

DIGNITY Publication Series

No. 6

Praxis paper

INTERVENTIONS FOR PHYSIOTHERAPISTS WORKING WITH TORTURE SURVIVORS

With special focus on chronic pain,
PTSD, and sleep disturbances

By Hanne Frank Nielsen

DIGNITY
DANISH
INSTITUTE
AGAINST TORTURE



PRAXIS PAPER

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**With special focus on chronic pain, PTSD,
and sleep disturbances**

Hanne Frank Nielsen

Interventions for physiotherapists working with torture survivors

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DIGNITY Publication Series on Torture and Organised Violence No. 6

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Foreword

Physiotherapy for torture survivors shares many features with other kinds of physiotherapy. The same clinical reasoning process and methodology is applied as for any other client. That said, torture survivors also show specific symptomatology. Due to their pronounced vulnerability, extra consideration needs to be given to how one establishes rapport and builds a safe working alliance with these clients. Chapter 1 focuses on this issue.

Certain symptoms are typical in torture survivors. A chapter has been dedicated to each of the three seemingly most important symptoms: "chronic pain", "bodily reactions to stress – PTSD" and "sleep disturbances". The purpose of these chapters is not to deal exhaustively with all issues in physiotherapy for torture survivors, but rather to highlight selected key areas where physiotherapists can very much contribute to relieving the client's problems. Treatment for other torture-related sequelae, for example symptoms incurred as a consequence of falanga or suspension, will be covered in later publications.

DIGNITY cooperates with several different partner countries. Originally, this publication was intended to provide a short description of physiotherapeutic tools that could be applied in those settings where, for some reason, clients are only able to attend therapy a handful of times. However, while developing these tools, the clinical team realized that the same theoretical background knowledge was required for designing shorter interventions as for longer interventions. For this reason, the material became more elaborate than was originally planned.

The development of this material has taken place over a long period of time and has involved the help and goodwill of many people. I would like to thank the following people for their patience and assistance: a special big thank you to Peter B. Polatin, M.D., M.P.H. Also thanks to Ms. Karen Prip, PhD, physiotherapist, and my fellow physiotherapy colleagues at DIGNITY: Mrs. Anne Mette Karrer, Ms. Anette Klahr, Ms. Laila Jacobsen, Ms. Lis Termansen, and Mrs. Lone Tived Salem.

Our hope is that this publication will provide practical guidelines to assist the clinician in identifying which issues are most pressing, and which physiotherapeutic tools are most useful for each individual client. We note that this material has been used as teaching material in several DIGNITY partner countries with good results.

Hanne Frank Nielsen

CHAPTER 1: Introducing brief interventions for physiotherapists working with torture survivors

Background

In many of DIGNITY's partner countries accessing physical rehabilitation may be a challenge. The numbers of rehabilitation staff are few and the treatment can be costly. Even if treatment can be offered for free, clients may not be able to attend on a regular basis because of such things as bad roads, no available transportation, lack of funding for transport, or extended work obligations.

To meet these challenges, DIGNITY is developing a physical treatment intervention designed for physiotherapists who work with torture survivors in third world countries with limited resources. The Brief Therapy intervention is designed to be delivered in a limited number of sessions as a minimum intervention. As the consequences of torture are very complex and difficult to deal with, a minimum intervention will not be able to solve all physical problems for the client, but will enable the client to achieve new knowledge and tools to handle his problems in a more appropriate manner.

In the physiotherapy at DIGNITY, Copenhagen, the physiotherapists work according to a view of the human nature which believes in the human being as an indivisible entity; made up by body, mind, social, existentialistic and spiritual domains, which all in a complex relationship interact with contextual factors (e.g. environmental and personal factors). The physiotherapy approach is based on the assumption that every individual has a healthy core and that symptoms and dependency on external help are layers that lie around that core. The individual will need support and guidance to regain contact with the healthy core and later to benefit from this renewed contact in his daily living.

The physiotherapists work to identify the functional capacity of the client rather than the functional deficit or dysfunctions. There is a focus on the resources, instead of the shortcomings and on the present life situation of the client and his future possibilities.

The relation between the physiotherapist and the client is characterized by mutual trust, interaction, dialogue and co-operative partnership.

We have identified three physical focus areas in which torture survivors typically experience difficulties;

- chronic pain
- bodily (psycho-physiological) reactions to PTSD
- sleep disturbances

What is most important to the individual client will vary, and the challenge, when only few sessions are available is to prioritize and focus according to the client's needs.

The Problem Solving Model

The physiotherapist can use a problem solving model to prioritize the problems in a particular case, and the order in which they should be addressed. Here the physiotherapist clarifies with the client:

- What is the problem(s)?
- What does the client want to achieve?
- What are the options?
- What is the plan of action?

Additional points need to be clarified as early as possible, preferably within the first session.

- The resources of the client
- Motivation of the client for treatment
- Life conditions of the client

Overall interventions

Education of the client is a priority from the first session in order to:

- assist him to understand the reasons for his suffering
- decrease his anxiety

- help him to cope in a better way.

Tools with which the client can help himself are another important measure. These can include:

- physical exercises, - strengthening, stabilizing, endurance, flexibility etc.
- advice on activity of daily living
- relaxation exercises
- body awareness training
- grounding and breathing exercises

The intervention will depend on the magnitude of problems and the resources of the client. It is most important, however, that the client is *empowered* to do something about his problem himself.

Points to remember

Torture is an act which violently and intrusively attacks the individual's boundaries.

The subjective experience of being tortured is characterized by:

- *Impotence*
 - *lack of control*
 - high degree of *helplessness* and *disempowerment*
 - no possibility to act or defend oneself
 - unpredictability - personal boundaries are being invaded and disregarded
- *Dehumanization*: total *disrespect* for the victim as a human being
- *Humiliation*
- *Fear*
- *Stress*; with intermittent or continuous physiological hyper arousal
- *Pain* all over the body

In the rehabilitation situation, the physiotherapist is striving to create a setting that counters these experiences:

- **Building a therapeutic relationship:** The physiotherapist should try to build a working relationship with the client and to establish *trust and rapport*. As a result of the torture experience, in which clients have experienced deliberate cruelty and betrayal, they tend to face the world and people in it with mistrust and lack of confidence. Often those in positions of authority, who were supposed to protect people, were the ones perpetrating torture. Understandably, many torture survivors resolve never to trust another human being, system or institution again.
 - The physiotherapist should present the client with an attitude of *understanding, interest and empathy*, and demonstrate a willingness to listen to and face the emotions that the client wishes to express when he is able to express them.
 - In the first session, the client is reassured that his information is kept in *confidentiality*.
 - The physiotherapist must be very careful to *avoid replicating the interrogation experience* when taking the history of the client. One way can be to *reduce the number of questions* asked.
 - At regular intervals the physiotherapist should ask *how the client is feeling*, and whether he needs a break, or it is fine to continue. This is especially important in the first session.

- **Education and information:** The client should be given *information* at all times to promote a feeling of *control and predictability*. The physiotherapist should constantly inform the client about her intentions and reasons for her recommendations.

- **Creating a safe place:** The physiotherapist should *provide a safe environment* where the client feels comfortable enough to tell his story, talk about his suffering and express his emotions. Also the client should know that he is allowed to stop and *back away*, at least temporarily, if he feels *uncomfortable*.

- **Pacing:** The client should be allowed enough *time* to express his views. One consequence of trauma is that the body and mind are

easily overwhelmed. The physiotherapist can help the client by *adapting herself to a pace that is tolerable for the client*. That pace may change throughout treatment and should be monitored continuously.

- **Validation:** The physiotherapist should *acknowledge* what the client has been through and what his present situation might be.

- **De-institutionalize the surroundings:**
 - The *surroundings* in which the therapy takes place should have as little resemblance to an institution as possible.
 - The physiotherapist should be aware of *possible traumatic reminders* in her room. She should also share with the client her awareness of the potential for the client to encounter traumatic reminders and should find a way to address this with the client. If the physiotherapist suspects that something is a reminder, the issue should be addressed directly with the client. For instance, a glass water bottle standing on the table caused distress and memories of torture. The water bottle was taken away when the physiotherapist, by asking the client, found out that this was a trigger and the client felt much calmer when it was removed.
 - The physiotherapist should consider whether it is best to wear *uniform* or it would be preferable to wear other *informal clothing*.

- **Boundaries:** In the physiotherapy session the contact should be characterized by a high degree of respect for the *client's boundaries*.
 - That can include *body positioning between the client and therapist* – at what distance does the client feel comfortable?
 - Can the client accept that the therapist is standing behind him, or should the client be able to see the therapist at all times?

- The *client's own position* is important - *where in the room does the client feel comfortable* – does he for instance need to be close to the door to have a possible “escape route”?
 - Is he comfortable *reclining*, or does that position trigger anxiety? Is prone perhaps better than supine, or is he more comfortable sitting? An “open” position is likely to trigger a greater feeling of vulnerability.
 - It may also be important to consider whether the client is more comfortable *when the therapist and client are positioned at the same physical level*. For instance, a client might be more comfortable if both are sitting, as compared to the client recumbent and the therapist standing, where the mere position signals the therapist’s superiority.
- **Undressing:** Usually during physiotherapy sessions clients are routinely asked to *undress*. With this client group more care should be exercised. Most of the torture survivors have been naked during torture in order to humiliate them. Therefore the question of undressing is very sensitive.
 - The client should *be asked* whether he is *comfortable undressing*. If he agrees to undress his reactions should be observed continuously to ensure that he stays comfortable.
- **Touching:** The physiotherapist should pay much attention to *how the client reacts to being touched*.
 - The client might perceive a well-meaning touch as an invasion of his personal space or as a threat. He might feel uncomfortable with the closeness and intimacies which touch involves. He might feel a need to protect himself and react with withdrawal, both physically and mentally, or with an increase of physical tension. If these signals are not observed by the physiotherapist, the arousal level of the client may increase and anxiety and distress may be provoked.
 - Other clients have no problems being touched and do not react with an increase of arousal.
 - Some clients can accept being touched on certain parts of the body and not on others.

- It can be a help to start manual treatment on a body region where the client can observe what is being done.
 - Above all it is essential that the physiotherapist pays extra attention to the reactions (physical/physiological and psychological) and responds to these reactions in order to show respect, avoid invasion and let the client keep control.
- **Pain:** During torture, the client has been exposed to excruciating pain. As a result the client often *fears and avoids pain*.
 - Many clients have a *low pain threshold* and a pain response will easily be provoked. In the beginning of a physiotherapy course, care should be taken to avoid painful treatments.
 - Many clients have *little understanding of the reasons for their pain*. Pain will often provoke anxiety as the clients perceive the pain as a sign that they are seriously ill.
 - Therefore, an important intervention is *education on pain* and pain mechanisms. Another intervention is to work with *increasing the tolerance of pain*.
 - It should be observed that the *infliction of pain can trigger bad memories or even flashbacks*.
 - *Physical activity will often provoke pain* and some clients tend to avoid activity to avoid pain. Other clients cannot accept that pain limits their activity and will carry out the activity in spite of pain. Neither of those solutions is recommendable. An intervention method can be education on *graded activity*.
 - When instructing the client in physical activity it is important to consider the pain level and capability of the client and grade the number and level of exercises accordingly. Sometimes the number of repetitions that the client can tolerate might be very small.

Special concerns when working with torture survivors with Post Traumatic Stress Disorder (PTSD)

Many torture survivors suffer from symptoms of PTSD which may influence their rehabilitation. Among the symptoms that can influence client response to physiotherapy are:

- A higher arousal level than normal
 - Flashbacks and bad memories
 - Decreased concentration and ability to remember
 - Decreased ability to think clearly
 - Depression
 - Poor sleep
- **A higher arousal level than normal:**
 - For many clients, *bringing the arousal level down and learning to control it* is an important goal of the rehabilitation. In the individual physiotherapy session it is important to avoid situations which may increase the arousal level.
 - *Indications of a high arousal level*, which the physiotherapist may observe, are in brief:
 - Faster respiration
 - Increased sweating
 - Pale skin colour
 - Cold skin (possibly clammy)
 - Dilatation of the pupils
 - Physical restlessness
 - If any of these signs are observed it is necessary to find out what is triggering the client's arousal and find ways to stop it. One example could be that the physiotherapist is positioned too close to the client, another could be that a position is uncomfortable for the client, either pain wise or memory wise, a third example could be that the client has become stressed by something that has been discussed.
- **Flashbacks and intrusive memories:** A high arousal level can increase the risk for triggering bad memories and flashbacks.
 - During a flashback a client *relives a traumatic incident*. It may be so vivid that the client believes that the traumatic incident is taking place right now, and appears to be a psychotic delusion or hallucination, which it is not.
 - If the client has a flashback, the physiotherapist should avoid physical contact with the client and in a calm voice say the client's name, remind him of where he is, and of who

the physiotherapist is.

