



## Anatomy of a baby's eye

In a baby born at term the eye has an anterior-posterior diameter of about 16mm and it continues to grow slowly over years to about 23 mm.

The eye is made up of three concentric tunics: **Outermost, Middle and Innermost.**

Outermost tunic is made of the **cornea [1]** and **sclera [2]**. The sclera is a fibrous layer or the 'white part of the eye'. The cornea is the transparent layer at the front of the eye and it helps focus light from an image on the retina.

Middle tunic is a vascular layer. It is made up of the **choroid [3]** at the back of the eye, the **ciliary body [4]** and the **iris [5]**. The iris is seen as a coloured ring around the pupil. Everyone has colour variations in their iris due to differences in the level of the pigment melanin. Melanin scatters light in the iris resulting in different shades of brown, blue and green. The iris is also a sphincter muscle that manages the amount of light entering into the eye by controls the size of the pupil. Mydriatic drops are used to dilate the pupil

when examining the back of a premature baby's eye for retinopathy of prematurity (ROP). The health care team must be at hand during the administration of mydriatic drops and monitor the baby throughout the eye examination.

Innermost tunic is the **retina [6]**, which is a nervous layer, made up of photoreceptors (rods and cones) which convert light impulses into electrical impulses that are then transmitted through the **optic nerve [7]** to the brain.

The **macula [8]** is seen as a pigmented area two disc diameters from the optic nerve within the retina. It has a small depression at the centre called the fovea, which is a compacted area of photoreceptors that provide a sharp central vision and visual acuity.

The blood supply for the retina is supplied by the **retinal artery and vein [9]**. In premature babies, the normal development of these blood vessels is interrupted by the preterm birth. A number of factors can then lead the immature retina to progress develop ROP.

The region between the anterior and posterior part of the eye is called the **ora serrata [11]**. This is a junction of transition between the different layers. In the innermost layer it is an important point of transition from non-photosensitive area of the retina to the multi-layered photoreceptor layer.

The **lens in the eye [10]** is suspended behind the pupil. It is a transparent elastic tissue in an ellipsoid biconvex shape, that changes to focus on near and far objects (accommodation). Even children born at term have relatively poor vision at birth due to the immaturity of the brain and retinal structures related to vision and movement of the eyes.

### **Abnormalities of the eye linked to prematurity**

The principle ophthalmologic abnormalities linked to prematurity are ROP, strabismus and refractive errors. Preterms may also exhibit reduced visual acuity because of cortical damage and glaucoma. Children that develop severe ROP also have a greater risk of suffering later with retinal detachment.

Visual development is a complex system that cannot be assessed simply by gestational or chronological age. In practice, no two children have identical visual development and there are great variations among preterms. This means that ophthalmic follow up of preterm babies is an important consideration, with or without ROP.