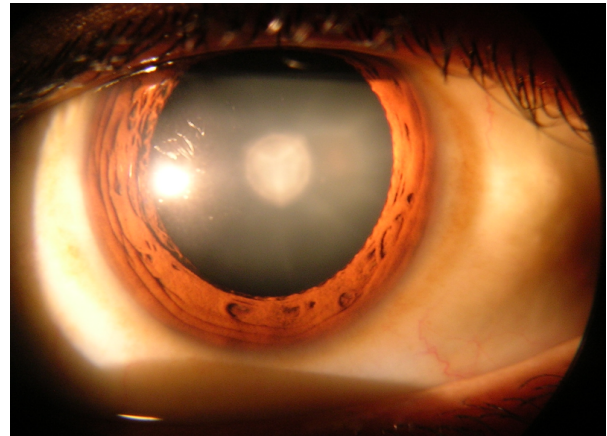


# Cataract surgery

**Cataract surgery** is the removal of the natural lens of the eye (also called "crystalline lens") that has developed an opacification, which is referred to as a cataract. Metabolic changes of the crystalline lens fibers over the time lead to the development of the cataract and loss of transparency, causing impairment or loss of vision. During cataract surgery, a patient's cloudy natural lens is removed and replaced with a synthetic lens to restore the lens's transparency.<sup>[1]</sup>

Following surgical removal of the natural lens, an artificial intraocular lens implant is inserted (eye surgeons say that the lens is "implanted"). Cataract surgery is generally performed by an ophthalmologist (eye surgeon) in an ambulatory (rather than inpatient) setting, in a surgical center or hospital, using local anesthesia (either topical, peribulbar, or retrobulbar), usually causing little or no discomfort to the patient. Well over 90% of operations are successful in restoring useful vision, with a low complication rate.<sup>[2]</sup> Day care, high volume, minimally invasive, small incision phacoemulsification with quick post-op recovery has become the standard of care in cataract surgery all over the world.



Cataract in Human Eye- Magnified view seen on examination with a slit lamp

## Types

Currently, the two main types of cataract surgery extraction performed by the ophthalmologists are **phacoemulsification** (phaco) and conventional extracapsular cataract extraction (**ECCE**). In both types of surgery an Intraocular lens is usually inserted. Foldable lenses are generally used when phaco is performed while non-foldable lenses are placed following ECCE. The small incision size used in phacoemulsification (2-3mm) often allows "sutureless" wound closure. ECCE utilises a larger wound (10-12mm) and therefore usually requires stitching, although sutureless ECCE is also in use.

Cataract extraction using intracapsular cataract extraction (**ICCE**) has been superseded by phaco & ECCE, and is rarely performed.

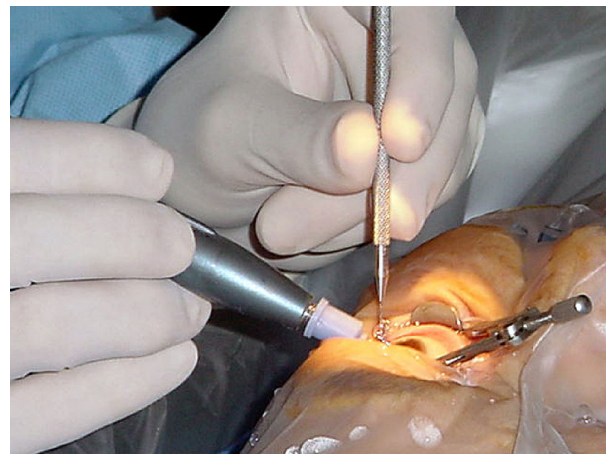
Phacoemulsification is the most commonly performed cataract procedure in the developed world. However, the high cost of a phacoemulsification machine and of the associated disposable equipment means that ECCE remains the most commonly performed procedure in developing countries.

