

# Accommodation

**Accommodation** is a process that increases the curvature of the lens and helps to focus nearby objects on the retina of the eye.

It is caused by the contraction of **m. ciliaris**, which is part of the (*corpus ciliare*) in the anterior part of the *tunica vasculosa bulbi*.

It is made possible by the properties of the lens: the pliability of the core and the elasticity (elasticity) of the envelope.

## Focus progress

File:Akomodation.svg  
Accommodation – display  
of the image on the retina

At rest, the ligamenta lentis (hanging apparatus) of the lens maintains tension and the lens has a flat shape in tension. Contraction of *m. ciliaris* innervated parasympathetically from n. oculomotorius (n. III, *ncl. Edinger-Westphali*) the edges of the ciliary body are concentrically approached, thus releasing the tension of the suspension apparatus and the **lens arches into a more convex shape** by its own flexibility. **Its optical power, increases, thus the refractive nature of the rays** and the image of a nearby object is projected onto the retina.

**Musculus ciliaris** forms fibers of 3 directions:

1. *fibrae meridionales* – pull forward, release of the rear fibers of the suspension apparatus,
2. *fibrae circulares* – sphincter, loosening of the anterior fibers of the hanging apparatus,
3. *fibrae radiales*.

The entire ciliary body is therefore pulled forward and inward.

## Accommodation Breadth

**Accommodation width (AS)** expresses the difference of distances between a near and far point in diopters.

$1 / \text{near point} - 1 / \text{far point} [m^{-1} = D]$

In children and adolescents: AS = 16 D

**Near point** = a point at a distance from the eye at which vision is sharp at maximum accommodation. Due to age, the near point moves away from the eye. This is caused by stiffening of the lens (presbyopia = **presbyopie**).

**Distant point** = a point at a distance from the eye, which is infinity (without accommodation) in people with normal vision.

## Accommodation disorders

### Excess accommodation

In young people, long-term reading or eye strain in insufficient lighting. It is manifested by excessive convergence, myopization of the eye and asthenopic difficulties.

### Accommodation Spasm

In patients with uncorrected or undercorrected hypermetropia or presbyopia when miotics are applied. Myopization of the eye and macropsy. The value of refraction can be up to  $-10 D$ . Similar symptoms occur with morphin and CO.

### Accommodation insufficiency

In myopes or emetropes before 40 years of age. The cause is insufficient contraction of m. ciliaris. An excess of convergence is being created.

### Polio accommodation

The cause is a disorder of innervation, eye injury or instillation of cycloplegics. Polio is associated mydriasis.

## Links

## Related Articles

- Eye (biophysics)
- Eye (biophysics)/Eye defects
- Refractive errors

## Literature

- GANONG, William F, et al. *Survey of Medical Physiology*. 1st edition. Jinočany : H & H, 1995. 681 pp. ISBN 80-85787-36-9.
- TROJAN, Stanislav, et al. *Medical physiology*. 4th edition. Praha : Grada, 2003. 772 pp. ISBN 80-247-0512-5.
- SILBERNAGL, Stefan and Agamemnon DESPOPOULOS. *Atlas of human physiology*. 6th edition. Praha : Grada, 2004. 435 pp. ISBN 80-247-0630-X.
- ČIHÁK, Radomír and Miloš GRIM. *Anatomy 3*. 2., upr. and complete the edition. Praha : Grada, 2004. 673 pp. vol. 3. ISBN 80-247-1132-X.

## Source

- BENEŠ, Jiří. *Studijní materiály* [online]. [cit. 16.02.2010]. <<http://jirben.wz.cz>>.