

# Cardiovascular System

more interesting stuff

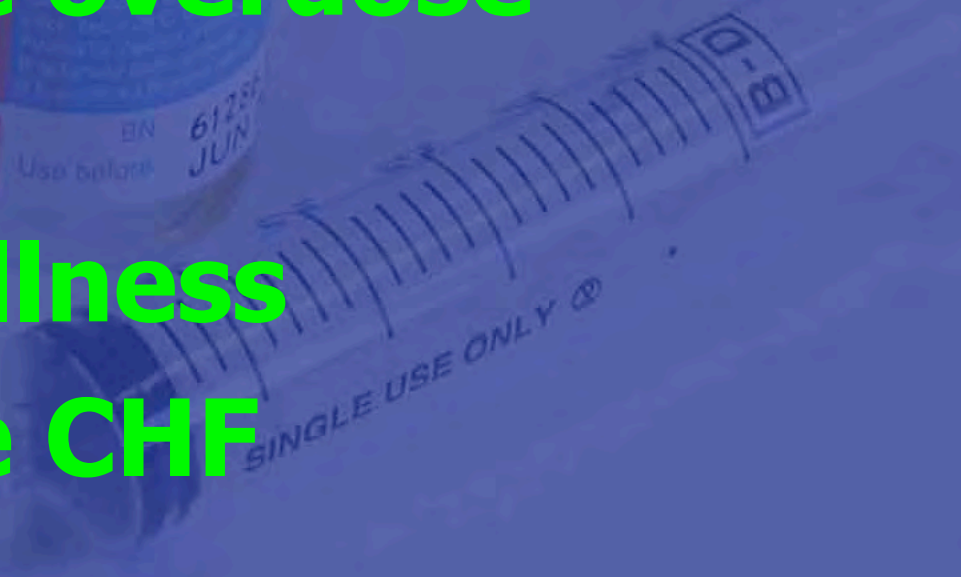


# acute heart failure

- Nurses should know which drugs are likely to be used and how they are normally given so that the drugs can be given as quickly as possible.

# 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

# chronic heart failure

The background of the slide is a blue-tinted photograph of medical supplies. In the center, there is a clear plastic bottle of furosemide (Lasix) with a red label. To the right of the bottle, a white syringe with a blue plunger and a needle is lying horizontally. The syringe has 'SINGLE USE' printed on it. The overall scene is set against a dark blue background.

- Nurses should know how to advise owners about minor side effects and how to cope with major side effects until a veterinary assessment can be made.

# CHF

The background of the slide features a photograph of medical supplies. In the center, there is a small glass vial with a white cap and a label that includes the word 'HEPARIN'. To the right of the vial, a clear plastic syringe with a black plunger and a needle is lying horizontally. The syringe has 'D-B' printed on its barrel and 'SINGLE USE ONLY' on the plunger. A thin metal needle is also visible in the lower-left corner. The entire scene is set against a plain white background.

- cardiac output down
- blood pressure down
- sympathetic tone up
  - vasoconstriction
  - tachycardia
- salt and water retention up

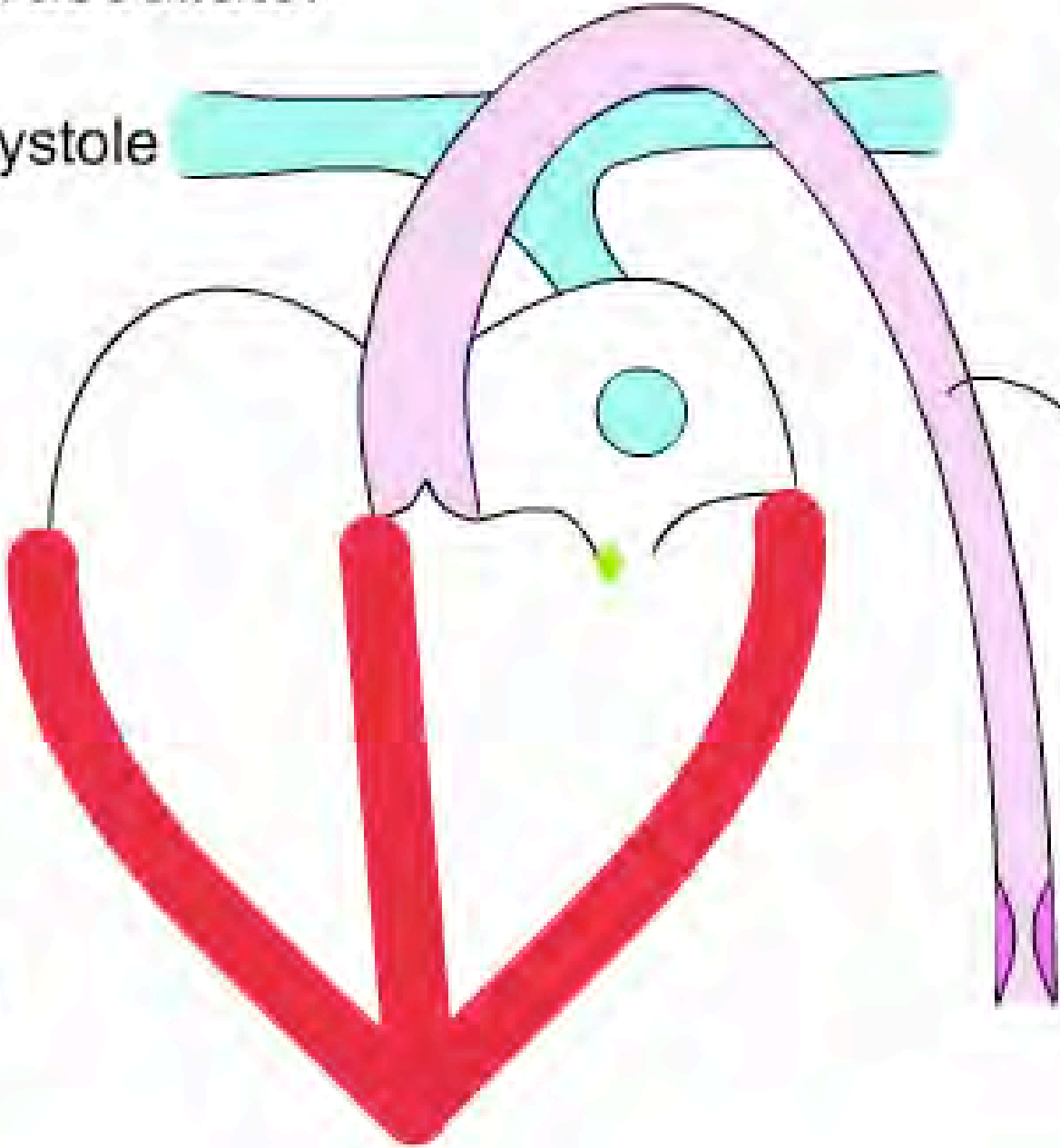
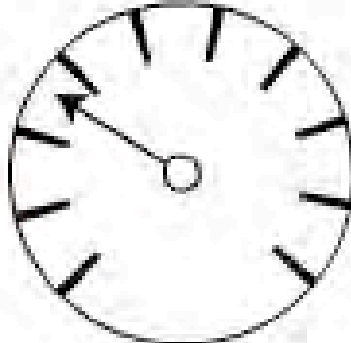
# congestive heart failure