## Types of surgery

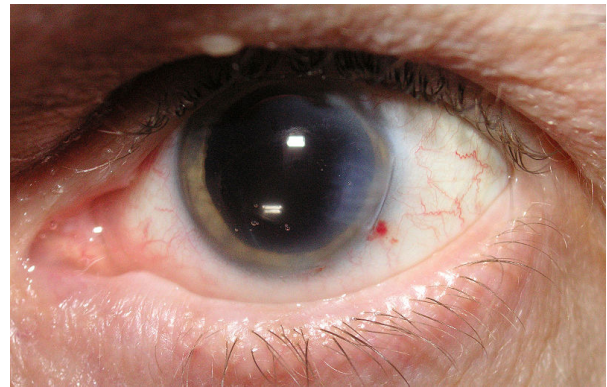
Extracapsular cataract extraction involves the removal of almost the entire natural lens while the elastic lens capsule (posterior capsule) is left intact to allow implantation of an intraocular lens<sup>[3]</sup>. There are two main types of cataract surgery:

- **Phacoemulsification (Phaco)** is the preferred method in most cases. It involves the use of a machine with an ultrasonic handpiece equipped with a titanium or steel tip. The tip vibrates at ultrasonic frequency (40,000 Hz) and the lens material is emulsified. A second fine instrument (sometimes called a **cracker** or **chopper**) may be used from a side port to facilitate cracking or chopping of the nucleus into smaller pieces. Fragmentation into smaller pieces makes emulsification easier, as well as the aspiration of cortical material (soft part of the lens around the nucleus). After phacoemulsification of the lens nucleus and cortical material is completed, a dual irrigation-aspiration (I-A) probe or a bimanual I-A system is used to aspirate out the remaining peripheral cortical material.
- **Conventional extracapsular cataract extraction (ECCE)**: It involves manual expression of the lens through a large (usually 10–12 mm) incision made in the cornea or sclera. Although it requires a larger incision and the use of stitches, the conventional method may be indicated for patients with very hard cataracts or other situations in which phacoemulsification is problematic. Microincision cataract surgery involves a technique by which a cataract can be reached through an incision of 1.5 millimeters or less.
- **Intracapsular cataract extraction (ICCE)** involves the removal of the lens and the surrounding lens capsule in one piece. The procedure has a relatively high rate of complications due to the large incision required and pressure placed on the vitreous body. It has therefore been largely superseded and is rarely performed in countries where operating microscopes and high-technology equipment are readily available<sup>[3]</sup>. After lens removal, an artificial plastic lens (an intraocular lens implant) can be placed in either the anterior chamber or sutured into the sulcus.

Cryoextraction is a form of ICCE that freezes the lens with a cryogenic substance such as liquid nitrogen<sup>[4]</sup>. In this technique, the cataract is extracted through use of a *cryoextractor* — a cryoprobe whose refrigerated tip adheres to and freezes tissue of the lens, permitting its removal. Although it is now used primarily for the removal of subluxated lenses, it was the favored form of cataract extraction from the late 1960s to the early 1980s<sup>[5]</sup>.



Cataract surgery, using a temporal approach phacoemulsification probe (in right hand) and "chopper" (in left hand) being done under operating microscope at a Navy medical center



Cataract surgery recently performed, foldable IOL inserted. Note small incision and very slight hemorrhage to the right of the still dilated pupil.

## Intraocular lenses

- **Intraocular lens implantation:** After the removal of the cataract, an intraocular lens (IOL) is usually implanted into the eye, either through a small incision (1.8 mm to 2.8 mm) using a foldable IOL, or through an enlarged incision, using a PMMA (polymethylmethacrylate) lens. The foldable IOL, made of silicone or acrylic material of appropriate power is folded either using a holder/folder, or a proprietary insertion device provided along with the IOL. The lens implanted is inserted through the incision into the capsular bag within the posterior chamber (in-the-bag implantation). Sometimes, a sulcus implantation (in front or on top of the capsular bag but behind the iris) may be required because of posterior capsular tears or because of zonulodialysis. Implantation of posterior-chamber IOL (PC-IOL) in patients below 1 year of age is controversial due to rapid ocular growth at this age and the excessive amount of inflammation, which may be very difficult to control. Optical correction in these patients without intraocular lens (aphakic) is usually managed with either special contact lenses or glasses. Secondary implantation of IOL (placement of a lens implant as a second operation) may be considered later. New designs of multi-focal intra-ocular lens are now available. These lenses allow focusing of rays from distant as well as near objects, working much like bifocal or trifocal eyeglasses. Pre-operative patient selection and good counselling is extremely important to avoid unrealistic expectations and post-operative patient dissatisfaction. Acceptability for these lenses has become better and studies have shown good results in selected patients. Brands in the market include: ReSTOR (R), Rezoom (R) and Technis MF (R).

