

Direct Ophthalmoscopy

By Thomas Anders Brevik

What is it used for?

- Examine the retina and its structures
- Also known as funduscopy (examination of the fundus)



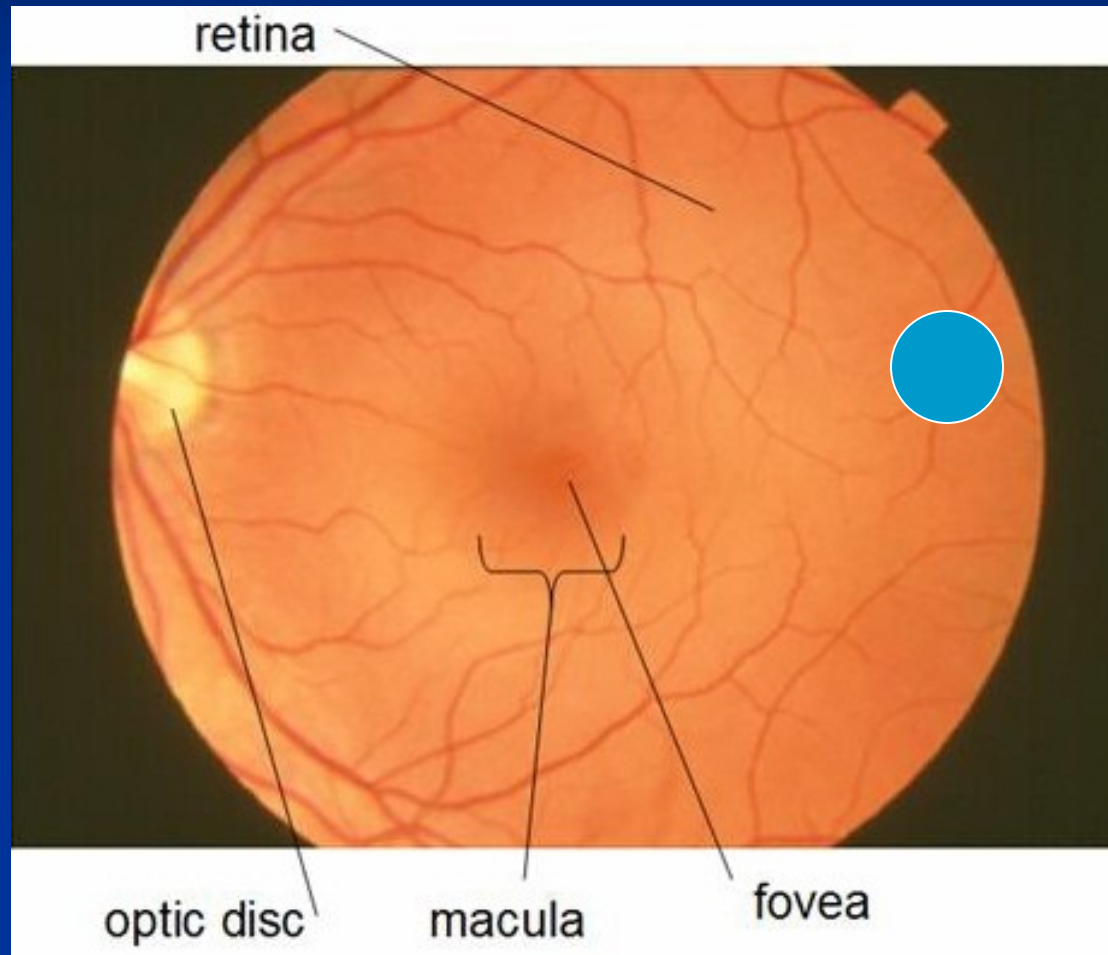
- Turning the dial to positive (or green) numbers increases the refractive index – short focal length lenses – for examining cornea, iris, or opacities in vitreous or lens. e.g. start at +20 and use the slit light
- Turning the dial to negative (or red) numbers decreases – infinite focal length lens that fits your refractive power (individual) – for examining retina, start at +10 as you move in and dim the scope light about halfway
- Rule of thumb: You will focus on the retina with same number as your refractive error, then correct for your patients refractive error

- Have patient sit in a comfortable position
- Tell them to look at something straight ahead and level over your shoulder
- Dim light in the room, so patients pupils dilate a little. You can also use mydriatic eyedrops to dilate the pupil
- Hold ophthalmoscope in same hand as eye you are looking at, and looking through (e.g. left hand for examining patients left eye, using your left eye)
- Hold head steady with thumb above eyebrow, or hold shoulder

