

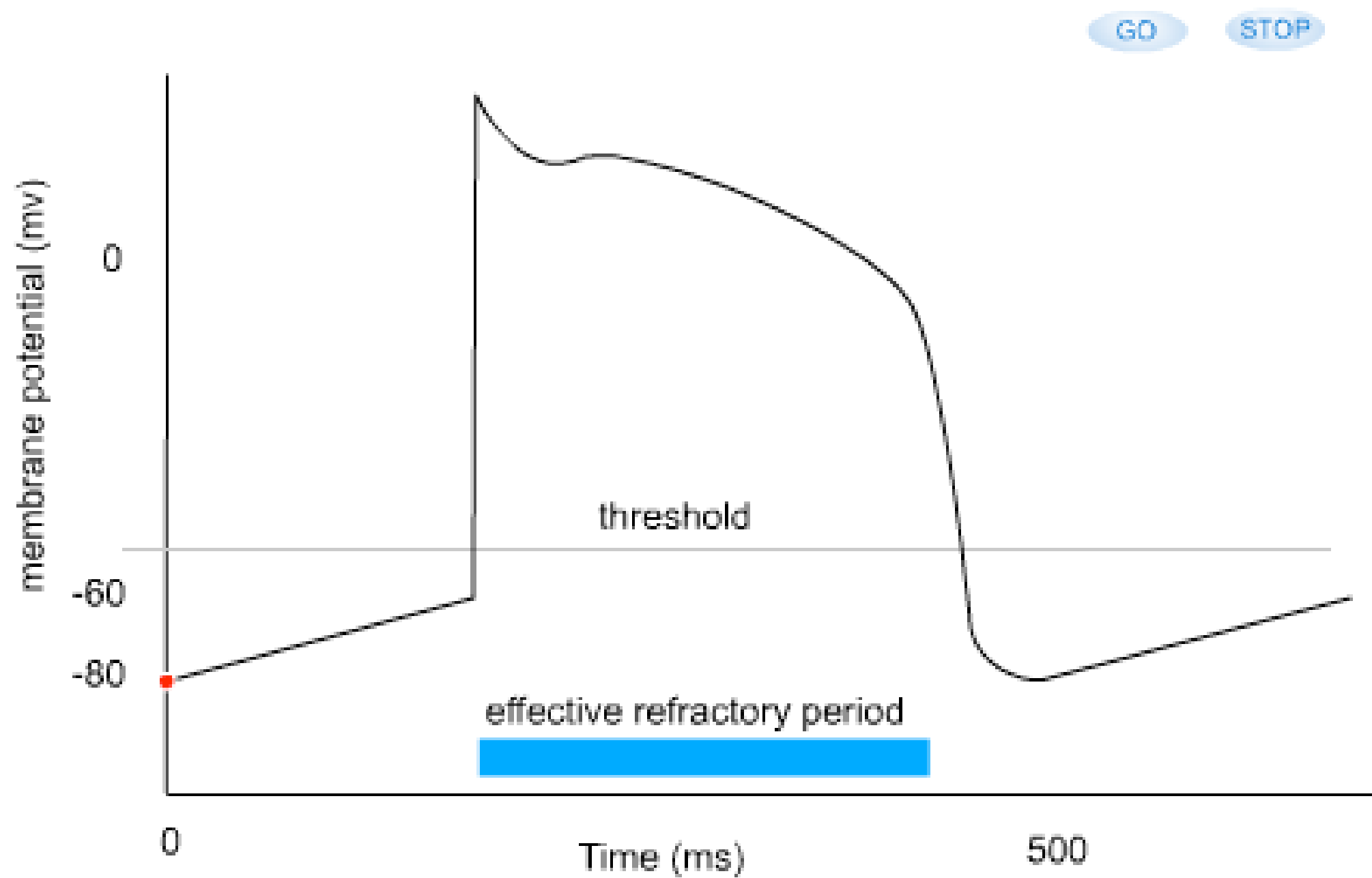
Antiarrhythmic Drugs



arrhythmias

- = dysrhythmias
- abnormal cardiac rhythm
- may be spectacular but not significant





