

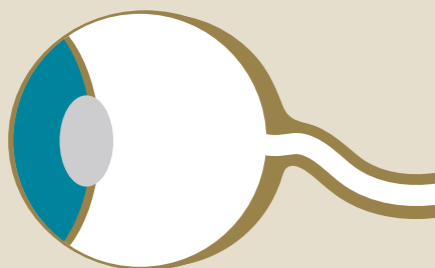
For the Primer, visit [doi:10.1038/nrdp.2015.14](https://doi.org/10.1038/nrdp.2015.14)

➔ **Cataract is the most common cause of blindness worldwide. Impaired vision in cataract is caused by progressive clouding of the normally clear lens. The disease is most often age-related; cataract is rarely present at birth or develops in childhood, but in these cases cataract can irreversibly impair visual development.**

**DIAGNOSIS**

Impaired vision is the main symptom of cataract. Symptomatic patients have to be assessed not only for the degree of vision impairment but also for concomitant eye diseases or abnormalities, such as retina disorders, astigmatism (warping of the cornea) or presbyopia (age-related loss of near focusing).

This helps to decide whether and how to perform surgery and which intraocular lens to select.



**SCREENING & PREVENTION**

Although nutritional supplements have been shown to reduce cataract rates in some studies, so far no treatment has been established that reliably prevents the development of cataract. Nevertheless, screening for cataract can be helpful in patients who are at risk of negative consequences of visual deprivation, including infants and young children. In developing countries, screening is also done to identify patients who are unable to seek treatment themselves or have no access to health care. Such screening programmes enable more people in need to receive cataract surgery.

**EPIDEMIOLOGY**



Regions with high levels of ultraviolet radiation have a higher incidence of cataract than those with less ultraviolet exposure

In developed countries, most patients have access to cataract surgery, including new advanced technologies

In developing countries, the prevalence of cataract is high as many patients cannot afford surgery or the needed personnel and infrastructure are lacking

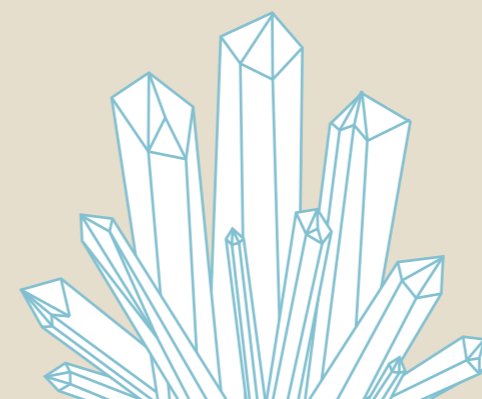


There is a marked difference in the disease burden and the preferred therapy options for cataract between the developed and the developing world

**MECHANISMS**

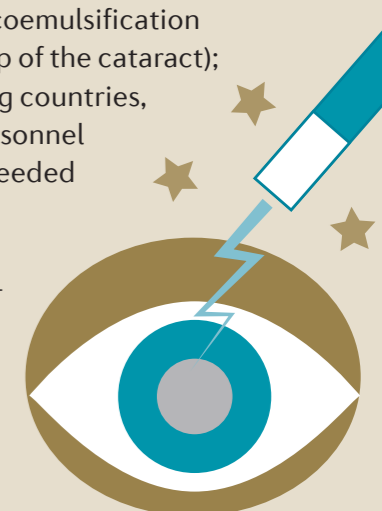
The human lens is densely packed with crystallins — a family of transparent proteins. Age-related damage, covalent modifications and protein destabilization lead to unfolding of the crystallins such that they become insoluble.

Eventually, the crystallins form opaque, dense aggregates. Several factors can accelerate this process, including crystallin mutations, certain medications and previous trauma or operation on the eye.



**Rx MANAGEMENT**

The only treatment for cataract is the surgical removal of the cataractous material and implantation of a new, synthetic lens. Different lens designs exist, and some can even correct various refractive errors. In the developed world, most surgeries involve phacoemulsification (ultrasonic breaking up of the cataract); however, in developing countries, the infrastructure, personnel and financial means needed for this technology are scarce or lacking. Instead, manual small-incision cataract surgery is performed. Both techniques have excellent outcomes in most patients.



**OUTLOOK**

Depending on the region of the world, the future of cataract research and management faces different needs and questions. In developed countries, laser-assisted surgery, multifocal or accommodating lenses that can adjust their point of focus and lenses designed especially for children are promising to change care. In developing countries, a different approach is needed. These countries carry most of the burden of cataract blindness and often do not have the means to treat patients. There, programmes that provide safe and cost-effective surgery for high numbers of patients are needed.

