should be appraised of potential adverse effects and possible risks. In addition the patient should be informed that during the procedure that they must not sneeze, cough or move, and that should they need to they must inform the practitioner so that the needle may be withdrawn [19]. In addition, any advice necessary regarding post-treatment considerations must be given to the patients such as post-needling soreness.

Clear documentation of the DN utilised on a patient must be recorded in the patients file, along with any adverse events that may have occurred [30].

Never insert the needle to the hub as this is an area of weakness and the needle may break at this point [30].

The utilisation of DN should be done with due consideration to evidence informed practice i.e. consultation of the scientific literature, the patient's beliefs and goals for the treatment and due clinical reasoning.

Only sterile, single use, disposable, solid filament needles must be used.

Where possible always position the patient in the recumbent position to avoid psychogenic syncope [30].

Hygiene and waste disposal guidelines must be adhered to.

7 HYGIENIC REQUIREMENTS FOR DRY NEEDLING

Hands should be washed, with soap and water and disinfected before and after DN, especially if blood contact is made.

The use of sterile disposable gloves to prevent infection is recommended.

If coughing or sneezing the practitioner must use their elbow to cover their mouth, as opposed to their hands to avoid transmission of infection [21].

Only use needles within their expiration date, dispose of those needles that have past their expiry date.

Do not contact the needle on any part other than the shaft, to maintain sterility [21].

Skin must be disinfected prior to DN.

Ensure that the needle is well handled and that the direction, depth and choice of needle size and length is given due consideration prior to inserting the needle. Avoid vulnerable anatomy.

On completion, the DN must be disposed of into a medical sharps bin, along with any material that contains blood. Avoid putting the needle back into its packaging. Medical waste must be disposed of accordingly.

Avoid using any medical device in the area where DN was applied that has not been disinfected to prevent the spread of infection [21].

In the instance of a needle stick injury occurring the area must immediately be washed with warm water and soap and disinfected with 70% alcohol. The patient and/or clinician should be tested for HIV/AIDS, Hepatitis B and C, if the status is not already known. Refer to an A + E department for PEP if necessary.

The chiropractor should be appraised of his/her own health status to prevent the transmission of infection to the patient. Relevant vaccinations should be current.

8 LEGAL REQUIREMENTS SPECIFIC TO DRY NEEDLING

9 REFERENCES

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