PAIN MANAGEMENT

Definition

Pain perception is a product of nociceptive input that is progressively modified at the spinal cord and brain levels to provide a perception of pain, which may have little to do with the initial stimulus intensity.

"Pain has many valuable functions. It often signals injury or disease, generates a wide range of adaptive behaviours, and promotes healing through rest. Despite these beneficial aspects of pain, there are negative features that challenge our understanding of the puzzle of pain, including persistent phantom limb pain after amputation or total spinal cord transection. Pain is a personal, subjective experience influenced by cultural learning, the meaning of the situation, attention, and other psychological variables."

Reference: WIREs Cogn Sci 2013, 4:1-15. doi: 10.1002/wcs.1201

Physical pain- signals the presence of noxious, tissue-damaging conditions.
Emotional pain- an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage

Physiology of Pain

- Nociceptors are the receptors for pain. They are free nerve endings found in every tissue of the body except for the brain.
- Intense thermal, mechanical or chemical stimuli can activate nociceptors.
- Tissue irritation or injury releases chemicals (prostaglandins, kinins, potassium ions) that stimulate nociceptors
- Pain may persist long after the pain-producing stimulus is removed because pain-mediating chemicals linger, and because nociceptors exhibit very little adaptation. This phenomenon is the focus of much investigation. Current research suggests that pain persistence may also be the result of stimulus arising from the glial cells within the CNS.

Types of Pain

There are 2 types of pain, fast and slow

- Fast pain
    - Occurs usually with in 0.1 seconds after a stimulus is applied
    - Nerve impulse transmits along a medium diameter myelinated A fiber
    - This pain is also known as acute, sharp, pricking
    - Fast pain is not felt by deeper tissues of the body
- Slow pain
    - Occurs a second or more after the stimulus is applied
    - It then gradually increases in intensity over a period of several seconds/ minutes
    - Nerve impulses are transmitted along unmyelinated C fibers
    - This type of pain is also referred to as chronic, burning, aching or throbbing pain
    - Slow pain can occur in skin and deeper tissue, or internal organs
- Fast pain = pin prick

- Slow pain = tooth ache

Gate Control Theory

Melzac and Wall's Gate Control Theory of Pain- The "gate" is a network of nerves in the spinal region. When closed the gate can block the transmission of slow moving small fiber pain impulses to the brain. The blocking occurs by stimulating the larger, fast moving sensory nerve fibers through stimulation of the proprioceptive and cutaneous nerve receptors. Therefore pain intensity can temporarily be reduced over a period of minutes or hours through additional sensory input. The closing of the "gate" can be achieved by:

-Instinctively rubbing, massaging or brushing the skin the way one does when injured.

-Deep focal massage including frictions

- Rhythmic movement of the body including oscillations of joint play techniques.

ACUTE PAIN

- Either a symptom of a disease condition or a temporary aspect of medical treatment
- Acts as a warning sign
- It is usually of sudden onset and easily localized
- Client can usually describe the pain and usually subsides with or without treatment

CHRONIC PAIN

- Is a major health problem for approximately 25% of the population
- It is pain that persists or recurs for indefinite periods, usually longer than 6 months
- Usually has an obscure onset and characteristics and quality changes over time
- Anxiety, sleep disturbances and depression are common
- Usually diffuse and poorly localized
- Affected and modified by the following: culture, environment, emotional state, sleep deprivation, opiate effects, gender, patient related activities such as cigarette smoking or continued heavy labour with multiple re-injuries.

UNTRACABLE PAIN

- When chronic pain persists even when treatment is provided or when it exists without certain disease
- Represents a great challenge to all health care professionals

REFERRED PAIN

- A type of pain that may be felt in a surface area from a stimulated organ
- In general the area to which the pain is referred and the visceral organ involved receive their innervation from the same segment of the spinal cord
- Referred pain can also be a result of a trigger point in a near by muscle belly

FUNCTIONAL OR PSYCHOGENIC PAIN

- Believed to arise from emotions or the psyche.
- It is experienced as though it originates form a disorder.

Structures and related pain descriptions

Nerve pain – tends to run in the distribution of the specific nerve
- Nerve root: sharp, shooting
- Nerve: sharp, bright, lightening like
- Sympathetic nerve: burning, pressure like, stinging and aching

Bone pain – deep, boring, nagging and localized
- Fracture: sharp, severe, intolerable

Vascular pain – diffuse, throbbing, aching and poorly localized and can be referred to other areas of the body

Muscle pain – hard to localize, dull and aching, cramping, often aggravated by injury and may refer to other area

Ligament or joint capsule pain – dull, aching

Somatic Pain – arises from stimulation of receptors of the joints, muscle, tendons and periostium (layer of tissue enveloping the bones).

