**D2 - Case Studies to evaluate the importance of homeostasis in maintaining the healthy functioning of the body.**

*Your responses to the following case studies will demonstrate your ability to evaluate the importance of homeostasis.*

Gemma is 23 years old, she was diagnosed with Type 1 Diabetes 8 months ago has been prescribed twice-daily insulin and diet modifications but is known to be non-compliant with this regime This is due to her commitment to maintaining her pre-diagnosis body image. She has not coped well with her diagnosis of Type 1 diabetes, being a hitherto independent young woman who travelled the world.

What should a normal blood glucose level be?

What could the consequences be if Gemma doesn’t follow her treatment?

 What might happen if blood glucose levels fall below or rise above their normal range?

Gemma has been admitted to A&E after collapsing at work. She is unconscious, and her hospital record identifies her as diabetic. Her symptoms suggest either acute hypoglycaemia or Diabetic Ketoacidosis (DKA) (hyperglycaemia).

Explain the difference between hypoglycaemia and hyperglycaemia.

Why is it important to be sure whether Gemma has hypoglycaemia or hyperglycaemia?

An immediate blood glucose test is carried out on admission using a standard Glucometer, and is found to be 1.3 mmols. This confirms the diagnosis of hypoglycaemia.

If Gemma’s blood Glucose level is not corrected what is likely to be the consequence?

Why might Gemma be suffering from hypoglycaemia?

What would have been the effect if Gemma had not taken her prescribed insulin and had snacked on chocolate and crisps during the day ?

Case Study 2:

Stuart is a keen jogger goes out for a run every morning regardless of the weather. Today the weather is just above freezing, it is raining heavily and windy because of this Stuart decides to put a thin long sleeve top on instead of his usual vest top. He considers doing at short run but when out he feels warm and does his usual run.

On arriving home Stuart feels cold and appears irritable, despite being fit Stuart is breathing much more heavily than usual and can feel his heart racing; beginning to shiver he goes upstairs to get changed.

What is the normal range for body temperature?

Why was Stuart breathing heavier than usual and more aware of his own heart beat?

A few minutes later his partner finds him in the bedroom still in his wet running clothes. Stuart has stop shivering but his partner is concerned that he seems to be confused and looks pale and clammy. She thinks he may be ill and checks his pulse to find it is 50 beats per minute.

She decides to call an ambulance and get Stuart out of his wet clothes.

What are the possible reasons for Stuart’s lower pulse rate?

What are the consequences of having a slow pulse rate?

Why is Stuart likely to have a slow pulse rate along with the other symptoms?

A paramedic arrives and takes Stuarts temperature using a tympanic thermometer, getting a recording of 33.5 C . He wraps in a silver space blanket and asks Stuarts partner to get Stuart a drink of warm but not hot milk whilst they are waiting for the ambulance to arrive.

Why did the paramedic use a tympanic thermometer?

What does a reading of 33.5C show?

Why did he wrap him in a silver space blanket and asks for a warm but not hot drink for Stuart?

What would have happened physiologically if the symptoms of hypothermia had not been spotted and Stuart had been left in his wet clothes?