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



No vasodilator

systole

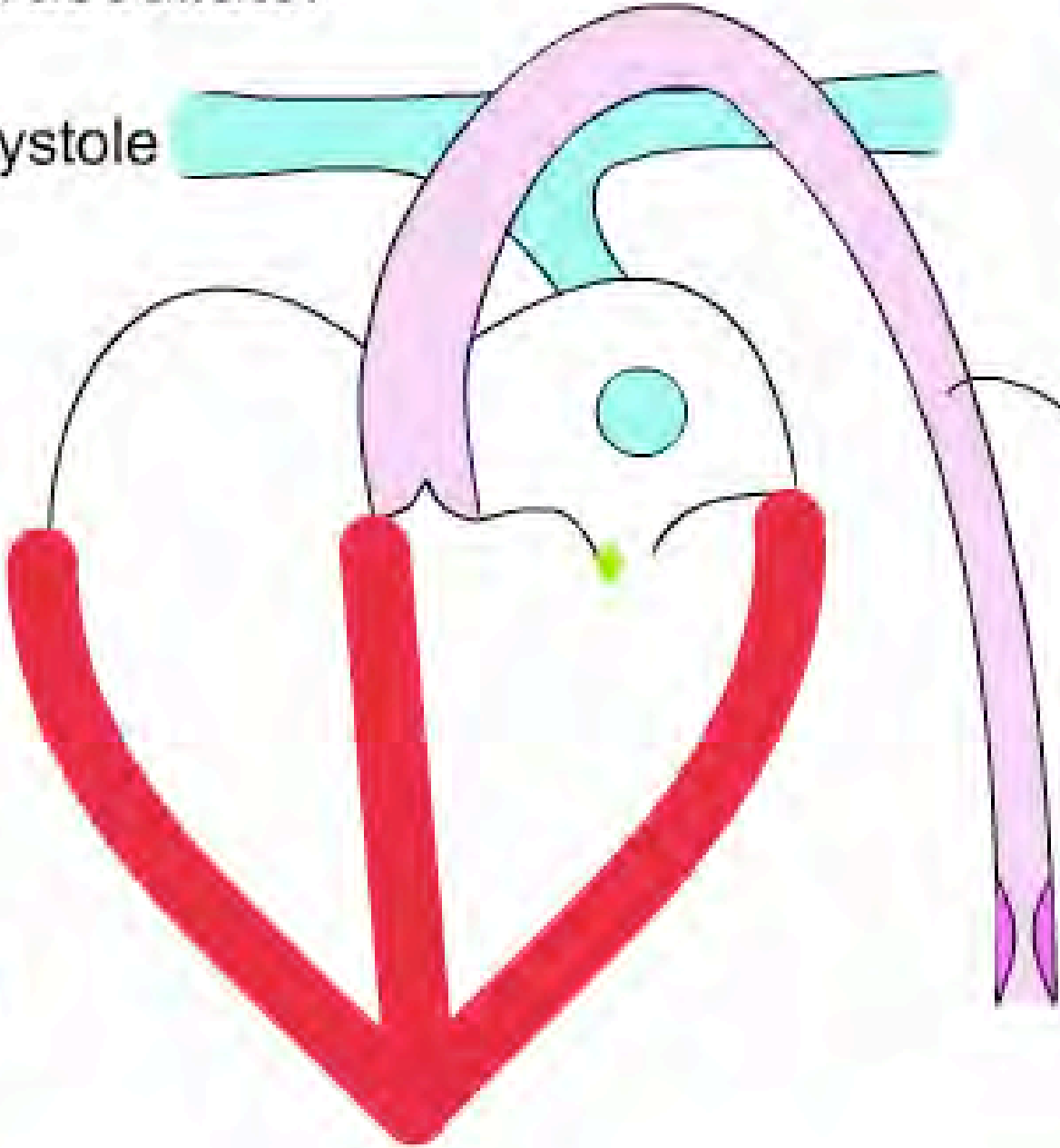
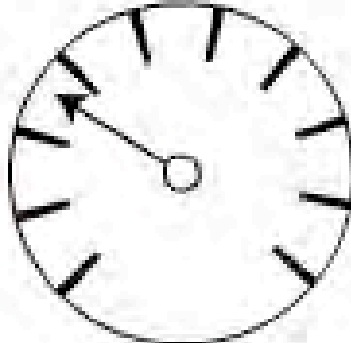


