

PAIN CARE

Abstract

Everyone has a different response to pain. Healthcare professionals need to be aware that pain is whatever the person experiencing pain says it is. Pain is typically divided into two classifications: *acute* and *chronic*, and the three primary types are *nociceptive pain*, *non-nociceptive pain*, and *psychogenic pain*. Treatments for pain are drug-based and non-drug based and there are varied types and dosing regimens of pain medication. While Certified Nursing Assistants do not administer pain medications, they need to have a basic knowledge and familiarity with commonly used pain medications and their side effects. Importantly, the Certified Nursing Assistant is able to deliver comfort measures to patients experiencing pain to help alleviate their symptoms and to enhance their feeling that the health team cares about their pain.

Learning Objectives:

1. Describe two classifications of pain.
2. Describe at least 3 factors that influence pain.
3. Describe the main aspects of the pain assessment.
4. Provide an example of non-pharmacological pain therapy.

Introduction

Pain is a universal phenomenon that affects millions of people, and it can be permanently disabling. There are two types of pain: acute pain and chronic pain. The causes of pain are generally the same for people but the experience is not because pain is subjective. There are many factors that influence the experience of pain, the type of pain experienced, response to pain, effectiveness of pain relief, and these factors are ultimately part of the patient's subjective report of pain. In this context, assessment tools for evaluating the nature and severity of pain have been developed that determine the pharmacological and non-pharmacological treatments used.

Recognizing and Defining Pain

Pain is the most common reason people seek health care, and many diseases and illnesses are discovered because a patient is in pain. Despite the importance and prevalence of pain in people's lives, pain is poorly understood. Helping someone who is in pain can be made easier by understanding the definition of pain.

According to the International Association for the Study of Pain, pain is "... an unpleasant sensory and emotional experience associated with actual or potential tissue damage ..." Yet, everyone has a different response to pain. Pain cannot be measured because it is partly subjective. Analgesics will work for one person but not another. In the end, health care professionals have to remember that pain is *whatever the person experiencing pain says it is*. Due to the subjective nature of pain and pain relief techniques, providing care for patients who have acute or chronic pain is one of the most challenging tasks for Certified Nursing Assistants (CNAs).

Pain Classifications

Pain is typically divided into two classifications: *acute* and *chronic*. There are other ways of identifying pain but this is the most common way of classifying pain.

Acute pain is typically defined as a sudden feeling of physical discomfort and distress. Acute pain differs from chronic pain in several important ways.

Table 1: Characteristics of Acute Pain

<p style="text-align: center;">Sudden onset An identifiable cause, event, or injury Short duration Temporary, improves with time Responds to treatment Protective</p>

Acute pain is precipitated by an accident, an injury, or the onset of an illness such as appendicitis or a heart attack. It is *protective* in nature. Acute pain indicates to a person that there is physical damage being done, and is a cue to the person to escape from the situation and to seek help. It is a survival mechanism.

Acute pain is usually of short duration and it lessens with time, but it is not exactly clear what defines short duration and recovery. Acute pain can seem quite long to a person who is suffering. Finally, acute pain will often (but not always) diminish with treatment.

The definition of chronic pain is less precise than that of acute pain. Many authorities use an arbitrary time limit of 3 months, 6 months, or even longer to define chronic pain. These may be generally stated as chronic pain is any pain that persists longer than a reasonable and expected time. Characteristics of chronic pain that distinguish it from acute pain are listed in Table 2.

Table 2: Characteristics of Chronic Pain

<p style="text-align: center;">Long duration There is often no identifiable cause May be resistant to treatment Does not improve with time Does not serve a protective function</p>
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Chronic pain is persistent. It may last for many months or many years, or it may never resolve. Chronic pain often does not have an identifiable cause. When chronic pain is caused by an acute injury or illness the pain may persist long past the point of recovery.

Approximately 35 million Americans suffer from chronic pain. Common causes of chronic pain include arthritis, diabetes, endometriosis, migraine headaches, herniated discs, fibromyalgia, post-stroke pain, peripheral vascular disease, herpes zoster, and inflammatory bowel disease.

Treatment of chronic pain is difficult. Patients who have chronic pain often do not respond to treatment. Unlike acute pain, chronic pain is not protective. Acute pain tells a person that the body has been injured and help is needed. However chronic pain, as previously mentioned, may persist long past the initial time of injury and well past the point an injury has healed or an illness

has resolved. While acute pain is a survival mechanism, chronic pain seems to have no useful purpose and only functions to make a person miserable.

