

## **Congestive Heart Failure**

more interesting stuff...

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### **congestive heart failure**

- rest
- low salt diet
- diuretics
- vasodilators
- long acting inotropes
- (antiarrhythmics)

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### **7 yr old Doberman**

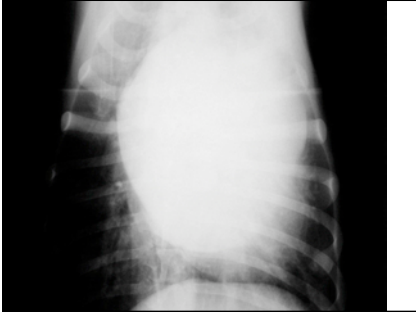
- cough
- lethargy / exercise intolerance
- anorexia
- ascites
- sudden onset 1 week ago

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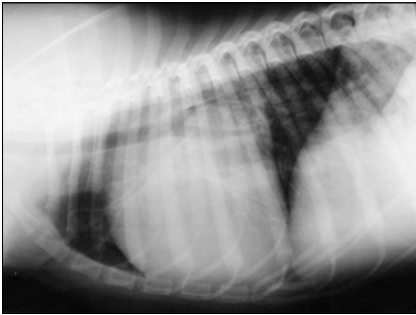
### **examination**

- soft systolic murmur
- heart rate 148
- harsh lung sounds

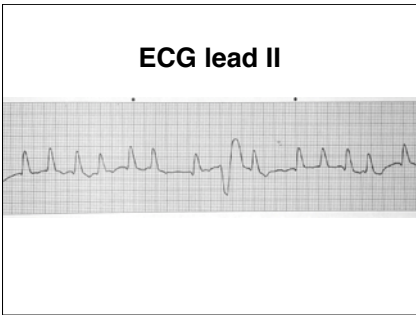
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**diagnosis**

- dilated cardiomyopathy

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### **treatment**

- diuretics
- positive inotropes
- antiarrhythmics?

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### **positive inotropes**

- sympathomimetics
- cardiac glycosides
- phosphodiesterase inhibitors

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### **cardiac glycosides**

- = digitalis

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## cardiac glycosides

- **digoxin**
- digitoxin
- ouabain
- lanatoside C
- strophanthin
- squill
- convallotoxin
- some toads' skin

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## chemistry

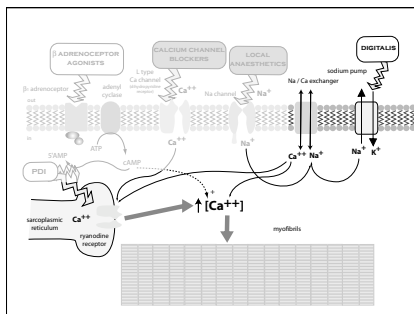
- steroid nucleus
- lactone group
- 3 sugars

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## effects

- positive inotropic
- negative chronotropic

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### **negative chronotropy**

- **vagal stimulation**
- **potentiation of ACh**
- **SA & AV node**

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### **indications**

- **congestive heart failure**
  - especially DCM
- **supraventricular tachycardias**
  - atrial fibrillation

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### **side effects**

- **cardiac**
  - ventricular tachyarrhythmias
  - heart block
- **generalised**
  - nausea / anorexia
  - vomiting

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### **contra-indications**

- **ventricular tachycardias**
- **pericardial disease**

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## **toxicity**

- **mild**
  - reduce dose / withdraw drug
- **ventricular tachyarrhythmias**
  - lignocaine, phenytoin
  - Ca blockers
- **accidental overdose**
  - cholestyramine
  - digoxin antibodies

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## **pharmacokinetics**

- **half life**
  - dog 24 - 36h
  - cat 33 - 58h
- **elimination**
  - 85% renal

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## **clinical use**

- **loading dose then maintenance dose**
  - not recommended
- **small dose and work up**

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## **monitoring**

- **nausea / vomiting**
- **plasma levels**

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### interactions

- **do not use with**
  - quinidine
  - verapamil
- **care with**
  - diuretics
  - altered K<sup>+</sup> concentrations

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### positive inotropes

- sympathomimetics
- cardiac glycosides
- phosphodiesterase inhibitors

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### phosphodiesterase inhibitors

- **methylxanthines**
  - caffeine
  - theophylline
    - aminophylline
    - etamiphylline
  - theobromine
- **synthetic**

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### phosphodiesterase inhibitors

- **methylxanthines**
- **synthetic**
  - milrinone
  - oxpentifylline
  - sildenafil
  - pimobendan

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## phosphodiesterase

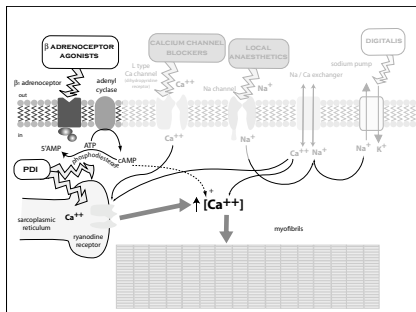
- **PDE 3**
  - milrinone
  - pimobendan?
- **PDE 4**
  - oxpentifylline
- **PDE 5**
  - sildenafil
- **all & A2**
  - theophylline

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## PDI effects

- **positive inotropy**
- **vasodilatation**
- **bronchodilatation**
- **CNS stimulation**
- **diuresis**

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## effects

- **pimobendan**
  - PDE inhibition
  - "calcium sensitisation"

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### **indications**

- mild - moderate CHF

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### **side effects**

- sudden death in people
- none obvious in dogs

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### **overdose**

- tachyarrhythmias
- convulsions

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### **congestive heart failure**

- digoxin binds competitively to potassium binding site of sodium pump
- low potassium increases effect
- positive inotrope, negative chronotrope
- side effects - vomiting & anorexia, ventricular tachycardia
- indications - atrial fibrillation with tachycardia, congestive heart failure
- phosphodiesterase inhibitors are useful and safe in mild / moderate CHF

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