START



No vasodilator

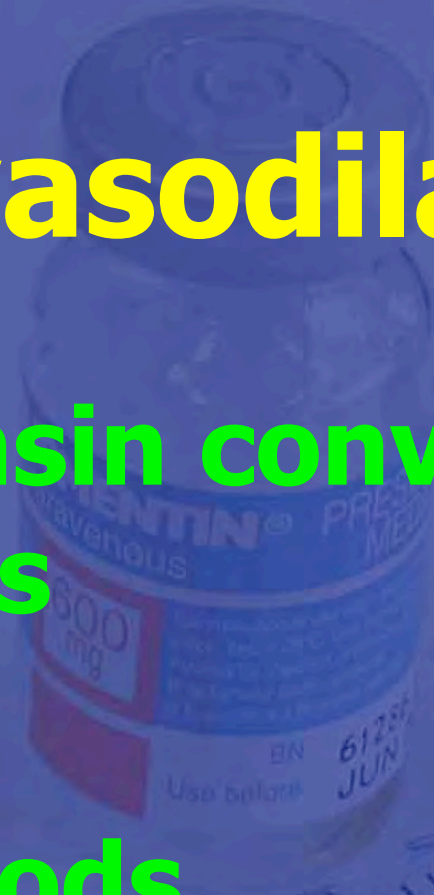
systole



START

# vasodilators

- angiotensin converting enzyme inhibitors
- nitrates
- odds & sods



# ACEI indications

- congestive heart failure
- especially mitral regurgitation
- ± diuretics



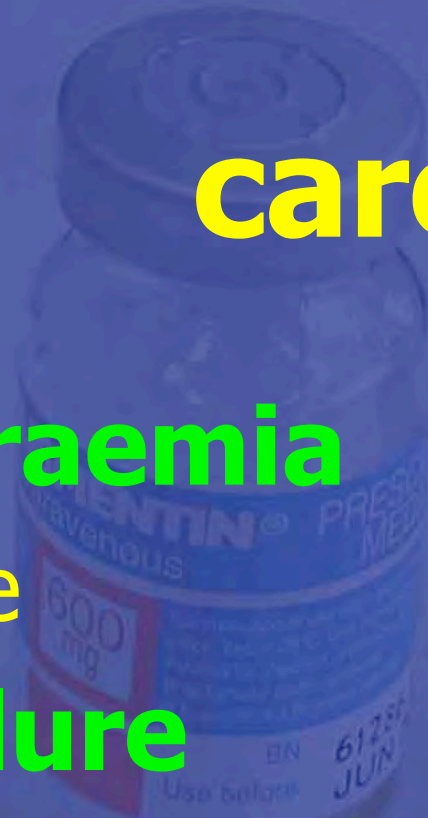
# side effects

- hypotension ( $\pm$  tachycardia)
- anorexia
- vomiting
- diarrhoea
- (cough)



# care

- **hyponatraemia**
  - frusemide
- **renal failure**
- **breeding bitches**



# drugs

- enalapril
- benazepril
- quinapril
- captopril
- etc, etc



# congestive heart failure



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



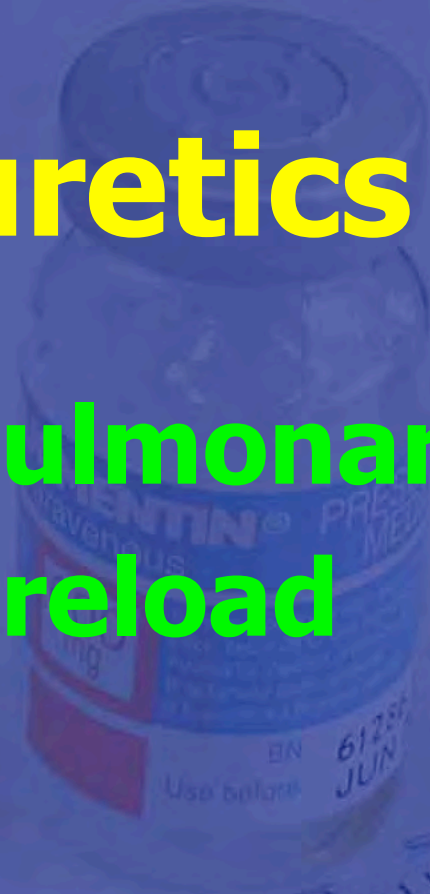
# diuretics

- act on the kidney to increase urine flow
- most block reabsorption of ions from tubules
- water kept in tubules by osmotic pressure