Causes of Pain

The basic causes of pain include injury and illness. Tissue damage, exposure to strong cold or heat, infections, swelling are all clear causes of pain. While much has been learned about the causes of pain where the source of pain is obvious, such as a broken bone or a laceration, there is still much about the phenomenon of pain that is unclear. How and why pain happens has long been a subject of intense investigation. The experience of pain is subjective, and painful stimuli can differ tremendously from patient to patient.

Factors Influencing Pain

There is a great number of factors that influence the experience of pain, the type of pain that a patient has, how the patient reacts to pain, and how well pain relief measures work. The experience of pain differs tremendously between people, in part, because pain, and the response to pain, is influenced by personal characteristics. These characteristics include a person's age, psychological and emotional make up, as well as the situation in which pain is experienced.

A patient's previous experience with pain, cultural and social norms regarding pain, and the physiologic response to pain also play a role. These factors include genetics, age, culture, causative agent, acute versus chronic pain, psychological issues, and biological issues.

Genetics:

An individual's tolerance and reaction to pain may be genetically determined.

Age:

Age can affect how someone reacts to pain and how he/she reports pain. For example, infants and young children cannot easily verbalize pain. Their pain receptors may be more sensitive and if they have little to no prior experience with pain they will be frightened by the experience and react more intensely. An adult or an elderly person may have pain but may not want to admit to the presence of pain for a number of reasons, for example due to fear of illness, and fear of appearing weak or needy.

Culture:

The expression of pain and a patient's willingness to share pain with health care professionals can vary widely from culture to culture.

Causative Agent:

Some injuries and illnesses are more likely to cause pain than others.

Acute versus Chronic Pain:

A patient who has chronic pain is more likely to develop emotional and psychological issues, and for good reason. The patient is confronted with pain that may have no diagnosed cause, pain that seems to have no end in sight, or the patient's pain that may not respond well to treatment.

Psychological Issues:

A patient's psychological makeup has a strong influence on how he/she reacts to pain, experiences pain, and what the patient expects from caregivers.

Biological Issues:

Emotions, culture, and psychological makeup certainly influence pain; however, pain is a biological phenomenon and individual variations in biological response to pain may explain the unpredictability of pain response and response to treatment. For example, the brain has a natural analgesic

system that works by way of substances called endogenous opioids, and the activity of the endogenous opioid system can vary from person to person.

There is also something called the gate-control theory of pain. The gate-control theory states that the nervous system has "gates" that in certain circumstances can prevent a pain signal from reaching the brain. The pain control gates can be activated by a distracting physical or psychological stimulus. This explains why rubbing an area that is painful or why talking to someone about pain can help diminish it.

The influences of personal and social factors that influence a pain experience can be accounted for, however, there are also physiological types of pain.

Physiological Pain

The physiological response to pain involves a painful stimulus, transmission of that stimulus, reception of the stimulus in the brain, the brain's response to the painful stimuli, modulation of the stimulus by the brain, and response of the body's natural analgesia system. It is a complicated and not well-understood process. The three primary types of pain are nociceptive pain, non-nociceptive pain, and psychogenic pain.

Nociceptive Pain

Pain receptors in our body are called nociceptors. Nociceptors are specialized nerve cells that detect damage to organs, tissues, or other body structures and send a nerve transmission (a "message") through nerve fibers and the spinal cord to a specialized area of the brain. The pain that the nociceptors sense can be chemical (*i.e.*, skin contact with an acid) thermal (*i.e.*, intense

heat or cold), or mechanical (*i.e.*, a broken bone, a laceration, intense swelling, or a sharp blow to the body).

Nociceptors are located in the skin, the joints, and some parts of the internal organs. The distribution of nociceptors is uneven. For example, people have many nociceptors that detect pain in their fingers and hands but very few in their internal organs. Nociceptive pain is usually temporary and often responds well to analgesics.

Non-Nociceptive Pain

Non-nociceptive pain is also called neuropathic pain. This type of pain is caused by injury to the central or peripheral nervous system. Common causes of neuropathic pain are stroke, multiple sclerosis, diabetes, and direct injury to structures in the nervous system. Non-nociceptive pain differs from nociceptive pain in that neuropathic pain is usually chronic, it can be difficult to diagnose, and often it does not respond well to analgesics. There may not be an obvious injury that causes neuropathic pain but even if there is, the pain will continue for long after the injury has healed.

