KEY LEARNING OBJECTIVES

- Understand what pleural space disease is
- Understand why pleural space disease occurs
- Understand how to manage patients suffering from pleural space disease

MULTIPLE CHOICE QUESTIONS

1. A patient is presented with dyspnoea and pleural space disease is suspected to be the cause. What treatment should take priority?
- (A) Administration of analgesia
 - (B) Thoracocentesis

- (C) Administration of antibiotic therapy
 - (D) Oxygen therapy
2. In preparation for a thoracocentesis procedure, which landmark should be clipped and aseptically prepared?
- (A) 3rd–5th rib spaces
 - (B) 4th–5th rib spaces
 - (C) 5th–7th rib spaces
 - (D) 7th–9th rib spaces
3. Which of the following conditions is most likely to cause a spontaneous pneumothorax?
- (A) Blunt trauma
 - (B) Penetrating trauma
 - (C) Bacterial infection
 - (D) Bullous emphysema

Heat exchange: loss, gain and management demystified

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Dogs and cats are endotherms, which means they mostly use metabolic heat to maintain a stable internal temperature, which often is different from the environmental temperature. The body possesses numerous homeostatic abilities in order to maintain an equilibrium and this is referred to as thermoregulation. Thermoregulation is a balance between heat production and heat loss. There are four principle mechanisms for heat loss or heat gain: convection, conduction, radiation and evaporation. Dogs and cats have behavioural, anatomical and physiological adaptation features that help them maintain a normal temperature.

During illness, anaesthesia or when an animal is exposed to extreme environmental temperature changes, thermoregulation may become adversely affected and patients may become hypothermic or hyperthermic.

Hypothermia is characterized by an abnormally low body temperature and can be classified as mild, moderate or severe. Hypothermia most commonly occurs when an animal is exposed to cold environmental temperatures. It can lead to depression of the central nervous system, cardiovascular system, respiratory system and the immune system. Hypothermia symptoms vary with the level of severity. Mild hypothermia can result in weakness, shivering and dull mentation. Moderate hypothermia can result in muscle stiffness, hypotension, stupor state and dyspnoea. Severe hypothermia can result in fixed, dilated pupils, dyspnoea, inaudible heart rate and coma.

Hyperthermia is defined as an elevation in temperature above the normal range for the species. Healthy patients have a 'set-point temperature', which may vary with

changing environments or differing activity levels, meaning that homeostatic mechanisms are employed to maintain a temperature within a normal range rather than a fixed value. The thermoregulatory centre, which is located in the hypothalamus, senses any changes from the set-point temperature and sends signals to initiate heat dissipation measures when hyperthermia is detected. Clinical signs of hyperthermia include excessive panting, collapse, ataxia, hypersalivation, vomiting, seizures, diarrhoea, dull mentation, haematuria, epistaxis and swollen tongue.

Treatment of hyperthermic or hypothermic patients should be focused on the primary disease process contributing to the derangement.

KEY LEARNING OBJECTIVES

- Understand how our patients lose and gain heat
- Understand how to manage patients suffering from hypothermia or hyperthermia
- Understand the effects that hypothermia and hyperthermia have on the body

MULTIPLE CHOICE QUESTIONS

1. Which of the following is another term for fever?
- (A) Hypothermia
 - (B) Hyperthermia
 - (C) Pyrexia
 - (D) Isothermia
2. Where are the peripheral thermoreceptors found?
- (A) Skin and mucous membranes
 - (B) Spinal cord
 - (C) Liver
 - (D) Brain
3. Which mechanism of heat dissipation is characterized by heat being transferred from the patient to a cooler object?
- (A) Convection
 - (B) Radiation
 - (C) Conduction
 - (D) Evaporation