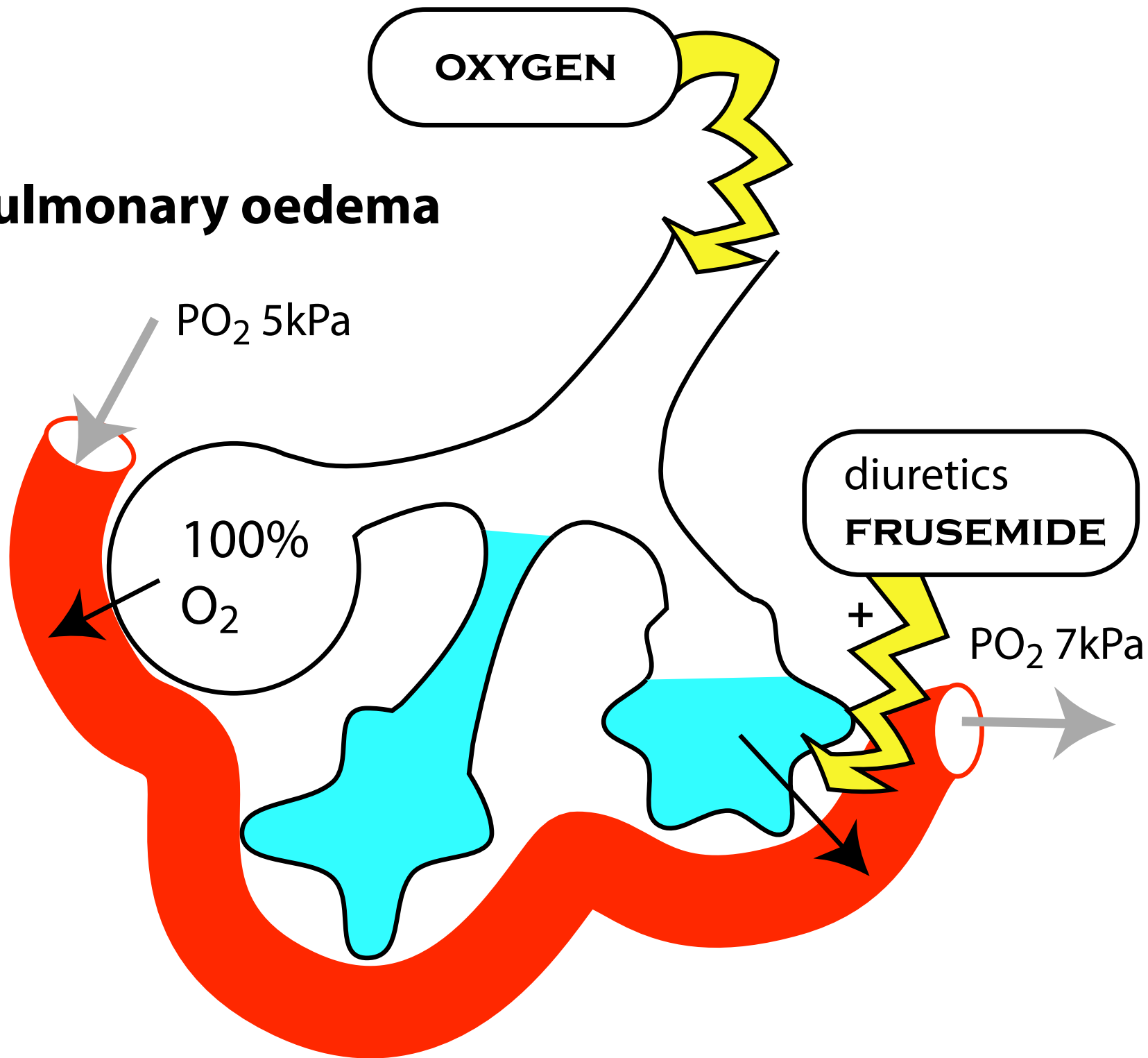


# diuretics & CHF

- reduce pulmonary oedema
- reduce preload



# pulmonary oedema



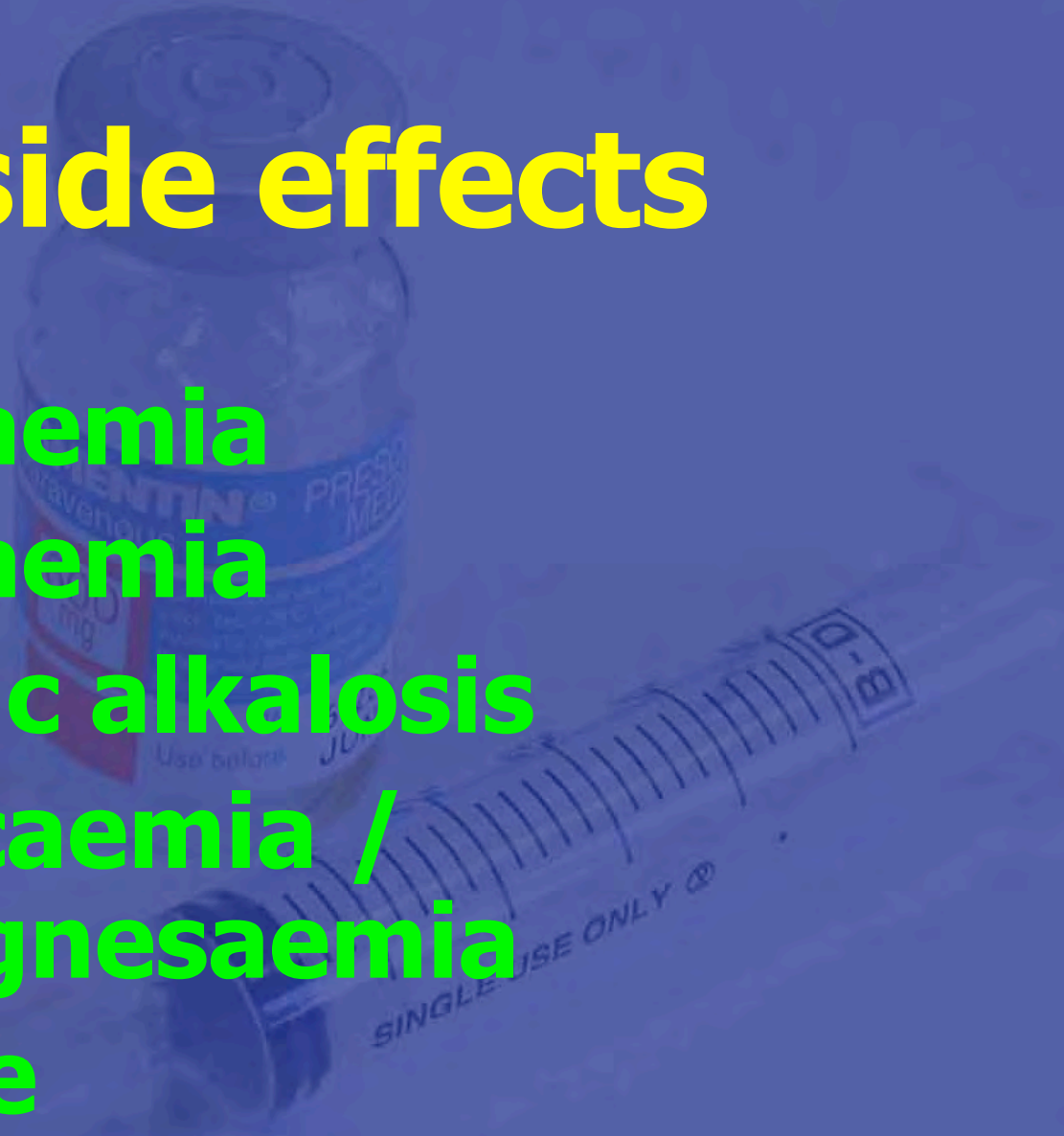
# common drugs

- frusemide
- (hydrochlorothiazide)
- (mannitol)



# side effects

- hypovolaemia
- hypokalaemia
- metabolic alkalosis
- hypocalcaemia / hypomagnesaemia
- tolerance



# interactions

The background of the slide features a blue-tinted image of medical supplies. In the center, there is a glass vial with a white label that includes the word 'GENTAMICIN'. To the right of the vial, a syringe is positioned diagonally, with the text 'SINGLE USE ONLY' visible on its barrel. A needle lies horizontally in the lower-left corner of the frame.