Diabetes is a common disease, and diabetic neuropathy is a common cause of chronic pain and non-nociceptive pain. When the blood sugar level is abnormally high for a long period of time, the metabolic by-products of glucose accumulate and cause damage to the nerves, decreasing the ability to sense pain.

Psychogenic Pain

Psychogenic pain is pain caused by emotional and/or psychological factors. This type of pain is difficult to understand because there is no injury or illness

that is a direct cause of the pain but the pain should be considered as real and distressing as nociceptive and non-nociceptive pain.

Headache and stomach ache are two common psychogenic pain situations, and emotional or psychological stress are well known causes of headache and stomach ache. It is important to remember that psychogenic can accompany nociceptive and non-nociceptive pain.

It is helpful to divide pain into these three types in order to better understand the issue of pain. The dividing line between them can be blurred, however, and patients who have one type of pain can develop another. Regardless of the type of pain a patient is experiencing, the most important aspect of pain to keep in mind when caring for a patient reporting pain is that pain is whatever the person describes the pain as being.

Pain Assessment

The assessment of a patient who is having pain is challenging. Unlike vital signs the presence of pain cannot be directly measured so a caregiver must depend on assessment parameters that are somewhat subjective and non-specific. For example, a patient who is having pain will often have physical evidence of pain such as diaphoresis, restlessness, or facial expressions that suggest discomfort. A patient may tell a caregiver that he/she is having pain. Pulse, blood pressure and respiratory rate may be increased when someone is in pain.

These assessment parameters may be accurate ways of determining the presence and severity of pain. However, they depend to some degree on the subjective impressions of the observer and on the patient's individual response to pain and expression of pain. Some patients are stoic in their

expression of pain and some are not. Some patients who are in pain have an elevated blood pressure and heart rate and others do not. Some of these assessment parameters are non-specific; for example, there are many causes of diaphoresis and tachycardia. There is no clear-cut definition of restlessness and one caregiver may feel that a patient appears uncomfortable while another will not.

Given these facts, obtaining an accurate, objective assessment of pain may seem to be difficult and challenging. The process of assessing pain is best approached by using a systematic and consistent approach, and using good documentation. Using a systematic and consistent approach means that when performing initial and subsequent pain evaluations, the same assessment parameters are employed. Good documentation ensures that anyone who cares for the patient will be able to determine from the written notes the results of the assessment and how the pain assessment was performed.

Patient Interview

When performing a pain assessment the patient should be asked about the pain location, time of onset, severity, characteristics and factors influencing pain symptoms.

Location:

The clinician should ask the patient the location of their pain. Some patients may not be able to verbalize where the pain is located. In these situations, it is best to review their chart; this may give some indication of where the pain is located.

Severity:

Pain assessment scales are a popular way of rating pain severity. A caregiver can ask a patient: "If the slightest level of pain you have experienced is level

1 and the worst is 10, what is the level of the pain you are having now?" Pain assessment scales that use pictures, for example, a picture of an unhappy face to indicate pain can be used to assess pediatric patients.

Time of Onset/Duration:

When did the pain begin? Is the pain constant or does it come and go?

Type of Pain:

Is the pain a sharp, stabbing pain or a dull ache?

Aggravating, alleviating, and precipitating factors:

What makes the pain better, what makes it worse? What caused the pain?

Body Language, Physical Examination, and Patient History

The clinician should evaluate the patient's body language during the pain assessment. Does the patient look and act distressed and uncomfortable and if so, how was this determined? Is there restless movement; is the patient crying or moaning, or showing a wrinkled forehead and clenched teeth?

There are many body language signs that indicate the presence of pain. Be sure to be consistent when observing a patient's body language. If another CNA has documented the presence of pain using body language, this method should be carried through in subsequent documentation to help trend the absence or presence of the same body language signs of pain.

Physical Examination:

A physical examination for pain would be restricted to inspection. CNAs should not palpate the area of pain. Simply look at it and document any abnormal findings, such as redness and swelling.

Vital Signs:

Elevations of blood pressure, heart rate, and respiratory rate often accompany pain. Vital sign measurement should be part of pain assessment and part of assessing the effectiveness of treatments for pain. In addition, vital sign measurements may help provide information about what is causing the pain.

