Cardiovascular System

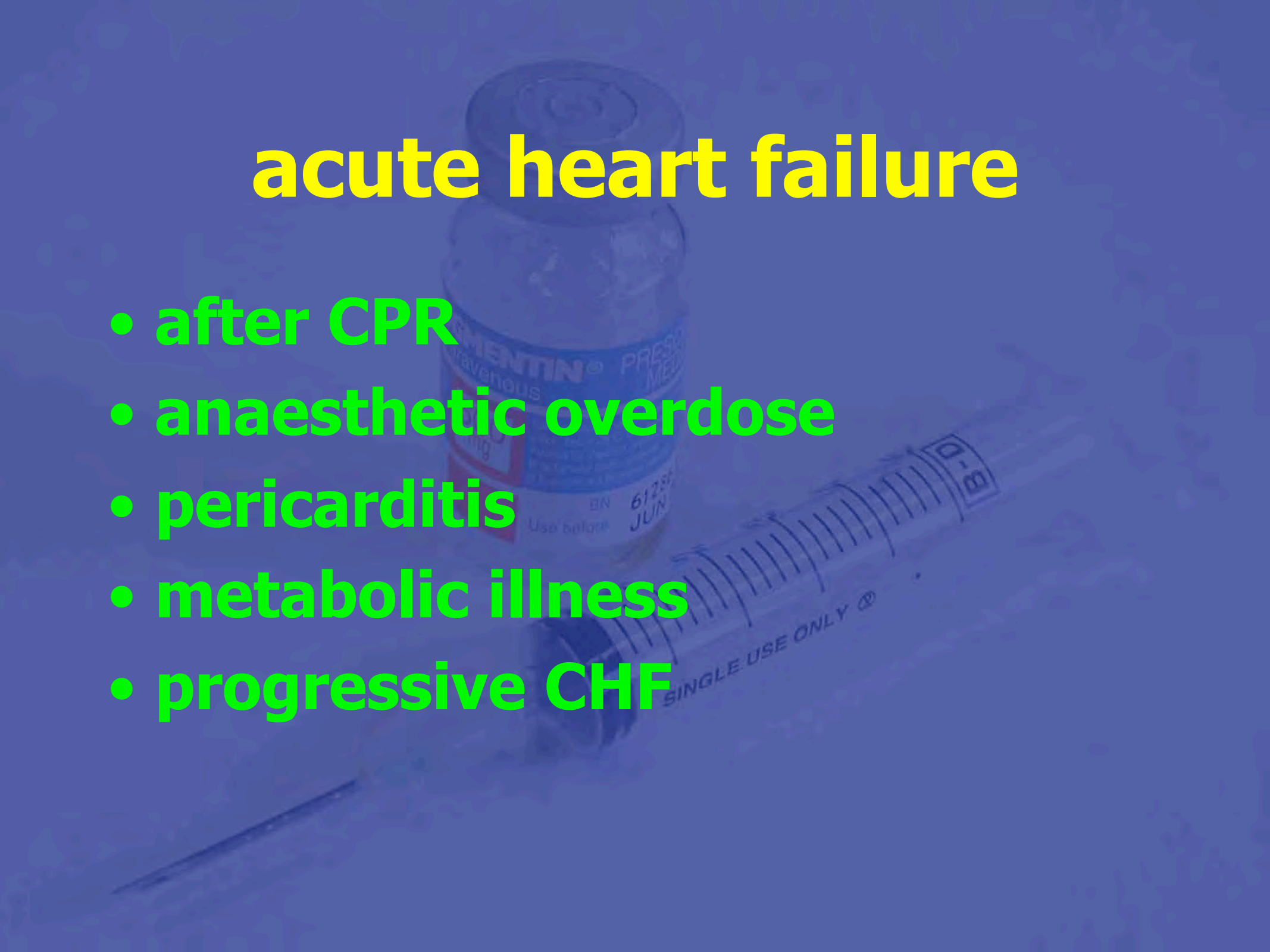
more interesting stuff

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 ± opioid
2. give oxygen
   - oxygen cage
   - mask
   - nasal tube
3. place large bore iv catheter
   - sedate if necessary
     - benzodiazepine ± 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