- At about 30cm distance with light on eye, locate red reflex (seen as an orange glow in the pupil)
- Follow red reflex into the eye as 15 degrees lateral to the patients line of vision, this will get you directly into the optic disc
- If you cannot find the disc, trace any blood vessels back to it
- Examine vessels in all 4 quadrants of eye (upper and lower nasal and temporal quadrants)
- Identify macula – slightly darker pigmented area, 2 optic disc widths lateral away from the optic disc
- You can tell the patient to look at the light – this will put the macula in your focus, however don't look at it too long as it can be irritating

Structures of the retina

nasal

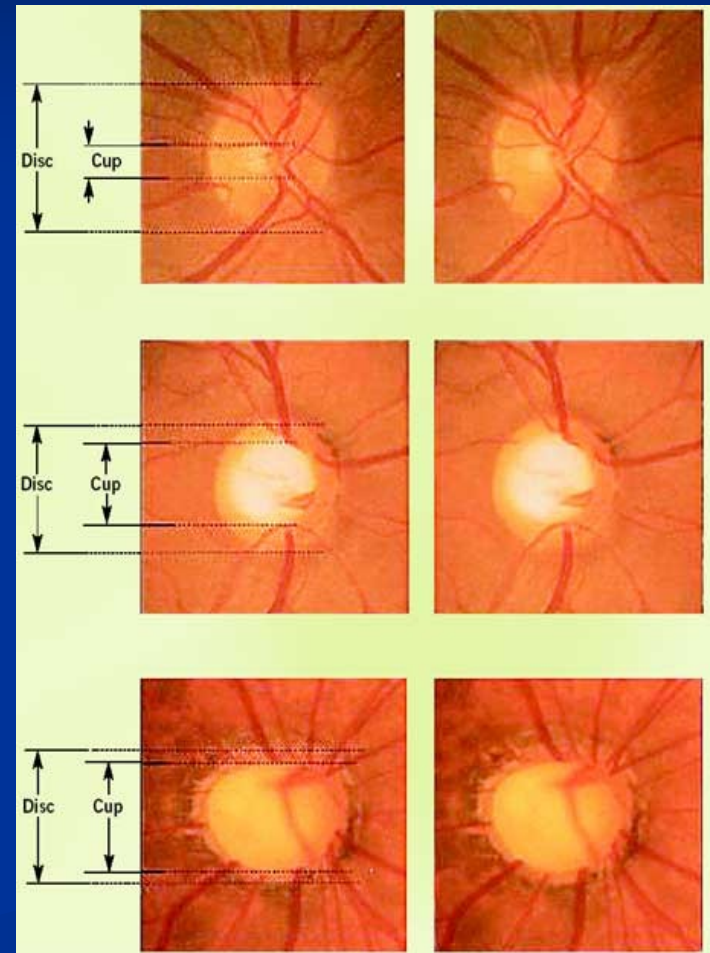


temporal

- 1 The size, shape and borders of the optic disc
- 2 The disc to cup ratio
- 3 The relative size of the arteries and veins
- 4 The texture of the retina
- 5 The color of the retina
- 6 Trace the vascular structure to the equator of the retina.
- 7 Find the macula and note its color and size

Glaucoma

- Identify disc-to-cup ratio
- The pink rim of disc contains nerve fibers. The white cup is a pit with no nerve fibers. As glaucoma advances, the cup enlarges until it occupies most of the disc area.