Past Medical History:

The CNA should always review a patient's chart as part of the assessment process. To be able to determine the source of pain, for example, for a patient who just had surgery or has diabetes), the patient's pain history must be known.

Pain Treatment

Treatments for pain are drug based and non-drug based. Patients will often benefit from and require both. There are dozens of medications that can be used to treat pain. Some of the medications used to treat pain are not the traditional analgesics such as acetaminophen (Tylenol®) and morphine; the antidepressant fluoxetine (Prozac®) and other atypical antidepressants or mood stabilizers may be used to treat fibromyalgia pain.

Certified Nursing Assistants do not administer pain medications. However, CNAs should have knowledge and familiarity with commonly used pain medications and their side effects. For ease of discussion, pain medications will be divided into narcotic and non-narcotic classes.

Narcotic Pain Medications

Narcotic pain medications (also called opioids) are more powerful than non-narcotic medications. Although it is difficult to classify the pain experience, the narcotic pain medications are used for moderate to severe pain or for pain

that is constant and life-disrupting. These medications are often used for patients who have pain caused by cancer.

These drugs have potential to develop into a substance use disorder and improper use can lead to physical and psychological craving and drug-seeking behavior. Because they have much stronger effects than non-narcotic drugs and because of the potential for a substance use disorder, the prescription and use of narcotic pain medications is tightly controlled by a system of drug scheduling.

The Drug Enforcement Agency categorizes narcotics by using a drug schedule, known as Schedule I - V. Schedule I drugs have no recognized medical use and are at the highest risk of developing into a substance use disorder. An example of a Schedule 1 drug is heroin. Many of the narcotic pain medications such as oxycodone and morphine are classified as Schedule II and they have a recognized medical use but they are also at risk of developing into a substance use disorder. Patients using Schedule II drugs may develop physical and psychological cravings and drug-seeking behaviors. Table 3 lists some of the commonly available and commonly used narcotic pain medications.

Table 3: Narcotic Pain Medications

<p>Codeine Fentanyl Hydrocodone Hydromorphone Meperidine Methadone Morphine Oxycodone Propoxyphene Tramadol</p>

The narcotic pain medications can be given as injections, as nasal preparations, as oral medications, as rectal suppositories, or as controlled-release patches applied to the skin. Codeine, hydrocodone, oxycodone, and tramadol are often combined with acetaminophen, for example, Percocet[®], a combination of oxycodone and acetaminophen.

The side effects of the narcotic pain medications are reviewed next.

Drowsiness:

Drowsiness is perhaps the most common side effect of narcotic pain medications, but this response is highly variable. For some patients, a small dose of oxycodone will relieve pain but will not cause drowsiness but for other patients the identical dose will cause a level of drowsiness that is profound and intolerable.

Respiratory Depression:

When used properly the narcotic pain medications will not cause respiratory depression. However, the potential for respiratory depression should always be considered, especially if a patient has respiratory problems.

Hypotension:

When used properly the narcotic pain medications will not cause hypotension. However, the potential for hypotension should always be considered, especially if a patient has a normal but borderline low blood pressure.

Dizziness:

Dizziness is a common side effect of these drugs.

Nausea and Vomiting:

Nausea and vomiting are common side effects of the narcotic pain medications.

Constipation:

The narcotic pain medications can slow down peristalsis and constipation is a common side effect of these drugs.

If a patient has been given a narcotic pain medication they should be periodically assessed for drowsiness. Blood pressure and respiratory rate should be measured before giving a dose of a narcotic pain medication, and if the drug is new to the patient, close monitoring should be done when therapy begins.

Drug Tolerance:

Drug tolerance is an important issue with the narcotic analgesics. After taking a narcotic analgesic for a certain period of time a patient may find that the prescribed dose no longer brings pain relief, or that the duration of pain relief is much shorter. This phenomenon is called drug tolerance and it presents a considerable problem when using narcotic medications, especially when these drugs are used to treat patients who have chronic pain.

The narcotic pain medications can cause dizziness and hypotension, especially orthostatic hypotension. This should be kept in mind when ambulating a patient who has recently been given a dose of morphine, oxycodone, or other narcotic, especially an elderly patient. A change in position from lying to sitting or sitting to standing could cause the patient to faint or fall.