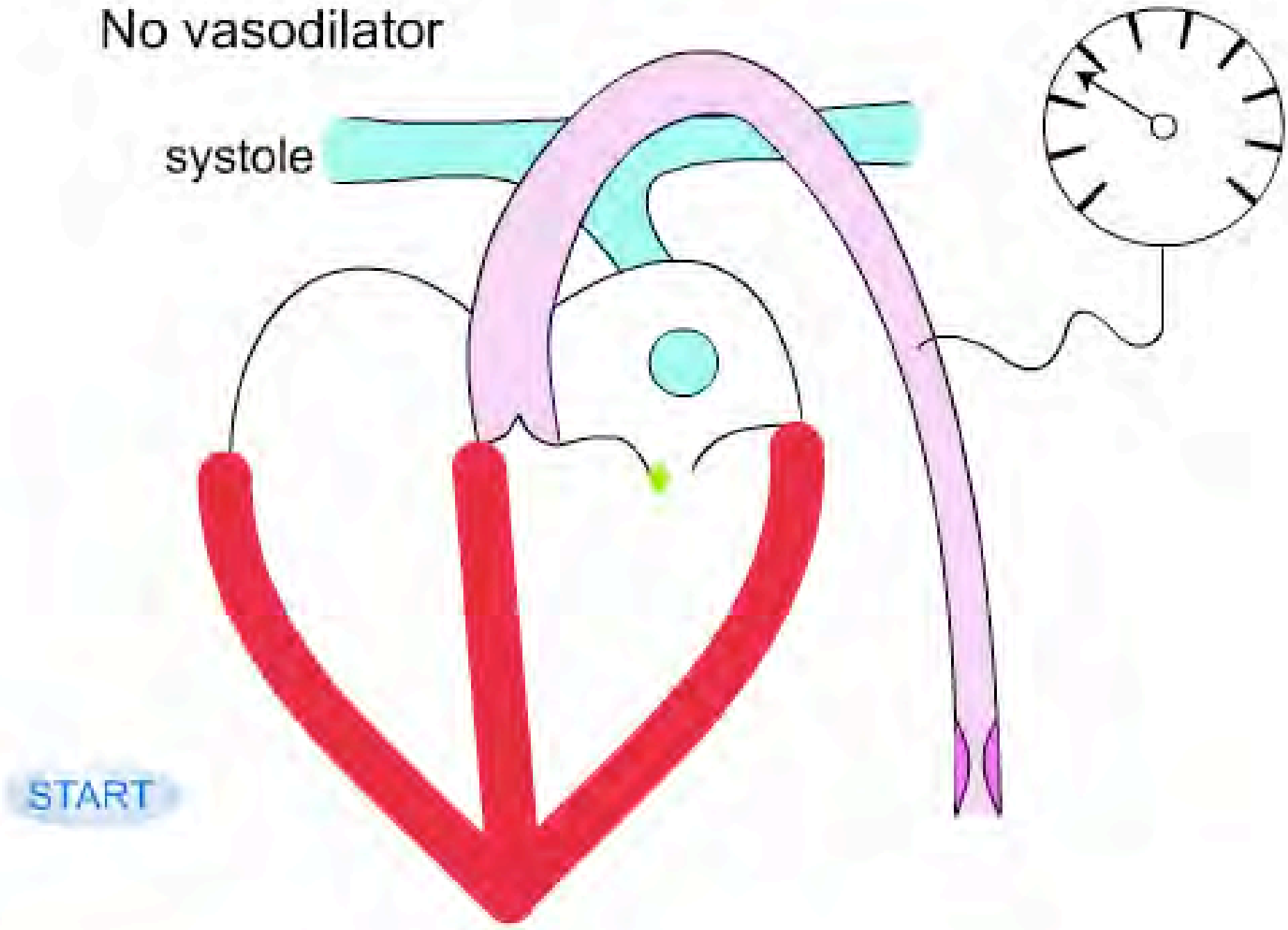
- Nurses should know how to advise owners about minor side effects and how to cope with major side effects until a veterinary assessment can be made.

