**BMSN1601 – Tutorial #4**

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**Tutorial Activities**

* + - Please **complete** and **submit** your answers before the tutorial day via appropriate links on Moodle. The deadline for submission of your work is on **15 Nov 2022 (Tuesday) by 11:59 pm**. Late submission/ submission to the wrong link will NOT be entertained.
    - During the tutorial students are expected to actively engage in the discussion and answering tutor’s questions. Your tutor will randomly choose students to answer questions.
    - Please refer the instructions and marking criteria posted on Moodle.
    - **NO model answer** will be posted on Moodle.
    - Please also note that the tutorial content may be assessed in mid-term test and/or the final examination.

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**Scenario**

Mr. Chan, a 50 year-old patient, was admitted to your ward because of heat stroke. He was working in a construction site on the hottest July day with temperature of 33°C. At noon, he was found unconscious on the ground by colleagues. A colleague attempted to move Mr. Chan into a bath tub of icy water but was stopped by the site nurse. The site nurse examined Mr. Chan and found that his skin was hot and dry. His pupillary light reflex was sluggish. She moved him to a shady area with his clothing removed and sprayed water on his body.

On the ambulance, Mr. Chan regained consciousness but was confused. The core body temperature was 41°C.The level of consciousness was assessed with Glasgow Coma Scale (GCS) and the score was 9/15.

At the hospital the doctor diagnosed that Mr. Chan had suffered heat stroke. Mr. Chan was managed in the intensive care unit. In the evening, Mr. Chan’s condition improved and his core body temperature was 37.5°C. His GCS score was 15/15.

Questions

1. What is core body temperature? How is it measured?

It is the temperature of internal organs which can be measured by a standard rectum thermometer

1. Where is the thermoregulatory center located?

Hypothalamus.

1. What is the function of thermoregulatory center?

It is used for maintaining stable core temperature, so the enzyme can function properly in their optimal temperature.

1. What kind of sensory inputs are delivered to the thermoregulatory center? What are the sensory receptors responsible? Where are these receptors located?

Signals from peripheral thermoreceptors are delivered to hypothalamus. They are responsible for detecting temperature changes in ambient temperature, which are located at skin

1. Describe the normal response of the body when the core body temperature increases.

Central thermoreceptors would be stimulated and send signals to hypothalamus. This induces vasodilation of skin arterioles, increasing blood flow to the skin, increasing heat loss by radiation and conduction and stimulate sympathetic cholinergic neurons, which promotes sweat secretion by eccrine sweat gland

1. Heat stroke is a form of hyperthermia. Define hyperthermia.

Hyperthermia refers to an increase in core body temperature above the set point, while the set point itself did not change.

1. How does hyperthermia differ from fever?

Although both are increase in core temperature, hyperthermia is happened when the set point of temperature remains unchanged

1. Why do patients sometimes complain of chills and rigors when they kick up a fever?

When patients kick up a fever, their body would release a chemical called pyrogens in the blood which stimulating the body to attain a higher ‘set-point’. Hence, patients would feel chills and rigors.

1. Explain why Mr. Chan developed heat stroke.

As Mr. Chan was continuously working at outdoor under hot environment at 33 degree, his body cannot carry out effective heat loss, which induces heat stroke.

1. What are the clinical presentations of heat stroke?

They are confusion loss of consciousness, dry skin.

1. There is another heat-related disorder known as heat exhaustion. Distinguish between heat exhaustion and heat stroke.

For both heat exhaustion and heat stroke, they have similar symptom. The only difference between them is heat exhaustion appears with heavy sweating, while heat stroke does not.

1. How would the cellular activities be affected by an excessive increase in core body temperature?

Under excessive increase in core body temperature, cellular activities are affected ranging from fluctuating with the temperature of external environment to decreasing rate of biochemical reaction rate.

1. What is the use of Glasgow Coma Scale and how is the assessment performed?

It uses for describing the degree of impaired consciousness of patients by offering physical test based on a patient ‘s ability to perform eye movements, speak, and physical movements.

1. Why did the nurse spray Mr. Chan with water at the scene?

As water has high heat capacity, it assists Mr. Chan to cool down his body temperature by carrying out large amount of heat from him

1. Why did the nurse stop the colleague from moving Mr. Chan into a bath tub of icy water?

With a sudden cold-water immersion, Mr. Chan may facing the shutdown of blood supply to the skin and make it harder for heat to dissipate from the body.

1. The opposite of hyperthermia is hypothermia. Briefly describe hypothermia.

It refers to the body is losing heat faster than producing heat, which normally exists as 35 or below degree of body temperature

Reference:

Helman, R. S. (Aug 02, 2019). Heat Stroke. Retrieved from <http://emedicine.medscape.com/article/166320-overview>