In addition, there is an accommodating lens that was approved by the US FDA in 2003 and made by Eyeonics,<sup>[6]</sup> now Bausch & Lomb. The Crystalens (R) is on struts and is implanted in the eye's lens capsule, and its design allows the lens' focusing muscles to move it back and forth, giving the patient natural focusing ability.

## Preoperative evaluation

An eye examination or pre-operative evaluation by an eye surgeon is necessary to confirm the presence of a cataract and to determine if the patient is a suitable candidate for surgery. The patient must fulfill certain requirements such as:

- The degree of reduction of vision due, at least in large part, to the cataract should be evaluated. While the existence of other sight-threatening diseases, such as age-related macular degeneration or glaucoma, does not preclude cataract surgery, less improvement may be expected than in their absence.
- The eyes should have a normal pressure, or any pre-existing glaucoma should be adequately controlled on medications. In cases of uncontrolled glaucoma, a combined cataract-glaucoma procedure (Phaco-trabeculectomy) can be planned and performed.
- The pupil should be adequately dilated using eyedrops; if pharmacologic pupil dilation is inadequate, procedures for mechanical pupillary dilatation may be needed during the surgery.
- The patients with retinal detachment may be scheduled for a combined vitreo-retinal procedure, along with PC-IOL implantation.
- In addition, it has recently been shown that patients taking tamsulosin (Flomax), a common drug for enlarged prostate, are prone to developing a surgical complication known as intraoperative floppy iris syndrome (IFIS), which must be correctly managed to avoid the complication posterior capsule rupture; however, prospective studies have shown that the risk is greatly reduced if the surgeon is informed of the patient's history with the drug beforehand, and has appropriate alternative techniques prepared.<sup>[7]</sup>

## Operation procedures

The surgical procedure in phacoemulsification for removal of cataract involves a number of steps. Each step must be carefully and skillfully performed in order to achieve the desired result. The steps may be described as follows:

1. Anaesthesia,
2. Exposure of the eyeball using a lid speculum,
3. Entry into the eye through a minimal incision (corneal or scleral)
4. Viscoelastic injection to stabilize the anterior chamber and to help maintain the eye pressurization
5. Capsulorhexis
6. Hydrodissection pie
7. Hydro-delineation
8. Ultrasonic destruction or emulsification of the cataract after nuclear cracking or chopping (if needed), cortical aspiration of the remanent lens, capsular polishing (if needed)
9. Implantation of the artificial IOL
10. Entration of IOL (usually foldable)
11. Viscoelastic removal
12. Wound sealing / hydration (if needed).

The pupil is dilated using drops (if the IOL is to be placed behind the iris) to help better visualise the cataract. Pupil constricting drops are reserved for secondary implantation of the IOL in front of the iris (if the cataract has already been removed without primary IOL implantation). Anesthesia may be placed topically (eyedrops) or via injection next to (peribulbar) or behind (retrobulbar) the eye. Oral or intravenous sedation may also be used to reduce anxiety. General anesthesia is rarely necessary, but may be employed for children and adults with particular medical or psychiatric issues. The operation may occur on a stretcher or a reclining examination chair. The eyelids and surrounding skin will be swabbed with disinfectant. The face is covered with a cloth or sheet, with an opening for the operative eye. The eyelid is held open with a speculum to minimize blinking during surgery. Pain is usually minimal in properly anesthetised eyes, though a pressure sensation and discomfort from the bright operating microscope light is common. The ocular surface is kept moist using sterile saline eyedrops or methylcellulose viscoelastic. The *discission* into the lens of the eye is performed at or near where the cornea and sclera meet (limbus = corneoscleral junction). Advantages of the smaller incision include use of few or no stitches and shortened recovery time.<sup>[3] [8]</sup> . A *capsulotomy* (rarely known as cystotomy) is a procedure to open a portion of the lens capsule, using an instrument called a *cystotome*<sup>[9]</sup> . An anterior capsulotomy refers to the opening of the front portion of the lens capsule, whereas a posterior capsulotomy refers to the opening of the back portion of the lens capsule. In phacoemulsification, the surgeon performs an anterior continuous curvilinear capsulorhexis, to create a round and smooth opening through which the lens nucleus can be emulsified and the intraocular lens implant inserted.