Non-Narcotic Pain Medications

Non-narcotic pain medications are less powerful than narcotics and they are used when pain is considered to be mild to moderate and is expected to be of short duration. Their side effects are not as intense or serious as those of the narcotics.

Many non-narcotics are available as over-the-counter medications. Non-narcotic pain medications are available as oral capsules and tablets, rectal suppositories, oral solutions, and topically applied creams. Table 4 lists some of the commonly used non-narcotic pain medications.

Table 4: Non-Narcotic Pain Medications

<p style="text-align: center;">Acetaminophen Aspirin Capsaicin (Topical cream) Celecoxib (Celebrex®) Ibuprofen Indomethacin Naproxen</p>

Some of non-narcotic drugs that are available over-the-counter are in lower doses than the prescription form. The most common of those is ibuprofen. It is available over-the-counter as 200 mg tablets; the prescription tablets are 400, 600, and 800 mg. Some over-the-counter drugs, such as Celecoxib for arthritis, are used for pain caused by a specific condition. The non-narcotic pain medications are relatively safe and their side effects are typically mild. Many of them can cause gastrointestinal (GI) distress.

Medications that do not have a labeled use as analgesics but are prescribed to treat pain include but are not limited to sedatives such as diazepam

(Valium®), antidepressants such as amitriptyline and fluoxetine, oral and injectable corticosteroids such as prednisone and methylprednisolone, and antiepileptic drugs such as topiramate (Topamax®) and Gabapentin (Neurontin®). Nerve blocks with a local anesthetic such as bupivacaine are used for pain caused by specific conditions.

Administering medications to treat pain is more art than science. A patient who is having severe pain may get relief from a relatively low dose of ibuprofen but someone having a mild to moderate level of pain will not respond to a strong narcotic. It is also possible that pain will intensify or improve over time so the pain medication needs will change. Pain medications should be delivered promptly and before a patient's pain becomes severe.

Non-pharmacologic Treatment

There are many non-pharmacologic treatments for pain. Some of them are proven to be effective and are well-established. Some are simply a matter of common sense, such as repositioning a patient who is having pain to feel more comfortable. Other non-pharmacologic pain treatments such as acupuncture are widely used but the effectiveness is unpredictable and unproven. Some of the non-pharmacologic treatments for pain are listed in Table 5. Certified nursing assistants may use comfort measures and therapeutic heat and cold to provide pain relief for patients.

Table 5: Non-Pharmacologic Pain Treatments

Acupuncture
Alternative therapies
Comfort measures
Electrical stimulation
Massage
Therapeutic heat and cold

Comfort Measures

Comfort measures are interventions that are relatively simple and non-technical in nature. Comfort measures for pain relief are any activity that someone would do to feel comfortable but cannot because of illness or injury. Using the terms simple and non-technical, however, should not diminish the importance of comfort measures. A patient's ability to tolerate pain is greatly influenced by the environment, and pain medications will be more effective if a patient is comfortable and feels that physical needs are being cared for by the health team.

Comfort measures include positioning, changing bed linen, adjusting the lighting, making sure that the patient has enough food and fluids, adjusting the room temperature so that it is comfortable, and other reasonable measures.

Therapeutic Heat and Cold

Therapeutic heat and cold can be effective treatments for pain. Heat acts to dilate blood vessels so heat would be used therapeutically when the intention is to increase the flow of blood to an injured area. The opposite is true of cold. Cold constricts blood vessels so therapeutic cold is used when a clinician wants to decrease the blood flow to an injured area.

Choosing to use therapeutic heat or cold depends on the situation. For example, heat would be applied to tissues that are painful because of an infection; the dilated blood vessels will increase blood supply to the area and in turn, deliver more oxygen, nutrients, and white blood cells that fight infection and increase the rate of healing. Another example is warm soaks as an additive therapy to treat a small, localized tissue infection in the hands or feet. Cold can provide pain relief because it decreases blood flow to an injured area and decreases swelling; cold is applied to a sprained ankle. Therapeutic heat and cold can also be used sequentially.

Therapeutic heat and cold are simple and effective but these therapies can also cause harm. In order to use heat and cold therapies safely, the following guidelines should be maintained by the CNA.