arrhythmia mechanisms

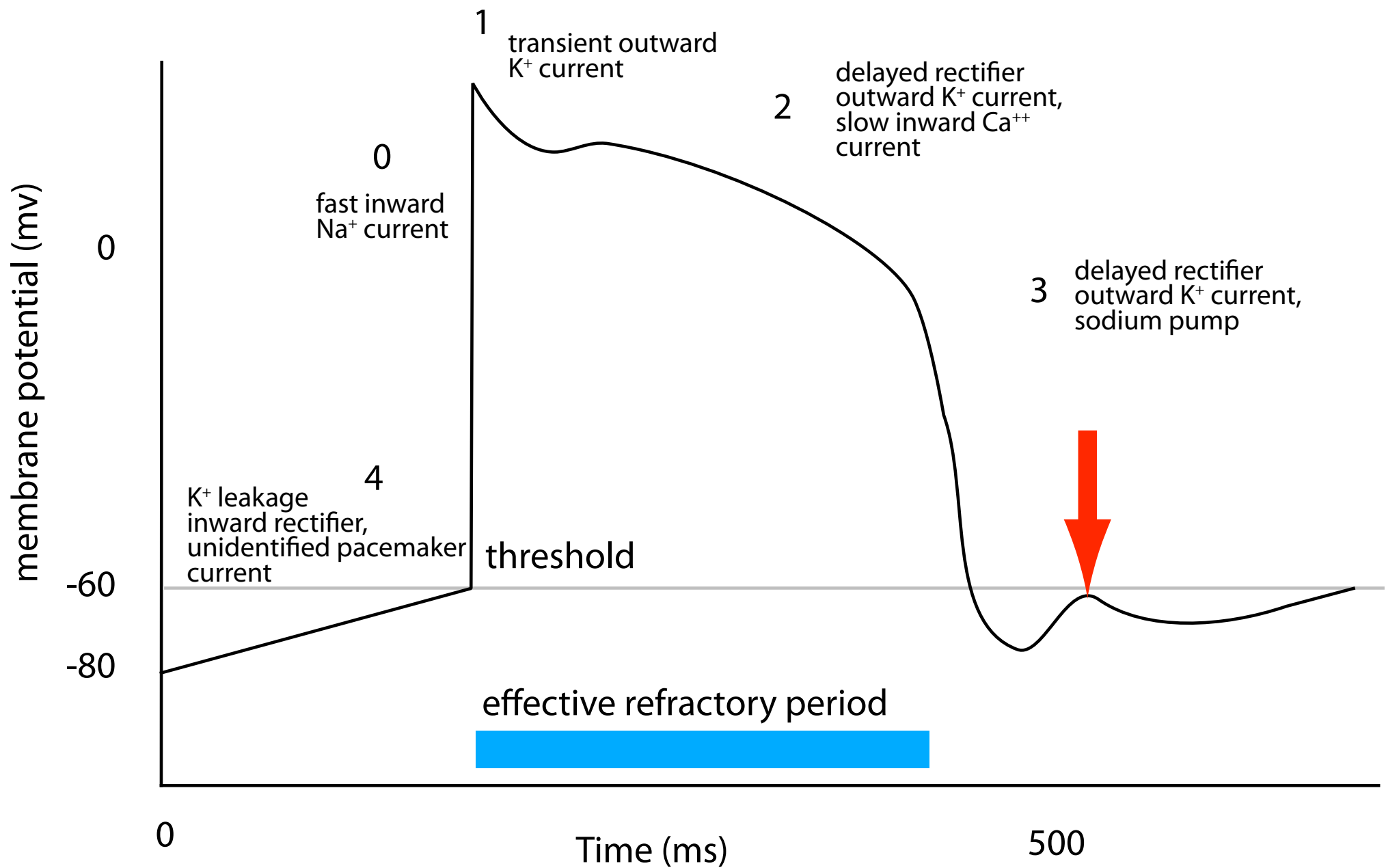
- delayed afterdepolarisation
- re-entry
- abnormal pacemaker
- heart block