- **Decreased concentration and ability to remember:**
 - A high arousal level can impair the client's concentration and ability to remember due to decreased activity of the hippocampus. As a result, his ability to stay focused in the present can deteriorate. For example, it may be difficult to carry out body awareness exercises where the attentiveness and concentration is needed.
 - Remember that poor concentration and poor memory often is a problem, and it is therefore important *not to over-dose the number of exercises* presented in a session.
 - It is essential to give *written and illustrated instructions* and to consider, how much information, he is able to digest during a session (such as in psycho-education).

- **Decreased ability to think clearly and focus attention:**
 - With a high level of arousal the client can have difficulties in thinking clearly and can become unfocused. In such a condition, the client will not be able to benefit from a psycho-education session or may have difficulties in grasping and remembering instructions.
 - Keep *information short and simple* without too much detail.

- **Depression:**
 - If the client suffers from a depression it can be *difficult for him to motivate himself* to attend to his appointments in physiotherapy or to do assignments at home.
 - Set *realistic goals* with the client so he does not feel overwhelmed.
 - *Integrate physical exercise* as much as possible *into daily activity*.
 - *Low intensity exercise* is preferable especially in the initial phase.
 - Communicate with the psychologist about cognitive strategies and psycho-educational material.

- **Poor sleep:**
 - Many torture survivors with PTSD suffer from poor sleep. Often they find it *difficult to fall asleep or they wake up numerous times* at night. Therefore some like to sleep in the mornings and it may be an advantage to *avoid making morning appointments*.
 - Communicate with the psychologist about reinforcing behavioural strategies to promote better sleep.

- **Relaxation:** When clients suffer from a high physical or psychological tension level many physiotherapists will automatically think of relaxation as a treatment measure. While this will work well in most cases, it can create additional problems in torture survivors.
 - If the physiotherapist chooses relaxation as an intervention, it is important to *think carefully about body positioning compared to the client's vulnerability*. As mentioned before, a very open position (for instance lying supine) may be a very vulnerable position and therefore not the best choice as a starting position for relaxation. In the beginning it may be beneficial to try out a sitting position.
 - Some torture survivors might *unconsciously use muscular tension as a way of keeping in difficult emotions and memories*. If the client is ready to contact these emotions or memories, relaxation training could be helpful before a psychotherapy session in order to access the emotions more easily. But, if the client is not ready to let go of the muscular defence (which is protecting him from difficult emotions), relaxation training might trigger anxiety or flashbacks.
 - The physiotherapist should carefully consider when to use active or passive relaxation methods. An active method will promote a higher degree of control and less vulnerability. In some cases, relaxation may be rejected to the benefit of *active exercise and increase of physical strength*.

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CHAPTER 2: Chronic pain in torture survivors

This chapter will focus on the symptom which torture survivors most commonly present in physiotherapy; persistent pain.

General models of pain will be presented and reflections on possible pain mechanisms in torture survivors will be discussed. The last part of the chapter will focus on suggestions for physiotherapy interventions.

Definitions

Pain: An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. (International Association for the Study of Pain, IASP, 1994).

Chronic Pain: Pain without apparent biological value that has persisted beyond the normal tissue healing time (usually taken to be 3 months). (IASP, 2003).

Chronic Pain in torture survivors

Among the multitude of problems presented by torture survivors referred for treatment, persistent pain in the musculoskeletal system is recognized as one of the most frequent physical complaints¹. Studies indicate a high prevalence of persistent pain in torture survivors, with overall incidence up to 83%².

The clinical picture is one of regional or widespread pain. Most common pain is headache, musculoskeletal pain, back, and/or neck pain, chest or thoracic pain, joint pain including shoulder pain, foot pain and pelvic pain. Visceral symptoms (cardiovascular, respiratory, intestinal, and urogenital complaints) are also prevalent^{2,3,4,5}. Multiple pains are common⁶. In a

¹ Pain, Clinical Updates, Oct. 2007, Vol. XV, Issue 7

² Scand J publ Health 2006;34:496-503

³ Torture 2006; 16(1)

⁴ Torture 2005; 15:16-24

study from 2010, 78% of 178 interviewed torture survivors reported persistent multiple pains, mainly in the head and low back. The study showed a clear association between female abdominal/pelvic/genital pain and rape/sexual assault and between male anal pain and rape⁷.

A Case Story

Ahmed is a Kurdish Iraqi who in his youth was involved in a Kurdish Liberation Movement. He was subjected to severe torture during his multiple interrogations and subsequent imprisonment. The torture methods used were beatings all over the body, including falanga, suspension by the arms, cigarette burns, forced positions and electrical torture. He was imprisoned in a small, overcrowded cell where it was impossible for all of the inmates to lie down to sleep all at the same time. The prison food was scarce and poor.

When released from prison Ahmed fled to Denmark and started a new life. In spite of suffering from back, neck and shoulder pain and from pain in his feet, he manages to learn Danish and pursue an education. He would occasionally get flashbacks and his sleep was interrupted by nightmares, but he worked hard on suppressing the memories from the torture.

After twenty years in Denmark, Ahmed finds it increasingly difficult to endure his pains and bad memories. He takes many sick days from his job and is fired because of this. He complains of recurrent headaches, constant neck and back pain, shoulder pain, tingling and tremor in his hands, and bilateral foot pain which gets worse with a heavy workload. After he loses his job, he gets flare ups of his pain symptoms and he experiences more stress due to worrying about his future. It becomes a vicious circle where pain and stress maintain each other.

Mechanisms of Pain – Current theories of pain

Gate Control Theory

Melzack and Wall developed the gate-control theory in 1965 to explain why there is not a simple, one-to-one relationship between the nociceptive input and the pain experience. The gate-control theory was

⁵ PhD Thesis, Olsen DR. Copenhagen: Faculty of Health Sciences, University of Århus and RCT. 2006

⁶ Pain 133 [2007] 5-8

⁷ Journal of Pain and Symptom Management, Vol. 40, No 5, Nov 2010

an attempt to explain the experience of pain (including psychological factors) on a physiological level.

In the gate control theory, pain is divided into two components that are processed separately by the body. These are:

- Signals from the peripheral nervous system which is outside of the brain and spinal cord, and
- Signals from the central nervous system that includes the spinal cord and the brain.

Nociceptive signals flow along the peripheral nerves to the spinal cord and proceed to the brain. In the spinal cord, there are “gates” (in the dorsal horn – substantia gelatinosa) that can inhibit (close) or facilitate (open) nerve impulses going from the body to the brain. These “gates” are influenced by a number of factors including the diameter of the active peripheral nerve converging in the dorsal horns as well as “signals/information/instructions” descending from the brain.

When the gates are more open, a person experiences more pain since the messages flow freely. When the gates close, the pain is decreased or may not be experienced at all.

This is a very simplified version of the original complex theory. Some of the physiological assumptions of the gate control theory have been revised, but the conceptual model has remained important and as such *it is valuable in the education of clients.*

The Neuromatrix Theory

This theory is a further development of the Gate Control Theory. In the neuromatrix theory, pain is seen as a multidimensional experience. The pain experience is divided into three dimensions:

- *The sensory-discriminative* (somatosensory), which refers to the sensation of pain and includes its location, quality (e.g. burning, dull, or sharp), intensity, and duration.
- *The affective-motivational* (limbic), which encompasses the emotional reactions to pain, for instance how much the pain bothers the patient.
- *The evaluative-cognitive* (thalamocortical), which refers to how pain is perceived and interpreted. The client’s beliefs and attitudes towards pain which may arise from their cultural

background and from previous pain experiences play a crucial part in this dimension which can modify the two other dimensions.

All three dimensions contribute equally to the experience of pain and also motivate actions to relieve pain.

The conclusion is that there is not just one centre of the brain which processes pain, but rather the pain experience/perception is a compilation of activities at multiple levels within the brain. Also, the more chronic the condition, the smaller the role of the somato/sensory, and the larger the roles of the limbic and thalamocortical centers. *This is important knowledge to convey to the clients. One implication for treatment is to make use of positive thoughts or actions which can overshadow and therefore lessen the pain perception.*

The bio-psychosocial model

This model views pain as an interaction among biological, psychological, and sociocultural variables. The model has been described in a variety of ways. The process of *nociception* is the first component. The second component is recognition of pain at the cortical level as a consequence of nociception. According to Loeser's model⁸, the next component is *suffering*, which is the negative affective response brought about by pain, such as depression, anxiety, or fear. It is important to stress that pain and suffering are two separate phenomena. The fourth component is *pain behaviour*, which can be influenced by cultural background and environmental factors and includes both verbal and nonverbal behaviours. Specific pain behaviour can, for instance, be avoiding physical activity for fear of re-injury. In other versions of the bio psychosocial model, additional components are *attitudes and beliefs* and *social environment*.

⁸ Loeser, JD. Pain and suffering. Clin J Pain, 2000, 16:2-6

Reflections on chronic pain mechanisms in torture survivors

Many factors are in play when acute pain develops into chronic, persistent pain. As mentioned above, a very large number of torture survivors suffer from daily persistent pain. In this chapter we try to identify reasons for this.

Initial pain severity, extent of injury and level of emotional stress at disease onset are believed to have an influence on whether acute pain develops into chronic pain. Inadequate treatment of the acute injury may also increase the risk for developing chronic pain. For torture survivors, this indicates a significant risk to develop chronic pain;

- In the torture situation there is a magnitude of nociceptive input repeatedly and for a long time.
- The pain intensity is extremely high.
- The level of emotional stress is devastating.
- The torture victim⁹ is out of control, leading to a sense of powerlessness.
- There is no or inadequate possibility for acute treatment of the injuries.
- There are other human beings who are inflicting this suffering, often with intent to humiliate and destroy the personality of the subject.

When pain has become chronic, several factors contribute to maintaining the pain:

- Continued emotional stress - continuous hyper arousal increases the sympathetic activation which in turn sensitizes the nociceptors and adds to the nociceptive input.
- Poor sleep decreases the tolerance to pain
- High degree of avoidance behaviour. Pain can act as a reminder of the torture situation. Therefore many torture survivors try to avoid pain provoking activities. This behaviour may lead to physical deconditioning and aggravation of pain.

⁹ The person who has been subjected to torture is usually referred to as a torture survivor. Here, however, the term torture victim is chosen as it describes the situation where the person is being tortured and therefore has lost control.

- Long lasting pain can lead to neuroplastic changes in the brain pointing to central sensitization
- Depression, which is a common comorbid factor with chronic pain, promotes cognitive distortions in which the pain is regarded as insurmountable. Every pain flare-up may be catastrophised into a worsening of the condition.
- Social withdrawal and minimal involvement in life activities may lead to boredom and increased focus on pain and past history
- Suffering from the frequently co-morbid conditions of PTSD, anxiety and depression
- Loss of trust in other human beings and social institutions

Peripheral mechanisms

Skin

Skin makes up about 15 to 20 % of our body weight and acts as an important sensor and protector in relation to the outside world. Injury to the skin very seldom leads to chronic pain. A few exceptions are severe burns and corrosion with acid. If the ability to slide over the underlying tissue is decreased, mechanical stretching of the small nerve fibres may elicit pain.

Scars after burns inflicted by cigarettes or other agents, gunshot wounds, lacerations, electrical torture or strapping can also act as reminders and may in this way spark or maintain pain.

Fascia

Fascia is a tough and strong tissue which is connected throughout the body. The fascial network surrounds all our internal body parts, muscles, tendons, ligaments, bones, nerves and even internal organs. The purpose of the fascia is to provide a sliding and gliding environment for muscles, to suspend organs in their proper place, to transmit movement from muscle to the bones they are attached to, and to provide a supportive and movable wrapping for nerves and blood vessels as they pass through and between muscles.

Any trauma, big or small, may produce adhesions and restrictions in this tissue which consequently insert large pressure on pain sensitive structures of the body. Restrictions in the fascia may be localized to the

specific area of injury, or extended into areas of the body that may not seem related. Untreated, these restrictions are likely to cause pain and dysfunction.

Torture related injuries which may compromise the fascia could be from strapping, blunt violence (blows to the body with fists, boots, or baton sticks etc., falls from heights etc.), falanga, suspension or prolonged forced positions. Pain maintaining factors could be poor posture which creates shortened and tense fascia.

Muscles

Muscle pain is the most frequently reported pain problem. The muscles have an efficient blood supply, and consequently heal well when injured. However, scar tissue in the muscles may decrease their flexibility and contractive abilities and lead to poor muscle performance, with increased load on neighbouring muscles as a result.

During torture, muscles may be injured by blunt violence (blows to the body with fists, boots, or baton sticks, falls from heights, crushing by rollers etc.), by carrying heavy loads, or by electrical torture which might cause micro ruptures due to extreme muscular contractions. Suspension and prolonged forced positions may cause strains/tears of muscle fibres and strapping may decrease the blood supply thus eliciting pain.

Long term pain maintaining factors after torture may be:

- Increased tension in muscle groups due to constant stress and pain.
- Altered posture with poor alignment which changes the muscular balance, causing pain in shortened muscles.
- Inactivity which causes deconditioning of the body. This causes unhealthy, weak and underused muscles which become painful even at low activity.

