Congestive Heart Failure is the inability of the heart to pump enough blood to the rest of the body. Blood does not get pumped out efficiently, and consequently pools in the heart.

Statistics
How many people die each year of CHF? 287,000 people
Myth: Only men suffer from CHF
Fact: Over 50% of sufferers are women

What are your odds of getting it?
CHF deaths far exceed cancer, HIV
Lifetime risk – 20% (men and women)
Life expectancy
- approximately 5 years
Overall median survival
- 1.7 years in men
- 3.2 years in women

Risk Factors
High cholesterol levels in blood
Diabetes
Physical inactivity
Obesity
Smoking
Poor diet
High blood pressure (Hypertension)

Treatment
Heart transplantation
Mechanical assistance
Total artificial heart

The Veterinary Black Bag Program
Project Goals:
- Develop Veterinarian’s Black Bags (VBBs) of instructional items and pamphlets for middle school teachers to support classroom visits by local veterinarians.
- Provide professional development for veterinarians and teachers on how to use items in the VBBs
- Promote inquiry-based thinking about health-related subjects while emphasizing the value of biomedical research and promoting careers in science.

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The instruction in this module includes:
Presentation on Heart Disease
Follow-up lessons on:
- Human Heart Function
- Heart Research
- Heart Function Inquiry
**Basic Anatomy**
Arteries – Carry blood away from the heart
Veins – Carry blood to the heart
Capillaries – Site of gas exchange

**Heart Rate**
- A slower rate tends to move more blood per beat. Why?
  More time for chambers to get filled with venous blood.
- Fast rates tend to move more total blood. Why?
  More beats per unit of time.
Though less blood is pumped per beat, the high beat rate will usually move more blood volume in total.
- But very fast rates are not efficient and may even be dangerous. Why?
  At high beat rates, there is not enough fill time for the chambers.

**The Heart and Heart Diseases**

**The Heart as a Pump**
The heart works as a pump, forcing blood forward into the arteries
Blood returns to the heart in veins. Veins have valves.
What is the function of the valves?
Look in the diagram at the direction of the blood flow and how the valves close

**Causes of Heart Attacks**
Genetics: it can run in families
Diet: too much fat and cholesterol
Not enough vigorous exercise

**Tendon-like cords connect valves to walls of the heart and help hold the valves shut during contraction**

**Patent Ductus Arteriosus (PDA)**
An arterial shunt called the ductus arteriosus is open in the fetus to prevent blood from being pumped into fluid filled lungs, but should close when the fetus is born. PDA occurs when the shunt does not close within 10-18 hours after birth, and blood does not get pumped to the lungs properly.

**In Dogs**
PDA is the most common canine congenital (present at birth) heart problem, and affects 5 out of 1000 dogs, in any size or breed.

**In Humans**
The estimated incidence is from 6 to 20 out of every 100,000 live births, and is increased in children who are born prematurely. It occurs twice as often in girls as in boys.

**Management Options**
- Observation and monitoring
- Medications may be prescribed to reduce blood pressure, maintain normal heart rhythm, and prevent fluid overload.
- Surgical repair
  - Ligating (suturing closed) the artery
- Catheter based occlusion
  - Placing a “coil” inside the artery to stimulate closure