HEMORRHAGIC GASTROENTERITIS
(SUDDEN, BLOODY INFLAMMATION OF THE STOMACH AND INTESTINES)

BASICS

OVERVIEW
- Very sudden (known as "peracute") bloody inflammation of the intestines (known as "hemorrhagic enteritis") of dogs, characterized by a sudden onset of severe bloody diarrhea that is often explosive; the dog also has vomiting (therefore, the disease is named "hemorrhagic gastroenteritis"), low circulating blood volume (known as "hypovolemia") and marked increase in the percentage volume of red-blood cells as compared to the fluid volume of blood (known as "hemoconcentration") due to a dramatic loss of water and electrolytes (chemical compounds, such as sodium, potassium, chloride, necessary for the body to function) into the intestinal lumen
- Also known as "HGE"

GENETICS
- Unknown; however, specific small-breed dogs may be more likely to develop hemorrhagic gastroenteritis than other breeds

SIGNALMENT/DESCRIPTION of ANIMAL

Species
- Dogs

Breed Predilections
- All breeds can be affected, but the incidence is greater in small-breed dogs; breeds most represented include miniature schnauzers, dachshunds, Yorkshire terriers, and miniature poodles

Mean Age and Range
- Usually seen in adult dogs, with a mean age of 5 years

SIGNS/OBSERVED CHANGES in the ANIMAL
- Clinical signs are variable in both the course and severity of the disease; the disease usually is very sudden (peracute) and associated with shock due to low circulating blood volume (known as "hypovolemic shock")
- Most animals affected have been healthy prior to having signs, with no historical environmental changes or other ongoing disease involving the stomach and/or intestines
- Signs usually begin with sudden (acute) vomiting, lack of appetite (anorexia), and depression that then is followed by watery diarrhea, quickly changing to bloody diarrhea
- Signs progress rapidly and become severe within a period of hours (usually 8 to 12 hours) and are the result of shock due to low circulating blood volume (hypovolemic shock) and marked increase in the percentage volume of red-blood cells as compared to the fluid volume of blood (hemoconcentration) due to a dramatic loss of water and electrolytes (chemical compounds, such as sodium, potassium, chloride, necessary for the body to function) into the intestinal lumen
- The patient generally is depressed and weak and has prolonged capillary refill time (that is, the pink color of the gums is slow to return when the gums are blanched by finger pressure) and weak pulse pressure
- Skin turgor (turgor is the normal fullness or tension of tissues resulting from fluid content) may appear normal due to the very sudden (peracute) nature of the disease and the lag time in body fluids moving from the skin tissues into the central organs (known as "compartmental shifts"), so that the skin turgor does not reflect the animal's dehydration
- The abdomen may be painful when the veterinarian feels it (known as "abdominal palpation") and s/he may feel fluid-filled intestines
- Rectal examination will identify bloody diarrhea, and later in the course of disease, a "raspberry jam" characteristic stool develops
- Occasionally fever, but often body temperature is normal or even subnormal

CAUSES
- Unknown
- Type 1 hypersensitivity reaction (immune reaction) directed against the dog's intestinal lining
- Bacterial cultures of some dogs with HGE yield mostly pure cultures of a bacteria, *Clostridium perfringens*, and its related intestinal poison (known as an "enterotoxin"), but the significance of these findings is unknown
- Searches for poison-producing (known as "toxigenic") *E. coli* strains have been unrewarding

RISK FACTORS
- Unknown
- Most dogs are previously healthy with no major ongoing illness

TREATMENT

HEALTH CARE

- Patients suspected of having acute HGE should be hospitalized and treated aggressively, because clinical deterioration is often rapid and can be fatal
- Rapid fluid-volume replacement is required
- Intravenous (IV) fluids containing balanced electrolyte solutions are given rapidly until the packed cell volume ("PCV," a means of measuring the percentage volume of red-blood cells as compared to the fluid volume of blood) is less than 50%; electrolytes are chemical compounds (such as sodium, potassium, chloride) necessary for the body to function
- A moderate rate of maintenance fluids is given to maintain circulatory function and to correct any potassium or other electrolyte deficits during the recovery period
- Continued body-fluid losses through the stomach (by vomiting) or intestines (by vomiting and/or diarrhea) should be estimated and that volume added to the fluid requirements
- Animals with low levels of protein in their blood (known as "hypoproteinemia") may require treatment with colloids or plasma; colloids are fluids that contain larger molecules that stay within the circulating blood to help maintain circulating blood volume, examples are dextran and hetastarch