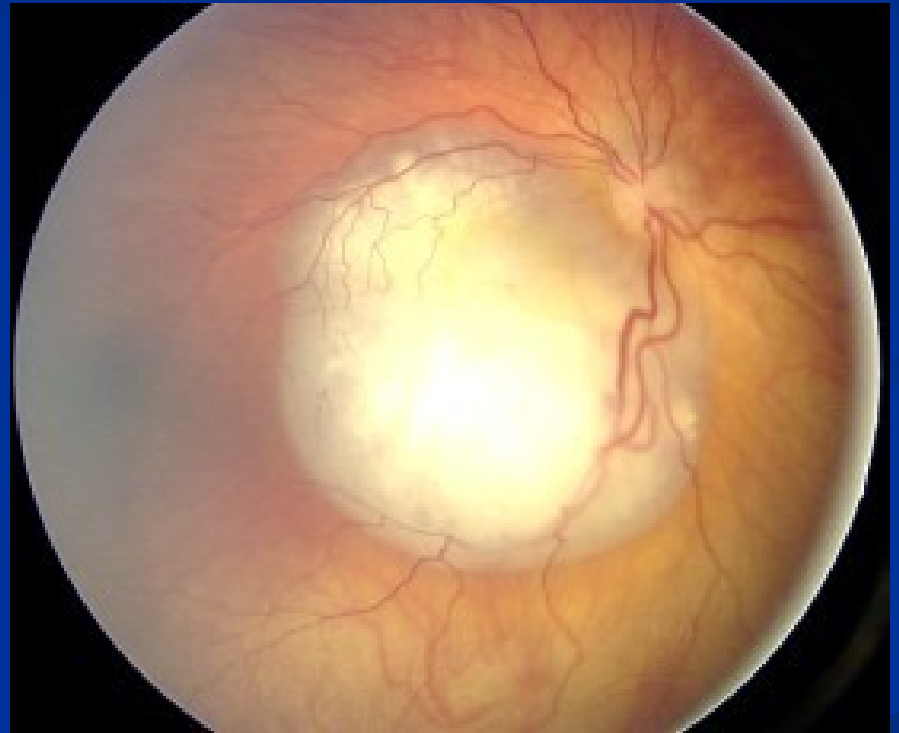


Retinoblastoma

- There is a white reflex, rather than red reflex when illuminated

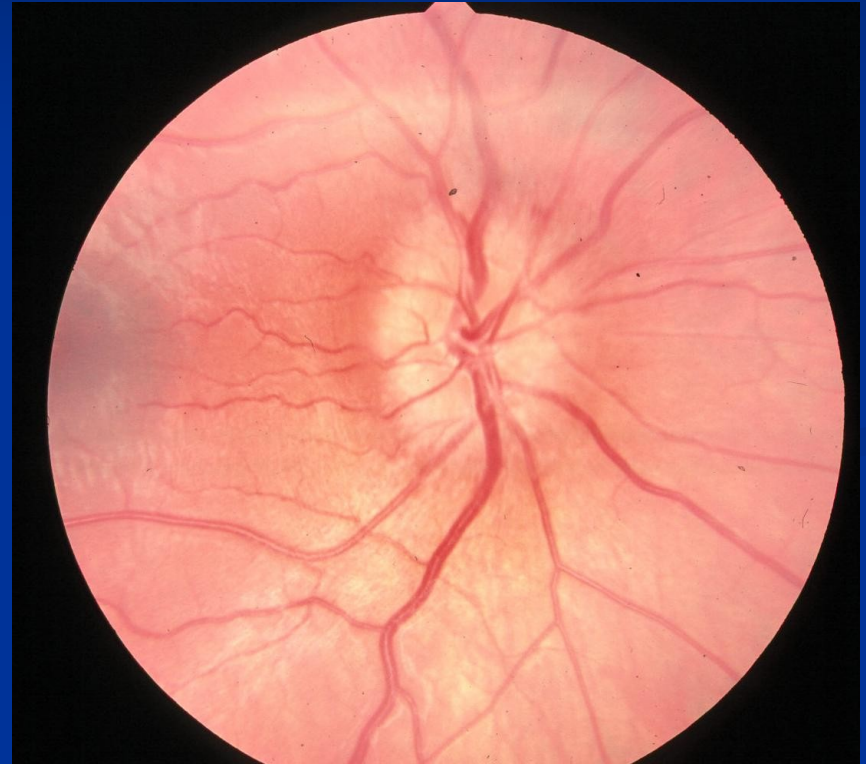


- Red reflex is also reduced in cataract



Papilledema

- Indicates increased intracranial pressure, e.g. due to hydrocephalus, brain tumor, idiopathic intracranial hypertension or acute intracranial hemorrhage