Nerves

The peripheral nerves connect the brain and spinal cord to the tissues. They consist of about 50% ligamentous tissue, which makes them quite strong, and 50% neurons. Nerves use a lot of oxygen and are therefore dependent on a high blood supply. In the peripheral nerve a continuous nociceptive input may lead to activation of nerve growth factors. This leads to sensitization and "upgrading" of the receptors (peripheral

sensitization). Clinically, this manifests itself as hyperalgesia, which is *increased sensitivity to pain*. Additionally, nociceptors, which are normally "silent", become active following tissue injury. Also, the nerve cells can change response in regard to which signals they transmit. This means that afferent nerves which usually convey information such as touch, temperature or movement, become noxious and transmit pain signals. This creates a situation where stimulation (e.g. touch) which normally is not painful will be perceived as such (allodynia).

Symptoms which commonly are associated with peripheral nerve injury are:

- Pins and needles
- Burning pain
- Pain at night, especially in the hands and feet

All around the body, nerves slide as you move. Injury which alters these movements may lead to pain when you move. When a nerve is sensitive, one tends to favour postures that avoid exerting mechanical load on the affected nerve, e.g. by raising the painful shoulder up, bending your spine sideways or poking your head forward.

Stress makes it worse. Nerves, especially the sensitized ones, become sensitive to the chemicals which are released in the body by stress. This can turn into a self-maintaining circle in which the stress of pain makes the nerve more sensitive, causing it to send more pain signals. Many torture survivors have an elevated level of arousal and probably a higher level of stress chemicals, which may contribute to maintaining their pain.

Nerves can be injured by cutting, too much squeezing and pulling, by irritating chemicals around the nerve, and by sustained reduction in blood supply. Forms of torture that may affect the nervous system include beatings, gunshot wounds, stab wounds, asphyxiation, prolonged suspension, prolonged forced positions, strapping and falaka/falanga and electrocution¹⁰.

Bones and joints

Bones and joints are full of nociceptors. Bones are covered with a supersensitive layer (the periosteum) which acts as an extra protection system. Most joints are synovial joints which mean that the joint cavity is

¹⁰ Spinal cord (2002) 40, 213-223

enclosed and contains a slippery lubricating fluid. The linings inside these joints are full of nociceptors. If these nociceptors are sensitized, movement will be painful.

Movement and regular compression are essential for the health of the joints. Movement produces and distributes the synovial fluid, and the cartilage is nourished by the pumping compression.

Bones heal as a rule very well. Fractures obtained during torture are mostly left to heal without treatment, sometimes causing deformities and poor alignment.

Torture methods which may cause injury to bones and joints and a risk for chronic pain originating from those structures may be blunt violence, fall from heights, suspension, falanga, carrying heavy loads, prolonged forced positions, cold, damp prison cells, or exposure to extreme cold.

Pain maintaining factors can be fear of moving. Decreasing the movement of a joint compromises the nutrition of the joint and its cartilage which in the long run can cause stiffness and pain.

Ligaments

Ligaments are dense tissues that connect bones to other bones to form a joint. Ligaments are present in every joint to hold the bones in place and prevent dislocation.

Ligaments are tough, slightly elastic bands of white connective tissue. They contain sensory nerve endings, including nociceptors. The ligaments also protect bones from fracture by acting as shock absorbers.

Ligaments are likely to be overstretched by torture methods such as prolonged forced positions or suspension. The overstretching may compromise the stabilizing abilities of the ligaments and lead to instability of the affected joint. Spinal instability may lead to back pain and possibly pain sensations corresponding to the dermatome, myotome or sclerotome of the strained segment(s). Trauma due to blunt violence might also injure the ligaments. Poor posture could cause further overstretching of ligaments.

Central mechanisms

Central sensitization

Sensitization is defined as: "Increased responsiveness of nociceptive neurons to their normal input, and/or recruitment of a response to

normally sub threshold inputs”¹¹. Sensitization can be both central and peripheral. Central sensitization: “*Increased responsiveness of nociceptive neurons in the central nervous system to their normal or sub threshold afferent input*”¹². Central sensitization is normally initiated only by nociceptor sensory inflow and is characterized by reductions in threshold and increases in the responsiveness of dorsal horn neurons, as well as by enlargement of their receptive fields.

Based on clinical experience, certain symptom constellations are considered to indicate pain due to central sensitization:

- Increased intensity and distribution of spontaneous pain, without a corresponding worsening of the underlying (peripheral) pathology
- After-sensations and summation (e.g. increased pain following palpation and massage)
- Increased pain intensity following physical activity
- Increased pain during sitting and standing that makes the client change position constantly.

Thoughts, beliefs, emotions about pain

How the torture survivor thinks about his or her pain is essential, as negative thinking about pain can maintain the pain. The negative thoughts lead to negative emotions. This can disturb sleep which can increase pain. It can also lead to increased stress and arousal which enhances the pain experience.

There are many ways of faulty thinking about one’s pain. The ones most commonly seen are listed below:

- *Catastrophizing* – is to imagine the worst possible outcome or scenario. “I am sure that my headache is because of a tumour in my brain” or “I am sure that this condition will paralyze me and leave me in a wheelchair”.
- *Blaming* – someone or something else is made responsible for the pain. Typically, the torturer is the one to be blamed for all the horrendous events in life, including the pain. For some torture survivors, the blame or guilt is turned inward: “It’s all my fault

¹¹ IASP, 2011

¹² IASP, 2011

that this happened to me". Blaming fate or a god is also a way of making someone else responsible.

- *Filtering* – involves seeing situations through a kind of tunnel vision. Most often, the torture survivors filter out any potentially positive aspects of their lives and keep focus on the pain and distress. "I am in pain all the time. This is not living. What's the use?" (Ignoring the sunny day, some good news, that spring has come etc.).
- *Polarized thinking* – everything is "black or white", "good or bad". There is no grey area in which reality or improvement can be seen. "I have done these exercises for a week now and it hasn't helped. I will never get rid of this pain". "It is never going to be any better". "I tried to do as the therapists said and levelled my activities, but my pain is just as bad. I will never be able to control my pain".

Pain-related fear

Fear is the emotional reaction to a specific, identifiable and immediate threat. Acute pain of a certain intensity will often be perceived as a threat, eliciting fear which promotes protective measures to stop further injury and facilitate healing. In most individuals, acute injury and pain subsides quickly and healing occurs, but for most of the clients at DIGNITY, healing in the tissue hasn't led to the expected reduction in pain. Because persistent pain is still interpreted as a signal of bodily threat, a mismatch occurs between what the client expects (decreased pain) and what actually happens (increased or lasting pain). In these cases, catastrophic misinterpretations of pain may occur. Catastrophizing inevitably results in pain-related fear – fear of pain, fear of injury, and fear of physical activity. Accumulating evidence now shows that these misinterpretations and the associated pain-related fear often cause a cascade of psychological and physical events, including hyper vigilance, muscular reactivity, and avoidance behaviour and guarding movements, which in turn perpetuate the pain problems and lead to disability.

Anxiety

Numerous studies have demonstrated that levels of anxiety have a significant impact on reports of pain severity. Studies with chronic pain patients have demonstrated that a high proportion is quite anxious and that their anxiety does not disappear¹³. In a study published in Pain in

¹³ Chronic Pain – Turk & Flor, p. 265

2007, findings from community-dwelling adults from 17 countries indicate that those with back or neck pain are two to three times more likely to have had, in the past 12 months, panic disorder, social anxiety disorder, generalized anxiety disorder or PTSD¹⁴.

PTSD

More studies indicate that pain and PTSD are highly comorbid conditions. Patients with chronic pain have higher rates of PTSD. Likewise, patients with PTSD are often diagnosed with numerous chronic pain conditions¹⁵. In fact, people with PTSD report chronic pain with striking frequency. Almost 30% of those seeking outpatient treatment for PTSD from community and mental health clinics, and 50-80% of military veterans and volunteer fire-fighters with PTSD, report chronic pain¹⁵.

Other studies found that increased PTSD symptoms are related to increased pain levels, pain disability and widespread pain¹⁶. PTSD has been identified as a risk factor for chronic pain, for the transition from acute to chronic pain and for pain disability¹⁶. Moreover, pain has been identified as a predictor for the development of PTSD. It seems that components of PTSD maintain and exacerbate symptoms of pain and vice versa.

Prolonged stress may deplete endogenous opioids and lower nociceptive thresholds and consequently may contribute to the development of stress-related gradual onset pain syndromes.

In prolonged stressful life situations the sympathetic nervous system is activated, leading to a lower nociceptive threshold and increased spontaneous activity of nociceptors¹⁷, and pain.

Depression

Research suggests that 40-50% of chronic pain patients experience depression¹⁸. In most cases, depression appears to be the patients' reaction to their predicaments. A disorder which is chronic, painful, and inhibits participation in normal daily activities will have a psychological impact on the individual. Furthermore, constant pain tends to cause a withdrawal to the inner life and a loss of interest in the outer world. The

¹⁴ Depression and Anxiety 26:888-901 (2009)

¹⁵ Moeller-Bertramm, T., et al., Pain and post traumatic stress disorder – review of clinical and experimental evidence, Neuropharmacology (2011).

¹⁶ Beckham et al., 1997; Geisser et al., 1996

¹⁷ Pain Clinical Updates, Vol. XII, No 7: Anxiety and Pain

¹⁸ Chronic Pain – Turk & Flor, p.260

practical result is an increased tendency to social isolation and emotional withdrawal.

Sleep

Research suggests that there is a link between sleep and the experience of pain. Pain can disrupt sleep and make it difficult to obtain a good night's sleep. In turn, disrupted sleep seems to contribute to enhanced pain perception. One study indicates that disrupted sleep seems to serve as a risk factor for inadequate pain-inhibitory processing¹⁹. Longitudinal research and preliminary experimental work suggest that while disturbed sleep is a consequence of pain, sleep disruption might also contribute directly to hyperalgesia²⁰. Another study indicates that sleep continuity disturbance, and not simple sleep restriction, impairs endogenous pain-inhibitory function and increases spontaneous pain²¹. These findings suggest that it is of great importance to improve sleep function in torture survivors with chronic pain.

Overall intervention and interdisciplinary teamwork

As a consequence of the many aspects of pain in torture survivors, the ideal rehabilitation is a multimodal, interdisciplinary approach where health professionals of different disciplines work together with the torture survivor. Relevant professionals could be doctors, psychologists, physiotherapists and social workers. In parts of the world where health resources are limited, a full interdisciplinary team is not always possible. However, regardless of the circumstances, it is essential that the therapists/counsellors who work with the torture survivors consider all aspects of their suffering and try to address as much as they can in a holistic and interdisciplinary manner. As a minimum a psychosocial counsellor and a rehabilitation technician (or the like) need to work together.

The physiotherapy intervention

Assessment

An accurate pain assessment is the first step in effective pain

¹⁹ European Journal of Pain 13 (2009) 1043-1047: Sleep continuity and architecture: Associations with pain-inhibitory processes in patients with temporomandibular joint disorder

²⁰ How do sleep disturbance and chronic pain inter-relate? Smith+Haythornthwaite, Sleep Med Rev 2004;8:119-32.

²¹ The Effects of Sleep Deprivation on Pain Inhibition and Spontaneous Pain in Women. SLEEP, Vol.30, No. 4, 2007

management. Information must be obtained about the nature of the pain, about the patient's physiological, behavioural, and emotional responses, and about the patient's previous experience with pain. Based on a thorough pain assessment decision is taken regarding which intervention should be chosen.

History of pain

A thorough history of pain should include questions which may play an important role for the later pain management. Basic information such as age, gender and ethnicity should always be included.

Below is a list of important considerations to evaluate regarding the history of pain:

- Pain pattern, pain intensity, pain location, pain characteristics and duration
- How and when the pain started
- Previous episodes of pain and its treatment
- Exacerbating and pain-relieving factors
- Activities of daily living inclusive of sports and leisure
- Work history
- Quality of sleep
- Thoughts about pain – pain beliefs and catastrophic thinking
- Pain behaviour including fear avoidance and kinesiophobia (fear of movement)
- How does pain influence the life situation of the client
- Social support system, regarding family, friends, work, economic situation
- Use of medication
- Symptoms of depression
- Symptoms of anxiety
- Symptoms of stress (PTSD)

As seen from the list, the approach is bio psychosocial, which is recommended when dealing with chronic pain.

Simple measures to assess pain intensity are visual analogue scale (VAS), numerical rating scale (NRS), verbal rating scale and facial expression scale. They have all been thoroughly tested for reliability and validity. The NRS seems to be the most useful. To get an easy overview of the pain location, a pain drawing/body diagram is a useful tool.

The *Brief Pain Inventory (BPI)* is useful to assess the functional impact of pain. The first part of BPI measures pain intensity/severity and the second part measures how pain interferes with general activity, mood, sleep etc.

Physical and Functional Examination

Self-reporting tools such as WHO-DAS or DRI can be used to assess the patient's ability to engage in functional activities.

