

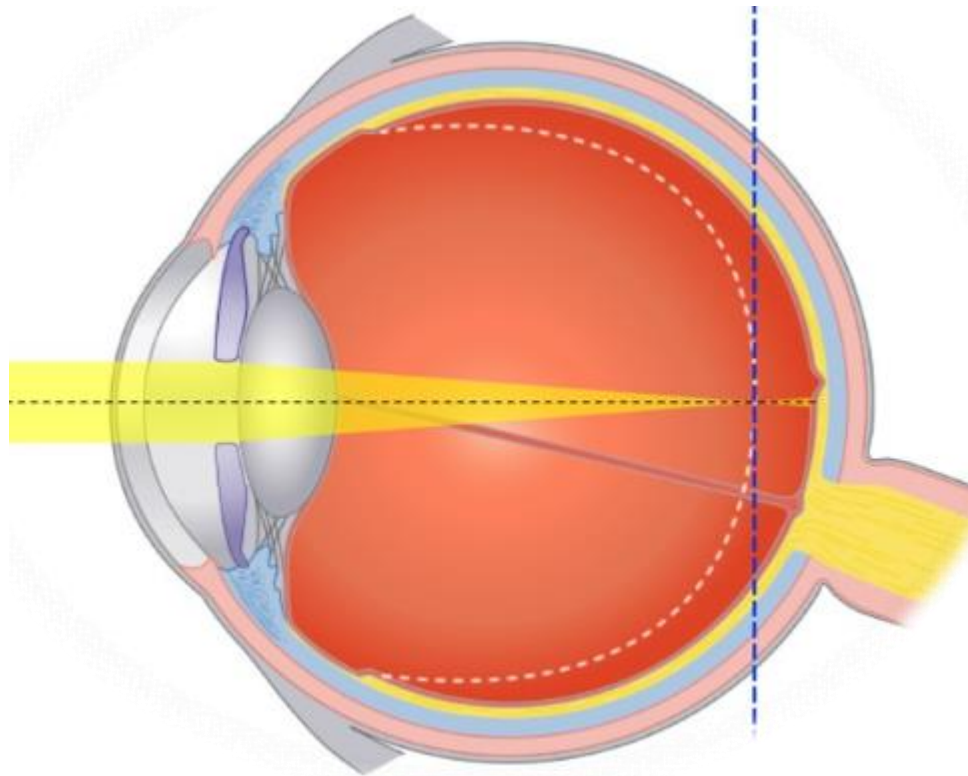
Myopia

- Definition
- Optical condition of the myopic eye
- Classification
- Symptoms
- Signs of the myopic eye
- Risk factors for the development of myopia
- Prognosis
- Night myopia
- Correction



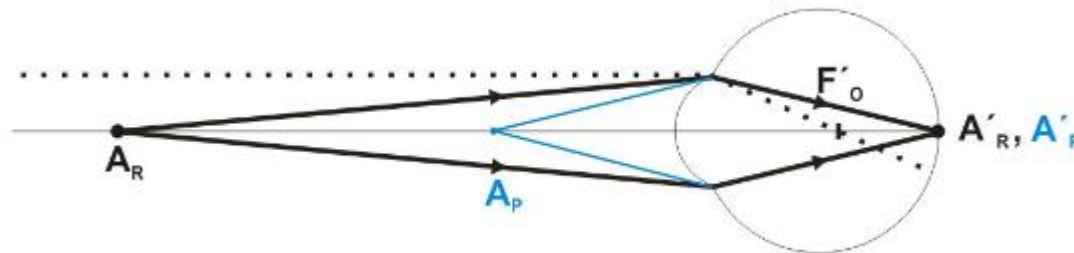
Myopia

- **Definition:** Parallel rays of light are focused in front of the retina (when the eye is at rest).