Proliferative retinopathy and cotton-wool spots

Cotton-wool spots are caused by ischemic damage to nerve fibers

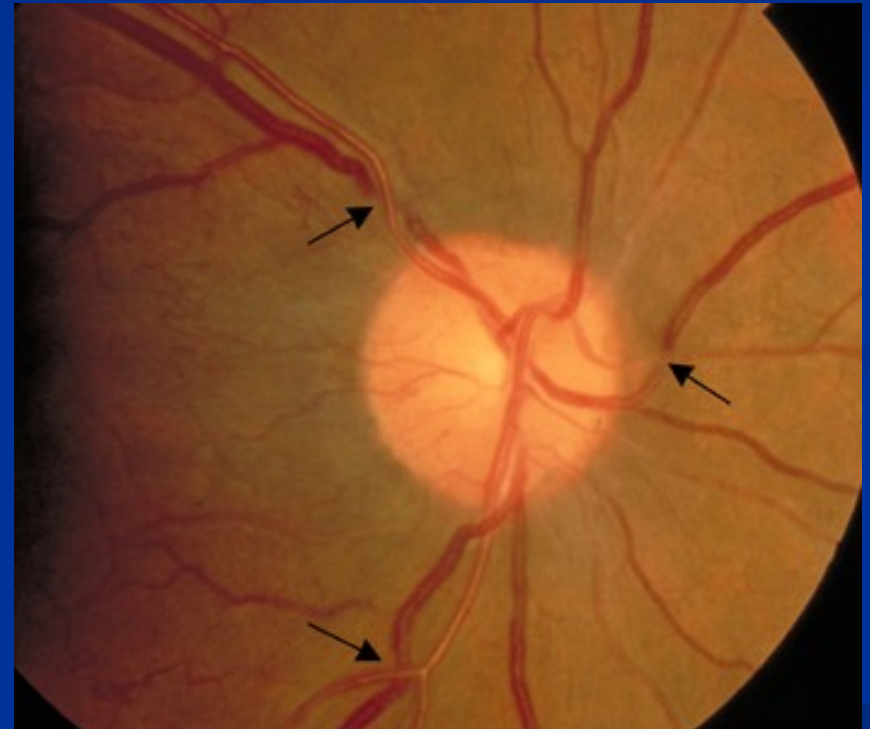
Compensatory proliferation of vessels

Diabetes and hypertension are the main causes



Hypertensive retinopathy

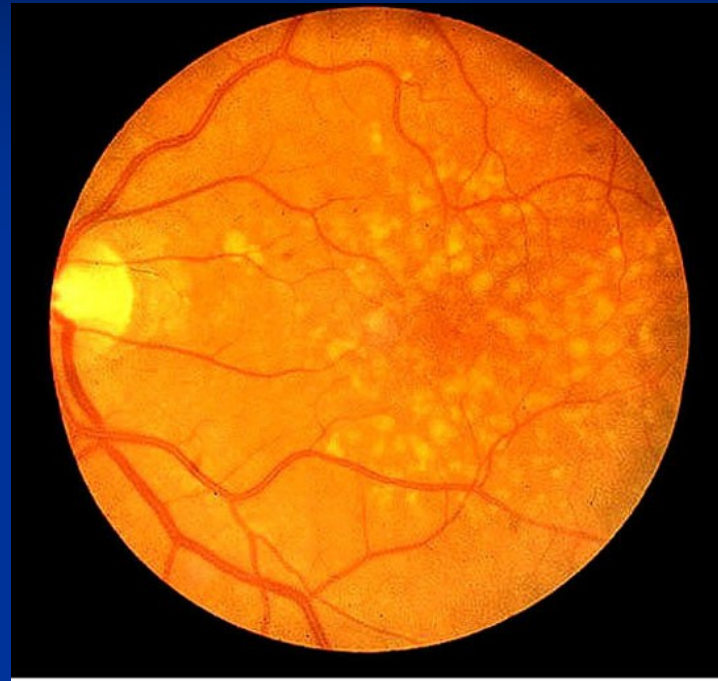
- Arteriosclerosis with moderate vascular wall changes (“copper wiring”) to more severe vascular wall hyperplasia and thickening (“silver wiring”)
- Arteriovenous crossing abnormalities (arteriovenous nicking)
- These vessel changes are better appreciated using the green light (makes the red retina appear in grey tones)



Age-related Macular Degeneration



- Wet form: abnormal blood vessel growth w/ hemorrhage and protein leakage



Fundas photograph of a patient with age related macular degeneration.

- Dry form: Drusen (cellular debris) build-up

- [http://www.youtube.com/watch?v=AutUi09JI
XY&feature=related](http://www.youtube.com/watch?v=AutUi09JIXY&feature=related)
- [http://www.jaapa.com/beyond-the-red-reflex-
examining-the-eye-with-an-
ophthalmoscope/article/151311/](http://www.jaapa.com/beyond-the-red-reflex-examining-the-eye-with-an-ophthalmoscope/article/151311/)