Furthermore, the physiotherapist should observe:

- Walking, posture, transfers, Activities of Daily Living (ADL), compensatory movements and patterns, and obvious neurological problems.
- When observing movement, items such as symmetry, flow, rhythm, pace, movement harmony, economic use of energy should be considered.
- An assessment of active and passive range of motion, strength and sensitivity should also be included.

Overall treatment for chronic pain

Many people with chronic pain just want to get rid of it. They have high hopes that somebody; doctors, physiotherapists or other health workers, will "fix them" and "free them of their pain". However, even if the most powerful treatments (medications such as opioid drugs and antidepressants, or even surgery) are available, these will typically only reduce their pain by 40%²². There is no easy way, no miracle cure. The involvement and participation of the client is essential and it is important that the client feels responsible and co-operate with the therapist/doctor for his own treatment/rehabilitation.

The main foci for chronic pain management are:

- For the client to gain control of his pain, to ensure that the client and not the pain is in charge of his life.
- To achieve the best possible function in spite of pain
- To increase general quality of life
- To alleviate the pain as opposed to curing the pain.

Interventions are directed towards the consequences of pain rather than the causes of pain. The physiotherapy interventions should focus on

²² Pain Survival Guide, p. 4

coping strategies, pacing activities, and education in order to achieve an understanding of the mechanisms behind pain, thereby decreasing anxiety and stress. The overall aim is to empower the client to help himself.

TOOL 1: Education and understanding – “Understand pain so you don’t fear it”

Learning about pain physiology reduces the anxiety about pain. Reduced anxiety will reduce the activation of all of our protective systems: sympathetic, endocrine and motor. And a reduction in the activation of these systems can reduce the pain experience²³.

Pain mechanisms: When dealing with clients who suffer from chronic pain one of the most important tasks is to make them aware of the difference between acute and chronic pain. Many chronic pain clients deal with their pain as if it were acute which has a negative influence on their pain behaviour.

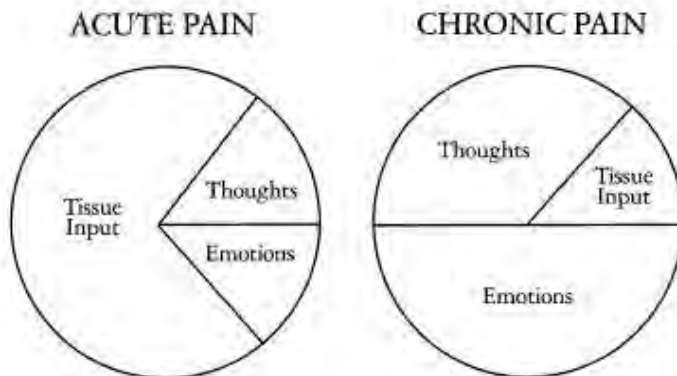
Acute pain: *“Pain that is associated with tissue damage, inflammation or a disease process”* (IASP, 2011). Acute pain is a warning signal. As such it serves to protect the body from tissue damage. If tissue damage has occurred, acute pain allows time for healing.

This is the kind of pain that you experience when you cut your finger or stick yourself with a needle. At first you will feel a sharp distinct pain and shortly after a more dull unspecific pain. In acute pain, there often is a one-to-one relationship between the amount of tissue damage and the pain experience. And the pain will subside when the tissue is healed.

Chronic pain: *“Pain that occurs past the point of tissue healing” or “Pain that lasts more than 3 to 6 months”.*

The most important message is that chronic pain is not a warning signal as is acute pain. It does not serve as a protective function for the body. Chronic pain *is not long term acute pain but is a condition in which pain is the problem in itself.* In opposition to acute pain, thoughts and emotions play a much greater role.

²³ Moseley, GI, Hodges PW, Nicholas MK. A randomized controlled trial of intensive neurophysiology education in chronic low back pain. Clin J pain, 2003 + Moseley GI. Evidence for a direct relationship between cognitive and physical change during an education intervention in people with chronic low back pain. Euro J Pain, 2004. 8:39-45



Source: "The Psychological Management of Chronic Pain by William W. Deardorff, Ph.D, ABPP

Sensitization of the central nervous system and its consequences

The model of central sensitization is best explained to the torture survivor in simple terms: " Due to the very intense and repeated pain input during the torture some changes have occurred in your brain which has made it more sensitive to painful stimuli. This means that you have a lower threshold to pain than you had before. Sensations that were painful earlier on will be perceived more painful now. Some sensations that you wouldn't have felt as painful before, will now be painful. Pain can spread to other areas which did not hurt before, even if these areas have not been affected. This is because your brain for a long time has received alarm signals from your damaged tissue and in order to protect you from harm, it has sent pain signals. This has been going on for so long, that the brain now reacts more quickly and more intense to this kind of stimulus, making you feel more pain, even if there is nothing wrong with the tissue. Also, when you do not sleep so well, the pain reducing system which everyone has, doesn't work so well. Furthermore stress and hyper arousal will also make you more sensitive to pain because the pain threshold is lowered."

TOOL 2: Awareness

An essential discussion with a torture survivor who suffers from chronic pain is about what factors influence the pain experience. The goal of that discussion is to make the client aware of the many dimensions which affect the way pain manifests itself in his/her specific case.

Impaired body functions – influence on pain

Torture survivors who experience chronic pain tend to tense their muscles in an attempt to protect themselves from pain. This may lead to the pain-muscle spasm-pain circle. When in spasm, muscles tend to remain in a tense or contracted state, the blood flow to the muscle decreases, and a compensated abnormal body posture is developed. This may serve to maintain the pain or make it worse. Pain is also likely to influence the respiratory pattern, potentially promoting shallow breathing or other faulty patterns. All these factors should be discussed with the torture survivor in order to raise his awareness and motivate him to change this negative circle. Focus on:

- Altered body posture
- Tension patterns
- Changed respiration patterns

It is helpful to discuss with the torture survivor what influences his pain experience. The factors can be categorized as “negative experiences”, which increase pain, and “positive experiences”, which decrease pain. It can be illustrated by writing “pain” on a piece of paper. The client is then asked to choose two pens in two different colours, one colour for negative influence and one colour for positive influence. The different factors are written around “pain” and arrows pointing towards “pain” can be made in a size to indicate how much a certain factor influences the pain. By becoming aware of which factors can increase and decrease pain the client can be encouraged to focus on the pain reducing factors and try to minimize the pain increasing factors. For both the therapist and the client it is a useful tool to get an overview. Often this exercise will show that the biggest negative influence on the pain experience is bad memories about the torture situation.

Awareness on thoughts and beliefs about pain

Thoughts and beliefs are conveyed by nerve impulses too. Through scientific research, it has now been shown that thought processes can be powerful enough to maintain a pain state²⁴. Typical harmful thoughts can be: “I’m in pain so there must be something harmful happening to my body” or “When the scan can’t find it – it must be really bad” or “I shouldn’t do anything until all the pain goes away”. Discuss with the client what thoughts and beliefs he has about his pain so as to promote his awareness. Through education on pain most of these pain-

²⁴ Butler and Moseley, Explain Pain

maintaining thoughts hopefully can be changed. If not, it is important to challenge them in a discussion with the client.

Promoting other sensations from the body besides pain

For many torture survivors with long term pain, the dominant sensory input from the body has developed into pain. Some clients are so absorbed with this sensation that other sensory inputs tend to be overlooked. A small exercise is to do a “body journey”, focusing on other sensory inputs than pain. Some examples are temperature, the outline of the body, connection to the ground (where does the body have connection to the mat or the chair), rhythm of the breathing etc. This exercise may be difficult because their habitual attention is on pain. It will take a lot of discipline to try to overrule this focus. An extra benefit from this exercise is that it will increase the overall awareness of the body. As a way of survival, many torture survivors have shut down the contact to own body, due to the extreme pain and suffering from the torture situation. For some, this contact has never been restored. This can lead to overhearing signals from the body and not being well grounded. For some torture survivors regaining awareness of the body can be an overwhelming experience and this exercise should be exercised with care in order to avoid flashbacks, panic attacks or dissociation.

TOOL 3: Activity – “Use it or lose it”

Inactivity spiral – deconditioning

A typical consequence of chronic pain is that the client becomes more and more inactive. Moving less leads to decreased strength in the muscles, reduced endurance, and decreased aerobic capacity. Over time this can increase disability. After just a few month of decreased movement, more activities will become difficult and will begin to cause pain. This additional pain is likely not related to the original cause of pain but to weakened muscles. Therefore, it is crucial to discuss this matter with the client, raising his awareness of the importance of becoming more active again.

Fear- avoidance

If the client has a problem with fear of pain, it will be helpful to use the illustration below to discuss with him which consequences this can have for his pain behaviour and how this can influence and main-tain pain. (See p. 27 – Pain related fear).



Figure 1. Vlaeyen's cognitive-behavioral model of chronic pain pathogenesis [Vlaeyen JWS, Linton SJ. Pain 2000; 85:317-332.]

Pacing principles, graded activity

Many torture survivors with chronic pain have become more physically inactive than they really need to be. Others think that they should be capable of doing the same activities as before torture, which often leads to increasing pain. Pacing or graded activity can be two ways of gently balancing both client groups' activities.

Pacing: is a method to teach the clients how to economize with their energy by working and resting intermittently. Pacing can be used when doing exercise or in daily activities and work situations. The pacing principles work as follows:

- The client chooses an activity
- The client is asked to estimate his current physical capability for this activity.
- The activity level is then set to be 20-25% under that estimate. This is the baseline for the training.
- The client carries out his activity and takes a break of the same length as the activity. The break can for instance be another activity
- If no pain is felt or anticipated, the procedure is repeated 1-2 times more.
- On "bad" days the client reduces activity by 50%.
- When pain has stabilized, the load/impact is increased by 10%. This "pacing" – increase in load – can for instance be carried out every second week.
- The client can be encouraged to keep a diary to keep track of his improvements.

Graded exercise: This overlaps quite a bit with pacing. It is a treatment program which includes graded increase of activity over a certain timespan and without regard to pain level.

Instruction in exercise – strength, endurance

When instructing the torture survivor in exercises it is important to do it in accordance with the principles described above. It is acceptable that the pain level goes up, both during the exercise and for up to 4 hours afterwards. Warn the client that this is a normal experience to prevent anxiety and loss of motivation. It also serves to strike a balance between monitoring the pain level and not focusing excessively on the pain.

TOOL 4: Reduction of bodily stress – how to reduce arousal and tension

An important tool to reduce pain is to teach the torture survivor how to lower his arousal, because elevated arousal increases pain and muscular tension.

Relaxation

Relaxation exercises give the client a *tool to activate the para-sympathetic nervous system* (put on the brakes) and decrease hyper-arousal and muscular tension. If used regularly and over time, relaxation exercises can help to decrease the experience of pain and the muscular tension. Relaxation exercises done over time can also help to restore disturbed sleeping patterns, and thereby give the client more energy to cope with pain. (See annex 1)

Breathing techniques

This is a fast and easy way to *activate the para-sympathetic nervous system* (“put on the brakes”) and decrease hyper-arousal and thereby reduce muscular tension and pain. (See annex 2)

Visualization/Pleasant imagery

Pleasant images are a good way to get distracted from pain, to achieve deep relaxation, and to reduce pain perception. This procedure promotes relaxation simply by focusing attention on pleasant, relaxed and positive images. (See annex 3.)

Distraction

Another way of achieving true relaxation is through distraction. Torture survivors with chronic pain tend to focus on their painful bodies, and on

how much they cannot do. This is human nature. The ability to attend to other things is, however, also human nature and this ability can be helpful in reducing the pain experience. The less attention, a client pays to pain, the less disabling and invasive the pain experience will be. Some clients will have resistance to this approach and say: "I can't distract myself. My pain is too severe". Here, it must be acknowledged that controlling attention when having pain is difficult and that this technique will not yield immediate relief. Effective distraction takes time and practice. Search for a type of distraction which makes sense for the torture survivor. If he is religious, prayer can for instance be a powerful distractor (See Annex 4).

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CHAPTER 3: Post-traumatic stress disorder (PTSD), hyper arousal and the bodily reactions

Definition

According to DSM-IV-TR diagnostic criteria for PTSD, both a) and b) must have occurred:

- a) loss of “physical integrity”, or risk of serious injury or death, to self or others, and
- b) an intense negative emotional response.

In addition, one or more of the following reactions must be present in the victim, as well as c) and d):

- 1) flashback or intrusive memories
 - 2) recurring distressing dreams
 - 3) subjective re-experiencing of the traumatic event(s),
 - 4) intense negative psychological or physiological response to any objective or subjective reminder of the traumatic event(s).
 - 5) symptoms of persistent avoidance
 - 6) emotional numbing
 - 7) persistent symptoms of hyper-arousal, which were not present before the traumatic event.
- c) The symptoms should persist at least one month after the traumatic event.
 - d) The symptoms must lead to “clinically significant distress or impairment” of major domains of life activity.

