

VETERINARY VOICE:
Tips of the Trade

Emergency & Critical Care – Chocolate Toxicity	
Definition	Chocolate is made from the fruit (beans) of the cacao tree. Theobromine , a component of chocolate, is the toxic compound in chocolate. (Caffeine is also present in chocolate, but in much smaller amounts than Theobromine.) Both Theobromine and Caffeine are members of a drug class called Methylxanthines.
Pathogenesis	Theobromine and caffeine effects on the body: <ul style="list-style-type: none"> • Central Nervous System (CNS) stimulant • Cardiovascular stimulant • Increase blood pressure (mild) • Nausea and vomiting
Clinical Signs	Signs are most commonly seen within 12 hours (or less) of chocolate ingestion. <ul style="list-style-type: none"> • Excitement / nervousness / trembling • Vomiting / diarrhea • Excessive thirst / sometimes excessive urination (at higher levels of Theobromine toxicity) • Muscle spasms • Seizures • Coma (rare) • Death (rare) -- likely due to heart rhythm abnormalities.
Toxic Dose	<p>Unsweetened (baker's) chocolate contains 8-10 times the amount of Theobromine as milk chocolate. Semi-sweet chocolate falls roughly in between the two for Theobromine content. White chocolate contains Theobromine, but in such small amounts that Theobromine poisoning is unlikely. Caffeine is present in chocolate, but less than Theobromine.</p> <p>Quick Guide for Theobromine levels in different types of chocolate: From The Merck Veterinary Manual, here are <i>approximate</i> Theobromine levels of different types of chocolate:</p> <ul style="list-style-type: none"> • Dry cocoa powder = 800 mg/oz • Unsweetened (Baker's) chocolate = 450 mg/oz • Cocoa Bean Mulch = 255 mg/oz • Semisweet chocolate and sweet dark chocolate is = 150-160 mg/oz • Milk chocolate = 44-64 mg Theobromine per oz chocolate • White chocolate contains an insignificant source of methylxanthines. <p>How much is too much? The toxic dose of Theobromine (and caffeine) for pets is 100-200mg/kg, however, various reports have noted problems at doses much lower than this (20mg/kg). At this level of ingestion, a 50 pound dog would have to consume 9 ounces (+/-) of milk chocolate to consume the 20mg/kg amount of Theobromine. Some dogs won't see problems at this rate. Some may. --Mild symptoms occur with the ingestion of 9 mg per pound of body weight of either caffeine or theobromine. --Severe signs occur around 20 mg/lb --Seizures and possible death can occur after ingestion of 27 mg per pound of body weight.</p> <p>Since milk chocolate contains 58 mg/oz of theobromine, this means a dose of less than 1 oz of milk chocolate per pound of body weight could potentially cause death. Less than 0.1 oz of Baker's unsweetened chocolate per pound of body weight could be lethal. Usually the more bitter the chocolate, the higher the level of theobromine.</p>
Treatment	The toxicity of Theobromine is dose dependent. There is no specific antidote for Theobromine toxicity. Medical treatment is supportive, and may include all or some of the following: <ul style="list-style-type: none"> • IV fluids - to prevent dehydration from vomiting, diarrhea, and /or increased urination, and to "flush" the Theobromine out of the system. • Emetics - medications that induce vomiting. Used when the ingestion of chocolate is within 4 hours. Up to 6-8 hours post chocolate ingestion may be effective. • Activated charcoal - for ingestion greater than 4 hours prior to treatment, or for patients that show continued signs of toxicity. • Anti-seizure medications - for patients having seizures and/or muscle tremors. • Cardiac medications - for patients exhibiting irregular heart rates or rhythms.
Why isn't chocolate toxic to humans?	Humans can break down and excrete Theobromine much more efficiently than dogs. The half life of Theobromine in the dog is long; approximately 17.5 hours.
Prognosis	Pets usually recover with hospitalization and aggressive therapy. May be fatal, if enough of the toxin is absorbed.
Questions? Emergency & Critical Care Experts: Danialle Babski, Residency Trained in ECC Heather Connally, MS, DVM, Diplomate ACVECC Dimitri Brown, DVM Christina Bejarano, DVM	The Veterinary specialty Center of Tucson has a board-certified critical care specialist, resident trained critical care specialist, and internship trained experienced emergency veterinarians available for questions and consultations on emergency conditions 7 days a week. Board-certified criticalists have four additional years of training and are certified by the American College of Veterinary Emergency and Critical Care to assure competency in their field.