arrhythmias

- **delayed afterdepolarisation**
 - excess intracellular calcium
 - excess adrenergic stimulation
 - digitalis overdose
- **re-entry**
- **abnormal pacemaker**
- **heart block**





arrhythmias

- delayed afterdepolarisation
- re-entry
- abnormal pacemaker
- heart block



RUN



arrhythmias

- delayed afterdepolarisation
- re-entry
- abnormal pacemaker
- heart block



7 year old mare



- gradual loss of performance
- unwilling to gallop
- coughs

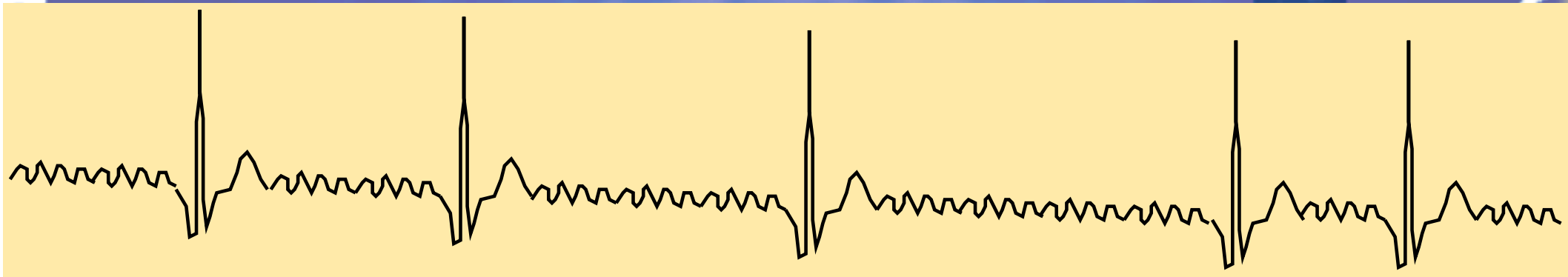


examination

- irregular pulse
- pulse rate 24 bpm
- otherwise normal



ECG lead II



problems

- atrial flutter / fibrillation



treatment?

- identify and remove cause
- establish goals of treatment
- decide on best treatment



treatment?

- antiarrhythmics
 - quinidine



Vaughan Williams

- 1 sodium channel blockers
- 2 β blockers
- 3 potassium channel blockers
- 4 calcium channel blockers
- others