Following cataract removal (via ECCE or phacoemulsification, as described above), an intraocular lens is usually inserted. After the IOL is inserted, the surgeon checks that the incision does not leak fluid. This is a very important step, since wound leakage increases the risk of unwanted microorganisms to gain access into the eye and predispose to endophthalmitis. An antibiotic/steroid combination eye drop is put and an eye shield may be applied on the operated eye, sometimes supplemented with an eye patch.

Antibiotics may be administered pre-operatively, intra-operatively, and/or post-operatively. Frequently a topical corticosteroid is used in combination with topical antibiotics postoperatively.

Most cataract operations are performed under a local anaesthetic, allowing the patient to go home the same day. The use of an eye patch may be indicated, usually for about some hours, after which the patient is instructed to start using the eyedrops to control the inflammation and the antibiotics that prevent infection.

Occasionally, a peripheral iridectomy may be performed to minimize the risk of pupillary block glaucoma. An opening through the iris can be fashioned manually (surgical iridectomy) or with a laser (called YAG-laser iridotomy). The laser peripheral iridotomy may be performed either prior to or following cataract surgery.

The iridectomy hole is larger when done manually than when performed with a laser. When the manual surgical procedure is performed, some negative side effects may occur, such as that the opening of the iris can be seen by others (aesthetics), and the light can fall into the eye through the new hole, creating some visual disturbances. In the case of visual disturbances, the eye and brain often learn to compensate and ignore the disturbances over a couple of months. Sometimes the peripheral iris opening can heal, which means that the hole ceases to exist. This is the reason why the surgeon sometimes makes two holes, so that at least one hole is kept open.

After the surgery, the patient is instructed to use anti-inflammatory and antibiotic eye drops for up to two weeks (depending on the inflammation status of the eye and some other variables). The eye surgeon will judge, based on each patient's idiosyncrasies, the time length to use the eye drops. The eye will be mostly recovered within a week, and complete recovery should be expected in about a month. The patient should not participate in contact/extreme sports until cleared to do so by the eye surgeon.

## Complications

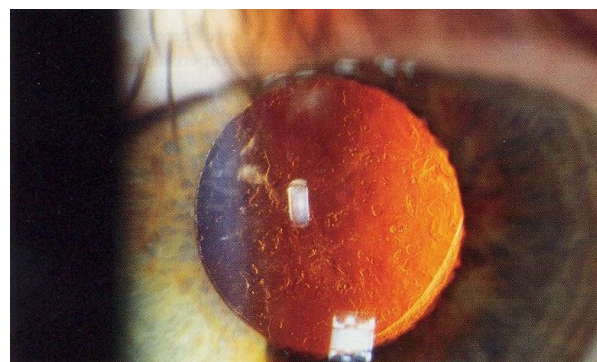
**Complications** after cataract surgery are relatively uncommon.

- Some people can develop a posterior capsular opacification (also called an after-cataract). As a physiological change expected after cataract surgery, the posterior capsular cells undergo hyperplasia and cellular migration, showing up as a thickening, opacification and clouding of the posterior lens capsule (which is left behind when the cataract was removed, for placement of the IOL). This may compromise visual acuity and the ophthalmologist can use a device to correct this situation. It can be safely and painlessly corrected using a laser device to make small holes in the posterior lens capsule of the crystalline. It usually is a quick outpatient procedure that uses a Nd-YAG laser (neodymium-yttrium-aluminum-garnet) to disrupt and clear the central portion of the opacified posterior lens capsule (posterior capsulotomy). This creates a clear central visual axis for improving visual acuity.<sup>[10]</sup> In very thick opacified posterior capsules, a surgical (manual) capsulectomy is the surgical procedure performed.
- Posterior capsular tear may be a complication during cataract surgery. The rate of posterior capsular tear among skilled surgeons is around 2% to 5%. It refers to a rupture of the posterior capsule of the natural lens. Surgical management may involve anterior vitrectomy and, occasionally, alternative planning for implanting the intraocular lens, either in the ciliary sulcus, in the anterior chamber (in front of the iris), or, less commonly, sutured to the sclera.
- Retinal detachment is an uncommon complication of cataract surgery, which may occur weeks, months, or even years later.
- Toxic Anterior Segment Syndrome or TASS is a non-infectious inflammatory condition that may occur following cataract surgery. It is usually treated with topical corticosteroids in high dosage and frequency.
- Endophthalmitis is a serious infection of the intraocular tissues, usually following intraocular surgery, or penetrating trauma. There is some concern that the clear cornea incision might predispose to the increase of endophthalmitis but is no conclusive study to corroborate this suspicion.
- Glaucoma may occur and it may be very difficult to control. It is usually associated with inflammation, specially when little fragments or chunks of the nucleus get access to the vitreous cavity. Some experts recommend early intervention when this condition happens (posterior pars plana vitrectomy). Neovascular glaucoma may occur, specially in diabetic patients. In some patients, the intraocular pressure may remain so high that blindness may ensue.
- Swelling or edema of the central part of the retina, called macula, resulting in macular edema, can occur a few days or weeks after surgery. Most such cases can be successfully treated
- Other possible complications include: Swelling or edema of the cornea, sometimes associated with cloudy vision, which may be transient or permanent (pseudophakic bullous keratopathy). Displacement or dislocation of the intraocular lens implant may rarely occur. Unplanned high refractive error (either myopic or hypermetropic) may

