

STUPOR AND COMA

BASICS

OVERVIEW

- “Stupor” is the medical term for impaired consciousness, in which the animal must be stimulated to be awakened
- “Coma” is the medical term for unconsciousness or lack of consciousness, in which the animal cannot be stimulated to be awakened

SIGNALMENT/DESCRIPTION of ANIMAL

Species

- Dogs and cats

SIGNS/OBSERVED CHANGES in the ANIMAL

- The pet may have had trauma or unsupervised roaming, or may have medical problems of significance (such as diabetes mellitus, low blood sugar [known as “hypoglycemia”], heart problems, kidney failure, liver failure, or cancer) that cause various signs other than stupor or coma
- Onset of stupor or coma may be sudden (acute) or slowly progressive, depending on underlying cause
- Severely low body temperature (known as “severe hypothermia”) or severely high body temperature (known as “severe hyperthermia”)
- Evidence of bleeding—small, pinpoint areas of bleeding (known as “petechiae”); bruises or purplish patches under the skin, due to bleeding (known as “ecchymoses”)
- Bluish discoloration of the skin and moist tissues (known as “mucous membranes”) of the body caused by inadequate oxygen levels in the red-blood cells (condition known as “cyanosis”)
- Heart or breathing abnormalities
- High blood pressure (known as “hypertension”)
- Nervous system abnormalities (such as abnormal pupils or short, rapid movements of the eyeball [known as “nystagmus”])

CAUSES

- Drugs—narcotics; depressants; ivermectin
- Structural or anatomic abnormalities—hydrocephalus (condition characterized by fluid build-up in the brain; also known as “water on the brain”)
- Metabolic abnormalities—numerous abnormalities, such as severely low blood sugar (severe hypoglycemia); high blood sugar (known as “hyperglycemia”); high levels of sodium in the blood (known as “hyponatremia”); low levels of sodium in the blood (known as “hypernatremia”); nervous system disorder caused by accumulation of ammonia in the system due to inability of the liver to rid the body of ammonia (known as “hepatic encephalopathy”); low levels of oxygen in the blood (known as “hypoxemia”); increased levels of carbon dioxide in the blood (known as “hypercarbia”); low body temperature (hypothermia); high body temperature (hyperthermia); low blood pressure (known as “hypotension”); blood-clotting disorders (known as “coagulopathies”); kidney failure
- Nutritional disorders—low blood sugar (hypoglycemia); thiamine (vitamin B1) deficiency
- Primary tumors or cancer involving the brain—meningioma; astrocytoma; gliomas; choroid plexus papilloma; pituitary adenoma; others
- Cancer that has spread to the brain (known as “metastatic cancer”)—hemangiosarcoma; lymphoma; breast cancer (known as “mammary carcinoma”); others
- Inflammatory noninfectious disease—granulomatous meningoencephalomyelitis (nodular inflammation of the brain, spinal cord and their surrounding membranes [the membranes are known as “meninges”])
- Infectious diseases—bacterial infections; viral infections (such as canine distemper, feline infectious peritonitis [FIP]); parasitic infections; protozoal infections (such as neosporosis, toxoplasmosis); fungal infections (such as cryptococcosis, blastomycosis, histoplasmosis, coccidioidomycosis, actinomycosis); rickettsial infections
- Unknown cause (so called “idiopathic disease”)—epilepsy
- Immune-mediated disease—inflammation of blood vessels (known as “vasculitis”) and low platelet count (known as “thrombocytopenia”) leading to bleeding; “platelets” and “thrombocytes” are names for the normal cell fragments that originate in the bone marrow and travel in the blood as it circulates through the body; platelets act to “plug” tears in the blood vessels and to stop bleeding
- Trauma
- Poisons—ethylene glycol (found in antifreeze); lead; rodenticide anticoagulants; others
- Vascular—bleeding disorders, high blood pressure (hypertension); sudden lack of blood supply that leads to death of tissues (known as “infarction”), such as seen in feline ischemic encephalopathy or migrating adult heartworm in the brain

RISK FACTORS

- Diabetes mellitus (“sugar diabetes”)—insulin therapy
- Tumor of the pancreas involving the cells that secrete insulin (known as an “insulinoma”)
- Severe heat or cold exposure without protection to maintain body temperature within normal limits