Description of the problem

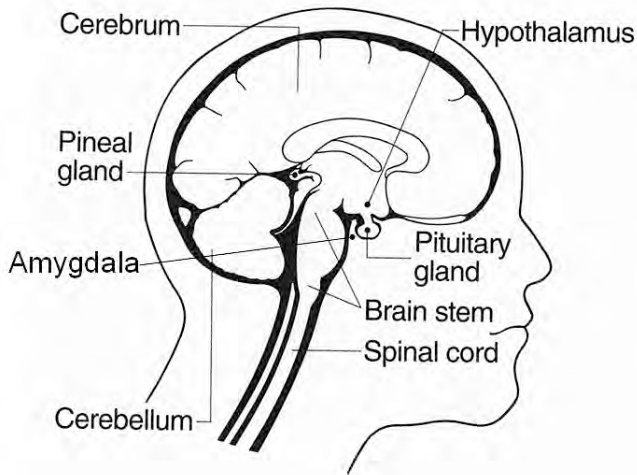
Many torture survivors suffer from some symptoms of PTSD. The condition can have a heavy impact on the everyday life of the torture survivor, such as

- *lack of concentration and memory impairment* can make it impossible for a torture survivor to learn a new language or engage in other forms of education.
- the *tendency to isolation* can stop a torture survivor from following his kids to the kindergarten or going to the supermarket.
- the *high arousal level* can make it impossible to get a good night's sleep with all the consequences this may have,
- it can be *difficult to control ones temper*.

The list of associated problems is long. PTSD is often complicated by the fact that it frequently occurs in conjunction with related disorders such as depression, panic attacks, substance abuse and other problems of physical and mental health.

The physiology of acute stress

The stress response begins in the brain. When someone confronts an oncoming car, a major fire or other danger, the eyes, ears or nose (or all three) send the information to the amygdala, an area of the brain which contributes to emotional processing. The amygdala interprets the images and sounds. When it perceives danger, it instantly sends a distress signal to the hypothalamus. The hypothalamus functions like a command centre, communicating with the rest of the body through the autonomic nervous system, which controls such involuntary body functions as breathing, blood pressure, heartbeat, and the dilation or constriction of key blood vessels and small airways in the lungs. The autonomic nervous system has two components, the sympathetic nervous system and the parasympathetic nervous system. The sympathetic nervous system functions like a gas pedal in a car. It triggers the fight-or-flight response, providing the body with a burst of energy so that it can respond to perceived dangers. The parasympathetic nervous system acts like a brake. It promotes the "rest and digest" response that calms the body down after the danger has passed.



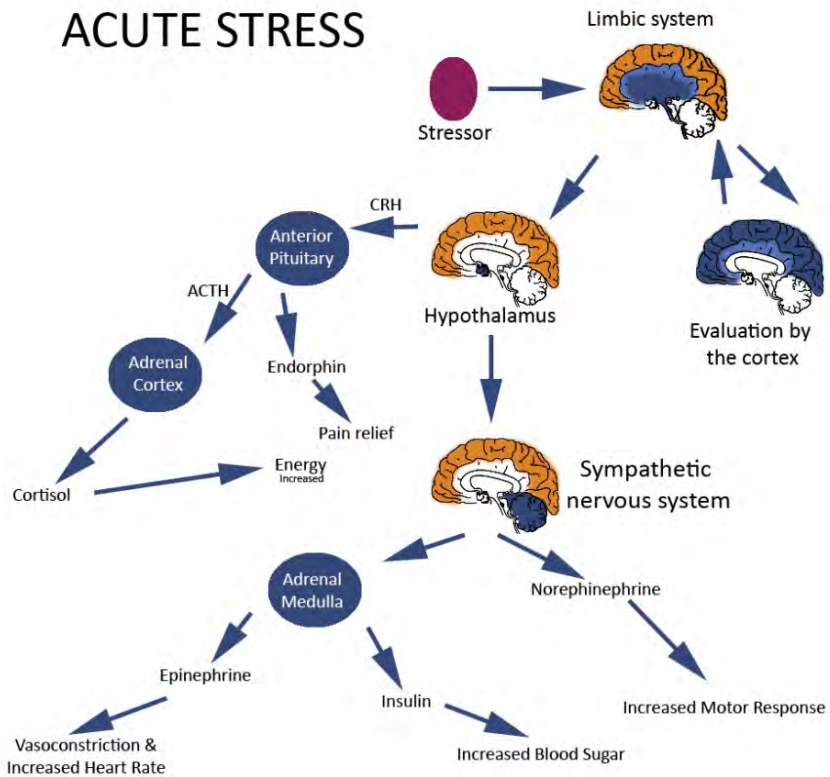
After the amygdala sends a distress signal, the hypothalamus activates the sympathetic nervous system by sending signals through the autonomic nerves to the adrenal glands. These glands respond by releasing the hormone adrenaline (also known as epinephrine) into the bloodstream. As adrenaline circulates through the body, it brings on a number of physiological changes, which will prepare the body to respond to the threat:

- The breathing rate increases
- The heart rate increases
- The blood flow is directed to the muscles and the heart, and away from the skin and the intestines
- More red blood cells are released from the spleen to increase the capacity of the blood to transport oxygen
- The content of glucose in the blood increases to mobilize more energy to the muscles
- The sweating increases to get rid of excess heat
- The pupils dilated to sharpen the vision

Shortly thereafter, the hypothalamus activates the second component of the stress response system – known as the HPA axis. This network consists of the hypothalamus, the pituitary gland, and the adrenal glands. If the brain continues to perceive something as dangerous, the hypothalamus releases Corticotrophin-releasing Hormone (CRH) which

stimulates the pituitary gland to release Adrenocorticotropic Hormone (ACTH). This again activates the adrenal glands to release cortisol. Cortisol at a certain level will inhibit ACTH and CRH and thus call the alarm off and the body will return to its normal balance.

The most common response to threat is “fight and flight”. If the threat is so overwhelming that the individual (unconsciously) evaluates the situation to be impossible to fight or flee, a third response can set in: “freeze”. This reaction is also called “tonic immobilization” and is characterized by paralysis, with either slack muscles (as when a mouse is captured by a cat) or stiff muscles (like a gazelle or rabbit caught in headlights).



During freezing there is an altered sense of time and space, reduced registration of pain, and dampened emotion. As such, freezing is a valuable survival defence. The physiology behind the freeze response is not as well described as in “fight and flight”. It is believed that the HPA-axis is involved and that the parasympathetic nervous system is activated along with the sympathetic nervous system, but this is only guesswork.

The physiology of PTSD

The etiology behind PTSD is unknown. Recent years have brought extensive research in the field and some patterns are becoming clearer.

More studies have shown that PTSD clients have low cortisol levels²⁵. Why this is so and what it means, is not known, but it is reasonable to believe that the low cortisol level could be responsible for a continuous hyper arousability. We know that it takes a certain level of cortisol to inhibit CRH and ACTH.

Studies^{26,27} show that the function of three areas of the brain may be altered in PTSD: the prefrontal cortex, amygdala and hippocampus. The volume of hippocampus is seen to be reduced in PTSD clients in some studies^{3,28,29,30,31}. As the hippocampus, together with the prefrontal cortex, is believed to attenuate the fear response triggered by the amygdala, a decreased response from hippocampus might result in a failure to regulate amygdala activity effectively, thus resulting in a hyper-reactivity to conceived threat.

Childhood trauma⁶ and chronic adversity seem to increase the prevalence for PTSD. Peri-traumatic dissociation also seems to predict the development of PTSD. Being exposed to a trauma caused deliberately by another human being (e.g. sexual assault, torture, child abuse etc.) carries a greater risk of developing PTSD than being exposed to a trauma caused by an object (e.g. a car crash) or a natural disaster (e.g. earth quake)³².

²⁵ Yehuda et al, 1990, 1995, Bauer, Priebe, and Graf, 1994

²⁶ Turnbull, GJ. The biology of posttraumatic stress disorder. *Psychiatry* 5:7. 2006 Elsevier

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²⁸ *Biol Psychiatry* 2006;59:171-177

²⁹ *Hippocampus* 14:292-300 (2004)

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³¹ *Neuroimag Clin N Am* 17 (2007) 523-538

³² Ekman R, Arnetz B. *Stress*. 2006. FADL ´s Forlag

All this being said it should be stressed that there is considerable controversy within the medical community regarding the neurobiology of PTSD.

Symptoms

Following a traumatic event, almost everyone experiences some symptoms of PTSD. When we are talking about extreme events, such as torture or detention in a concentration camp, 8 out of 10 develop PTSD⁸.

The symptoms of PTSD can arise suddenly, gradually, or come and go over time. They can be triggered by something that reminds you of the original traumatic event or they can appear seemingly out of the blue. The symptoms can be divided into the following categories:

Re-experiencing symptoms:

- Intrusive, upsetting memories of the event
- Flashbacks – reliving the trauma over and over
- Nightmares (either of the traumatic event or of other frightening things)
- Feeling of intense distress when reminded of the trauma
- Intense physical reactions to reminders of the event (e.g. pounding heart, rapid breathing, nausea, muscle tension, sweating)

Symptoms of avoidance and emotionally numbing:

- Avoiding activities, places, thoughts, objects or feelings that remind you of the trauma
- Inability to remember important aspects of the trauma
- Loss of interest in activities that were enjoyable in the past and in life in general
- Feeling emotionally numb and detached from others
- Sense of a limited future (you don't expect to live a normal life span, get married, have children, have a career etc)

Symptoms of increased arousal:

- Difficulties falling asleep or staying asleep
- Irritability or outburst of anger
- Hypervigilance, feeling tense or “on the edge”
- Difficulty in concentrating
- Feeling jumpy and easily startled

- Increased stress sensitivity

Other common symptoms of PTSD:

- Guilt, shame, or self-blame
- Depression and hopelessness
- Suicidal thoughts and feelings
- Feeling alienated and alone
- Feelings of mistrust and betrayal
- Panic attacks
- Headaches, stomach problems, chest pain, decreased immune defense

Interdisciplinary intervention

Psychotherapy is the main intervention for PTSD along with pharmacological treatment. Prolonged Exposure Therapy, EMDR and other types of CBT along with somatic experiencing are widely used methods.

Family therapy is another important intervention, as PTSD can influence the whole family in a negative manner.

Physiotherapy is a strong supplement to these interventions.

Physiotherapy assessment and intervention

If possible, BARS (Body Awareness Rating Scale) or BAS (Body Awareness Scale) are good assessment tools which can grasp some of the bodily symptoms of PTSD. If this is not an option, observation of vegetative reactions, respiration, level of arousal, level of attention and ability to be mentally present are helpful measures to assess the physical reactions to PTSD. An assessment of the client's body awareness can also be relevant, as many PTSD clients have decreased sense of their body, possibly due to dissociation.

As physiotherapy intervention it can be recommended to use:

- **Psycho-education about PTSD and the related bodily reactions**
 - That should include information about;
 - the acute stress reaction – the “fight-flight-freeze” response

- how the stress reaction is felt in the body and why
 - how the body reacts to prolonged stress
- The goal of this intervention is to;
 - increase the knowledge of the client about his bodily reactions to stress so he gains
 - a better understanding for his reactions and thereby reduce the anxiety that can be sparked by these reactions
- **Breathing exercises**
 - This is a fast and easy way to activate the para-sympathetic nervous system (put on the brakes) and decrease hyper-arousal.
 - Can be used as a help to, for instance, control anxiety and anger
- **Different kinds of relaxation**
 - Relaxation exercises will provide the client with a tool to activate the para-sympathetic nervous system (put on the brakes) and decrease hyper-arousal and enhance tranquillity.
 - If used regularly and over time, relaxation exercises can help in counteracting some of the negative physical reactions to stress, such as for instance hypertension.
- **Grounding exercises**
 - The main aim for doing grounding exercises is to achieve better stability and a sense of standing firmly and flexibly on the ground.
 - Grounding is best trained with open/flexible joints allowing gravity to approximate them. This will reflectorically activate the postural muscles to contract and work against gravity.
 - The exercises should be done rhythmically as this will stimulate the breathing to fall into this rhythm. A rhythmical steady breathing will facilitate calm and control.
 - A good sense of grounding facilitates a good balance and a sensation of standing firmly on the ground, both physically and mentally.
- **Basic Body Awareness Therapy (BBAT)**
 - BBAT consists of a set of low intensity exercises performed in lying, sitting or in standing. The exercises are performed repeatedly and rhythmically. The concept is including

training of the mental awareness of the client while doing the exercises.

- The goal of BBAT is to achieve increased flow in movements, increased balance & stability and a free respiration. Other goals are increasing the sense of centering, increasing the sense of own boundaries and reestablishment of contact to own body. A more overall goal is to move effortlessly in a harmonious way using least possible energy.
- When done regularly over time the physical achievements will spill over in the mental state of the client so he achieves greater awareness in the presence, better sense of self and better mental stability.

- **Other kinds of body awareness training**

- There is an abundance of different ways to train body awareness. The common denominator for all is that the exercises strive to achieve better contact to and awareness of the body.

