**Section 1 – Thermoregulation**

**Complete the table to define the following:**

|  |  |
| --- | --- |
| **Dynamic equilibrium** |  |
| **Setpoint** |  |
| **Normothermia** |  |
| **Hypothermia** |  |
| **Hyperthermia** |  |
| **Pyrexia** |  |

**Explain how body temperature is monitored by the skin and hypothalamus:**

**Explain how 3 environmental and 3 physiological factors influence body temperature:**

**Explain how *body temperature must be closely monitored when under anaesthesia***

**Explain the physiological consequences to the body when temperature increases too high**

**Explain the physiological consequences to the body when temperature drops too low**

**Explain how we adapt when body temperature increases *(so it doesn’t get too high)***

**Explain how we adapt when body temperature decreases *(so it doesn’t get too low)***

Hypothermia

**List three population groups who are at higher risk of hypothermia. For each explain why**

|  |  |
| --- | --- |
| Population Group | Reason |
|  |  |
|  |  |
|  |  |

Hyperthermia

**What is the critical difference between pyrexia and hyperthermia?**

Read the case study:

Patient A, a 23-year-old male with no history of medical issues, is rushed to A&E at approximately 13:30 with suspected heatstroke (hyperthermia). He presents with tachycardia and increased respiratory rate. His skin is pale and dry. Oral temperature measured at 40.3°C. He has been working on a construction site all morning, wearing safety equipment. The sun has been out all day, yet they have not had access to running water with it being a construction site.

**What is the immediate action that should be taken for Patient A? Explain the physiological response behind each action taken.**

**Read the article below:**





When someone is going through severe hypothermia, they may display strange behaviours such as taking clothes off.

**Q - What is this behaviour called?**

**Q - What are the physiological changes that happen in the body to cause someone to do this?**

**Section 3 – Osmoregulation**

**The main waste product in urine is called urea (pictured).**

**Why is it important to remove urea?**

**Here is a diagram of a nephron:**



**For areas 1-5 in the diagram above, state what the area is called and fully explain what is happening at that point.**



**Explain the diagram above and give an example of how cells may become hypertonic and hypotonic in the body**

Read the case study:

Patient B, a 58-year-old male with a history of alcohol dependence is admitted. He presents under the influence of alcohol, slurring his speech and his movements are erratic. You are told to put him on fluids, however, you notice he is producing large amounts of clear urine, which would normally indicate a person is well hydrated.

**Explain the physiological mechanism behind why he is dehydrated, yet he is producing large amounts of clear urine**