ACTIVITY

- Restricted

DIET

- No food or drink by mouth (known as "NPO") during acute disease
- During recovery period, feed a bland, low-fat, low-fiber diet for several days before returning to the normal diet

MEDICATIONS

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive.

- Injectable antibiotics are given because of the potential for the spread of bacteria and their poisons in the blood (known as "blood poisoning" or "septicemia") and possible implications of the bacteria, *Clostridium perfringens*, being involved in the disease; ampicillin is recommended
- Alternate antibiotic choices include trimethoprim-sulfa or cephalosporins; ampicillin in combination with gentamicin or a fluoroquinolone (such as, enrofloxacin) is suggested in cases of suspected septicemia
- Short-acting steroids have been suggested by some, reasoning that a hypersensitivity reaction may be involved; for example, dexamethasone sodium phosphate
- Excessive blood loss may require a blood transfusion (rare)
- Antibiotics by mouth and intestinal protectants are of little benefit, and generally not administered
- Rectal administration of agents to protect the lining of the intestines (known as "mucosal protectants") is of questionable value
- Drugs to control vomiting (known as "antiemetics") may be given for severe vomiting
- Drugs that change the motility of the intestines (known as "intestinal motility modifiers") are not considered necessary and are not recommended

FOLLOW-UP CARE

PATIENT MONITORING

- Monitor the packed cell volume ("PCV," a means of measuring the percentage volume of red-blood cells as compared to the fluid volume of blood) and total solids (a quick laboratory test that provides general information on the level of protein in the fluid portion of the blood) frequently (at least every 4 to 6 hours)
- Modify fluid replacement based on PCV, continued fluid losses from the stomach and/or intestines, and circulatory function
- If clinical improvement is not seen in 24 to 48 hours, reevaluate the patient, as other causes of hemorrhagic diarrhea are probable

POSSIBLE COMPLICATIONS

- Occasionally a blood-clotting disorder (known as "disseminated intravascular coagulopathy" or "DIC") may develop
- Nervous system signs or even seizures may occur secondary to "sludging of the blood"—the very high percentage volume of red-blood cells compared to the fluid volume of blood (hemoconcentration) makes it difficult to move the blood through the blood vessels
- Irregular heart beats and rhythms may occur from suspected myocardial reperfusion injury (a condition that may occur when the heart has had poor blood flow or circulation with low levels of oxygen and then the blood flow and oxygenation is

restored; the previously oxygen-starved heart muscle may release high levels of free radicals, which causes more heart muscle tissue damage; blood flow is known as “perfusion” and the reestablishment of blood flow is known as “reperfusion”)
- A hemolytic-uremic syndrome (a syndrome in which the red-blood cells break down [known as “hemolysis”] and excess levels of urea and other nitrogenous waste products build up in the blood [known as “uremia”]) may occur (rare)

EXPECTED COURSE AND PROGNOSIS

- Course of the disease is generally short, lasting from 24 to 72 hours
- Prognosis is good, and most patients recover with no complications
- Sudden death is uncommon.

KEY POINTS

- Very sudden (known as “peracute”) bloody inflammation of the intestines (known as “hemorrhagic enteritis”) of dogs, characterized by a sudden onset of severe bloody diarrhea that is often explosive; the dog also has vomiting (therefore, the disease is named “hemorrhagic gastroenteritis”), low circulating blood volume (known as “hypovolemia”) and marked increase in the percentage volume of red-blood cells as compared to the fluid volume of blood (known as “hemoconcentration”) due to a dramatic loss of water and electrolytes into the intestinal lumen
- Immediate and aggressive medical management is needed
- With appropriate therapy, mortality is usually low
- Recurrence is reported in about 10% of cases