Visceral Pain – results from stimulation of receptors of the internal organs

Cutaneous pain- from superficial tissue damage. It is described as being bright, burning and well localized.

Radicular pain- associated with nerve root compression. Sharp shooting pain may be accompanied by other neurological signs such as paresthesia corresponding to a dermatome or muscle weakness.

Kick back pain- post treatment soreness for hours or days after a treatment. Can be prevented by using proper sequencing of techniques.
general –specific- general and superficial- deep- superficial

SYSTEMIC	MUSCULOSKELETAL
Disturb sleep	Generally lessens at night
Deep aching or throbbing	Sharp or superficial ach
Reduced by pressure	Usually decreases with activity
Constant or waves of pain and spasm	Usually continuous or intermittent
It is not aggravated by mechanical stress	Is aggravated by mechanical stress

Associated with the following …

Jaundice	Weight loss	Cyclic and progressive symptoms
Migratory arthralgias	Low-grade fever	Tumors
Skin rash	Generalized weakness	History of infection
Fatigue		

Efforts to modulate or reduce pain:

- Anesthetic (local) or analgesics (pain killers)
- Hot and cold applications
- Pressure
- Epidural
- Behavioural training

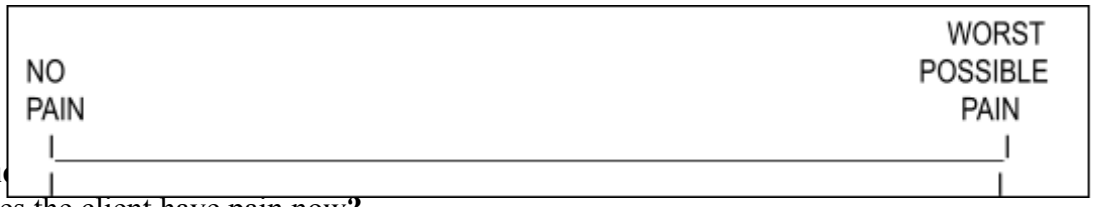
- Meditation
- Relaxation

ASSESSMENT:

Pain Scales

There are many different ways to measure pain.

Chart formation (VAS)



Qu

Does the client have pain now**?**

Where is your pain? (circle on a human figure)

What does your pain feel like?

1. pulsing, beating, throbbing, pounding
2. jumping, flashing, shooting
3. pricking, stabbing, drilling
4. sharp, cutting, lacerating
5. pinching, pressing, cramping
6. tugging, pulling, wrenching
7. hot, burning, searing
8. tingling, itchy, stinging
9. dull, aching, sore
10. tender, taut, splitting,

How does your pain change with time?

Does the pain move?

Ex. does it start in one place such as the back of the head and move to another place such as the forehead.

Which word would you use to describe the pattern of your pain?

Continuous rhythmic brief steady periodic momentary consistent intermittent transient sporadic

How strong is your pain?

Mild/annoying
Uncomfortable
Dreadful
Horrible
Agonizing/excruciating

Numerical scale 1- 5

On a scale of 0 – 5 how would you rank your pain.

0 – no pain at all
1 – little pain
2 – moderate pain
3 – quite bad pain
4 – very bad pain
5 – the pain is almost unbearable

Ten Pain Questions:

Location of complaint
Onset of the pain
Radiation of pain
Duration of complaint
Frequency of pain
Intensity of the pain
Character of the pain
Aggravating factors
Relieving factors
Associated symptoms

The Wong-Baker faces scale gives children and elders a useful way to communicate pain.

Following is the short form of the McGill Pain Questionnaire (SF-MPQ). The long form (MPQ) takes 10-15 minutes to complete, while the short form should take 2-3. This is the most widely used instrument to measure pain clinically.

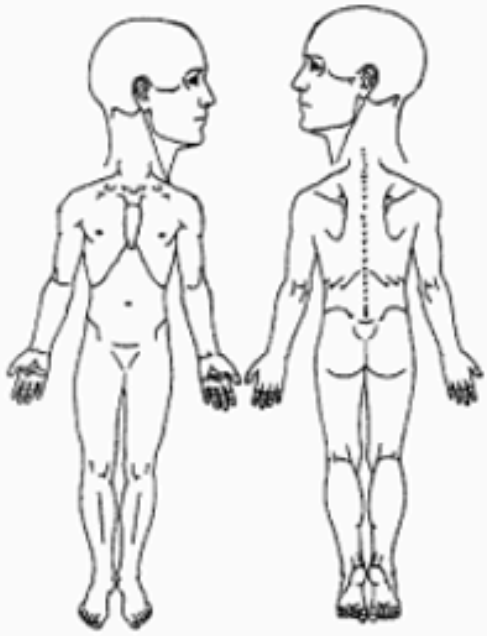
SHORT FORM McGILL PAIN QUESTIONNAIRE and PAIN DIAGRAM