- **increased PCT toxicity**
  - aminoglycosides
  - out of date tetracyclines
  - some obsolete cephalosporins
- **potentiates digoxin**
- **ACE inhibitors?**

# congestive heart failure

A medical vial of Clonidine and a syringe are visible in the background. The vial is labeled 'CLONIDINE' and 'PRESA'. The syringe is labeled 'D-B' and 'USE ONLY'. The background is a solid blue color.

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

# positive inotropes

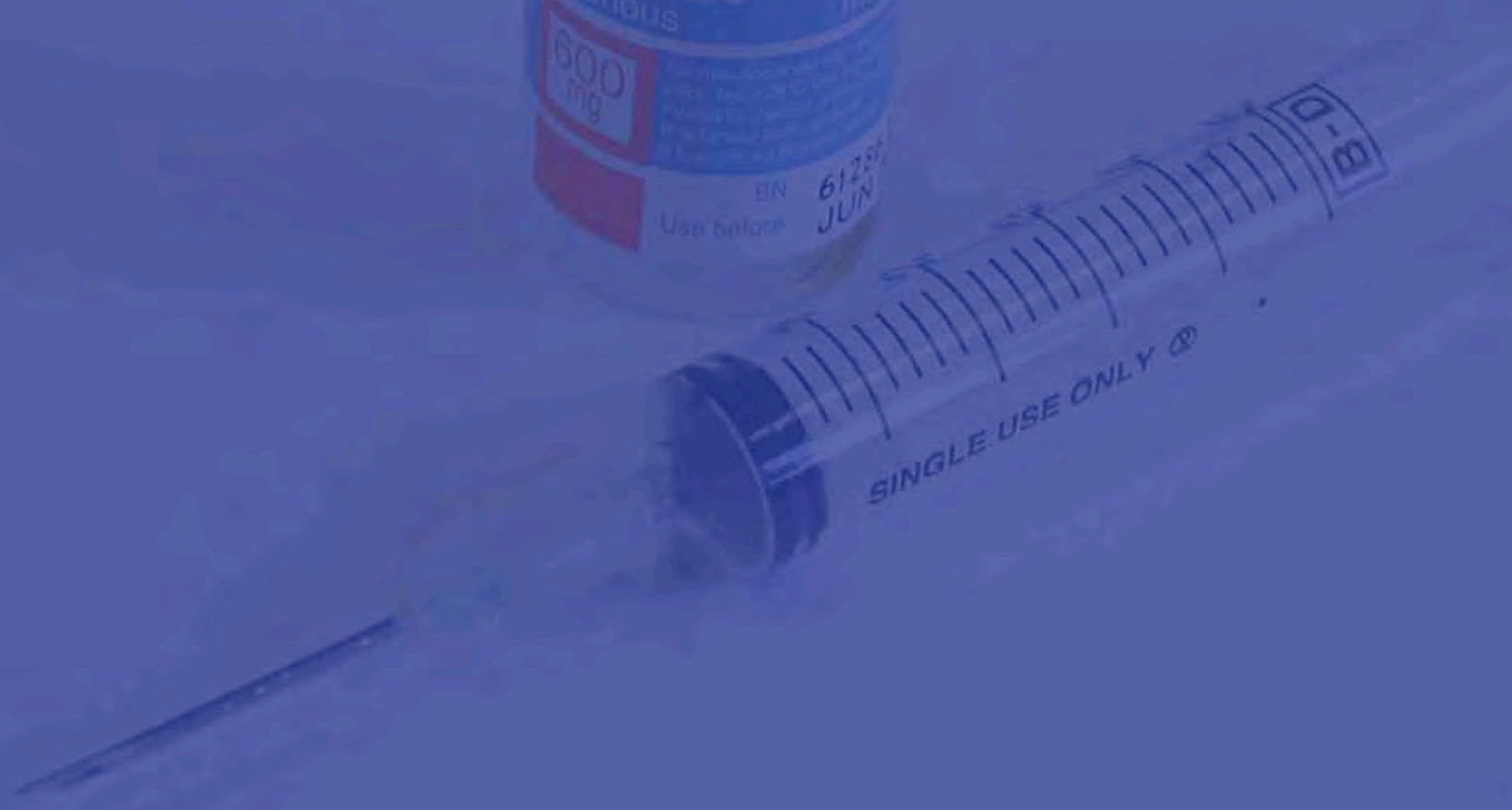
- **sympathomimetics**
- **cardiac glycosides**
- **phosphodiesterase inhibitors**