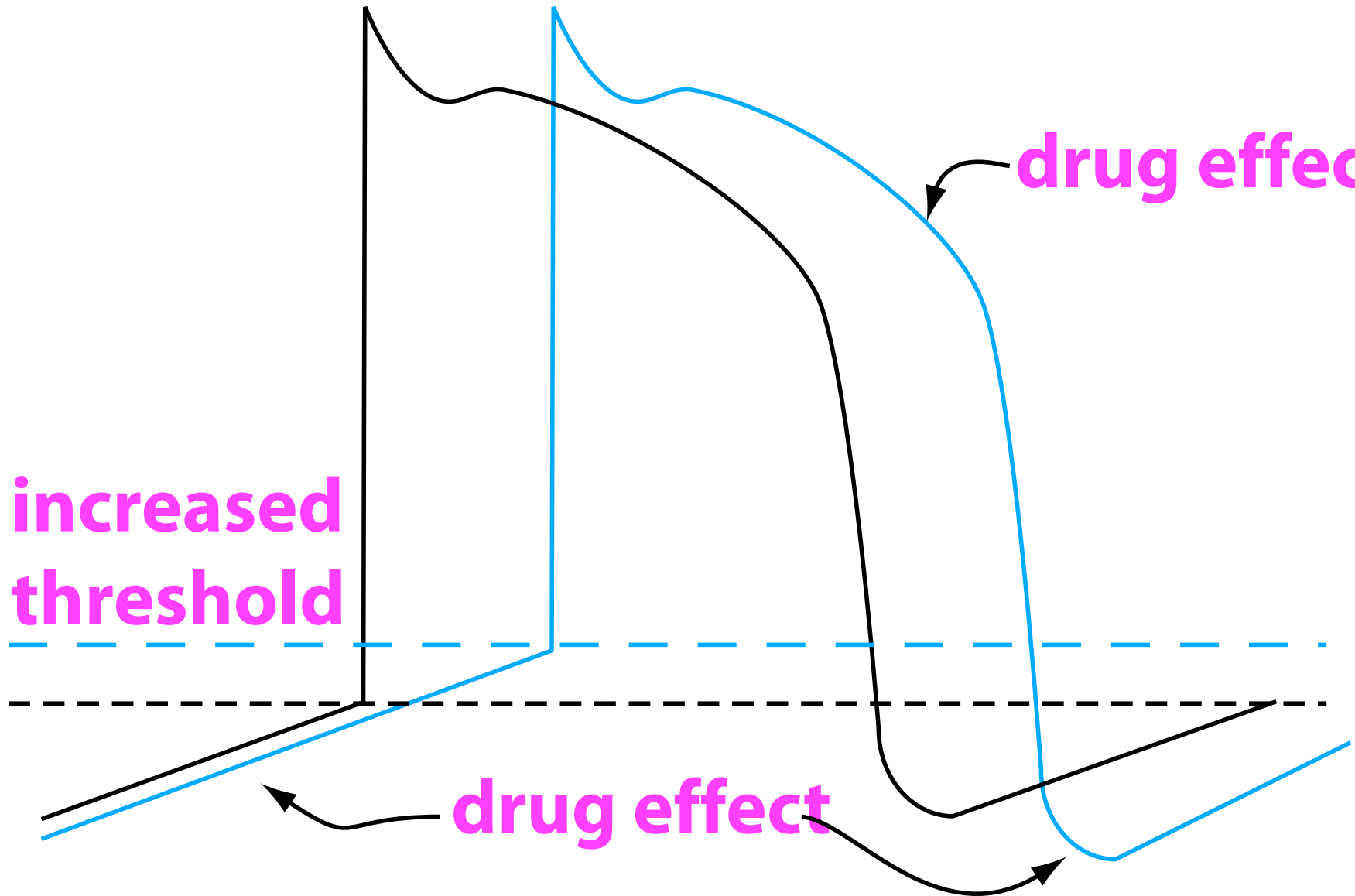


class 1

drug effect

**increased
threshold**

drug effect