Date: _____

Name: _____

Check the column to indicate the level of your pain for each word, or leave blank if it does not apply to you.__

		Mild	Moderate	Severe
1	Throbbing	_____	_____	_____
2	Shooting	_____	_____	_____
3	Stabbing	_____	_____	_____
4	Sharp	_____	_____	_____
5	Cramping	_____	_____	_____
6	Gnawing	_____	_____	_____
7	Hot-burning	_____	_____	_____
8	Aching	_____	_____	_____
9	Heavy	_____	_____	_____
10	Tender	_____	_____	_____
11	Splitting	_____	_____	_____
12	Tiring-Exhausting	_____	_____	_____
13	Sickening	_____	_____	_____
14	Fearful	_____	_____	_____
15	Cruel-Punishing	_____	_____	



Mark or comment on the above figure where you have your pain or problems.

Indicate on this line how bad your pain is—at the left end of line means no pain at all, at right end means worst pain possible.

No Pain _____ Worst Possible Pain

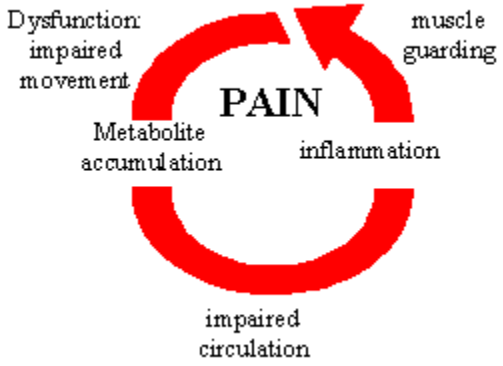
S /33 A /12 VAS /10

Purpose of Pain Assessment

Massage and Pain

- Massage is believed to decrease local and referred pain by increasing circulation, thereby reducing ischemia
- Massage is believed to stimulate the release of endorphins (pain reducing neuro-chemical)
- General relaxation brought on by massage also has a diminishing effect on pain perception/awareness
- The pressure of massage may interfere with pain information entering the spinal cord by stimulating pressure receptors

- Massage interrupts the pain cycle by relieving muscular spasms, increasing circulation and promoting rapid disposal of waste products
    - Pain cycle is initiated when painful stimuli result in reflex muscle contraction and local muscle guarding. The local muscle guarding restricts movement and decrease local circulation, which allows for an increase in swelling due to lack of oxygen and build up of metabolic waste. The increase in swelling creates more pain and the muscle guarding intensifies and the cycle repeats itself.



Pain Threshold – is the point at which a stimulus is perceived as painful

Pain Tolerance – refers to the length of time or intensity of pain that the person endured before acknowledging it and seeking relief

Treatment Considerations

- All techniques are viable as long as the application is maintained within the client's pain tolerance
- Increasing circulation and reducing sympathetic nervous system stimulation is the primary focus of treatment
- Massage can provide symptomatic and/or temporary relief from pain
- Massage may be able to decrease the stress associated with chronic pain
- Lighter depth of technique and application may be indicated, but do not make assumptions! Always check-in with the client and confirm their comfort.
- Utilizing hydrotherapy to assist in pain reduction prior to and post treatment may be indicated, however keep in mind the effects of the application. Cold hydrotherapy can decrease the client's ability to appropriately sense pain and pressure.
- Use your principles of treatment to stay within the client's pain tolerance, while still effectively applying the techniques in order to achieve the desired outcome.

Contraindications/precautions

- Clear communication is a priority for patients suffering with pain. Do not engage in a treatment unless consent and communication are possible
- Avoid any painful techniques that will aggravate the already painful area
- Treatment should not be so long and vigorous as to fatigue the client
- Awareness of medications the client might be taking and their side-effects
- Deep and invasive work may need to be avoided based on the clients presentation
- Caution with certain assessment techniques may be required, for example PROM and RROM
- Hydrotherapy may need to be adjusted for the individual needs of the client
- Circulatory techniques to distal structures may painfully increase circulation to proximal structures
- Therapeutic exercises and homecare may need to be adjusted for the individual needs of the client

Visceral and other systemic pathology pain referral patterns

When results from assessment and testing are negative or inconclusive for a neuromusculoskeletal source of the pain there can be other referral patterns.

