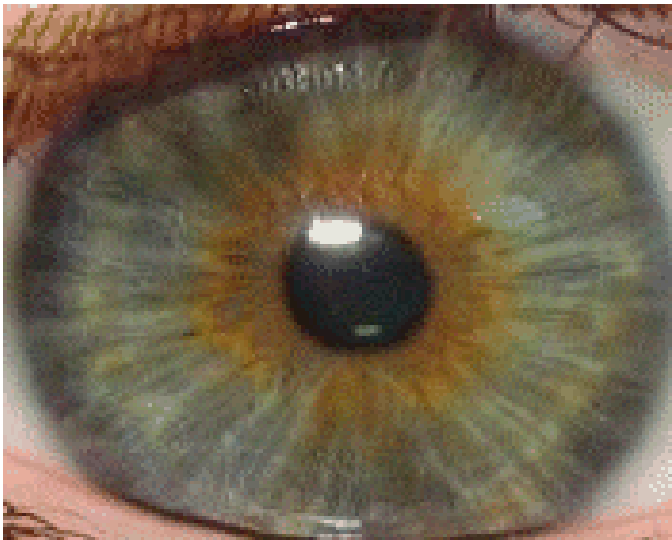


Drops that dilate the pupil

# Anatomy and physiology

- ◆ Iris has two smooth muscle layers
  - ◆ Circular
  - ◆ Radial



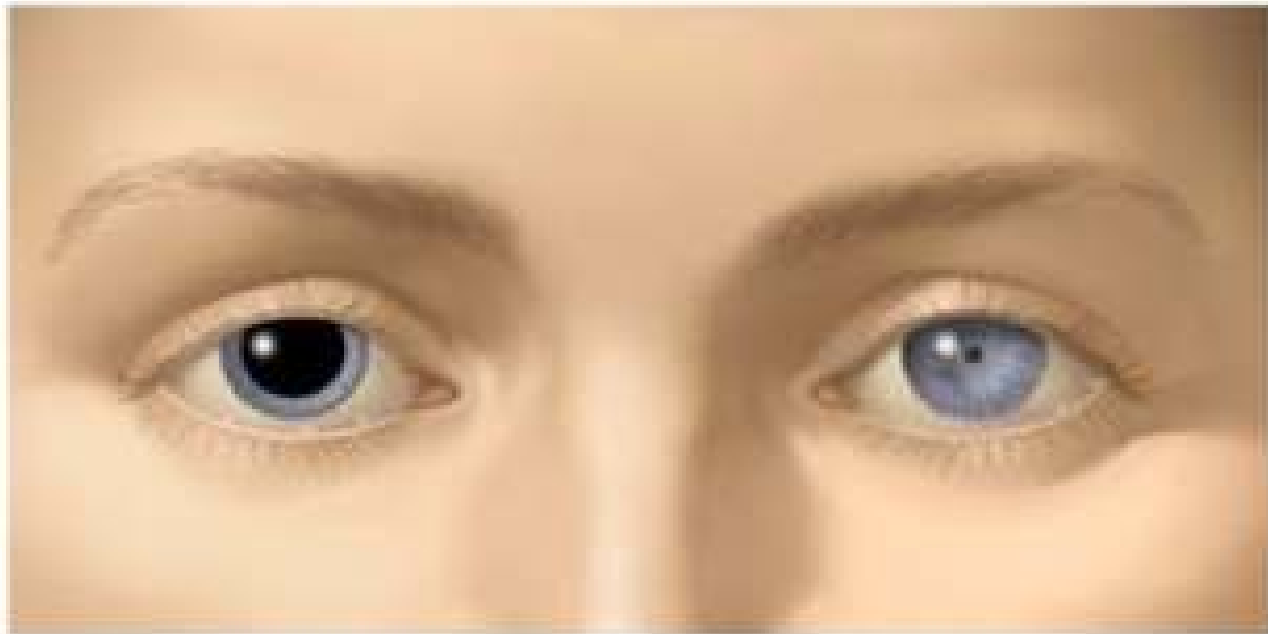
# Anatomy and physiology

- ◆ Contraction of the circular layer
  - = constriction
  - = controlled by parasympathetic fibres
- ◆ Contraction of the radial layer
  - = dilation
  - = controlled by sympathetic fibres