- Only apply heat or cold if directed to do so by a supervisor or if these therapies have been ordered by the physician or another clinician who has the authority to do so.
- Only apply heat and cold to the specific areas that have been outlined by a supervisor's instructions or the physician's orders.
- Make sure that instructions are received or there are orders that clearly indicate what method of heat and cold should be used and how to use it, for example, moist or dry heat, apply four times a day for 20 minutes per application, do not apply directly to the skin, *etc.*
- Closely monitor the patient to make sure the therapy is effective.
- Most importantly, closely monitor the patient to make sure he/she is not injured by the heat or cold. It is not unreasonable to check the treated area every five minutes.
- Be especially careful when applying heat or cold to elderly patients. Their skin is more delicate than the skin of a younger person. In addition, elderly

patients often do not have a large amount of insulating fat and their pain receptors may be blunted by age or a medical condition.

- Be especially careful when applying heat or cold to infants and children. Their skin is very sensitive and can easily be damaged and they cannot effectively verbalize their pain
- Be careful when applying heat or cold to patients who have dementia or are disoriented. These patients may not know when they are being injured or they might be unable to communicate their feelings of pain.
- Be *very* careful when applying heat or cold to patients who have diabetes. Diabetes decreases peripheral circulation and it damages the nerve receptors that sense pain, making the diabetic patient susceptible to injury *and* unable to sense the injury. If heat or cold is improperly applied to a patient who has diabetes, he/she may suffer an injury but not realize the presence of the pain until damage has been done.
- Do not apply heat or cold to irritated or damaged skin. Do not apply heat or cold to an area with stitches or a surgical wound unless there is an order to do so and never apply moist heat or cold to damaged skin or an area with stitches or an open wound; the moisture can cause infection and prevent healing.

When using cold or heat, it is almost always safer to avoid direct contact with the heat and cold source and the skin. Use some sort of barrier such as a towel, a piece of cloth, or a specialized paper cover between the cold and the heat source, especially if using moist applications. The barrier prevents skin injury. The patient should be checked shortly after beginning the treatment, several times during the treatment, and immediately after stopping the treatment. The area should be closely examined. If using heat, the clinician should observe for any burns or excessive redness. If using cold, look cold or pale skin or cyanosis should be noted.

Effectiveness of Pain Relief Method

An assessment of the effectiveness of pain relief therapies is crucial. Pain relief therapies can be conscientiously and correctly administered, but the goal is to provide pain relief. If a patient's pain is not diminished then the existing therapies need to be modified or new therapies should be used.

Assessment of the effectiveness of pain relief therapies should be done in the same organized, systematic way that pain assessment is done. If pain assessment has been done using a 1-10 pain scale, use the 1-10 scale. If pain assessment has been done by observing body language and measuring vital signs, these parameters should be part of the assessment of effectiveness of the pain relief therapies. Most importantly, the CNA should talk to the patient. Pain is subjective and one can never know how someone is experiencing pain. Regardless of what assessment parameters are used, the most meaningful one is how the patient feels.

Case Study: Non-pharmacological Pain Management

The following case study was obtained from a PubMed search and discusses the case of a non-pharmacological pain management technique for a severe case of back pain.

The authors reported on a male in his early thirties who had no prior history of serious low back pain (LBP) with the exception of an intermittent and nonspecific mild low-back discomfort. This nonspecific pain did not initially require medical attention or cause any psychological distress in the patient.

The patient had been able to engage in general physical strength training 3 times a week for approximately an hour at his local fitness center, and

participated in various physical activities without any symptoms of LBP. Past medical history included acute LBP from sporting activities when he was 16 years of age, which caused significant pain and physical limitation for almost a week. This episode recurred a year later.

The patient reported onset of low back pain and requested an appropriate rehabilitation program through his primary care physician. The patient's treatment goals were to significantly reduce LBP, perform activities of daily living without restriction in movements, perform various strength exercises without an increase in pain, and reinstate maximal strength exercise without pain.

Subjective pain measures were used to evaluate the patient's progress during treatment, and these were completed before any physical activities took place. In addition, strength and stabilisation tests were conducted. During evaluation, the patient's history was taken and physical examination was carried out to determine functional restrictions, symptoms, risk factors, and neurological conditions.