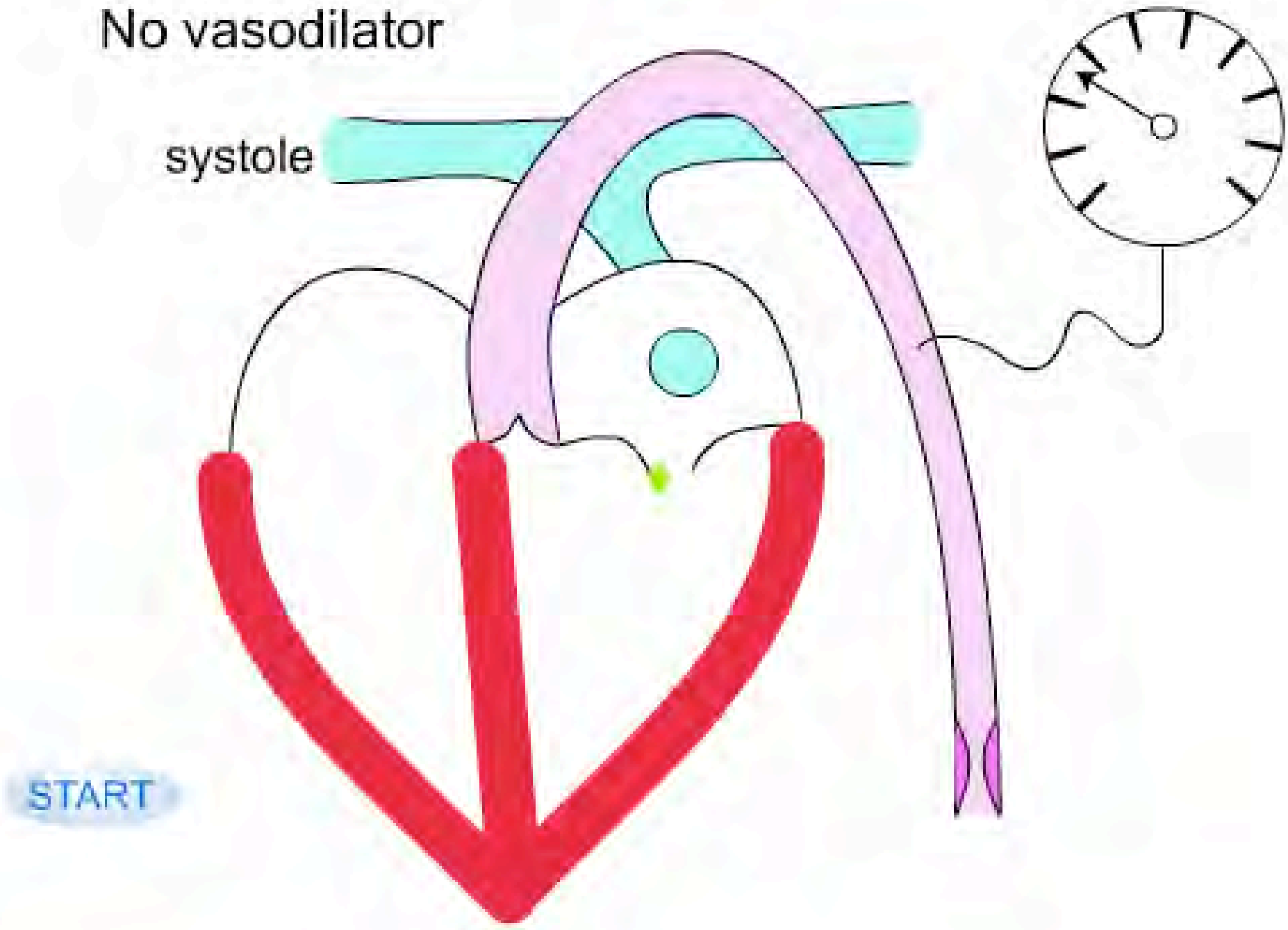
CHF

- **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 (± tachycardia)
- anorexia
- vomiting
- diarrhoea
- (cough)