class 1

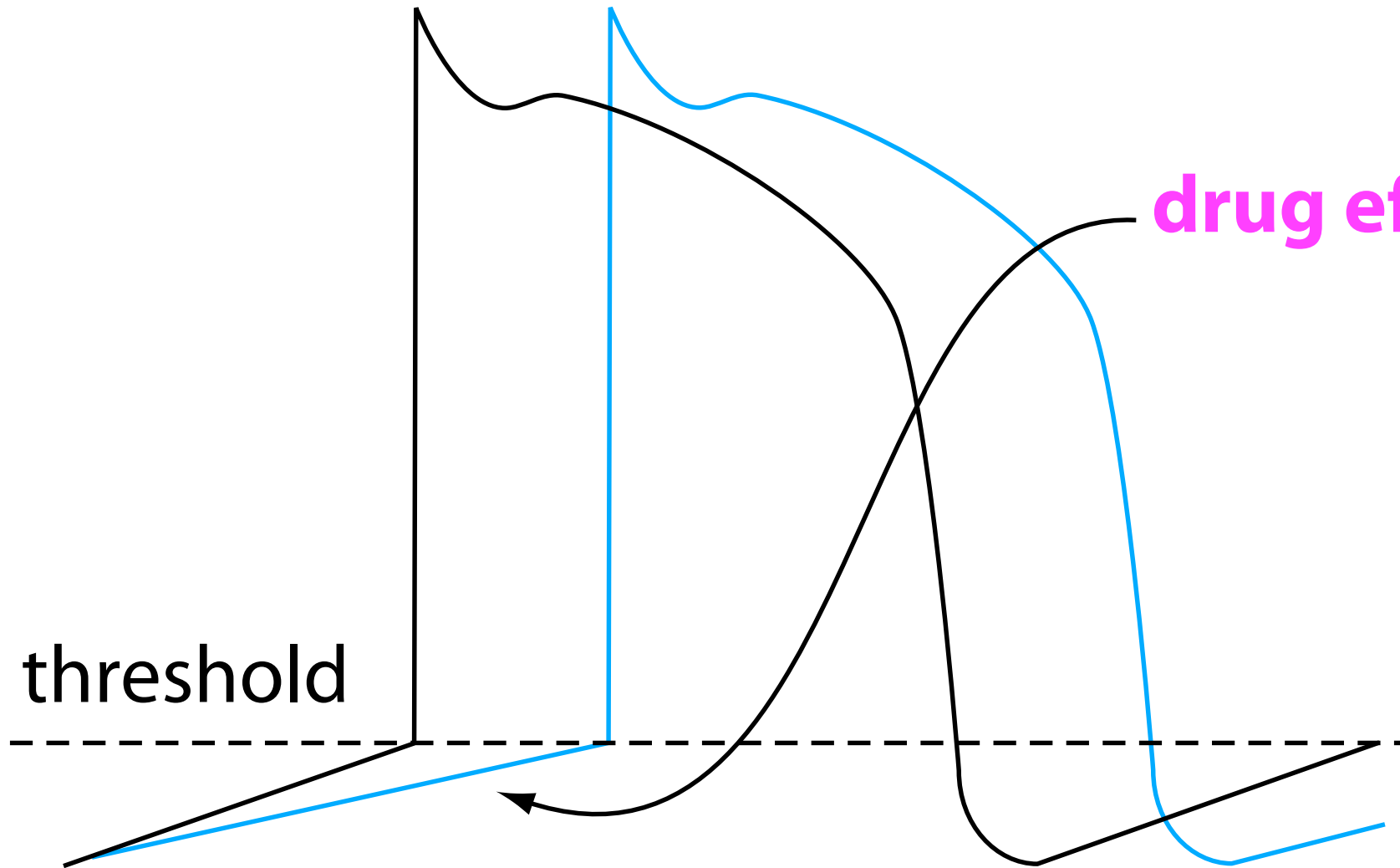
- 1a - quinidine
- 1b - lignocaine
- 1c - flecainide



