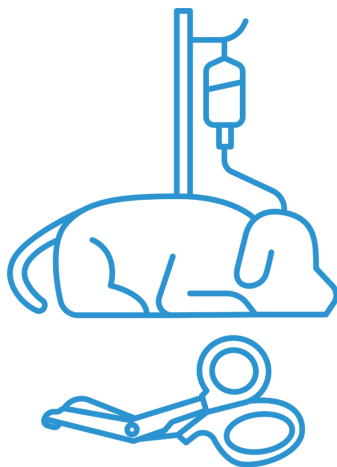




Understanding Shock & Defining an Emergency

DRIP 3

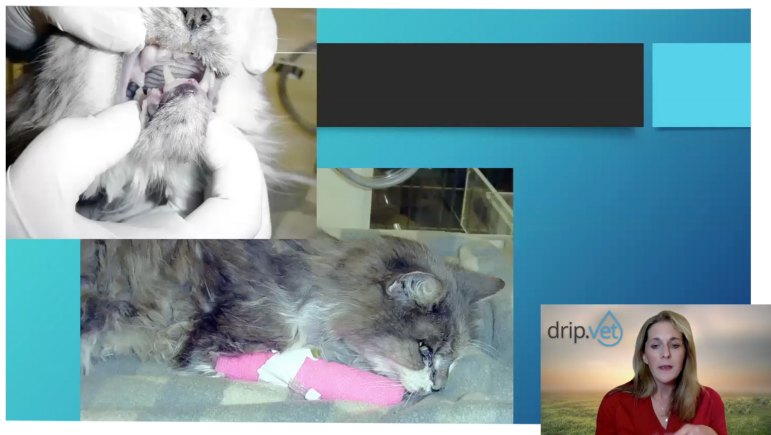
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Instructor: Amy Newfield, MS, CVT, VTS (ECC)

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All right, so this is our kitty cat shock patient. We've got upper left hand picture-- pale, yucky-looking gum color. This animal is definitely either in the decompensatory stage or in the late decompensatory/terminal phase of shock.

Shock Organs

- Dog Shock Organ: GI Tract
(shock often leads to ileus, diarrhea or melena)
- Cat Shock Organ: Lungs
(shock often leads to respiratory problems)



And there are things called shock organs. And so let's talk about what's the differences in the dog and the cat. So the shock organ is defined as the organ who takes the most insult during shock. And in a dog, it's very clear. Depending on the literature, some say the liver but, honestly, hands down, always the GI tract.

Think about it. Any time you've ever seen a dog in shock, you will have them experience some GI abnormality. They're going to be vomiting. They're going to regurgitate. They're going to have diarrhea. Dogs always have GI things.

Right before I was about to give this lecture, my dog decided to vomit, like 20 minutes before this lecture. He is fine, by the way, everybody. Don't think I'm neglecting him. He's a small dog. He just does it.

But dogs have GI problems, especially when they're in shock. They just tend to have more diarrhea than cats. I will argue that sometimes cats vomit more than dogs, but especially when it comes to shock. Think about all the hit-by-car traumas, I guarantee you, they broke out in diarrhea.

All the heat strokes, even if it was a mild heat stroke, they broke out in diarrhea. All the bloats, they regurgitated, and had vomiting, even after surgery. That's just what happens.

So shock often leads to the ileus, the diarrhea, the melena, all of those things. And in cats, they're going to take the blunt of the trauma of the shock to their lungs. And so we often see a lot of respiratory problems with our cats that have gone through shock.

So just keep that in mind. We're going to see less GI issues with cats. We're going to see less respiratory issues with dogs that undergo shock. But we are going to see GI issues for our dogs and lung issues for our cats.

Cats Are Different

- Rarely present in decompensatory stage
- Usually present early or terminal (late stage)
- More common to see bradycardia

Cats often present with the trifecta of shock:

- Bradycardia
- Hypothermia
- Hypotension



So cats like to be different. You're going to hear me say that throughout this lecture series. I have two cats and two dogs, and they just like to be a little bit different than our dogs. Rarely do they present in the decompensatory stage. They either present in the early stage of shock, or they're trying to die on you.

And just in general, that's my own anecdotal, and that's what you'll read in textbooks too. And that's when a lot of criticalists will tell you that it's really just an early stage of shock or they're trying to die. And most commonly, you're going to see more bradycardias than you are tachycardias.

And so I very on occasionally have had a tachycardiac shocky cat. Most of the time, it's a bradycardiac, I'm-trying-to-die, I'm-not-doing-very-well cat. Cats are often presenting with the trifecta of shock, and so they will present bradycardiac, hypothermic, and hypertensive. One of the things that-- and we're going to talk about triage in the lecture after this and treatment of critical patients and things like that-- but one of the things that I see a lot of is wanting to get data points on how shocking the animal is. If they're laying there, if they look depressed, if they are not very responsive, you do not need a blood pressure in that moment. I guarantee you, it's bad.

So it's bad. It's not doing great. If you can't find pulses and they're pale white and their temperature's low, it's bad. So sometimes I see people fighting to try to get cat blood pressures, and the answer is it's bad. We don't need to-- we really don't need to waste our time doing it. It's not good.

All TYPES Of Shock Can Go Through
The Same Stages, But They Are Not
Caused By The Same Thing....



So now that we understand all the stages, there are different types of shocks. And all types of shocks can go through the same stages-- so regardless, we're going to talk about the types of shock-- but they're not all caused by the same thing. So there's a variety of different types of shock now that we understand stages.

Types Of Shock

Mainly categorized by the cause
(Can be more than one at the same time)

- Cardiogenic
- Distributive
- Obstructive
- Hypovolemic



So the types of shock are these four. Depending on literature, some usually older literature, there might be one or two that are slightly different than what you see here. But, arguably, this is what most people agree upon in veterinary medicine are the four main stage-- or four types of shock.