care

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

drugs

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

congestive heart failure

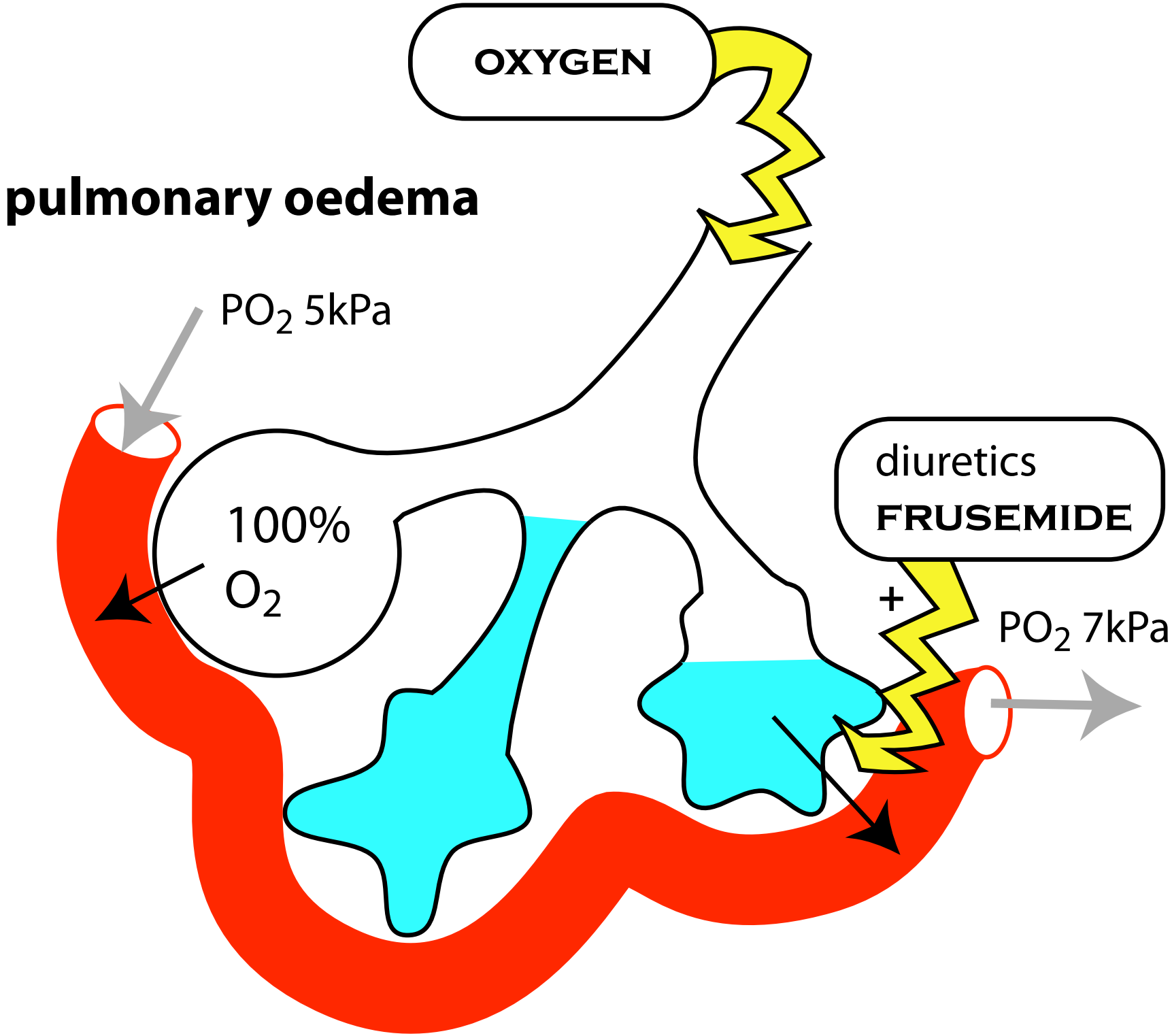
- rest
- low salt diet
- vasodilators
- diuretics
- long acting inotropes
- (antiarrhythmics)