- **Mindfulness training**

- Mindfulness is the practice of focusing attention on what is happening in the present and accepting it without judgment.
- Mindfulness can be practiced as distinct exercises or less formally where the client is encouraged to stay in the present and truly participate in life. Any task or movement can be used to practice mindfulness, for instance mindful walking.
- Mindfulness training can help clients enhancing their ability to concentrate, stay in the present and relieve stress.

- **Physical training, both endurance and strengthening, done with a big component of mindfulness and body awareness**

- If performed regularly at moderate intensity, exercise offers a host of health-enhancing benefits. It improves cholesterol levels, lowers blood pressure, keeps bones strong and healthy, and enhances the immune system. It also boosts metabolism and mood. In this way it counteracts some of the negative consequences of long term stress/PTSD.
- If exercise is performed shortly after a stress response is engaged, stress hormones can also be burned off just as nature intended.
- If exercise is carried out with full attention on the task at hand, the sensations in the body and the surroundings, the

stress-relieving effect can be boosted. It should leave the client feeling calmer and more centred.

- Rhythmic, repetitive activities, such as walking, jogging, swimming, or bicycling, can be calming and relaxing. The client should be aware of how his breathing complements the activity. Then he should breathe rhythmically, focusing on the movement and the breathing.
 - It should be noted, that with acute stress it is important to keep exercise intensity on a low to moderate level in order not to activate the sympathetic nervous system to a too high degree.
- **Relaxation massage**
 - Research shows that massage lowers blood pressure and heart rate and may enhance certain measures of immune function.
 - A 2005 review of research studies involving massage therapy showed that massage increased the activity of pleasure-related brain chemicals in clients with a broad range of physical and psychological conditions.
 - **Cognitive behavioural training, for instance focusing on breaking isolation or taking public transportation.**

Monitoring and evaluation

Specific monitoring of PTSD is a part of the psychotherapeutic assessment and intervention.

In physiotherapy monitoring tools which are used in a broader context can also be used to indicate progress concerning PTSD. The monitoring tools could be BAS, BARS, individual goal setting and DRI (Disability Rating Index).

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CHAPTER 4: Sleep disturbances

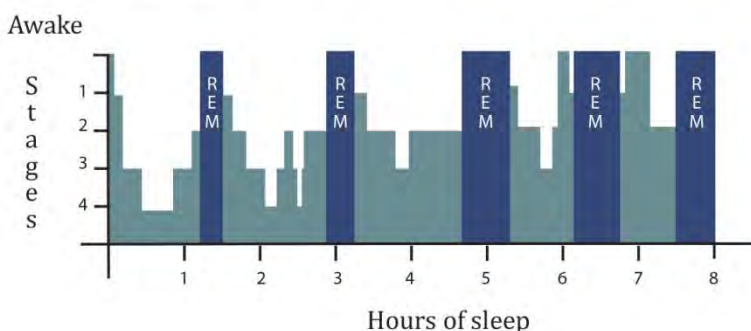
Many torture survivors suffer from various sleep disturbances. They may have difficulties in falling asleep due to intrusive memories, flashbacks and troubling thoughts. Some torture survivors maintain a high level of vigilance, causing a high level of adrenalin in the blood which may influence the sleep negatively. During sleep, nightmares or pain may cause awakenings followed by difficulties in getting back to sleep. Some torture survivors suffer from depression or anxiety and these conditions may also influence sleep in a negative manner. The result is that many torture survivors have very poor sleep, often getting a maximum of 4-5 hours of fragmented sleep each night. Among PTSD patients, 50-70% report chronic nightmares and at least as many report frequent insomnia³³.

Sleep stages

Sleep has distinctive stages that cycle throughout the night. With EEG monitors sleep stages may be divided into two different phases:

- 1.) Non-REM-sleep (stages 1-4), divided into
 - a) Light sleep (stages 1 and 2)
 - b) Deep sleep (stages 3 and 4)
- 2.) REM-sleep (REM = Rapid Eye Movement)

SLEEP STAGES



³³ Basics of Sleep Guide, chapter 21

1) Stage 1-4 sleep

Stage 1 (Transition to sleep)

- This stage is a transitional short “dozing” period lasting about 5 minutes. The thoughts become dull. You drift in and out of this stage. Sometimes you can recall visions from this stage, as a preview of your dreams. Few muscle spasms can occur.

Stage 2 (Light sleep)

- This stage lasts about 10 to 25 minutes. You go into a light sleep, you have no thoughts and you are easily woken up. No eye movements, the heart rate slows down, and the body temperature decreases.

Stages 3 and 4

- Deep sleep is characterized by relaxation, decreased metabolism, lower heart rate, blood pressure and temperature. This deep stage lasts 30-40 minutes in the beginning of the night, but decreases during the night in depth and duration. During the deep sleep the brain gradually works less. Muscular activity decreases. You are difficult to wake up, and if you are awakened, you do not adjust immediately and often feel groggy and disoriented for several minutes.

All four stages are connected with:

- relaxation
- low muscular activity
- decreased blood pressure
- decreased heart and breathing rate
- decreased metabolism
- increased growth hormone, (only seen in stages 3 and 4)

2) REM- sleep

After the first deep sleep, that is about 1½ hours after falling asleep, you will return to the light sleep again. Here you will enter the REM-sleep. REM-sleep is characterized by:

- The eyes are moving rapidly from side to side periodically.
- Considerable activity of the brain.
- The muscles are extremely relaxed, actually paralyzed.
- The heart rate and breathing rate is irregular.
- The blood pressure varies.

REM sleep is a psychologically active sleep phase, which makes up 20-25% of the sleep. During REM-sleep the brain is working, but the muscles are almost paralyzed so you can't move. The different sleep stages follow each other in a certain pattern throughout the night. You can say that the REM sleep is characterized by an "awake" brain in a "sleeping" body.

The REM periods last from 15 minutes in the beginning of the night up to 30-40 minutes closer to morning. You dream most vividly and dramatically during the REM sleep, especially in the end of the night.

How much sleep do we need?

- Most healthy adults need between 6,5 to 8,5 hours of sleep per night to function at their best. But the need for sleep is very individual.
- There is a big individual difference between the amount of sleep you can get by on and the amount you need to function optimally.

Health and sleep

It seems that we benefit most from the deep sleep. During this sleep stage;

- The body repairs itself and builds up energy for the day ahead
- Growth and development are stimulated. Deep sleep triggers enhanced release of growth hormone, which promotes growth in children
- Deep sleep helps build muscle mass and repair cells and tissues in children and adults.
- The immune system is boosted. The hormone which works to fight infections increases during sleep. This might explain why a good night's sleep helps to keep you from getting sick and helps you recover when you do get sick.
- We need sleep to think clearly, read quickly, and create memories. In fact, the pathways in the brain that help us learn and remember are very active when we sleep. Studies show that people who are taught mentally challenging tasks do better after a good night's sleep. Other research suggests that sleep is needed for creative problem solving. Studies show that when you lack sleep, you are more likely to make bad decisions and take more risks. This can result in lower performance on the job or in school and a greater risk for car accidents.

- Studies indicate that REM sleep plays a key role in learning and memory. During REM sleep, your brain consolidates and processes the information you've learned during the day, forms neural connections that strengthen memory, and replenishes its supply of neurotransmitters.

Consequences of lack of sleep

When you continuously do not get the amount of sleep you need, you begin to pay for it in many ways:

Impaired mood, memory and concentration. When you don't get enough sleep, you are less productive. Lack of sleep affects your ability to concentrate and remember things. It makes you irritable and cranky. As a result, your social and decision-making skills suffer. Also your ability to cope with stress suffers.

Dampened immune system. Without adequate sleep, the immune system becomes weak, making you more vulnerable to colds, flu, and other infections and diseases. And if you get sick, it takes you longer to recover.

Increased risk of accidents. Did you know that driving while seriously sleep deprived is similar to driving while intoxicated? The lack of motor coordination skills associated with sleep deprivation also makes you more susceptible to falls and injury.

Increased risk of medical conditions. That is conditions such as hypertension, diabetes, heart disease etc. Studies show that not getting enough sleep or getting poor quality sleep on a regular basis increases the risk of having high blood pressure, heart disease, and other medical conditions.

Increased risk of obesity. Hormones released during sleep affect how the body uses energy. Studies find that the less people sleep, the more likely they are to be overweight or obese, to develop diabetes, and to prefer eating foods that are high in calories and carbohydrates.

Common mental and physical causes of disturbed sleep

Psychological/psychiatric problems that may cause disturbed sleep: Depression, anxiety, chronic stress, PTSD. While depression will cause

different disturbances in sleep (trouble falling asleep, trouble maintaining sleep, awoken in the early hours of the morning), sleep deprivation may in some cases cause depression.

Medical problems that may cause disturbed sleep: Asthma, allergies, acid reflux, cancer, or chronic pain. Notice that patients who are unable to sleep notice pain more.

For torture survivors, the most common causes of disturbed sleep are:

- *intrusive memories, flashbacks and troubling thoughts.*
- *a high level of vigilance*, which can make sleep difficult. When the body is over-stimulated, the brain is flooded with neuro-chemicals that keep us awake, such as adrenaline. The neuro-chemicals remain present in the brain and can interrupt the normal sleep cycle.
- *darkness* may bring added anxiety and restlessness for some.
- repeated awakenings during the night due to *nightmares or pain*. When awakened it is often difficult to fall asleep again.

Symptoms of disturbed sleep

- Difficulties in falling asleep
- Waking up frequently during the night
- Trouble getting back to sleep when awakened
- Unrefreshing sleep
- Too few hours of sleep per night
- Relying on sleeping pills or alcohol to fall asleep
- Waking up too early in the morning
- Daytime drowsiness, fatigue, or irritability
- Difficulties concentrating during the day

Assessment

The most important assessment tool to find out if the client suffers from sleep disturbances is history taking. Below is a list of questions for inspiration

- Do you feel refreshed after your sleep?
- How many hours do you sleep per night?
- Is your sleep interrupted?
- If you wake up, what wakes you up?
- Do you have trouble falling asleep?

- Do you feel sleepy during the day? Do you take frequent naps? Do you fall asleep at inappropriate times during the day?
- Sleeping conditions – mattress, pillows etc., noise, light, privacy etc.?

Emotional issues such as stress, (PTSD), anxiety, and depression cause half of all cases of disturbed sleep. But daytime habits, sleep routine, and physical health may also play a role. Help the client to become a sleep detective.

- Has the client recently gone through a traumatic experience?
- Is the client under a lot of stress?
- Is the client depressed? Does he/she feel emotionally numb or hopeless?
- Does the client struggle with chronic feelings of anxiety or worry?
- Does the client take any medications that might be affecting his/her sleep?
- Is the sleeping environment of the client promoting sleep?
- Does the client feel safe where he/she sleeps?
- Does the client have appropriate sleeping habits?

If the client suffers from depression or anxiety, this should be addressed by a doctor or in the lighter cases, by a counsellor.

Treatment

Depending on the findings in the assessment the treatment is planned accordingly. One or more modalities can be offered. A cornerstone in the treatment is psycho-education about sleep, so the client achieves a better understanding for what promotes and hinders good sleep. The intervention demands the understanding and motivation of the client as it often is necessary for him to change old habits.

- Instruction in promotion of good sleep
- Instructions in relaxation exercises (see chronic pain chapter)
- Instructions in good resting positions
- Suggestions for suitable daytime exercise/physical activity, if necessary
- Pain management in general (see chapter on chronic pain)

Promotion of good sleep

Create a good sleeping environment. Minimize disturbances such as noise and bright lights. Have a bed and pillow which provides good support, as comfortable as possible. Concerning the mattress, it is important to have a single mattress instead of sharing one big mattress with your partner. This allows the mattress to be as suitable as possible to your needs. If pain wakes you up, experiment with resting positions. Keeping the temperature in your bedroom on the cool side, if possible, can help you sleep better.

Develop a calm bedtime routine. A consistent, relaxing routine before bed sends a signal to your brain that it is time to wind down, making it easier to fall asleep. Make the time before sleep a time of peace and quiet, and find your unique routine that relaxes you. It can be reading, listening to gentle music, praying, doing hobbies such as knitting, doing cross words etc.

Avoid coffee, black tea, cola, chocolate before bedtime. These drinks all contain caffeine and the stimulating effect of this may stay in the body for 4-8 hours and can make it difficult to fall asleep.

Avoid smoking before bedtime. Nicotine is also a stimulant. Heavy smokers often sleep very lightly and have reduced amounts of REM sleep. Some heavy smokers tend to wake up after 3 or 4 hours of sleep due to nicotine withdrawal and for them it can be necessary to smoke just before bedtime.

Avoid alcohol before bedtime. One drink might help you get to sleep, but more alcohol will give you a lighter sleep with increased muscular activity and awakenings.

Avoid medication that delays or disrupts your sleep, if possible. Some commonly prescribed heart, blood pressure, or asthma medications, as well as some herbal remedies for coughs, colds, or allergies, can disrupt sleep patterns. Talk to your doctor about it.