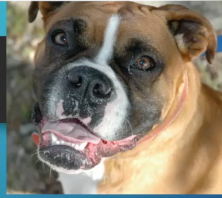
So it's mainly categorized by the cause, but you can have more than one cause at the same time. That gets super tricky and annoying when that happens. So we've got cardiogenic, distributive, obstructive, and hypovolemic. So let's break it down into the types of shock that we see.

Cardiogenic

Marked by primary cardiac failure

- Jugular venous distention
- Usually a history of heart disease
- Harsh lung sounds
- Muffled heart sounds
- Most have third spacing (pleural effusion, peritoneal effusion)

Myocardial Failure, Congenital Disease, Overdose On Cardiac Drugs, Cardiac Arrhythmias



Cardiogenic-- heart shock, basically. This is marked by your primary cardiac failure, i.e. your boxer. One of the things that I miss about general practice is I knew my patients. I knew who is Milo. And he was a boxer, and he was on these heart medications. And when the owner called and said he's not breathing right or he's having a lot of coughing, I already knew.

One of the disadvantages to working in emergency medicine is you don't know any of your veterinary patients. You get to meet them hopefully only once in their lifetime, and it's for something terrible. And you have to pull the information out of the owner, like does he have any history? And they may forget in that moment.

So it can be very frustrating. No, he was fine the other day. They just happened to forget to tell you it's been on heart medication for the last two years, which happens, unfortunately.

So how do we know it's heart failure? One, again, a history of heart disease. We know this patient. The parents know the patient. And, unfortunately, we've got a history of heart disease. Or they say, my veterinarian said something about a heart murmur. Ding, ding. That'll clue you in it might be cardiac failure.

There's usually a jugular venous distension, like you'll actually see a bulging. Now, in super fluffy animals, it's hard to appreciate that. But in our boxers or short-haired cat, if you pick up on their neck and look, you'll actually see almost the jugular pulsating. That will give you a clue that there's a lot of pressure on that part, and so we're seeing a actual venous distension that's happening.

Harsh lung sounds. You'll listen to the heart and the lungs, and you'll say, ooh, these sound harsh. And this is where I advocate that you all purchase an excellent stethoscope, not something that looks cute. I mean, they actually do have some really pretty like-- I saw sort of a rainbow. I think it was a Littmann or something.

But get like a Welch Allyn, a Littmann. Now they have electronic and digital ones too. If you have one of those silly-- they look like plastic bowl bulbs and it has a sunflower or a smiley face or a whale going across it and then it only costs you under \$20, you can't hear anything with that thing. Please throw it out.

Ask for a new stethoscope. Do check out the ones that are actually functioning at your hospital and then buy a really good quality medical grade stethoscope so that you can appreciate the muffled heart sounds, so you can appreciate the heart murmurs and the lung sounds. When we talk about respiratory stuff, by the way, I have really great videos to help you hear lung sounds and heart sounds and stuff like that.

Most of them have third spacing. So third spacing is fluids in inappropriate spaces. So pleural effusion, peritoneal effusion. So, unfortunately, now we have fluid building up in the lungs. We have fluid building up in the abdominal cavity and spaces it shouldn't belong.

And so the causes of general cardiac failure could be myocardial failure. It could be a congenital disease. Overdose on cardiac drugs, I've actually seen this only once. The dog got into the owner's cardiac meds and ate the whole bottle. Luckily, she knew it was cardiac meds, and, luckily, she knew that's what her dog got into and then just cardiac arrhythmias.

And so the interesting thing about cardiogenic shock is that it is-- really, the treatment of it is very different. We're going to talk about treating emergency patients and getting them out of this. But cardiogenic shock is the one-off from all the other types of shock.

And so it really does depend on the cause. And the reason is all other types of shock, we want to think IV catheter and fluids get this animal out of shock. That's what we think on the other three types. But in cardiogenic shock, that's not the case.

Because if you push fluids into an animal, like let's just say you place a catheter and start pouring fluids into them to try to, quote unquote, "reverse the shock," you have a sick heart. You cannot push an increased amount of fluids onto that sick heart. It can't keep up with the demand. It actually will fail worse, and you'll worsen the pulmonary effusion, you'll worsen the fluids in inappropriate spaces, and you'll also make that heart a lot sicker than you want to make it.

And so depending on the cause, dobutamine is the most common emergency treatment that usually helps to increase function of the heart. Cats that are experiencing hypertrophic cardiomyopathy may benefit from calcium channel blockers or beta-2 antagonists like atenolol.

Certainly, if it has pericardial effusion, in the case of boxers or golden retrievers, you may notice that there's actually fluid around the heart sac. We do that by doing a quick scan, and we're going to notice that, unfortunately, there's a pocket of fluid around the heart and it's not contracting because of that. We can do a pericardiocentesis.

Or if we have pulmonary edema, we think about giving oxygen and Lasix because Lasix, furosemide, that's going to help to pull the fluid off of the inappropriate space. And so this is the one-off that is important, that if we think it's cardiogenic shock, we do not bolus fluids. And we'll talk about bolusing fluids in other lectures and why we want to reverse that and how it helps to reverse the shock. But this is the one that we don't bolus fluids, and veterinarians have to really make sure that they get the cause of the shock down right in order to treat this appropriately.

So as a technician or assistant or the vet nurse, if you're listening to this and you notice jugular distension and you're noticing, hey, I hear muffled heart sounds, and your doctor says bolus a bunch of fluids, I want you to say, do you think it could be cardiogenic shock? Because this is the one that you don't want to do that.