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


OXYGEN
pulmonary oedema
PO2 5kPa
100%
O2
diuretics
FRUSEMIDE
+
PO2 7kPa

common drugs

- frusemide
- (hydrochlorthiazide)
- (mannitol)

side effects

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

interactions

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  - out of date tetracyclines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

congestive heart failure

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

positive inotropes

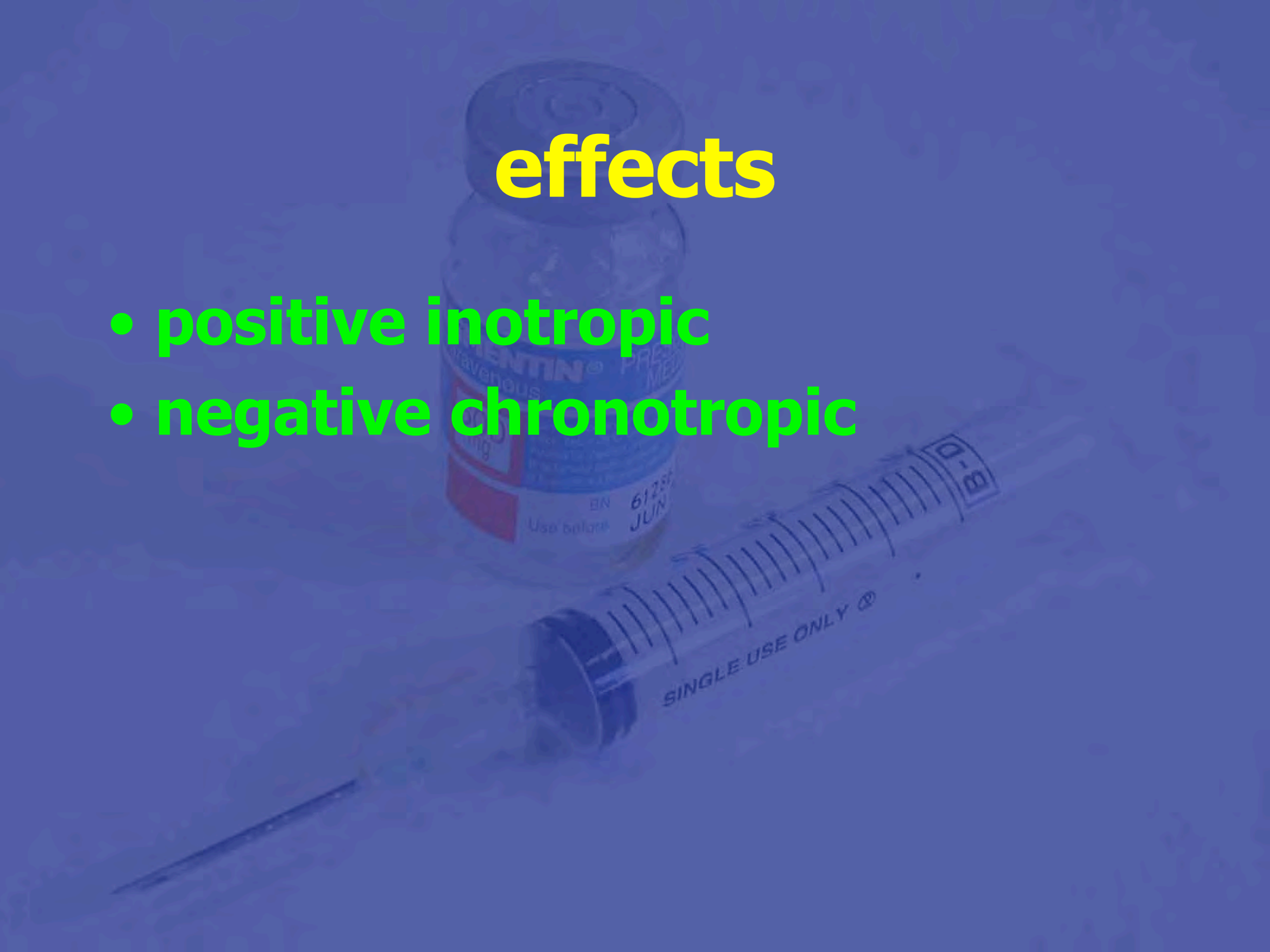
- sympathomimetics
- cardiac glycosides
- phosphodiesterase inhibitors

