

# Cardiovascular System



# factors which can be changed

- heart
  - rate
  - force
- blood vessels
  - tone
- blood
  - volume
  - composition



# common problems

- heart disease
- injury
- anaesthesia
- shock



# heart

- **conducting system**
  - antiarrhythmics
  - chronotropes
- **myocardium**
- **blood supply**
- **valves**
- **nerve supply**





# heart

- conducting system
- myocardium
  - inotropes
- blood supply
- valves
- nerve supply



# heart

- conducting system
- myocardium
- blood supply
  - vasodilators
- valves
- nerve supply



# heart

- conducting system
- myocardium
- blood supply
- valves
  - vasodilators
  - (surgery)
- nerve supply



# heart

- conducting system
- myocardium
- blood supply
- valves
- nerve supply
  - chronotropes





# heart failure

- cardiac arrest
- acute heart failure
- chronic (congestive) heart failure



# cardiac arrest

- prevention is better than cure!
- treat the causes before it happens!



# What would you do?

- 7 year old fluffy dog
- not breathing
- no palpable pulse



# cardiac arrest

- Airway
- Breathing
- Circulation
- Drugs
- ECG etc





# drugs

- **asystole**
  - atropine
  - adrenaline
  - bicarbonate



# drugs

- **ventricular fibrillation**
  - DC defibrillation







# drugs

- **ventricular fibrillation**
  - DC defibrillation
  - (lignocaine)
  - adrenaline
  - bicarbonate





# problems after CPR

- hypoxic myocardium & brain
- acidosis
- bruising of myocardium
- lung contusions / pneumothorax
- broken ribs



# acute heart failure

- after CPR
- anaesthetic overdose
- pericarditis
- metabolic illness
- progressive CHF



# severe acute heart failure treatment priorities

- 1 avoid excitement  
sedate if necessary  
benzodiazepine  $\pm$  opioid
- 2 give oxygen  
oxygen cage  
mask  
nasal tube
- 3 place large bore iv catheter  
sedate if necessary  
benzodiazepine  $\pm$  opioid  
cut down if necessary  
local anaesthetic
- 4 give frusemide iv  
1 - 2 (up to 8 in dogs)mg/kg/hr
- 5 attach ECG machine
- 6 make diagnosis  
x rays, ultrasound, etc
- 7 drugs  
vasodilators  
inotropes  
antiarrhythmics  
fluids

# cardiac arrest

- **Airway**
- **Breathing**
- **Circulation**
- **persist for 15 mins**
- **if resuscitation successful, treat for acute heart failure**