occur due to error in the ultrasonic ecobiometry (measure of the length and the required intra-ocular lens power). Cyanopsia, in which the patient sees everything tinted with blue, often occurs for a few days, weeks or months after removal of a cataract. Floaters commonly appear after surgery.

## History

Cataract surgery was known to the Indian physician Sushruta (6th century BCE), who described it in his work the *Sushruta Samhita*. This text describes an operation called "couching", in which a curved needle was used to push the lens into the rear of the eye and out of the field of vision. The eye would later be soaked with warm clarified butter and then bandaged. Sushruta claimed success with this method but cautioned that this procedure should only be performed when absolutely necessary.<sup>[11]</sup> <sup>[12]</sup> This method may have been brought to the West by Greek travelers from India and the Middle East.<sup>[11]</sup> The removal of cataract by surgery was also introduced into China from India.<sup>[13]</sup>



Slit lamp photo of IOL showing Posterior capsular opacification visible few months after implantation of Intraocular lens in eye, seen on retroillumination

In the Western world, bronze instruments that could have been used for cataract surgery have been found in excavations in Babylonia, Greece, and Egypt. The first references to cataract and its treatment in the West are found in 29 AD in *De Medicinae*, the work of the Latin encyclopedist Aulus Cornelius Celsus, which also describes the couching operation.<sup>[14]</sup>

Couching continued to be used throughout the Middle Ages and is still used in some parts of Africa and in Yemen.<sup>[15]</sup> <sup>[16]</sup> However, couching is an ineffective and dangerous method of cataract therapy, and often results in patients remaining blind or with only partially restored vision.<sup>[16]</sup> For the most part, it has now been replaced by extracapsular cataract surgery and, especially, phacoemulsification.

The lens can also be removed by suction through a hollow instrument. Bronze oral suction instruments have been unearthed that seem to have been used for this method of cataract extraction during the 2nd century AD.<sup>[17]</sup> Such a procedure was described by the 10th-century Persian physician Muhammad ibn Zakariya al-Razi, who attributed it to Antyllus, a 2nd-century Greek physician. The procedure "required a large incision in the eye, a hollow needle, and an assistant with an extraordinary lung capacity."<sup>[18]</sup> This suction procedure was also described by the Iraqi ophthalmologist Ammar ibn Ali of Mosul, in his *Choice of Eye Diseases*, also written in the 10th century.<sup>[18]</sup> He presented case histories of its use, claiming to have had success with it on a number of patients.<sup>[18]</sup> Extracting the lens has the benefit of removing the possibility of the lens migrating back into the field of vision.<sup>[19]</sup> A later variant of the cataract needle in 14th-century Egypt, reported by the oculist Al-Shadhili, used a screw to produce suction. It is not clear, however, how often this method was used as other writers, including Abu al-Qasim al-Zahrawi and Al-Shadhili, showed a lack of experience with this procedure or claimed it was ineffective.<sup>[18]</sup>

In 1748, Jacques Daviel was the first modern European physician to successfully extract cataracts from the eye. In the 1940s Harold Ridley introduced the concept of implantation of the intraocular lens which permitted more efficient and comfortable visual rehabilitation possible after cataract surgery. The implantation of foldable intraocular lens is the procedure considered the state-of-the-art.