Angina

- perceived as mild to moderate vice like pressure
- usually lasting less than 10 minutes
- pain is located mostly along the sternum and left shoulder and down the left medial arm to the fingers.
- Rest or nitroglycerin relieves the pain

Pericarditis

- pain is continuous, moderate to severe and sharp
- leaning forward or sitting upright relieves the pain

- pain is concentrated over the sternum

Myocardial Infarction
- pain may be along the sternum and left shoulder and down the left medial arm, and also localized to the sternum, anterior neck and upper abdomen.
- pain is burning vice like and severe.
- lasting for approximately 30 minutes to 1 our
- there are no relieving factors

Anxiety attack
- this is localized, non radiating stabbing pain, pressure or burning
- commonly located over the substernal area
- pain is relieved by relaxation rest and medication

Pleural
- sharp pain that is located close to the chest wall and is made worse by coughing, inspiration and movement
- palpation will not localize the pain
- possible causes include infectious disease, rib fractures, pneumothorax and pulmonary embolism

Breast
- pain is located in the breast itself and down the medial side to the affected arm
- this is a sharp, intermittent to constant aching pain, with possible signs of inflammation and edema of the breast tissue
- relief is gained temporarily through ice and rest
- possible causes include mastitis and benign or malignant tumors

Esophagus
- pain is projected around the anterior thorax at the level of the lesion
- the client feels a sharp, burning pain often associated with eating
- an esophageal stricture due to reflux or spasm may be the cause

Stomach and Duodenum
- pain is inferior to the xiphoid process which is occasionally referred to as the T-6 through T-10 vertebral level
- pain is mild to severe waves of aching cramp-like pain
- the pain is associated with eating
- possible causes are peptic ulcers and carcinoma including Kaposi's sarcoma

Small Intestine
- pain is located anteriorly around the umbilicus and posteriorly in the lumbar area
- pain is cramping and intermittent
- pain may not be relieved by defecation
- symptoms may be due to Crohns disease, an increase in intestinal motility or neoplasm

Large Intestine
- poorly localized lower abdominal pain

- cramping and dull nature
- There may be constipation or diarrhea with relief often occurring after defecation
- Crohn's disease, ulcerative colitis, irritable bowel syndrome, long-term antibiotic use or carcinoma may be causes

Appendix
- right lower quadrant of the abdomen
- well localized, moderate to severe aching pain
- pain is first referred around the umbilicus, then to the right groin and upper thigh
- pain worsens over time and is associated with nausea, vomiting and fever

Liver
- pain is local to the right upper quadrant of the abdomen with a possible referral to the right shoulder and associated pain between the scapulae
- pain is dull and constant increasing over time or after exertion
- possible causes include hepatitis A or B (fever, jaundice, fatigue and malaise are often present) , cystic tumors, abscesses and cirrhosis (pallor and bleeding disorders are often present)

Gall Bladder
- pain is located below the xiphoid process and into the right upper quadrant of the abdomen. There is a possible referral pattern to the right shoulder blade and between the scapulae
- the pain is dull and aching, and increases over two to three hours to become severe
- movement and respiratory inspiration increases the pain
- with gall stones, the pain and nausea occur several hours after eating
- with gall bladder inflammation, the pain strikes immediately after eating
- there is an intolerance of fatty food
- with prolonged obstruction the skin may be jaundiced or appear greenish

Common Bile Duct
- location and referral pattern are similar to gall bladder pain
- dull and aching at first the pain steadily and constantly increases over a three to four hour period
- other symptoms include nausea after eating, fatty food intolerance and jaundice
- gall stones, common bile duct stricture and pancreatic carcinoma are possible causes

Pancreas
- pain is located inferior to the xiphoid process and typically is also referred to the left shoulder or low back
- constant burning , gnawing, severe pain of sudden onset can be accompanied by vomiting
- if the symptoms are related to digestion, pancreatitis may be a cause. If the symptoms are not related to digestion, the cause may be carcinoma

Kidney
- pain is usually located in the posterior costovertebral and subcostal regions on the side of the affected kidney. There may be a referral to the ipsilateral abdomen.
- chronic problems usually exhibit poorly localized, constant, dull and aching pain

- acute problems exhibit intense and severe pain sometimes accompanied by nausea'
- changing position does not relieve the pain and hyperesthesia of the T-9 and T-10 dermatomes occurs.
- the pain may arise from a prerenal impairment of blood flow, such as hypertension or heart failure, renal tissue damage from infection, diabetes mellitus or lupus and post-renal blockage due to calculi or tumors of the ureters or urethra.

Ureter

- pain at the costovertebral angle and referring into the ipsilateral lower abdomen and upper thigh are associated with passing calculi (kidney stones)
- excruciating waves of colicky pain are present
- hyperesthesia of T-10 and L-1 dermatomes is present
- pain is unrelieved by changing position

Bladder

- pain is felt in the lower abdomen and the suprapubic area
- pain is localized and sharp
- pain is intermittent and may be relieved by urination, which may be urgent and accompanied by a burning sensation.
- some possible causes are infection, tumor and an enlarged prostate gland