# Constriction and dilation of the pupil

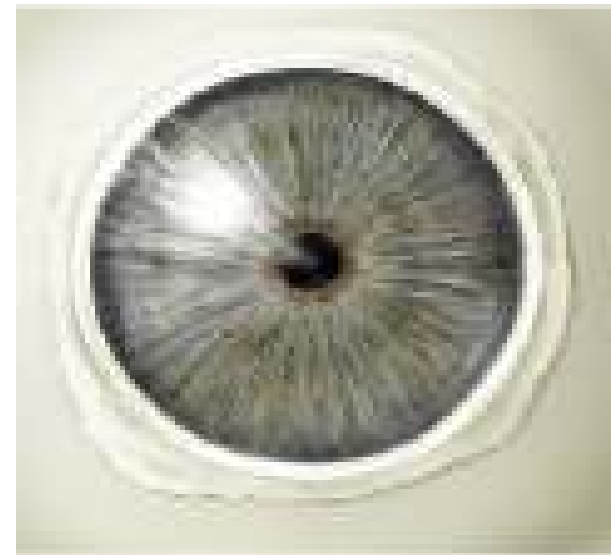
Dilated pupil

Constricted pupil



## Drugs that act on the parasympathetic

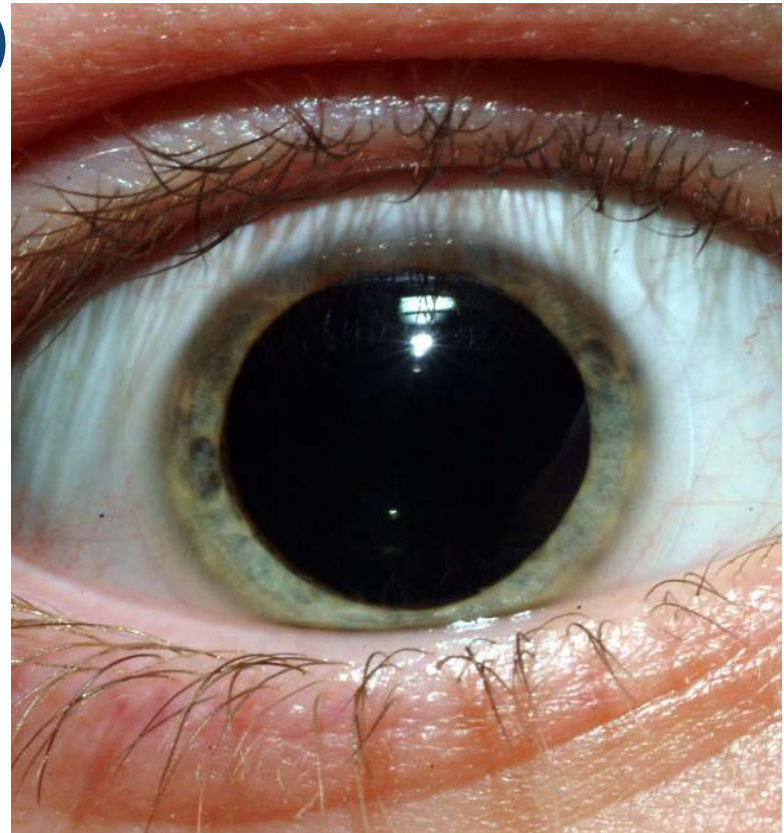
- ◆ Agonist (switch it on) cause *miosis* or *constriction*:
  - ◆ Pilocarpine
  - ◆ Acetylcholine
    - ◆ Eg: miochol



## Drugs that act on the parasympathetic

◆ Antagonist (switch it off) cause *mydriasis* and *cycloplegia*:

- ◆ Homatropine
- ◆ Atropine
- ◆ Cyclopentolate
- ◆ Tropicamide



# Drugs that act on the sympathetic

- ◆ Agonist (switch it on) cause *mydriasis*:
  - ◆ Phenylephrine
  - ◆ Adrenaline



# Drugs that act on the sympathetic

- ◆ Antagonists (switch it off):
  - ◆  $\alpha$  receptors – *miosis*
    - ◆ Thymoxamine
  - ◆  $\beta$  receptors – *reduction in aqueous production*
    - ◆ Timolol

# Common eye drops

- ◆ Phenylephrine
  - ◆ 2.5 and 10% solution
  - ◆ Causes mydriasis
  - ◆ Maximum effect 60 – 90 minutes
  - ◆ Duration of action 5 – 7 hours
  - ◆ Cautions
    - ◆ Cardiac disease, hypertension, aneurysms, thyrotoxicosis, long standing IDDM, tachycardia

# Common eye drops

## ◆ Tropicamide

- ◆ 0.5 and 1% solution
- ◆ Causes mydriasis and cycloplegia
- ◆ Maximum effect
  - ◆ Mydriasis 15 – 30 minutes
  - ◆ Cycloplegia 25 minutes
- ◆ Duration of action
  - ◆ Mydriasis 4 – 6 hours
  - ◆ Cycloplegia 6 hours

# Common eye drops

## ◆ Cyclopentolate

- ◆ 0.5 and 1% solutions
- ◆ Causes mydriasis and cycloplegia
- ◆ Maximum effect 30 – 60 minutes
- ◆ Duration of action 24 hours

# Driving with dilated pupils?



- ◆ Regulation
  - ◆ NTC "Assessing Fitness to Drive"
    - ◆ Suitable advice, not to drive for a specified period of time
- ◆ Evidence
  - ◆ Minimal impact on VA
  - ◆ Decreased ability to detect and avoid low contrast hazards

# Phenylephrine and hypertension?

- ◆ Evidence of an effect
  - ◆ Many case reports
  - ◆ Controlled trials in paediatric patients
- ◆ Evidence of no effect
  - ◆ Prospective double-blind study
  - ◆ Evidence of severe hypertensive event very low



# Local anaesthetic and dilating drops?



- ◆ Evidence
  - ◆ No significant difference in discomfort experienced with the application of dilating drops

# Time between drop instillation?

- ◆ Evidence
  - ◆ Cochrane register of controlled trials
  - ◆ Same drop (cyclopentolate 1%)
  - ◆ Instilling two drops one minute apart is as effective as instilling two drops five minutes apart