# cardiac glycosides

- = digitalis



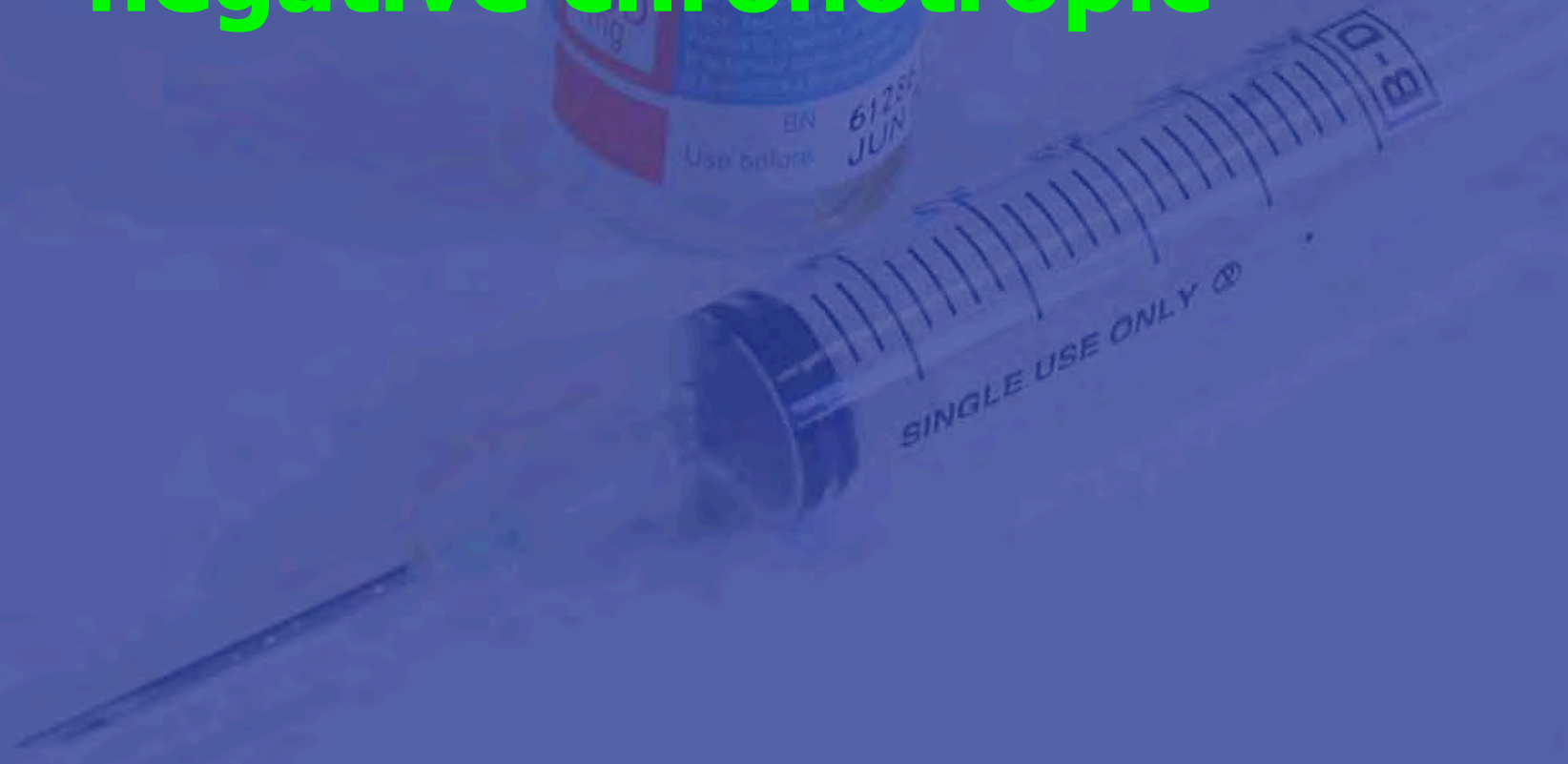
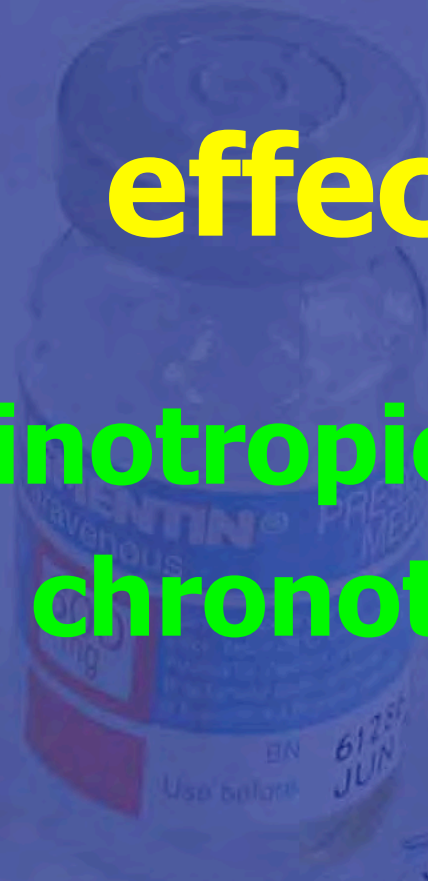