Have a bedtime snack. This may promote sleep. Foods containing carbohydrates can help calm the brain and allow you to sleep better. Examples of sleep promoting foods: banana, warm milk, whole-grain foods. Avoid large, high-fat meals, as that disturbs the sleep.

Be physically active during the day. In this way the body will be naturally

tired. Avoid being too physically active close to bedtime. Sleep experts recommend exercising at least three hours before bedtime, and the best time is usually late afternoon. Body temperature rises during exercise and takes as long as 6 hours to begin to drop. Because cooler body temperatures are associated with sleep onset, it is important to allow the body time to cool off before sleep.

Sleep in a location where you will feel most rested and safe. If complete darkness brings more anxiety, keep a dim nightlight on. It may also help to have a friend or a family member stay in the room, or a nearby room, while you are sleeping. This can enhance the feeling of safety.

Practicing relaxation techniques before bed is a great way to wind down, calm the mind, and prepare for sleep.

Do religious practices before going to bed, such as prayers or meditation.

Avoid watching or hearing the news late in the evening. The news can be disturbing and contain violent pictures which can cause bad memories and thoughts, which make it hard to sleep.

Avoid doing exposure homework close to bedtime. If you are doing therapy and are working with exposure, it is a good advice to do this in the middle of the day, so the hyper arousal and emotional reactions connected to this will have time to calm down before bedtime.

Handle excessive thoughts. If you suffer from excessive thoughts and this stops you from falling asleep, it can be a help to keep a notepad by your bed and write down your thoughts in order to handle them the next day.

Take a warm bath. The drop in body temperature after the bath will help you feel sleepy, and the bath can help you relax.

Don't stay in bed awake. If you find yourself still awake after staying in bed for more than 20 minutes, get up and do some relaxing activity until you feel sleepy. The anxiety of not being able to sleep can make it harder to fall asleep.

Don't take naps after 3 p.m. Late afternoon naps can make it harder to fall asleep at night. If you take a nap, keep it to under an hour.

Have the right daylight exposure. Daylight is key to regulating daily sleep patterns. Try to get outside in natural daylight for at least 30 minutes each day.

Resting positions



Sleeping on your side

Your usual sleep position - along with other factors, including your weight and your sex - can strain your back and contribute to development of back pain. Sleeping positions also affect existing back pain, either by letting you sleep comfortably or by making you wake up sore.

Similarly, back pain is more likely to keep you awake when your sleeping position provides no relief.

The most common sleeping position is on your side, with your legs and hips aligned and flexed. Because this position leaves your upper leg unsupported, the top knee and thigh tend to slide forward and rest on the mattress, rotating the lower spine. This slight rotation may contribute to back or hip pain. To prevent that problem, place a pillow between your knees and thighs.



Sleeping on your back

If you sleep on your back, place a pillow under your knees to help maintain the normal curve of your lower back. You might try a small, rolled towel under the small of your back for additional support. Support your neck with a pillow. This position may be helpful if you have low back pain.



Sleeping on your abdomen

Sleeping on your abdomen can be hard on your back. If you can't sleep any other way, reduce the strain on your back by placing a pillow under your pelvis and lower abdomen. Use a pillow under your head if it doesn't place too much strain on your back. If it does cause strain, try sleeping without a pillow under your head.

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Annexes

Annex 1: Training in progressive muscle relaxation

Relaxation is another good method to reduce tension that may cause or maintain pain or that may be caused by pain. In addition to a direct relaxing effect on the musculature, relaxation also has additional positive effects: it can distract from the pain, it can reduce sleep disorders that may accompany the pain problem, and it can reduce irritable moods and anxiety and increase your sense of well-being in general. Perhaps the best things about relaxation are that it is under your control and it is “portable”—you can take it with you (use it) anywhere you go.

There are many different methods that can produce a relaxed state. As we work together, one of our goals will be to find one or more types of relaxation that will be pleasant and helpful for you. It is important that you give each method a try so that we can determine what will be best suited to you. This means that you will need to practice each method, so that we can see how helpful each of the methods you try will be for you.

One type of relaxation is called progressive muscle relaxation (PMR). This is a simple and easy-to-learn type of relaxation training that many people with problems similar to yours have found beneficial. In PMR you will learn to successively tense and relax all important muscles in the body. The change from tension to the relaxation is performed to improve the perception of your tension level so that you can distinguish the differences between muscles that are tense from those that are relaxed. Often when muscles have been tense for a long time, we are not even aware that they are tense. Toward the end of the training we can completely leave out the tensing part and only practice relaxing the muscles. You will perform relaxation exercises throughout most of the sessions, but we will reduce the amount of time you spend practicing as you become better able to relax your muscles.

It is very important that you practice at home the exercises you learn here, once or twice a day, for 10–15 minutes each time. As you become better able to relax your muscles, you will learn that you can use relaxation during the day, even when you are not at home. Your cue to take a few moments to relax your muscles will be whenever you notice any tension building up in them.

Let's give it a try. When I ask you to tense your muscles, please hold the tension for 5 seconds (count slowly 1001, 1002, 1003, 1004, 1005) and then let go of all the tension—just let it flow out of your muscles. Only tense your muscles to a point where the tension does not become painful—about half of your maximal tension. If this level of tension gives you discomfort just lower it to a level you are comfortable with. Too much tension can result in unnecessary cramping and pain—I just want you to be aware what tension feels like.

Any questions? Okay, now let's begin. Sit as comfortably as possible in your chair. Your arms and hands should be placed comfortably on the armrest or on your lap, and your legs should not be crossed but side by side, with your feet resting on the floor. Breathe calmly and evenly. Concentrate on your breathing and relax as much as you can (30 seconds).

Now focus your attention on your right hand and forearm ... make a fist so that all the muscles in your hand and forearm are tense, bring your fist up towards your shoulder as if you were trying to show how big the muscles (your biceps) are ... hold the tension ... notice the tension, feel it in your fingers, your fist, your biceps, and in the muscle under your biceps ... and now relax again. Let all the tension flow from these muscles and let your right fist and forearm become more and more relaxed ... Notice the feelings of relaxation that you have produced by letting the tension flow out of your muscles. (30 seconds) ... Now try it again. Make a fist with your right hand, tense your right forearm, and let all the muscles become very tense. Now hold the tension—feel it in the fingers, the hand, the forearm ... and now relax again. Let all the tension flow out of these muscles ... let the right arm become relaxed ... and feel the difference between the tension and the relaxation you can create by letting the tension flow out of you ... Notice the pleasant feeling of relaxation you have attained that is now spreading through your right arm ... the fingers, the hand, the forearm. Pay attention to the difference in the feeling when you clench your fist and bring it to your shoulder and when your fingers are separated and your arm is resting on the chair.

Now focus your attention on your upper right arm and tense the muscles by pushing the elbow down on the armrest. Tense those upper arm muscles and leave the forearm relaxed. Hold the tension and attend to the tension in your upper arm, pay attention to the feelings of tension ... and now relax again ... Let all the tension flow out of your upper arm, the forearm and the hand, out through the fingertips and into the armrest. Let your entire arm become more and more relaxed ... Enjoy the pleasant

feeling of relaxation that you have been able to produce as it spreads through your right arm ... Now once more. Tense your right upper arm. Make it very hard and hold the tension for a few seconds ... and now relax again. Let all the tension flow from your right upper arm and feel again the difference between the tension and relaxation you have created ... and enjoy the pleasant feeling of relaxation ...

Further muscle groups to be included in training:

- left hand and forearm—same as right
- left upper arm—same as right
- forehead—raise your eyebrows as high as possible
- upper cheeks and nose—squint your eyes, wrinkle your nose
- lower face—clench your teeth and pull the corners of your mouth outward
- neck—push your chin toward your chest without touching it
- chest, shoulders, upper back—take a deep breath and while holding your breath, pull your shoulders up and back
- lower back—arch your back
- abdomen—push your stomach out and in at the same time
- right leg—stretch your right leg and point your toes toward the head
- right leg—tense your right foot and roll your toes under
- left leg—stretch your left leg and point your toes toward the head
- left foot—tense your left foot and roll your toes under

Now that you have tensed and relaxed many muscles in your body, please lean back and enjoy the relaxation that is spreading through your body. Take a deep breath, and with every breath you take, let the relaxation spread more and more throughout your body. In your mind, go through all the muscles in your body again and if you still find tension anywhere, just tense and relax that muscle again ... Feel how you can become more and more relaxed ...

In the next few minutes I will stop talking so you can concentrate completely on your relaxation ... Just breathe evenly and calmly and let the relaxation spread through your body ... (3 minutes).

Whenever you are ready, move your hand and feet ... take a deep breath and stretch ... Whenever you are ready, open your eyes and feel refreshed and relaxed ...

Patient Information about autogenic training

Autogenic training has similarities with progressive muscle relaxation (PMR). In contrast to PMR, which focuses directly on the muscles, autogenic training focuses more on breathing and on creating a general sense of well-being. Autogenic training can be used as either a complement to PMR or as a relaxation technique by itself. Even if you did not have a good experience with PMR, autogenic training may be a useful method for you.

Autogenic training involves focusing your attention on two ideas: feelings of warmth and a sense of calmness and letting things go. As you relax, you should focus on the sense of warmth that you can bring about by relaxing your body and by concentrating on feelings of well-being and relaxation throughout your body. Do you have any questions?

Let's give it a try. Make yourself as comfortable as you can in your chair. Place your arms on the arm rests of your chair, and place your feet flat on the floor. Close your eyes and try to get as relaxed as you can. Now think about warmth. Say to yourself: "I am feeling comfortably warm." Feel yourself sinking comfortably into your chair. Feel the tension leaving your body. Your body is becoming more and more relaxed, and you are feeling heavy and sinking gently into your chair.

You are feeling more and more calm, relaxed, and comfortably warm as you settle into your chair. Repeat the statement to yourself, "I feel comfortably warm. My body feels heavy," several times. Now continue to focus on the sense of warmth, peace, and calmness that you have been able to produce for 3–4 minutes. Just enjoy the pleasant feelings as you sit comfortably in your chair.

Chronic Pain: An Integrated Biobehavioral Approach:
Appendices
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Annex 2: Breathing awareness exercises

1. Lying or sitting

Place your hands on the lower edge of your ribs, fingertips a few centimetres apart. Feel your hands rise and separate as the air flows in, and recoil as it flows out.

2. Sitting with head and arms resting on a table

With movement in the front of the chest now restricted, you can feel the chest expanding backwards.

3. Lying or sitting

Place your right hand over the solar plexus (the soft part between the ribs and the navel) and your left hand over the front of your chest below the clavicle (collar bone). Notice what happens under your hands when you breathe. As the air enters, feel the expansion growing, first under your right hand, then rising through the chest to reach the area under your left hand. Explore that idea for a minute or two.

Taking into account that breathing also has an emotional component, the next exercise explores the difference in breathing depending on your emotional state:

4. Sitting or lying

Imagine for a few moments a situation that makes you feel uneasy Next, imagine one in which you feel at ease.....Did you notice any change in your breathing pattern from one to the other?

Controlled Breathing Exercise

Practice controlled breathing at least twice a day every day. Start with 2 minutes the first day, then add a minute each day thereafter. Record your experiences in a journal or notebook.

Some people find it helpful to have a written script that they can follow as they learn to practice controlled breathing. The following is one suggested script:

- Sit or lie down in a comfortable, relaxed position
- Inhale slowly and deeply through your nose.
- Hold your breath and count up to 4 at 1-second intervals (“a thousand 1”, “a thousand 2”, “a thousand 3”, “a thousand 4”), and then slowly exhale through your mouth.

- As you hold your breath, think of a single word such as “C-A-L-M” or “P-E-A-C-E”, to help free your mind from distracting or stressful thoughts. You can also say “breathe in” as you are breathing in and “breathe out” as you are breathing out.
- As you exhale, let your chest and stomach muscles relax, and if seated drop your shoulders.

Repeat this cycle at least three times for approximately 3 to 5 minutes.

The Pain Survival Guide – How to Reclaim Your Life. Dennis C. Turk, Ph.D,
Frits Winther Ph.D. American Psychological
Association, Washington, DC

Brief relaxation with diaphragmatic breathing

One way that people can learn to relax is to start by concentrating on their breathing. Strange as it may sound, most people do not breathe properly. They pull their stomach in when they inhale and push it out when they exhale. Thus, they don't get as much air as they could. Chronic tension usually blocks their breathing even more. External sources of stress and emotional conflicts can increase tension levels and can prevent deep, relaxed breathing.

The correct type of breathing is called diaphragmatic or abdominal breathing. If you put your hand on your body and take a deep breath by pushing the stomach out, you can feel how the diaphragm is being pressed down by the abdominal muscles. Thus, the lungs can make more oxygen available to the body, and deeper relaxation is possible. In addition, used air can be exhaled better. Slow, deep breathing also improves the circulation in tense areas of the body and thus reduces tension.