In 1967, Charles Kelman introduced phacoemulsification, a technique that uses ultrasonic waves to emulsify the nucleus of the crystalline lens in order to remove the cataracts without a large incision. This new method of surgery decreased the need for an extended hospital stay and made the surgery ambulatorial. Patients who undergo cataract surgery hardly complain of pain or even discomfort during the procedure. However patients who have topical, rather



than peribulbar block, anesthesia may experience some discomfort.

According to surveys of members of the American Society of Cataract and Refractive Surgery, approximately 2.85 million cataracts procedures were performed in the United States during 2004 and 2.79 million in 2005 <sup>[20]</sup>.

In India, modern surgery with intraocular lens insertion in Government- and Non Government Organisation (NGO)-sponsored Eye Surgical Camps have replaced older surgical procedures.

## See also

- Eye surgery
- Africa Cataract Project

## References

### Bibliography

- Finger, Stanley (2001). *Origins of Neuroscience: A History of Explorations Into Brain Function*. US: Oxford University Press. ISBN 0195146948.
- Lade, Arnie & Svoboda, Robert (2000). *Chinese Medicine and Ayurveda*. Motilal Banarsidass. ISBN 812081472X.

## External links

- Keith P. Thompson (inventor). "Near Vision Accommodating Intraocular Lens with Adjustable Power" <sup>[21]</sup> (PDF). *U.S. patent No. 5,607,472*. Retrieved 2007-02-04.

## References

- [1] **U.S. News and World Report**, December 17, 2007, page 64.
- [2] University of Illinois Eye Center. "Cataracts." (<http://www.uic.edu/com/eye/LearningAboutVision/EyeFacts/Cataracts.shtml>) Retrieved August 18, 2006.
- [3] Extracapsular Cataract Extraction - Definition, Purpose, Demographics, Description, Diagnosis/preparation, Aftercare, Risks, Normal results, Morbidity and mortality rates, Alternatives (<http://www.surgeryencyclopedia.com/Ce-Fi/Extracapsular-Cataract-Extraction.html>) Encyclopedia of Surgery: A Guide for Patients and Caregivers
- [4] Cryotherapy for cataracts. (<http://www.surgeryencyclopedia.com/Ce-Fi/Cryotherapy-for-Cataracts.html>) Encyclopedia of Surgery
- [5] Meadow, Norman B. *Cryotherapy: A fall from grace, but not a crash* (<http://www.opthalmologytimes.com/opthalmologytimes/article/articleDetail.jsp?id=186750>). Ophthalmology Times. October 15, 2005.
- [6] New Device Approval - CrystaLens Model AT-45 Accommodating IOL - P030002 (<http://www.fda.gov/cdrh/mda/docs/p030002.html>). U.S. Food and Drug Administration.
- [7] Charters, Linda *Anticipation is key to managing intra-operative floppy iris syndrome* (<http://www.opthalmologytimes.com/opthalmologytimes/article/articleDetail.jsp?id=339794>). Ophthalmology Times. June 15, 2006.
- [8] Surgery Encyclopedia - Phacoemulsification for cataracts (<http://www.surgeryencyclopedia.com/Pa-St/Phacoemulsification-for-Cataracts.html>)
- [9] Capsulorhexis using a cystotome needle during cataract surgery ([http://www.medrounds.org/bookstore/ProductDetail.php?product\\_id=79](http://www.medrounds.org/bookstore/ProductDetail.php?product_id=79))
- [10] Surgery Encyclopedia - Laser posterior capsulotomy (<http://www.surgeryencyclopedia.com/La-Pa/Laser-Posterior-Capsulotomy.html>)
- [11] Finger, page 66
- [12] p. 245, *A History of Medicine*, Plinio Prioreschi, volume 1, 2nd ed., Omaha, Nebraska: Horatius Press, 1996, ISBN 1888456019.
- [13] Lade & Svoboda, page 85
- [14] Cataract history (<http://www.mrcophth.com/Historyofophthalmology/cataracthistory.htm>)
- [15] PCLI: Cataract - History (<http://www.pcli.com/cataract/history.html>)
- [16] 'Couching' for cataracts remains a persistent problem in Yemen (<http://www.escri.org/Publications/EuroTimes/05September/pdf/couching.pdf>), *EuroTimes*, September 2005, p. 11.
- [17] Factors influencing the genesis of neurosurgical technology, William C. Bergman, M.D., Raymond A. Schulz, M.Sc., and Deanna S. Davis, M.S., P.A.-C., *Neurosurgical Focus* **27**, #3 (September 2009), E3; doi:10.3171/2009.6.FOCUS09117.

