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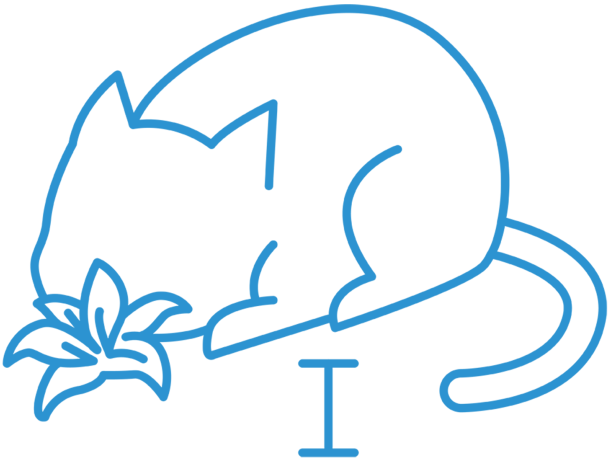

Toxicology Part 1

drip 7

version 1

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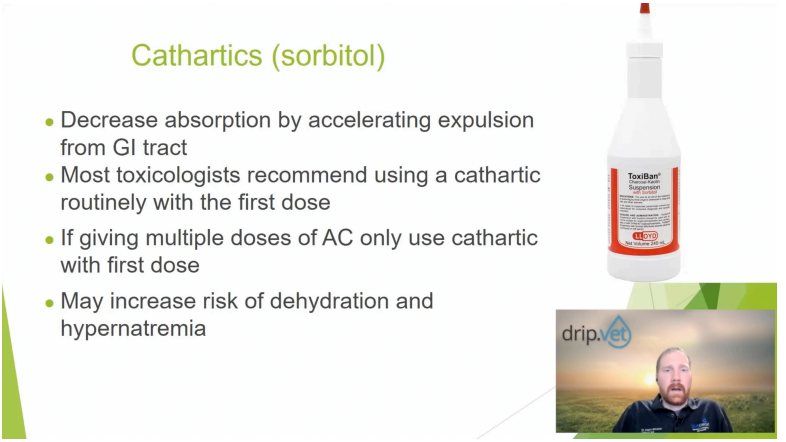
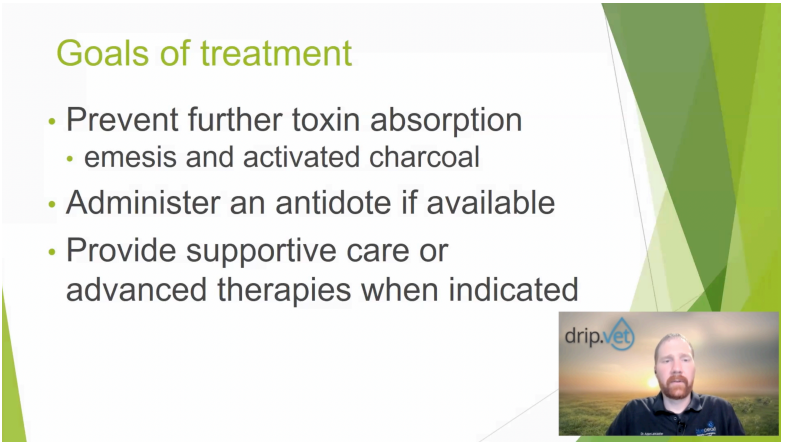


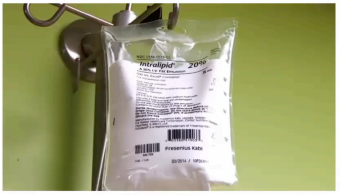
The cathartic that I just mentioned is typically sorbitol and its function is to essentially decrease absorption by accelerating expulsion from the GI tract. So it's sort of like a laxative and that it just moves everything through and doesn't allow it to be absorbed. Most toxicologists do recommend using a cathartic routinely with the first dose. And then again, if you are giving multiple doses of activated charcoal, you want to make sure that you only use the cathartic with the first dose. And again, with activated charcoal, even without the cathartic there's a risk of hyponatremia and dehydration. But with the cathartic, that's going to go up. So just keep an eye on these guys. If they're in the hospital, make sure that they're on fluids and things. If they're going to go home, just warn the owners that they need to watch them for signs of that, and make sure they're drinking those sorts of things.



So the general goals of treatment, one, prevent further toxin absorption we already talked about that. That's going to be emesis and the administration of activated charcoal. 99% of these, you do want to administer an antidote if it's available. And then you want to provide supportive care or advanced therapies when indicated.