The patient was reported to have an increased amount of work in his daily occupational roles, which included sedentary office work (6–7 hr a day) and physical field work (3–4 hr a day). These may have led to increased physical workloads. He was evaluated to have average physical fitness, and was able to continue being active. His youthful age and high level of activity may have been the cause of increased tension in his body and lower back. The lower back pain eventually flared up and was intolerable after he tried to rack a loaded barbell after performing a squat exercise during a workout. He tried to find the best position to relieve the back pain, and ended up lying down for almost an hour while applying ice therapy. He initially thought he had caused a muscle strain. Ice therapy was applied 3 times for a duration of 10–

15 min each. The simple analgesics and nonsteroidal anti-inflammatory drugs (NSAIDs) had not been effective. He was later given similar medications in addition to an injection to ease the pain. The discomfort eased for about 10 days however did not completely stop.

Four weeks later, the pain occurred sporadically, moderate to severe levels, and could be felt when standing or sitting for more than 10 minutes. Any activity that required lifting, or higher intensity movement raised the pain to a high level. This stress from the pain started to interfere with his daily work and life quality. His clinical examination did not raise suspicion of serious spinal abnormality. He was given another injection to relieve the pain, and subsequently referred to physical therapy.

The physical therapy was divided into two phases with phase 2 being the longest period of treatment. Phase 1 involved relaxation and stabilisation exercises, heat therapy, and gentle physical therapy to ease the muscle tension. The general aims of this phase were to reduce the perceived LBP and to restore the functional limitations. Phase 2 involved an individualized strengthening program that aimed to restore the patient's normal lifestyle.

During Phase 2, various free-weight and machine exercises were used with the principle of progressive overload. Specific exercises for lumbar and core stabilisation were also included. In order to remain effective, challenging, and enjoyable, most of the training program involved at least two different exercises within the same session while avoiding risks of aggravating the pain in the low back. The exercises in the program was planned to gradually increase exercise complexity. A light warm-up (3- to 5-min cycling or running, and 5- to 10-min dynamic movements) was followed by bodyweight, and/or the strength exercises. Taking into consideration the patient's goals and fitness background, a strength test was also conducted. This type of testing

was to identify the patient's strength level based on a specified benchmark over time.

The patient was observed during seven sessions in phase 1 of the rehabilitation period. During phase 2, from week 5 onwards, the patient performed various free-weight exercises without any restrictions. He accomplished all of his goals during phase 2 without any complaints of pain or discomfort. He occasionally felt mild discomfort at the lower-back during routine office work activities, which required minor adjustments to his body posture for the pain or discomfort to disappear.

Discussion

This case study describes the use of strength training for low back pain management. The primary finding suggests that the rehabilitation program has a clinically meaningful effect on pain intensity and disability reduction, while restoring functional mobility. The individualized strength program helped to avoid the recurrence of LBP, while helping the patient to accomplish his goals. He performed various physical activities including strength exercises without functional limitations and pain. With regards to pain reduction, there was considerable symptom improvement.

In addition to the exercises, changes in the patient's body position while at work were addressed. As LBP development is related to the degeneration of intervertebral discs, a higher risk of tissue strain may occur as a result of forces through the lower spine. People can develop back problems from repetitive strain due to occupational factors. The patient needed to have physical therapy aimed at improving low back fitness and occupational interventions that addressed sedentary desk work.

The authors stated that strength training has been recommended by the American College of Sports Medicine (ACSM) for various health and performance benefits. Different types of strengthening exercises were used as part of a strategy for restoring muscle functions while improving stability of the lower spine. The results in this case suggested that individualized strength training is more efficient when compared to other strategies used for LBP management. The major goal of this type of rehabilitation program is to return the patient to an active lifestyle. According to the authors, the intervention used in this case study has clinically meaningful effects on pain intensity, disability, and functional mobility.

Summary

Pain is a universal phenomenon. Pain affects millions of people and it can be permanently disabling. There are two types of pain: acute pain and chronic pain. The causes of pain are generally the same for people but the experience is not because pain is subjective. There are many factors that influence the experience of pain, the type of pain felt, how an individual reacts to pain, and how well pain relief measures work. Because pain is subjective, a clinician can indirectly measure someone's response to pain but cannot measure pain itself.

In the end, health care professionals should remember that essentially, pain is whatever the person experiencing pain says it is. Factors that influence the experience of pain are multi-varied. The pain assessment must be organized, systematic, and above all consistent. Pain treatments are medication based or non-pharmacologic but both can be used together. Comfort measures are non-pharmacologic pain relief therapies that CNAs will frequently use in their practice and help the patient to feel the health team cares about their pain.