

Cardiovascular System



cardiovascular system

- heart
- blood vessels
- blood



factors which can be changed

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



common problems

- heart disease
- injury
- anaesthesia
- shock



heart

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



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



consequences of HF

- **upstream pressure increases**
 - increased preload
- **downstream pressure goes down**
 - vasoconstriction
 - increased afterload



consequences of HF

- **blood dams back in lungs**
 - pulmonary oedema
- **blood dams back in body**
 - ascites & peripheral oedema
- **lack of forward flow to muscles and lungs**
 - tissue hypoxia



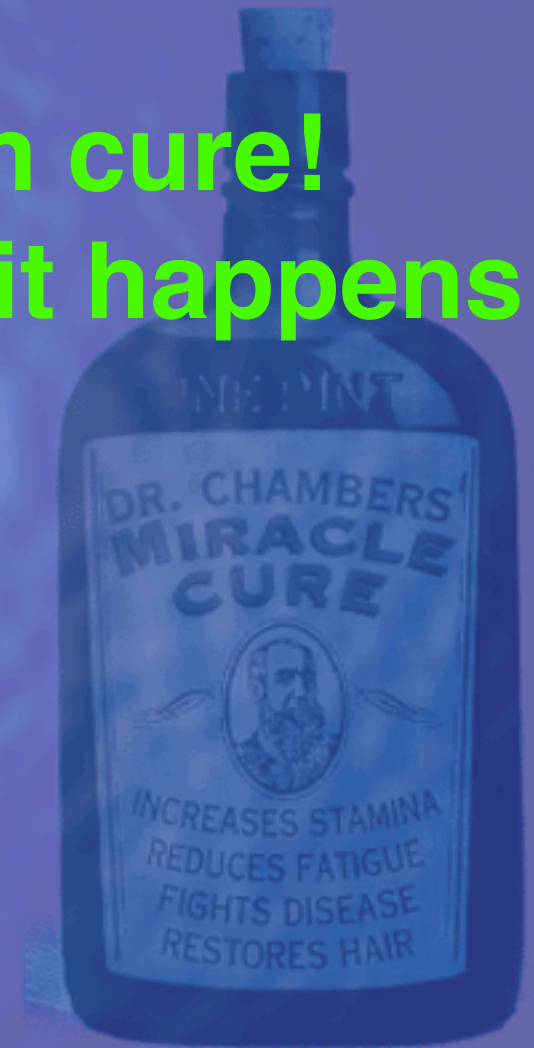
heart failure

- 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



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**