# effects

- positive inotropic
- negative chronotropic



# indications

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



# side effects



- **cardiac**

- ventricular tachyarrhythmias
- heart block

- **generalised**

- nausea / anorexia
- vomiting

# contra-indications

- ventricular tachycardias
- pericardial disease

# toxicity



- **mild**

- reduce dose / withdraw drug

- **ventricular tachyarrhythmias**

- lignocaine, phenytoin

- Ca blockers

- **accidental overdose**

- cholestyramine

- digoxin antibodies

# interactions

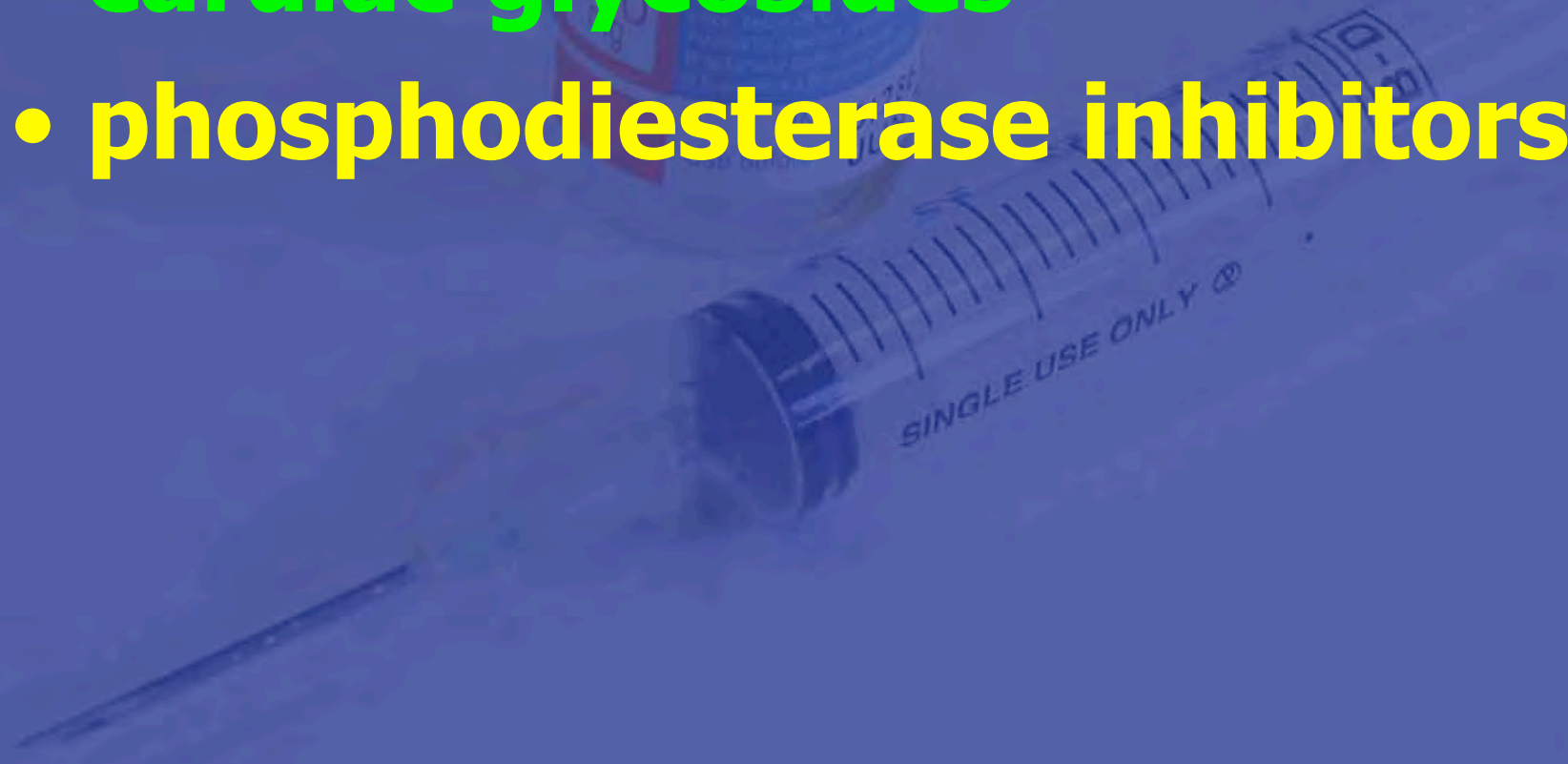
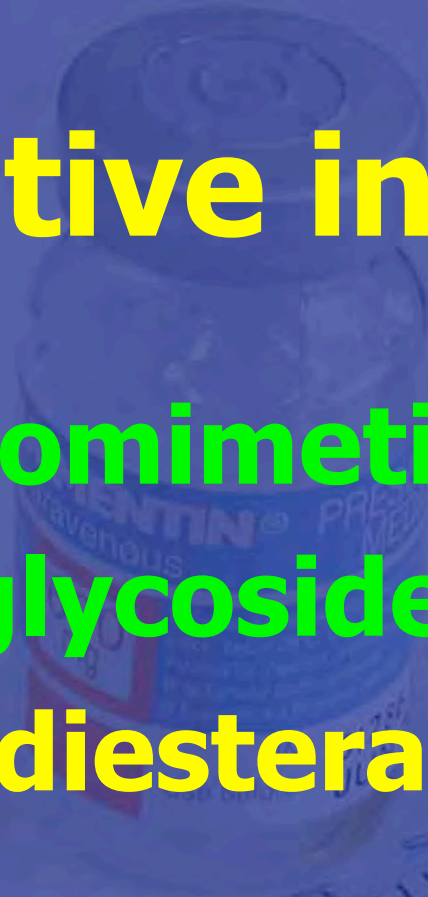
- **do not use with**
  - quinidine
  - verapamil
- **care with**
  - diuretics
  - altered  $K^+$  concentrations





