12. Non-pharmacological pain techniques

Section A: Adults

Non-pharmacological pain techniques refer to interventions that do not involve the use of medication to treat pain. These techniques may be used as an adjunct to pharmacotherapy and are usually not used in isolation.

The goals of non-pharmacological techniques are to decrease fear, distress and anxiety, as well as to reduce pain and provide patients with a sense of control. The advantages of non-pharmacological techniques are that they are relatively inexpensive and safe. Further advantages include reducing analgesic drug doses and the potential adverse effects thereof, reducing the focus on the pain, anxiety, stress and pain behaviour, and enhancing muscle strength, functional capacity and activity.

Non-pharmacological techniques are typically categorised into the following:

- **Physical (sensory) interventions** that reduce the nociceptive input and pain perception.
- **Psychological interventions** that are used where a therapeutic relationship, or rapport, is developed with the patient. These techniques are important because recurrent and continuous acute pain may lead to maladaptive physical and psychological functioning. Patients who suffer from this may experience depression, anxiety and posttraumatic stress due to their vulnerability. In addition, preoperative anxiety has been associated with the development of chronic regional pain syndrome (CRPS).
- **Other interventions**

12.1 Physical interventions

12.1.1 Massage

Massage is the process of rubbing and kneading muscle groups and joints, using either hands or other implements such as hot stones, to help relieve pain and reduce tension, tightness and spasms in these muscles groups and joints. Massage may help to increasing blood circulation and lymphatic drainage, as well as reducing inflammation and oedema. It may also increase endogenous endorphin and dopamine levels and promote lower blood pressure, improved circulation, a strengthened immune system, and reduced pain and anxiety in surgical and nonsurgical patients. In cancer patients, massage has been shown to improve mood and quality of life.

12.1.2 Heat and cold

Historically, hot-water bottles have been used to alleviate backache and sore abdomens. These days, this technique has been modified to use wheat-based heat packs and electrical pads to reduce the potential risk of burn injury.

Active warming may be used to treat appendicitis, colitis, cystitis and urolithiasis. Heat therapy has been shown to reduce pain, anxiety, nausea and heart rate. It has been postulated that heat therapy may work in several different ways: heat reduces spasm in striated muscle, and reduces muscles spindle excitability and tension in trigger points; heat also stimulates the thermoreceptors in the skin and deeper tissues and reduces pain by closing the gate in the spinal cord; and lastly, heat reduces the viscosity of synovial fluid in joints, and alleviates pain and stiffness, thereby improving the range of movement.

Conversely, cold and ice have been used to treat acute injuries and to reduce swelling, inflammation and pain.

12.1.3 Transcutaneous electrical nerve stimulation

Electrical stimulation may be used to treat mild to moderate acute pain, including back pain, labour pains and musculoskeletal pain. Transcutaneous electrical nerve stimulation (TENS) is administered through a battery-operated electrical device which consists of 2–4 leads that are connected to sticky pads. These sticky pads are applied to the painful area. The TENS device delivers a low voltage alternating electrical impulse at a low frequency of 540 Hz. Patients feel a mild tingling sensation in the area where the pads are placed.

TENS stimulates the large β-nerve fibres and, according to the gate theory, thereby blocks transmission of pain from the smaller C- and Aδ-fibres. It may also modulate pain by enhancing descending inhibition and blocking sympathetic outflow. TENS is contraindicated in patients with cardiac conditions such as dysrhythmias and those with pacemakers. However, TENS has no adverse effects.

12.1.4 Acupuncture

Acupuncture began in China more than 5 000 years ago. It consists of inserting extremely thin needles into specific points along invisible meridians in the body. These needles stimulate the nerves and the immune system, increase blood flow, and promote wound healing, pain modulation and analgesia. In addition to treating acute pain, acupuncture has been used for, among others, allergies, anxiety and depression, hypertension, insomnia, menstrual cramps and migraines.

12.1.5 Progressive muscle relaxation

Progressive muscle relaxation involves the patient tightening and relaxing different groups of muscles in the body in a progressive manner (e.g. starting at the toes and feet and moving up the body, tightening and relaxing each muscle group). This proves a sense of relaxation and comfort. This technique may be used for all types of pain and may be combined with psychological techniques such as guided imagery.

