**Mid-Term Assignment (Spring-20) (DPT 6th Semester)**

**Course Title: Physical Agents and Electrotherapy-ll Instructor: Dr. Maria Feroze**

**Time: 48 hours**

**Name Ufaq khan**

**ID 6944 Max Marks: 30**

**Note:**

* **You can use Google/ Google Scholar as a source of help but refrain from copy pasting the data directly from these sources.**
* **More than 25% plagiarism in your answer will not be acceptable.**
* **Attempt all questions from this section, all questions carry equal marks.**

Q1. Write in your own words:

1. What is the difference between 1 g of ice at 0°C and 1 g of water at 37°C?

ANS)

Energy flows from higher concentration towards lower concentration. 1 g of ice at 0 c will require more energy to melt at 37c of water. It requires 491 j of energy while to increase the temperature of 1 g of water at o c to 37c will require 115 j of energy . when we apply ice to the body ice will absorb a lot of heat from the body by conduction and body will become cold . As ice needs more heat so it will absorb a lot of heat from body as compare to cold water.Therefore it is necessary to use ice in treatment and not just cold water.

1. Explain why the rate of conduction of nerve fibers in a mixed (motor and sensory) peripheral nerve is reduced by cooling.

ANS)

In our bodies cold receptors are present more than warm receptors . when cryotherapy is applied these cold receptors react by sustained release of impulses and its rate increases with more cooling. A fibers are the first fibers as the cooling starts and after some time B and C fibers are also affected by it . Cooling causes delay in synaptic transmission . Therefore it reduces the rate of conduction of in a mixed nerve fiber.

1. Why is Cryotherapy contraindicated in cardiac patients?

ANS)

When we apply cryotherapy to a patient . The initial responce of his body will be vasoconstriction in order to preserve heat which will result in rise in blood pressure and there will be more load on heart so his heart rate will increase . For cardiac patient it will be very harmful. Therefore cryotherapy is contraindicated in cardiac patients.

1. Write in detail the uses of ice cube massage?

ANS)

Ice cube massage is used for 2 main purposes.

1. Counter irritant action.

To reduce pain ice is covered in a cloth and moved slowly over the surface of skin in circular motion for about 10 ton 15 minutes.

1. Muscle stimulation

For activation of nerve fibers ice is applied only for a short amount of time to provide stimulus for inhibited muscles.

Other uses of ice cube massage

1. It can be used for reducing swelling . puffy eyes and acne.
2. It can decrease oiliness of skin. .
3. It can be used for wrinkles and glowing skin.
4. It can speed up healing process.
5. It can soothe skin from rashes , insect bites and insect bites.

Q2. Explain how Cryotherapy reduces:

1. Pain

ANS)

Cryotherapy causes cooling which leads to activation of cold receptors. Signals will go through spinal cord and anterior horn cells to the brain . Nerve fibers that sense pain have small diameter and less speed as compare to cold sensing nerve fibers which have large diameter and more speed. As a result cold sensing nerve fibers suppress the ability of pain sensing nerve fibers and pain is reduced temporarily After ice is removed small diameter nerve fibers will cause pain again. If we want lasting effects we will give patient exercises (strengthening and mobilization) during cryotherapy so that he will not feel pain even after ice is removed.

1. Spasticity

ANS)

In spasticity muscle tone is increased because of upper motor neuron lesions. Signals travel fastly towards anterior horn which is controlled by extrapyramidal system and with an increased rate fires spontaneously . Hence causing increased muscle tone which results into spasticity which will limit movements and cause pain. When cold is applied it will slow down nerve conduction hence receptors will have suppressed sensitivity and there will be no more fast travelling signals which will not result into spasticity.

Q3. A) Differentiate between luminous and non-luminous generators. (At least ten differences)

ANS)

Luminous generators

1. Luminous generators gives visible and ultraviolet rays along with infrared rays.
2. Luminous infrared radiation penetrate more deeply than non luminous.
3. It is used in chronic lesions.
4. It has counter irritant effect.
5. It contains incandescent lamp.
6. It has tungsten filament and inert gas with low pressure.
7. Radiation is produced by reflection from silvered glass.
8. It does not take that much time to warm up.
9. Its wavelength ranges from 350-4000nm.
10. It should be given for 15 to 20 minutes.

Non luminous generators

1. Non luminous generators gives only infrared rays.
2. It penetrates less deeply than luminous.
3. It is used when there is acute inflammation or recent injury.
4. It has sedative effect.
5. It has a wire coiled around a cylinder of insulating material.
6. Electric current pass through wire and produce heat.
7. Infrared radiations are produced by hot wire.
8. It takes some time to warm up.
9. Its wavelength ranges from 1500-12000nm.
10. It should be given for 20 to 30 minutes.
11. Are infra-red rays more effective in relieving the pain than Ultraviolet (UV) light or not? Give evidence to support you answer.

ANS)

Infrared radiations have a wavelength longer than visible light and is less harmful than ultraviolet radiation which has a shorter wavelength . Infrared radiation is more effective in relieving pain as compare to ultraviolet radiations because ultraviolet radiations has more harmful effects on skin like cancer. Both infrared and ultraviolet radiations has many benefits but in relieving pain infrared is more useful.It can be used to treat acute and chronic pain while ultraviolet light can damage skin cells. Infrared radiations can help in healing process of cells. Infrared has the ability to penetrate deeply and provide effective pain relief . It can even be used for infants and is safe. Ultra violet is proved to be effective up to some extent in relieving pain in fibromyalgia . A study showed that 19 patients of fibromyalgia were given treatment by ultraviolet light and non ultraviolet light . They were divided into 2 grouops .After 6 weeks those patients who received treatment through ultraviolet radiations showed improvments .But world health organization declared ultraviolet radiation from tanning bed one of the most dangerous forms of cancer causing radiation. It is more effective in other areas like sterilizing , mood changing , vitiligo , psoriasis and other diseases.While infrared radiations are effective in healing neck pain , back pain , diabetic neuropathy , rheumatoid arthritis and many other diseases. A study showed that 40 patients of chronic low back pain were given treatment by infrared radiations for 6 years .Infrared radiation therapy proved to reduce pain in these patients without showing any adverse effects. And it was also effective in reducing menstrual pain.

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1. https;\\www.ncbi.nlm.nih.gov\pmc\article\pmc2539004
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3. researchgate.net\publication
4. online library.wiley.com\doi
5. hhtps;\\www.news\amp\health\how-does-infrared-therapy-work-apx
6. http;\\www.91outcomes.com\2010\1\ultraviolet-light-may-help-chronic-pain.html