Optical condition of the myopic eye

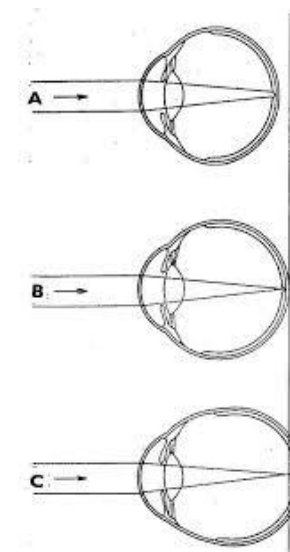
- Distant objects cannot be seen clearly, only divergent rays will meet at the retina, **parallel rays of light are focused in front of the retina.**
- **The far point** (punctum remotum) of the myopic eye – the farthest point, at which objects can be seen distinctly – it is in the finite distance in front of the eye at the optical axis (in the emmetropic eye it is at infinity)
- The higher the myopia – the shorter the distance
- **The near point** (punctum proximum) of myopic eye is greatly shifted to the eye



Classification of the myopia

Aetiology:

- **Axial myopia** – the greatest majority of cases, it is due to an increase in the antero-posterior diameter of the eye
- **Curvature myopia** – myopia refractiva - may be associated with an increase in the curvature of the cornea or one or both surfaces of the lens
- Myopia **combined**



Axial myopia

- The greatest majority of cases
- The normal optical power and an increase in the antero-posterior diameter of the eye
- **$d > 24$ mm, whereas $\varphi = 58,64$ D**
- **The effect of the refraction:**
 - the change of axial length $0,34$ mm ~ 1 D

Curvature myopia

- Does not appear as much
- The cause – increased refraction of the optical system at its normal length
- **$l = 24 \text{ mm}$ a $\varphi > + 58,64 \text{ D}$**
- **Classification of curvature myopia:**
 - index myopia
 - radius myopia

HOMEWORK

Classification of the myopia

- Classification according to the degree (**according to diopter (optical power)**)

- Low myopia (myopia simplex, myopia levis) ($< -3,0$ D)
- Medium myopia (myopia modica) ($- 3,25$ D to $- 6,0$ D)
- High myopia (myopia gravis) ($> -6,0$ D)
- Severe myopia ($> -10,0$ D)

In the presence of pathological changes in high myopia - myopia gravis degenerativa (2-3% in general population)

- These forms of myopia practically do not change with the termination of an individual's growth
- The prognosis of myopia – it depends upon the age of the patient

The risk factors for the development of myopia

- Genetic factors:
 - Human clinical data also support the genetic bases for myopia. Myopic parents tend to have myopic children in higher proportions than no-myopic parents
 - The prevalence of myopia in children with two myopic parents is 30-40 %, 20-25 % in children with only one myopic parent and to less than 10 % in children with no myopic parents.
- Ethnicity (Chinese, Japanese)
- Environmental factors
- Association with near work
- Computers, tablets
- Night lighting

Symptoms of the myopia



- Blurred distance vision x good near vision
- Half shutting of the eyes – greater clarity of stenopaeic vision



- Advantage: In middle life, when the accommodation fails, presbyopic problems come later (not require spectacles for reading)

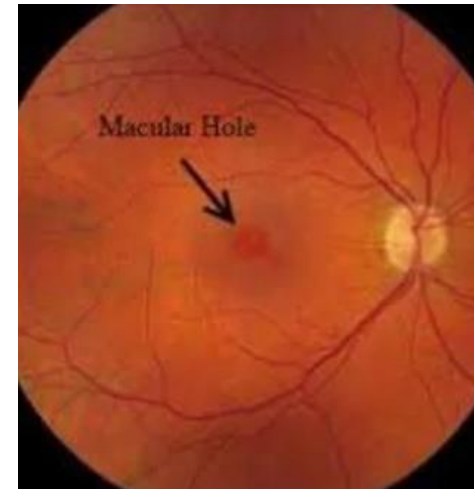
The night myopia

- A refractive change occurring in reduced illumination, which is very variable in degree, but rarely exceed $-0,5$ D, but it can achieve $-4,0$ D.
- Causes of night myopia:
 - Spherical aberration
 - Chromatic aberration
 - **HOMEWORK**
 - Error in accommodation occurring in dim light



The prognosis of myopia

- ***In simple myopia*** – the prognosis is good. The error usually does not progress beyond 6-8D and stabilizes by the age of 20 years.
- ***In pathological myopia*** – the visual prognosis is always guarded. In all cases, the possibility of progressive visual loss due to degenerative changes and danger of complication.



The optical correction of the myopia

Prescription: the lowest possible power of minus lens (concave lens) by which can be accorded VA 6/6 (1,0)

Guidelines for correcting low degrees of myopia up to -6 D

- Low degrees of myopia (up to -6 D) – full correction

Guidelines for correcting high myopia

- High myopia – the full correction can rarely be tolerated

Modes of prescribing concave lenses

- Glasses
- Contact lenses
- Next possibilities of correction of the myopia
 - Surgery for myopia
 - Non-corneal interventions