- 
- [18] Emilie Savage-Smith (2000), "The Practice of Surgery in Islamic Lands: Myth and Reality", *Social History of Medicine* **13** (2), pp. 307-321 [318–9], doi:10.1093/shm/13.2.307
- [19] Finger, Stanley (1994), *Origins of Neuroscience: A History of Explorations Into Brain Function*, Oxford University Press, p. 70, ISBN 0195146948
- [20] American Academy of Ophthalmology reference ([http://www.aao.org/news/academy\\_express/20060405.cfm](http://www.aao.org/news/academy_express/20060405.cfm))
- [21] <http://www.ott.emory.edu/share/technologies/descriptions/92008.pdf>
-



# Article Sources and Contributors

**Cataract surgery** *Source:* <http://en.wikipedia.org/w/index.php?oldid=364164341> *Contributors:* AED, Agne27, Al tally, Altzinn, Arcadian, Arthur Rubin, BFritzen, Brewcrew, Brim, Bticho, CarTitans, Ceyockey, Chowbok, Circus54, CliffC, December21st2012Freak, Deli nk, Descemet, ERcheck, Edwin, Eleassar, Evert, EyeMD, Fbarw, Fratrep, Gadfium, Gehandy, Gomphos, Graham87, Gzuckier, HHahn, Hellbus, Hgb asicwizard, IceCreamAntisocial, Iridescent, Itschris, JSR, JackyR, Jagged 85, Janke, Jeffrey Mall, Jfdwolff, Jidanni, Jmb info, JohnnyB256, KelleyCook, Kgashok, Kobra333, Lawilkin, Lou Sander, MC10, Mellison, MissMJ, Myshivin, Nuttycoconut, Old Moonraker, Oneiros, Para2002, PedEye1, Pion, Poetaris, Pol098, RedDrag0n, Retired username, Rjwilmsi, Roberta F., Robertofreda, Ronhjones, SameOldSameOld, Sarindam7, Shadowjams, Someguy1221, Soumyasch, Spacepotato, Srleffler, Stevenfruitsmaak, Tarek, TerryE, VanBuren, Verbum Veritas, Warut, Wouterstomp, 121 anonymous edits

# Image Sources, Licenses and Contributors

**Image:Cataract in human eye.png** *Source:* [http://en.wikipedia.org/w/index.php?title=File:Cataract\\_in\\_human\\_eye.png](http://en.wikipedia.org/w/index.php?title=File:Cataract_in_human_eye.png) *License:* Creative Commons Attribution-Sharealike 2.5 *Contributors:* Rakesh Ahuja, MD

**Image:Cataract surgery.jpg** *Source:* [http://en.wikipedia.org/w/index.php?title=File:Cataract\\_surgery.jpg](http://en.wikipedia.org/w/index.php?title=File:Cataract_surgery.jpg) *License:* unknown *Contributors:* Denniss, Lipothymia, Mattes

**Image:CataractOperated.jpg** *Source:* <http://en.wikipedia.org/w/index.php?title=File:CataractOperated.jpg> *License:* Creative Commons Attribution-Sharealike 2.5 *Contributors:* Janke

**Image:Posterior capsular opacification on retroillumination.jpg** *Source:* [http://en.wikipedia.org/w/index.php?title=File:Posterior\\_capsular\\_opacification\\_on\\_retroillumination.jpg](http://en.wikipedia.org/w/index.php?title=File:Posterior_capsular_opacification_on_retroillumination.jpg) *License:* Creative Commons Attribution-Sharealike 2.5 *Contributors:* Rakesh Ahuja, MD

# License

Creative Commons Attribution-Share Alike 3.0 Unported  
<http://creativecommons.org/licenses/by-sa/3.0/>