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

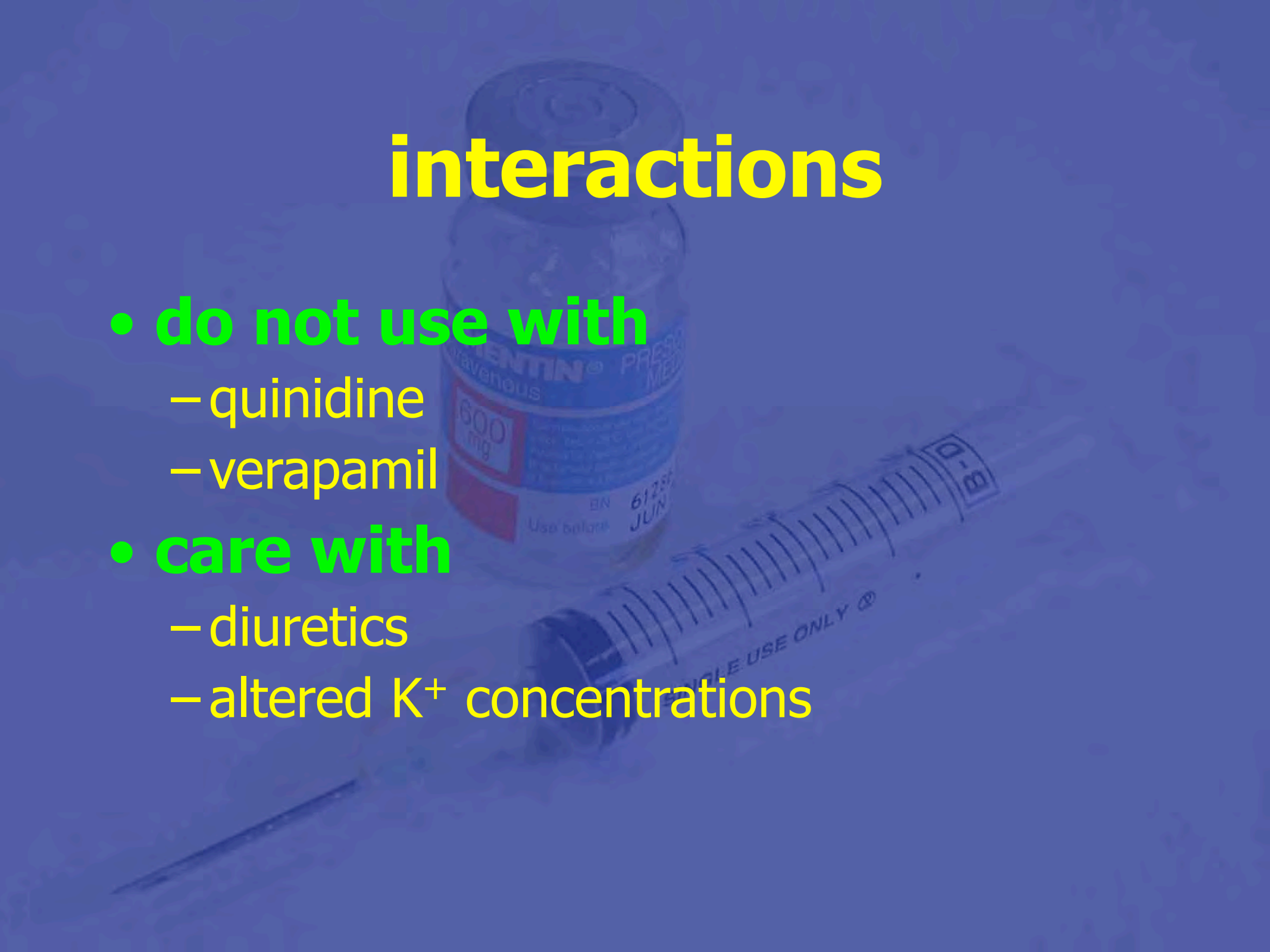
- ventricular tachycardias
- pericardial disease