class 2

drug effect

threshold



class 2

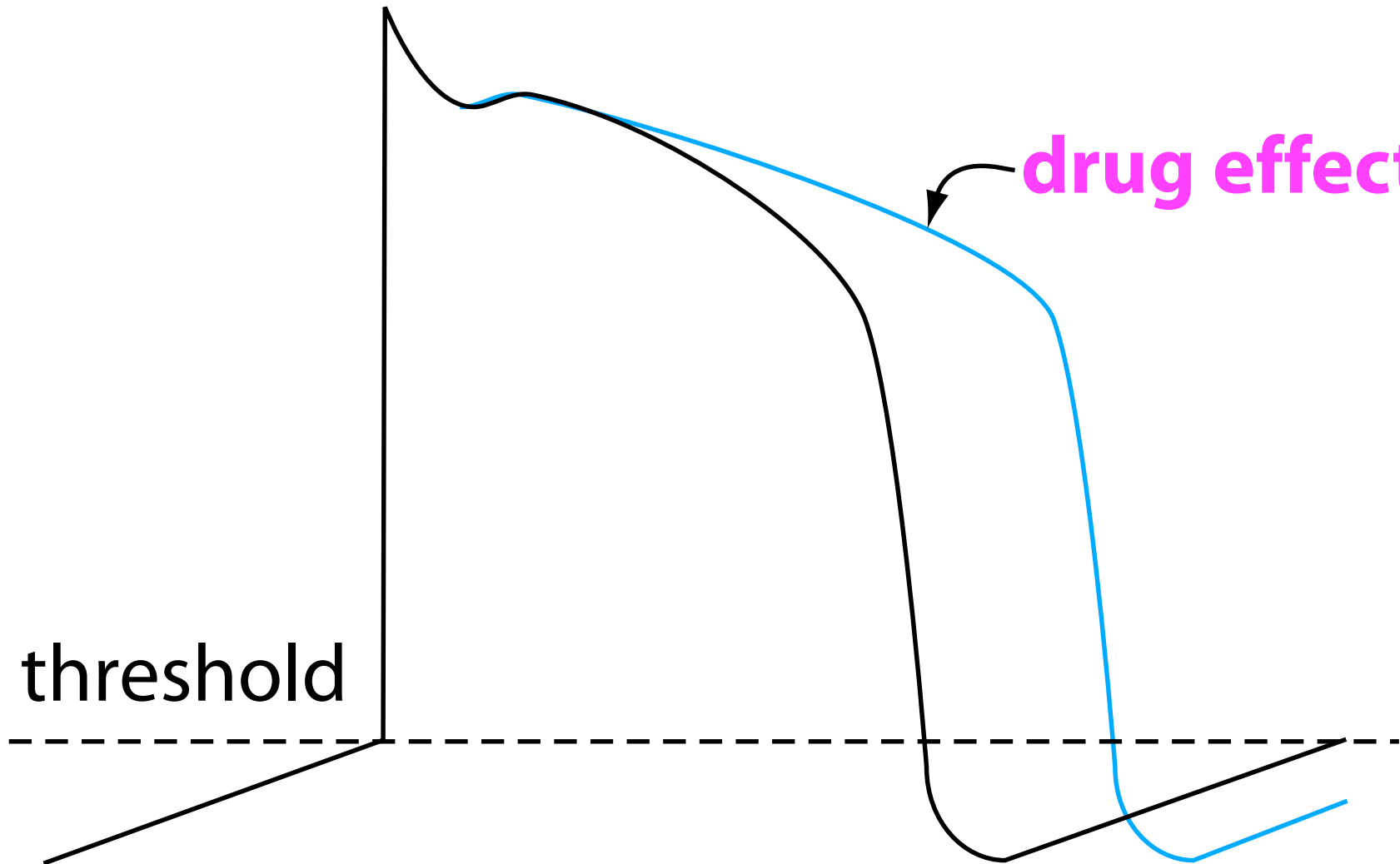
- propranolol
- labetalol
- atenolol
- esmolol
- etc,etc



