

# ATRIAL STANDSTILL

## BASICS

### OVERVIEW

- The heart of the dog or cat is composed of four chambers; the top two chambers are the right and left atria and the bottom two chambers are the right and left ventricles
- “Atrial” refers to the atrium (singular) or atria (plural) of the heart
- “Atrial standstill” is an abnormal heart rhythm seen on a recording of an electrocardiogram (“ECG,” a recording of the electrical activity of the heart), characterized by absence of P waves—the P wave is the first upward deflection of the ECG tracing that looks like a “bump” in the tracing; the P wave is a measure of the electrical activity of the atria—absence of P waves indicates an absence of atrial activity; atrial standstill can be temporary (such as associated with too high levels of potassium in the blood [known as “hyperkalemia”] or induced by medications); persistent; or terminal (such as associated with severely high levels of potassium in the blood [severe hyperkalemia] or dying heart)
- Rare heart rhythm disturbance

### SIGNALMENT/DESCRIPTION of ANIMAL

#### **Species**

- Dog and cat

#### **Breed Predisposition**

- Persistent atrial standstill—most common in English springer spaniels; other breeds occasionally affected

#### **Mean Age and Range**

- Most animals with persistent atrial standstill are young
- Animals with inadequate production of steroids by the adrenal glands (known as “hypoadrenocorticism” or “Addison’s disease”) leading to too high levels of potassium in the blood (hyperkalemia) are usually young to middle-aged

#### **Predominant Sex**

- Inadequate production of steroids by the adrenal glands (hypoadrenocorticism or Addison’s disease) more common in females (69%)

### SIGNS/OBSERVED CHANGES in the ANIMAL

- Vary with underlying cause
- Sluggishness (lethargy) is common; fainting (known as “syncope”) may occur
- Patients with persistent atrial standstill may show signs of congestive heart failure (CHF); CHF signs include cough; difficulty breathing (dyspnea); bluish discoloration of the skin and moist tissues (mucous membranes) of the body caused by inadequate oxygen levels in the red-blood cells (known as “cyanosis”); congestive heart failure is a condition in which the heart cannot pump an adequate volume of blood to meet the body’s needs
- Slow heart rate (known as “bradycardia”) is common
- Patients with persistent atrial standstill may have skeletal muscle wasting of the forearms and shoulders

### CAUSES

- Too high levels of potassium in the blood (hyperkalemia)
- Heart disease involving the upper chambers of the heart (known as “atrial disease”), often associated with dilated or distended atrial (such as cats with disease of the heart muscle [known as “cardiomyopathy”])
- Muscle disorder of the atria (known as “atrial myopathy”)—persistent atrial standstill

### RISK FACTORS

#### ***Atrial Standstill Due to Too High Levels of Potassium in the Blood (Hyperkalemia)***

- Inadequate production of steroids by the adrenal glands (hypoadrenocorticism or Addison’s disease) leading to increased levels of potassium in the blood
- Conditions leading to obstruction or rupture of the urinary tract
- Kidney failure characterized by production of only small amounts of urine (known as “oliguria”) or no urine (known as “anuria”)

## TREATMENT

### HEALTH CARE

#### ***Persistent Atrial Standstill***

- Not life-threatening condition; animal can be treated as an outpatient

### ***Atrial Standstill Due to Too High Levels of Potassium in the Blood (Hyperkalemia)***

- Potentially life-threatening; often requires aggressive treatment
- Aggressive fluid therapy with 0.9% saline often necessary to correct low circulating blood volume (known as “hypovolemia”) and to lower serum potassium levels in patients with atrial standstill due to too high levels of potassium in the blood (hyperkalemia)

#### **ACTIVITY**

- Restrict activity in patients with persistent atrial standstill and signs of congestive heart failure (CHF) or fainting (syncope); CHF signs include cough; difficulty breathing (dyspnea); bluish discoloration of the skin and moist tissues (mucous membranes) of the body caused by inadequate oxygen levels in the red-blood cells (known as “cyanosis”); congestive heart failure is a condition in which the heart cannot pump an adequate volume of blood to meet the body’s needs

#### **SURGERY**

##### ***Persistent Atrial Standstill***

- Surgically implant a permanent ventricular pacemaker to regulate heart rate and rhythm

##### ***Atrial Standstill Due to Too High Levels of Potassium in the Blood (Hyperkalemia)***

- Too high levels of potassium in the blood (hyperkalemia) secondary to urinary tract obstruction or rupture may require surgery to treat the problems in the urinary tract

#### **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.

##### ***Persistent Atrial Standstill***

- Treat with diuretics to remove excess fluid from the body (such as furosemide or spironolactone) and angiotensin-converting enzyme inhibitors (ACE inhibitors) to dilate blood vessels (such as enalapril or benazepril), if congestive heart failure (CHF) develops

##### ***Atrial Standstill Due to Too High Levels of Potassium in the Blood (Hyperkalemia)***

- Treat the underlying cause (such as kidney failure characterized by production of only small amounts of urine [oliguria], inadequate production of steroids by the adrenal glands [hypoadrenocorticism or Addison’s disease])
- Aggressive fluid therapy with 0.9% saline and possibly sodium bicarbonate or insulin with dextrose
- Calcium gluconate—counters the heart effects of too high levels of potassium in the blood (hyperkalemia); can be used in life-threatening situations to reestablish a normal heart rhythm while instituting treatment to lower potassium concentration in the blood

#### **FOLLOW-UP CARE**

##### **PATIENT MONITORING**

- Monitor electrocardiogram (ECG, a recording of the electrical activity of the heart) during treatment of too high levels of potassium in the blood (hyperkalemia) and periodically in animals with a permanent ventricular pacemaker
- Monitor electrolytes in patients with atrial standstill due to too high levels of potassium in the blood (hyperkalemia)
- Monitor patients with persistent atrial standstill for signs of congestive heart failure (CHF); CHF signs include cough; difficulty breathing (dyspnea); bluish discoloration of the skin and moist tissues (mucous membranes) of the body caused by inadequate oxygen levels in the red-blood cells (known as “cyanosis”); congestive heart failure is a condition in which the heart cannot pump an adequate volume of blood to meet the body’s needs

##### **POSSIBLE COMPLICATIONS**

- Congestive heart failure (CHF) in patients with persistent atrial standstill

##### **EXPECTED COURSE AND PROGNOSIS**

##### ***Persistent Atrial Standstill***

- Clinical signs generally improve after pacemaker implantation
- Signs of congestive heart failure (CHF) may develop, and weakness and sluggishness (lethargy) may persist even after heart rate and rhythm are corrected with the pacemaker; CHF signs include cough; difficulty breathing (dyspnea); bluish discoloration of the skin and moist tissues (mucous membranes) of the body caused by inadequate oxygen levels in the red-blood cells (known as “cyanosis”); congestive heart failure is a condition in which the heart cannot pump an adequate volume of blood to meet the body’s needs

##### ***Atrial Standstill Due to Too High Levels of Potassium in the Blood (Hyperkalemia)***

- Long-term prognosis is excellent if underlying cause can be corrected and the increased levels of potassium in the blood (hyperkalemia) are reversed

## KEY POINTS

### ***Persistent Atrial Standstill***

- Clinical signs generally improve after pacemaker implantation
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