

CRITICAL ILLNESS IN CATS
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Cats are very different when it comes illness. They never ever follow the book. Knowing how to approach a feline patient that comes into the clinic with a critical illness will be the key to successful treatment. Cats require a nursing staff to critically think and anticipate their needs in order for them to go home to their owners. Cats also do not always show how ill they are until they are very critically ill.

Cats do have similar anatomy than dogs, but they are different physiologically. Special considerations must be made when a cat is hospitalized. There are multiple unique things to consider when cats come into the ER critically ill. These considerations are shock, blood volume, cardiovascular system, tendency to easily volume overloaded, drug metabolism, blood types, liver physiology, nutrition, pain management, kidney function, and of course, anxiety leading to aggression.

The first step is to always quickly assess the patient that has just walked into the ER. A complete physical exam must be done. Once that is done and whatever diagnostics needed are obtained, stabilizing the patient is next. An intravenous catheter should be placed as long as the patient will tolerate it without stress. Another thing to consider at the time of placing the catheter is the amount of blood needed for all tests to be done. Try and draw blood when the catheter is placed. As long as the catheter is not flushed, blood can be pulled from the catheter, so the patient does not have to be poked multiple times. The less stress the better for the patient. Size of the catheter should not be as important in unstable patients. As long as a catheter is in the vessel it does not matter the size. The theory is "the bigger and shorter the catheter it is, the quicker fluids and drugs can get to the patient." Which is true in most cases, but if a staff member is trying to place an 18g catheter into a cat vessel that is vasoconstricted and tries to poke the vessel multiple times, it is better to get a smaller catheter in. A jugular catheter or an intraosseous catheter can also be considered if vascular access is problematic.

Shock is different in cats than it is in canines. Shock in cats can be identified as hypothermia, hypotension, and bradycardia. They may present with depressed mentation or laterally recumbent, weak pulses and cool extremities. The body is trying to perfuse the main organs of the body: kidneys, heart, brain. The feline's shock organ is the lungs. This is unfortunate as the lungs are important for perfusion of oxygen to the rest of the body. When in stress, due to stress cytokines, vessels will leak protein into the alveoli of the lungs. Cats will often present to the clinic in respiratory distress due to being in shock. It is important to keep reassessing and listening to the lungs once stabilization is achieved. It is also very important to keep these patients calm and oxygenated. Place them in an oxygen cage instead offlow-by. Flow-by oxygen may stress them out more than help. Consider giving these patients pain medications to keep them calm in a very stressful environment. Heart rate should also be monitored. If a cat's heart rate drops below 160, intervention must be done immediately. Hyperthermia hypothermia should also be addressed with heating elements. If a patient is hypothermic it can affect metabolism, platelet function, perfusion, renal function, and increase cardiac arrest risk.

Blood Volume in cats is smaller than in dogs. Blood volume in cats is about 60mls/kg compared to dogs who have about 90mls/kg. Special considerations should be implemented when giving a fluid bolus or blood products to our feline patients. Isotonic crystalloid boluses should be given in increments and total 40-60mls/kg. It is important to watch the patient's temperature, heart rate, and respiratory rate during these fluid bolus'.

Blood types are also different in the cat compared to the dog. There are three different blood types for the cat: A, B, and AB. A is the most common blood type for the cat. If you transfuse a critically ill patient, it is very important

that you blood type before a blood transfusion. Giving a type B cat type A blood will cause a very severe transfusion reaction and eventually death.

Heart disease in cats can be silent until they have a critical illness or come in the clinic in respiratory distress. Cardiomyopathy is not uncommon in cats so staff should be aware of how a murmur sounds in cats, which can be very difficult to discern because their heart rates are high. If a cat is suspected to have any symptoms of heart disease, it is very important that if the cat needs fluids that it is monitored closely. Respiratory rate, heart rate and temperature should be monitored closely. Fluids should not be given if the cat is suspected to be in heart failure. The heart is unable to pump blood efficiently to the rest of the organs, so perfusion is low.

Fluid overload can happen quickly in cats. When they come into the clinic stressed, or in shock, pulmonary edema can happen because the lungs are the shock organ for the cat. Once fluids are given, sometimes more fluid can be dispersed into the lungs due to the leaky vessels. Signs of fluid overload are crackles heard in the lungs, gallop rhythm heart sounds, arrhythmias, weak pulses in the femoral arteries, and increased respiratory rate.

Stress in cats can also cause hyperglycemia. This is due to increased catecholamine and lactate release due to stress. Increased lactate is also an indication of decreased perfusion. Most of the time, the stress induced hyperglycemia does not need to be treated. If it is determined that the hyperglycemia is due to a disease process like diabetic ketoacidosis, then that is recommended to be treated.

The liver is an important organ for the cat. The liver controls many functions of the body including metabolism, detoxification of many substances and medications, produces tissue factor, stores minerals, glycogen and triglycerides, and produces bile acids. Thiopurine methyltransferase is deficient in cat's livers which decreases the ability to metabolize certain drugs. This is why toxicity of certain drugs can occur at lower doses than their canine counterparts. Bloodwork should be performed regularly to monitor for liver function.

Nutrition in our critically ill cats is also very important. Cats need a higher protein requirement than dogs. Nutrition in critically ill patients is also associated with shorter hospital stays. Cats that come in with hepatic lipidosis need nutrition to treat the disease. A nasogastric tube or esophageal feeding tube would be beneficial in these patients. An esophageal tube is not ideal in critically ill patients because they would have to be anesthetized to place it. You want to make sure that your patient is stable before undergoing anesthesia for any procedure.

Pain in cats can be very subtle. They are very stoic animals and can hide their pain. Signs of pain in a cat can be abnormal body position, mentation, ear position, eye position, and sometimes aggression. The best way to assess pain in a cat is during their physical exam. Blood pressure, heart rate, temperature and behavior should be considered. Drug choices dosages should be adjusted if liver or kidney disease is suspected due to metabolism of the drug.

Kidney function is also very important to monitor in a critically ill cat. Cats like to have kidney disease. Kidneys have to be at 70-75% dysfunction before any clinical signs are shown. The kidneys can have congenital abnormalities, infections, dehydration, or toxin ingestions. When a critically ill feline is hospitalized in the ICU, it is important to keep up on their kidney function. A urinary catheter should be placed in order to keep an eye on hydration status and kidney function. A specific gravity can be measured to see if the kidneys are concentrating the urine. Measuring urine output every four hours or less not only tells us about hydration status but if the kidneys are functioning. If less than 2mls/kg/hr of urine is produced, then kidney function should be questioned. The patient is then at risk of fluid overload and electrolyte abnormalities because the kidneys cannot do their job.

Cats in the hospital should be kept in a quiet, feline only ward. If they are stressed because of barking dogs or the busyness of ICU, it is best for their healing if they are placed in a quiet, cat only room. Pheromones can be used to decrease stress which in turn will help with healing. Most of the time, our most aggressive patients in hospital are cats. This is not due to any fault of their own. They may be in pain or have never been in a kennel before. Asking why the patient is aggressive will help with treatment. Is the cat in pain? Do they not like restraint? If chemical restraint is the only option, it is less stressful for the staff as well as the patient.

In conclusion, knowing the anatomy and physiology of our feline patients will help us better care for them in the hospital setting. Being prepared and critically thinking about their disease process will help us better treat their disease process and have greater outcomes of the patient going home.

Case Discussions will be discussed during lecture

References upon request