Advanced Therapies

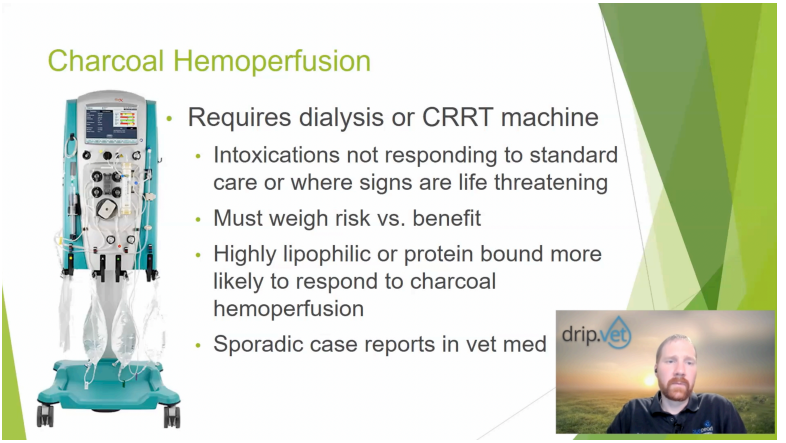
- IV lipid therapy
  - Fat soluble toxins
  - Higher Log P = more lipid soluble



Drug	Log *P* value
Amlodipine	1.90
Baclofen	1.30
Bupivacaine	3.64
Bupropion	3.47
Carbamazepine	2.30
Carprofen	4.13
Chlorpheniramine	3.17
Chlorpromazine	5.35
Clomipramine	3.30
Cyclosporine	3.00
Dexamethasone	1.83
Diazepam	2.82
Digoxin	1.26
Diltiazem	2.80
Indomethacin	4.27
Itraconazole	5.90
Ivermectin	3.50
Ketoprofen	3.12
Lidocaine	2.26
Loratadine	5.20
Metoprolol	1.88
Moxidectin	4.10
Naproxen	3.18
Nicotine	1.17
Nifedipine	3.22
Nifedipine	2.50
Promethazine	2.85
Trazodone	1.80
Verapamil	3.83
Vinblastine	3.69

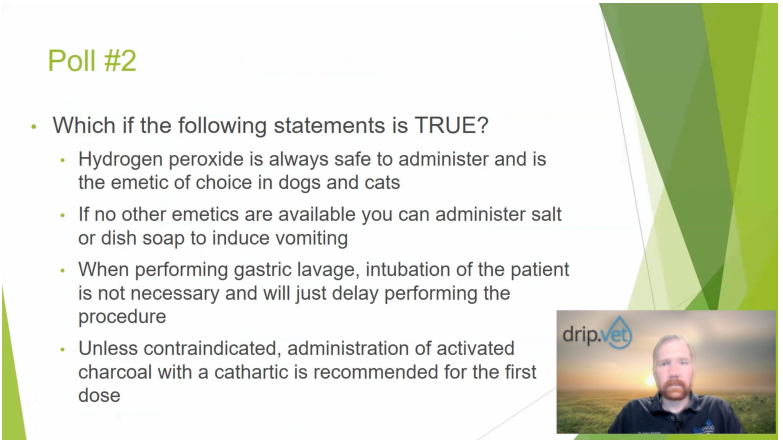
Some of these advanced therapies could be things like IV lipid therapy. This is useful for, basically, fat-soluble toxins. This chart here basically looks at a bunch of different toxins and it shows their log P-value. The higher the number under that log P value, it just means it's more lipid-soluble, essentially. So we can just pull out a couple of these here if anybody can read them here, bupivacaine has a fairly high log P-value of 3.64, carprofen 4.13. Let's see, what else we got on? Ivermectin 3.5, et cetera. So these are all drugs where IV lipid therapy might actually be useful in specific instances. If you have a drug that is not fat-soluble it's just water-soluble, then this is not going to actually do much.

The way that it works there's a variety of different theories. The most accepted theory is the lipid sink theory, which, basically, sequesters the toxin in the lipid component of the blood. So what you're doing with the IV lipid is you're basically artificially increasing the fatty component of the blood. It's going to for lack of a better term, I guess, sort of pull the toxin into the lipid that's circulating in the blood, and then that's going to basically get metabolized and then excreted out the body. So the way that it is typically administered is, initially with a bolus and then as a CRI after that. There have been a number of reported uses in vet med, so these are all various case reports that have been published for different kinds of NSAIDs like naproxen, ibuprofen, baclofen, and different kind of ivermectin, moxidectin, lidocaine, diltiazem, marijuana, even and those sorts of things. So again, this has been reported it does seem to be effective. When you would want to do this would be, again, when you have a severely affected pet, where the traditional emesis, activated charcoal, and supportive care are insufficient.



Another thing that can be considered is dialysis or CRRT. And then, in particular, charcoal hemoperfusion with that, so I guess, a couple of things. You can do dialysis or CRRT without charcoal hemoperfusion for certain toxins if it is a dialyzable toxin. But then putting a charcoal filter into the CRRT machine actually increases the types of toxins that it can help get rid of. So if you have a patient who they are not responding to standard care or where signs are life-threatening, then you may want to consider this. Obviously, not every place is going to have something like this, you need to have a place that is capable of performing it. But if you have someplace nearby that you can refer those cases too, this is something that it's important to at least know that this is available.

Again, highly lipophilic or protein-bound drugs are more likely to respond to charcoal hemoperfusion. And again, there are sporadic cases in vet med using it for things like marijuana, ibuprofen, baclofen, cyclosporine, and methotrexate.



Another quick poll for you here. So which of the following statements is true this time? See, hydrogen peroxide is always safe to administer and is the emetic of choice in dogs and cats. If no other emetics are available, you can administer salt or dish soap to induce vomiting. When performing gastric lavage, intubation of the patient is not necessary and will just delay performing the procedure. And then unless contraindicated, administration of activated charcoal with the cathartic is recommended for the first dose.