- Free-roaming animals—trauma
- Young and unvaccinated animals

TREATMENT

HEALTH CARE

- Maintain blood pressure; avoid high blood pressure (hypertension)
- Maintain hydration—cautious use of fluids, as they can contribute to fluid build-up in the brain (known as “cerebral edema”)
- The head should be level with the body or elevated to a 20° angle; the head should never be lower than the body to avoid increase in pressure within the skull/brain (known as “intracranial pressure”)
- Prevent thrashing, seizures, or any other form of uncontrolled motor activity; may elevate pressure within the skull/brain (intracranial pressure); medications to cause relaxation or to control seizures (such as diazepam) may be required
- Meticulous nursing care to prevent secondary complications—eye lubrication to keep the eyes moist; sterile technique with placement of catheters; turning periodically to avoid lung congestion and development of “bed sores” (known as “decubital ulcers”)
- Drainage of cerebrospinal fluid (CSF) in some cases, if critical elevation of pressure within the skull/brain (intracranial pressure) does not respond to medical treatment

DIET

- Nutrition—maintain during the unconscious period with nutrients administered through feeding tubes or by intravenous routes; adjust nutritional requirements

SURGERY

- Surgical decompression and exploration—seriously consider if nervous system signs worsen, including progressive brain dysfunction with a history of trauma or bleeding, high pressure within the skull/brain (intracranial pressure) that is not responsive to medical therapy, depressed skull-fracture fragments, and penetrating foreign body

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.

High Pressure within the Skull/Brain (Intracranial Pressure)

- Increased ventilation to remove excess carbon dioxide from the body (known as “hyperventilation”) or medication to remove excess fluid from the brain (known as a “diuretic”), such as furosemide or mannitol
- Consider medication to control seizures (such as phenobarbital), if on-going seizure activity suspected

Underlying Disease

- Steroids—to treat inflammatory and space-occupying abnormalities within the skull/brain
- Lactulose enemas and fluid support—to treat hepatic encephalopathy (nervous system disorder caused by accumulation of ammonia in the system due to inability of the liver to rid the body of ammonia)
- Increase urine production by administration of fluids (known as “fluid diuresis”)—to treat kidney failure
- Rehydration and insulin—to treat diabetes mellitus (“sugar diabetes”); lower blood sugar (glucose) slowly
- Glucose supplementation—to treat low blood sugar (hypoglycemia)
- Fluid support of blood volume; cool body temperature—to treat high body temperature (hyperthermia)
- Fluid support of blood volume; warm body temperature—to treat low body temperature (hypothermia)
- Flush out the stomach (known as “gastric lavage”) and instill activated charcoal—to treat suspected ingestion of a poison (treatment determined by type of poison)
- Specific poisons may require specific treatments (such as administration of an antidote)
- Antibiotics—examples include trimethoprim-sulfa, chloramphenicol, and metronidazole, and first-generation cephalosporins
- Adjust fluid selection to correct electrolyte disorders.
- Drugs that improve the propulsion of contents through the stomach and intestines (known as “gastrointestinal prokinetic agents” or “motility modifiers”), such as cisapride, may be necessary

FOLLOW-UP CARE

PATIENT MONITORING

- Repeat nervous system examinations—detect deterioration of function that warrants aggressive therapeutic intervention
- Blood pressure—keep fluid therapy adequate for normal blood flow, while avoiding high blood pressure (hypertension)
- Blood gases (measurements of oxygen and carbon dioxide levels in arterial blood)—assess need for oxygen supplementation or ventilation; monitor carbon dioxide levels when hyperventilating
- Blood glucose—ensure adequate blood level to maintain brain functions

- Electrocardiogram (“ECG,” a recording of the electrical activity of the heart)—detect irregular heart beats (known as “arrhythmias”) that may affect blood flow and oxygen levels
- Monitor pressure within the skull/brain (intracranial pressure), if have necessary monitoring instrumentation—detect marked elevations; track success of treatment
- Electrolytes—detect increased levels of sodium in the blood (hypernatremia) and decreased levels of potassium in the blood (known as “hypokalemia”)

PREVENTIONS AND AVOIDANCE

- Keep pets confined or leashed
- Prevent exposure to poisons or in-home medications
- Routine health-care program to minimize infectious and metabolic disease complications

POSSIBLE COMPLICATIONS

- Residual nervous system deficits, such as gait abnormalities or seizures
- Complications consistent with underlying disease

EXPECTED COURSE AND PROGNOSIS

- Vary with underlying cause
- Prognosis is worse with cases of brain-stem disease than with disease of the cerebral cortex (the outer layer of the brain)