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

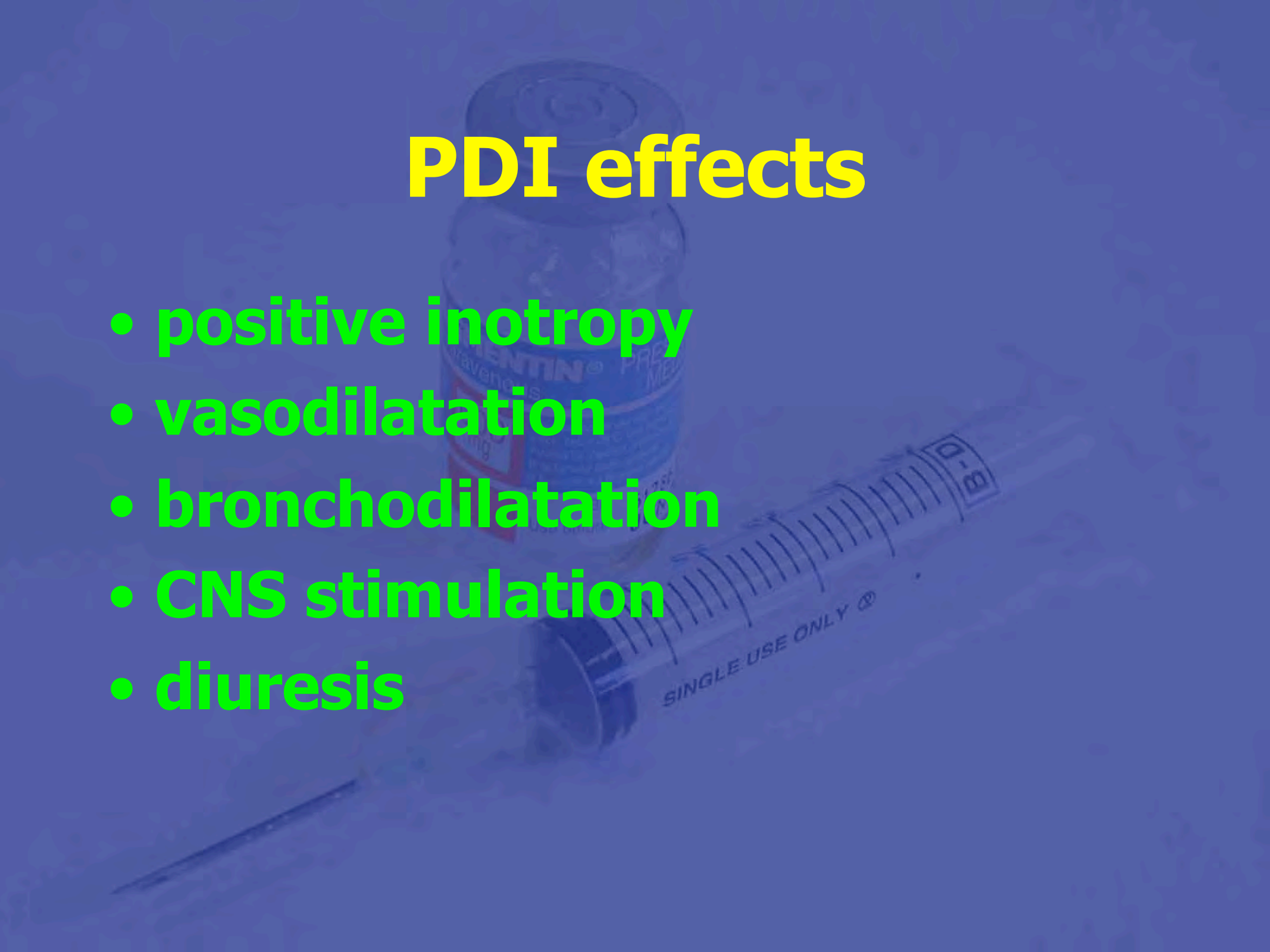
- sympathomimetics
- cardiac glycosides
- phosphodiesterase inhibitors

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

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