12.2 Psychological interventions

12.2.1 Cognitive behaviour therapy

In terms of the bio-psycho-social-spiritual model of pain, psychological factors may influence pain and pain behaviours. By targeting cognition, cognitive behaviour therapy (CBT) may modify the maladaptive behaviour associated with pain. It teaches patients coping skills which improve cognitive and psychological functioning, and change negative behaviours to positive choices. These techniques include structured relaxation therapy, recalling and scheduling pleasurable and enjoyable activities and events, positive assertions and reinforcements, and pacing strategies. CBT can also reduce maladaptive thoughts and pain catastrophising thoughts and behaviours.

12.2.2 Mindfulness-based stress reduction

There is a range of attention-based techniques such as distraction, attention, imagined scenery, or external stimuli. Mindfulness-based stress reduction was popularised in the western world by Kabat-Zinn, and is adapted from yoga meditation. Therefore, it is a technique similar to other strategies such as awareness and meditation. The aim is to uncouple, or create a disconnect between, the sensory elements of the pain and the emotional and consequential overlays thereof.

12.2.3 Acceptance and commitment therapy

In this technique, patients are taught that they do not need to change their thoughts, but rather accept these and modify their responses to ameliorate the negative consequences and achieve a more positive outcome. This technique emphasises non-judgement and acceptance and may help to augment the patients' wellbeing and sense of purpose. Therefore, in conducting acceptance and commitment therapy (AACT), patients may be able to improve purposeful awareness and pain acceptance, divert the focus from the pain, and thereby modify their behaviour to achieve more fulfilling outcomes.

12.2.4 Guided imagery

Guided imagery is a technique whereby an experienced practitioner helps the patient create a particular calm, relaxing and blissful state of mind, and/or create soothing and relaxing mental images (e.g. walking on the beach, or watching a daytime or nighttime sky). It may also take the form of storytelling and metaphors. These images elicit a physiological response via modulation of the ANS which results in changes in the respiratory system (i.e. deep breathing and lower RR), CV system (i.e. reduced heart rate and blood pressure), and reduced stress response via the endocrine and immune systems. Many trials have been conducted and have shown a reduction in the pain score when used either alone or in combination with hypnosis or CBT.

12.3 Other interventions

12.3.1 Spirituality and religion

Spirituality and religion are an important part of many people's lives. The meaning assigned to the pain experience may therefore be seen in terms of the spiritual and/or religious context (e.g., pain may be seen as either a consequence of their actions, or as a sign of punishment from God [Christianity/Hinduism], or as a sign of suffering caused by attachment [Buddhism]). Patients may not see pain as merely a sign of disease or ailment, but it may have added meaning for them, which may either interfere with treatment and worsen the pain or improve it, depending on the particular patient's beliefs and context. The power of prayer and the place it has in the patients' lives also plays a role and this will either improve or negatively impact on the patient's pain experience. Therefore, pain needs to be addressed holistically within the bio-psycho-social-spiritual model pain.

12.3.2 Music therapy

Music has been shown to enhance wellbeing and reduce pain and suffering. Since ancient times, it has been used as a tool to improve wellness, emotion and quality of life. It has been shown that music played during operations reduces pain and the consumption of morphine or other analgesic, and improves sedation and anxiolysis. Many randomised controlled trials (RCTs) have demonstrated lower pain scores, and less sedation requirements in patients undergoing procedures. Women in labour, elderly patients with osteoarthritis, and cancer patients have all reported lower pain scores and analgesia requirements when receiving music therapy.

12.3.3 Patient education

It is very important to provide patients with adequate information regarding surgery and procedure, anatomy, pathophysiology of their disease/injury, expected pain and treatment options, and recovery timelines. The well-informed patient has an enhanced recovery and reduced analgesia requirements, compared to the uninformed patient.

12.4 Conclusion

In general, non-pharmacological interventions are inexpensive, safe and have a low adverse effect profile. Patient-, procedure- and context-specific non-pharmacological interventions may be harnessed and may be used as ***an adjunct*** to pharmacotherapy to improve pain management and patient outcomes.