# positive inotropes

- **sympathomimetics**
- **cardiac glycosides**
- **phosphodiesterase inhibitors**





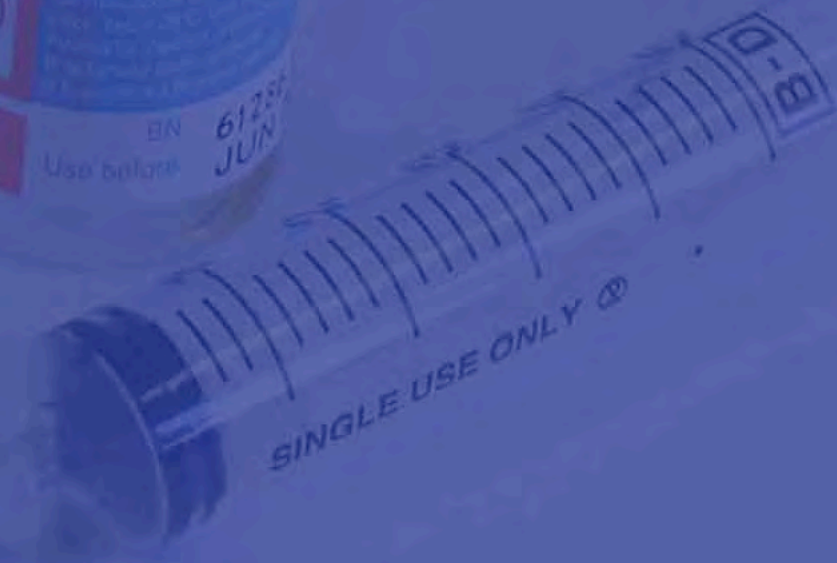
# phosphodiesterase inhibitors

- **methylxanthines**

- caffeine
- theophylline
  - aminophylline
  - etamiphylline
- theobromine

- **synthetic**

- milrinone
- oxpentifylline
- sildenafil



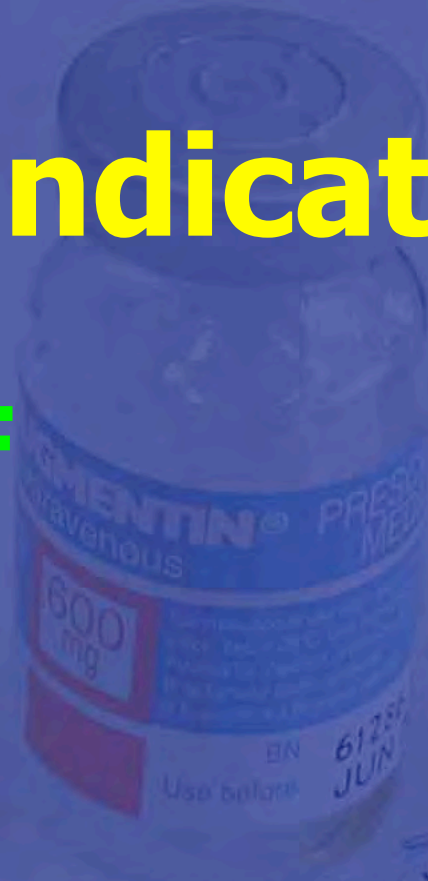
# PDI effects

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



# indications

- mild CHF



# overdose

- tachyarrhythmias
- convulsions



# general rules

The background of the slide is a blue-tinted photograph of medical supplies. In the center, there is a glass vial with a white label that reads 'PREVENTIN® PRE-MIXED' and 'intravenous'. Below the vial, a clear plastic syringe with a black plunger and a needle is lying horizontally. The syringe has 'SINGLE USE ONLY' printed on its side. The overall scene is set against a light blue background.

- know about minor side effects
- avoid excitement
- get vet to check animal if in doubt