Let's try some diaphragmatic breathing. Put your hand on your stomach, feel how the muscles of your belly stretch out when you inhale slowly ... and how they go back in again when you exhale. Breathe through your nose, not through your mouth. Breathe without tension ... in and out ... in and out ... using your stomach and abdominal muscles. Don't pull your shoulders up.

As you breathe in, count to yourself slowly (1001, 1002, 1003), and now exhale slowly as if you are blowing toward a lighted candle but don't want to blow it out, and slowly count to yourself as you exhale (1001, 1002, 1003). Good—let's try it a few more times.

As you are inhaling you might want to think of something pleasant like a gentle cloud floating in the sky, or you might picture the letter in the word calm, C A L M. Just focus on your breathing for the next few moments, inhaling slowly and then gently exhaling.

Good! How did it go? Could you feel the difference in your breathing? Could you feel your body becoming more relaxed? With practice, this method of breathing will become a habit—it will become the way you breathe all the time without even thinking about it.

Practice breathing like this as often as possible at home. Choose an activity that is something you do frequently during the day (having a cup

of coffee, talking on the phone, or looking at your watch or a clock). Every time you begin this activity, check how tense you are and then use your diaphragmatic breathing for just a few seconds to relax completely. Or put small relaxation markers such as stick-on dots (you can buy those in any office supply store) or little signs with the word "relax" or "quiet" somewhere you will see them often during the day and practice noticing your tension and doing diaphragmatic breathing whenever you see those little dots or a signs. Remember: Deep breathing will only become automatic if you practice often. When you are in pain, diaphragmatic breathing helps you to relax and can reduce any tension-related pain. Imagine that every time when you exhale, the tension flows out of your body and takes away a little bit of the pain. And imagine that every time you inhale, relaxation and rest spread through your body and reduce your pain more and more. Any questions?

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Out tension, in peace

Listen to your breathing without altering its pattern.....imagine your tensions being breathed out.....imagine them being carried away, a little at a time with each breath out.....and now, imagine that every time you inhale, you are breathing in peace, a little at a time with each breath.....breathe out tension.....breathe in peace.....gently breathing.....feeling peace flowing through your body.....always keeping your breathing natural.....

Annex 3: Deep relaxation with pleasant imagery

Pleasant images are a good way to distract yourself from pain, to help you relax deeply, and to reduce pain perception. Unlike the progressive muscle relaxation you have already learned, this procedure helps you to become relaxed simply by focusing your attention. No tensing of the muscles is involved here.

Let's give it a try and see what you think. Please sit as comfortably as possible with both legs uncrossed and your feet side by side, with your arms on the armrests or in your lap. Relax and breathe slowly and regularly, and concentrate completely on my voice. Close your eyes. Breathe in through your nose and out through your mouth. In this exercise you'll learn to concentrate on one part of your environment while shutting out all other thoughts. In this state of mind you can hear my voice much better and are much better able to relax than in your normal waking state.

Now breathe slowly and deeply ... take a deep breath ... fill your lungs completely with air ... and then slowly exhale ... very slowly ... and when you exhale, let go of all the tension you can feel in your body ... just become more and more relaxed and quiet.

Now open your eyes, lean your head back slightly, and look up toward the wall. Keep your head still and look for a spot on the wall in front of you so that you are looking slightly upward ... perhaps look at the point where the wall and the ceiling meet ... Now concentrate completely on this point ... try not to blink ... let this spot completely fill your attention ... stare at this point ... and notice how your eyes are getting tired ... your eyes are getting tired and your eyelids feel very heavy, very heavy ... and the heavier your eyelids get, the more difficult it becomes for you to keep your eyes open ... and now you can slowly let your eyelids close ... if you feel like it ... and relax ... while you continue to breathe slowly and evenly ... and listen to me ... (30 seconds).

Now that your eyes are closed, feel how your body and mind are relaxing ... your heartbeat is becoming more regular ... you are breathing slowly and regularly ... the seconds are becoming very long, and you have a lot of time to become completely relaxed and calm ... you feel more and more calm, relaxed, more and more pleasant ... at one with everything ... and with every breath you take you relax more and more ... and you say to yourself "calm and relaxed" ... "calm and relaxed" ... "calm and relaxed" ... (approximately 30 seconds).

Now I will count backwards from 10 to 1 ... With every number you relax more and more ... You are in a state of quiet peaceful relaxation ... enjoy the relaxation ... the pleasant feeling of becoming more and more relaxed ... more relaxed than ever before ... 10 ... feel calm and relaxed ... experience great inner peace ... your mind is relaxed ... your body is relaxed ... you relax more and more ... 9 ... your relaxation increases ... you feel calm and relaxed ... more and more relaxed ... calm and peaceful ... 8 ... Your body is becoming more and more relaxed ... your mind becomes calm ... you feel great inner peace and pleasant feelings of relaxation ... you are relaxed and contented ... 7 ... more and more relaxed ... quiet and calm ... an inner feeling of peace and calm ... free of worry ... calm and peaceful ... growing relaxation ... endless calm ... deeper and deeper ... very calm and relaxed ... 6 ... deep inner rest and relaxation ... you feel warm, comfortable, and secure ... the muscles relax more and more ... feel your body letting go of tension ... your thoughts are on the relaxing feelings ... they are free and floating ... 5 ... deeply relaxed ... more and more ... endless calm and peace ... 4 ... deep inner relaxation ... completely relaxed ... united with everything ... calm and peaceful ... very quiet ... 3 ... very slow breathing ... your body and mind are calm and relaxed ... very peaceful ... away from everything ... floating ... 2 ... deeply relaxed ... deep inner peace and calm ... well-being ... complete relaxation ... calm and content ... your body is resting ... light and floating ... your mind is at ease ... 1 ... completely relaxed ... deep inner peace ... well-being ... calmness ... (approximately 30 seconds).

Now that you are so deeply relaxed ... enjoy this feeling for some time ... feel your breath ... how you are breathing slowly and deeply ... experience each breath you take and enjoy the pleasant feeling of relaxation that is spreading through your body ... totally relaxed and calm ... feel the warm, slow wave of relaxation flooding your body ... let it begin in your head ... feel the warmth in your head and face ... every muscle is relaxed ... now it is spreading to your neck ... your shoulders ... your back and chest ... into your arms and hands ... just let the relaxation spread through your entire body ... your hands are becoming warm and relaxed ... the relaxation is spreading now to your stomach, your hips and thighs, your legs, and down to your feet ... heavy and warm and relaxed ... very slowly into your toes ... the wave of relaxation has now spread throughout your entire body ... and you are even more relaxed and calm ...

Now imagine a very pleasant and relaxed scene ... maybe a place you have been to where you felt happy and relaxed ... maybe on vacation ... maybe a quiet beach, a lake, a forest, a meadow ... choose a pleasant and

relaxing spot ... and let your thoughts wander to this place ... Imagine that you are there ... Experience all the sensations and feelings that go along with it ... If you are outside ... feel the air and the sun on your skin ... the sounds ... the smells ... spend a few moments in this wonderful special place and enjoy yourself ... feel relaxed and calm ... (approximately 90 seconds).

Now I will count to 10, and while I am counting please feel more and more alert ... 1 ... 2 ... you feel more alert ... 3 ... 4 ... move your hands and feet and head ... 5 ... 6 ... take a deep breath and feel more alert ... 7 ... 8 ... take another deep breath and stretch yourself ... 9 ... 10 ... slowly open your eyes ... and whenever you are ready, feel relaxed and alert.

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Annex 4: Distraction of attention

“Sit back in your chair. Close your eyes and relax a little bit ... Pay attention to where your attention is wandering now ... Tell yourself: ‘Now I am noticing X (fill in the sentence) ... ’ You will notice that you can concentrate on things outside of your body, such as sounds or noises, or that your thoughts and sensations are focused on your body, for example where your hand is placed or how your heart is beating. Just let your attention wander between inside and outside and notice how, when you change your attention or focus, the thing you were concentrating on fades from your attention and other things will enter into the centre of your attention ...” (pause)

Discussion:

“What did everyone notice? How bad was the pain? Has something changed? Have people been able to concentrate well? Has anyone had a problem with this?”

“As you may have noticed, at any one point in time you can be fully focused on only one object or one sensation.

Now you can learn to control where your perception is going. You can learn to use it as flexibly as a searchlight. The light can only illuminate a small area at a time, but you can control the direction and focus of the beam.

“Instead of the image of a searchlight, the image of a TV screen can also be used. For example, you can switch from channel two to channel three. The signal from channel two is still there, but we cannot view it any more. We can reach similar goals by using our attention. We can switch the channel and switch from pain to something else.

“There are a number of possible ways to distract ourselves from pain, such as by concentrating on a positive image, by a change in our bodily sensations, or by external distraction, such as a good movie or an interesting talk.”

In the course of treatment, patients will be taught a number of different ways to distract themselves from pain. It is very important to determine what types of distractions the patients are already using and to enforce and potentially improve them.

Distraction with internal images or ideas

“Guiding your attention to positive images will be helpful in coping with certain pain problems. To be able to practice this form of internal distraction, it is a good idea to relax beforehand. We know that images

and fantasies become more vivid and clear when we are in a relaxed state. Remember that this inner distraction will have to compete with your pain perception. Thus, it is essential that the image is attractive for you, and that you create it as vividly and clearly as possible. Use all your senses (vision, hearing, touch, smell, and taste).

“These pleasant images that have been reported by patients might give you suggestions for your own images:

‘I’m imagining that I’m lying in a recliner chair on my back porch on a pleasant spring afternoon. Around me, everything is blooming, and I can see the colors of the flowers and smell their wonderful fragrances. There is perfect silence around me, and the sunshine feels warm on my body. I’m enjoying it all very much.’ ‘I’m lying on the beach at the ocean on a warm summer day. The beach is wide and flat, and there is nobody there except me.

I can feel the warmth of the sand under my body. A refreshing breeze from the ocean is cooling my forehead. I can hear the sounds of the waves and become aware of how my breathing follows their rhythm.’

Distraction of attention

“As these examples show, there are very different themes in those images. They can be memories of vacations, or they can be images that exist only in your fantasy. You can imagine beautiful landscapes or social activities with friends, or imagine being successful and recognized in your profession. It is important to have these images available in a ‘push-button’ way. After some practice you’ll find that the images become more vivid and detailed. It is also important to note that these images evoke different feelings of varying intensity (joy, fun, entertainment, pride, relaxation, security, and so on). The more diligently you practice, the more these positive images—and the positive moods they bring about—will be able to compete with your pain.”

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Body focus

“Another method of distraction focuses the attention directly on the part of your body in which the unpleasant feelings originate. Find a comfortable position for this exercise, and try to relax as much as possible ...

It is helpful to concentrate on your own breathing ... Observe how inhaling tenses the muscles of your chest and exhaling relaxes them again ... With every exhalation you can relax more and more ... Take a deep breath and exhale slowly ... Remember your relaxation word whenever you exhale ... very calm ... just relax ... Now focus all your attention on the part of your body that is painful for you ... for example your knee joints, your shoulders, or your hips ... Try to pay attention to these sensations in all their details. If you don't have any pain at the moment, try to imagine a pain sensation that is typical for you.

“Now focus first on the more objective characteristics of this sensations ... notice if the sensation is there all the time, or if it comes and goes in a wavelike pattern ... if it is concentrated on one point, or if it is spreading... notice how far it spreads ... Now analyze the quality of this sensation ... is it a feeling of warmth ... a pulling sensation ... rubbing?

“Take some time and watch your current experience. Simply watch where your attention or your thoughts are wandering ... Maybe your attention is focused on an inner process right now, perhaps a thought or a pleasant memory ... Your attention may also be focused on something external, e.g., what is written here ... Now direct your attention to something that was not so much in the focus of your awareness just now and take some time to become more aware of it.

“Now try to become aware of the sounds around you, what you hear ... While you are doing this, for example, you are mostly unaware of the sensations in your hands ... When I mentioned your hands, your attention probably moved there right away, and you are becoming more aware of sensations there, while the awareness of sounds is fading away.

“This exercise shows you that the thing that is the focus of your attention will move into the center of your experience. Other things will fade away into the background. Like a searchlight, your attention may change quickly from one thing to another, but you only become fully aware of whatever you totally focus your concentration on. Through training, we can learn to use our attention in a very flexible way. As our skill level

increases, we will be more and more able to decide what to focus our attention on.

“Some things do have the ability to draw our attention more than others. This is especially true for pain. In these situations our searchlight threatens to get “stuck” and is fixed on a certain sensation. In this case it is especially important to learn how to make our attention more flexible again.”

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Spiritual focus: meditation and prayer

One way to divert attention from pain and induce a state of relaxation is to focus on some spiritual word, phrase, or prayer. Prayer by itself or a focus on a religious figure such as Jesus, Mohammed, Buddha, or the spiritual being some call a *higher power* can be tremendously calming. Others find focusing on a sense of oneness with nature to be helpful. If this kind of focus appeals to you, you can focus on whatever you find most meaningful and relaxing.

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