class 3

drug effect

threshold



class 3

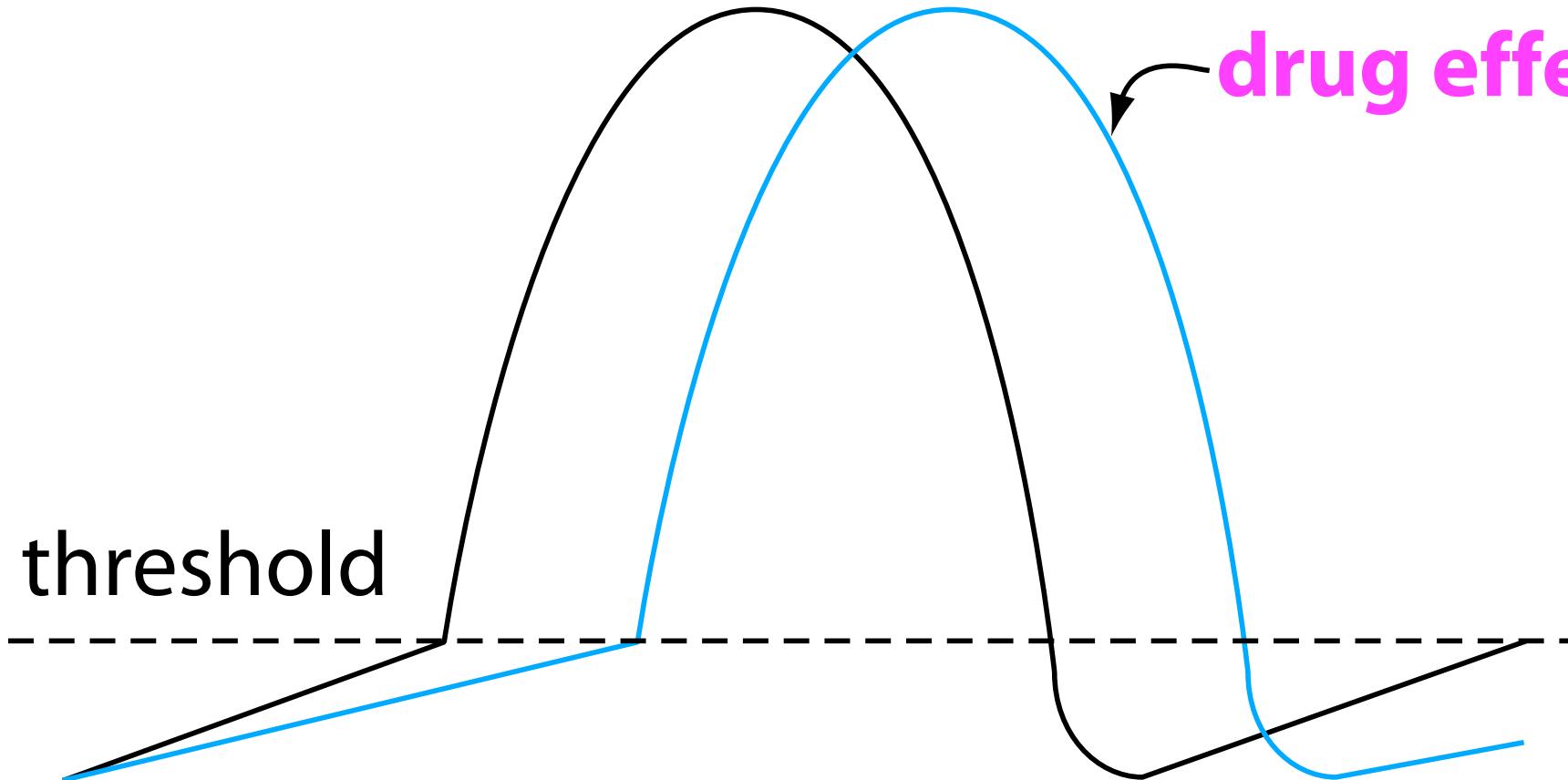
- amiodarone
- bretylium
- sotalol



class 4

drug effect

threshold



class 4

- verapamil - iv
- diltiazem - po



others

- muscarinic antagonists
- digoxin
- isoprenaline
- adenosine
- calcium
- magnesium



antimuscarinics

- atropine
- glycopyrrolate
- bradyarrhythmias



digoxin

- AF with tachycardia



isoprenaline

- bradyarrhythmias
- last resort when pacemaker not available



adenosine

- supraventricular tachycardias



calcium

- hyperkalaemia only
- sort out K^+ as well!



magnesium

- blocks Ca^{++} channels
- use proper channel blocker instead



non drug methods

- pacing
- dc cardioversion
- CPR



dog under anaesthesia



history

- 2 yr old, no obvious problems
- submandibular lymph node biopsy



routine monitoring

- irregular pulse, 35 bpm
- saturation 97%
- ET CO₂ 4.1kPa
- depth - light



ECG lead II



problems

- **sinus bradycardia**
 - vagal stimulation?



treatment

- do nothing
- atropine



antiarrhythmics

- class 1 sodium channel blockers - 1a atrial fibrillation - quinidine, 1b ventricular ectopic beats - lignocaine
- class 2 β blockers - tachyarrhythmias
- class 3 potassium channel blockers - resistant ventricular tachyarrhythmias
- class 4 calcium channel blockers - supraventricular tachyarrhythmias
- digoxin - atrial fibrillation in dogs
- adenosine - supraventricular tachyarrhythmias
- calcium - V tach from hyperkalaemia

all antiarrhythmics can make things worse!

