1: Ophthalmology. 2002 Mar;109(3):606-12; discussion 612-3. Related Articles, Links

Incremental cost-effectiveness of initial cataract surgery.

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PURPOSE: The purpose of this study was to perform a reference case, cost-utility analysis of initial cataract surgery using the current literature on cataract outcomes and complications. DESIGN: Computer-based econometric modeling. METHODS: Visual acuity data of patients treated and observed over a 4-month postoperative period was obtained from the US National Cataract Patient Outcomes Research Team (PORT). The results from this prospective study were combined with other studies that investigated the complication rates of cataract surgery to complete the cohort of patients and outcomes. These synthesized data were incorporated with time-tradeoff utility values, decision analysis, and econometric modeling to account for the time value of money. MAIN OUTCOME MEASURES: The number of quality-adjusted life-years (QALYs) gained was calculated for the study group undergoing cataract extraction in the first eye when the vision was the same in both eyes. This was divided into the cost of the procedure to find the year 2000 nominal US dollars spent per quality-adjusted life-year ($/QALY) gained. RESULTS: Initial cataract surgery, compared with observation, resulted in a mean gain of 1.776 QALYs per patient treated. A 3% annual discount rate was used to account for the benefit over time, yielding 1.25 QALYs gained. The mean cost of treatment (also discounted at a 3% annual rate) of each patient totaled 2525 US dollars. The cost divided by the discounted benefit resulted in $2020/QALY gained for this procedure. CONCLUSIONS: Initial cataract surgery seems to be highly cost-effective compared with procedures across multiple medical specialties. This information, incorporating patient preferences into evidenced-based medicine, will play an increasingly important role in the evaluation of health care in the future.

1: Bull World Health Organ. 2004 May;82(5):338-45. Related Articles, Links

Cost-effectiveness analysis of cataract surgery: a global and regional analysis.

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OBJECTIVE: To estimate the population health effects, costs and cost effectiveness of selected cataract surgery interventions in areas of the world with different epidemiological profiles. METHODS: Effectiveness estimates are based on a review of the literature taking into account factors such as operative failure, complications and

patient non-compliance. A population model was applied to follow the lifelong impact on individuals having cataract surgery. Costing estimates are based on primary data collected in 14 epidemiological subregions by regional costing teams and on a literature review. Costings were estimated for different geographical coverage levels using non-linear cost functions. FINDINGS: Intra- and extra-capsular cataract surgeries are cost-effective ways to reduce the impact of cataract-blindness. Extra-capsular cataract surgery is more cost-effective than intra-capsular surgery in all regions considered. Providing extra-capsular cataract surgery to 95% of those who need it (95% coverage level) would avert over 3.5 million disability-adjusted life years (DALYs) per year globally. The cost-effectiveness ranges from 57 International dollars (1 dollar) per DALY in the WHO South-East Asia Region where there is high overall child and adult mortality to 1 dollar 2307 per DALY in the WHO Western Pacific Region where there is low overall child and adult mortality. CONCLUSION: Extra-capsular surgery for cataracts at a high level of coverage is the most cost-effective way of restoring sight in all epidemiological subregions considered. Analysts from countries within a region are encouraged to further contextualize the results based on their own country's specific parameters.

1: Ophthalmic Epidemiol. 2005 Oct;12(5):343-51. Related Articles, Links

Cost-effectiveness analysis of PMMA, silicone, or acrylic intra-ocular lenses in cataract surgery in four European countries.

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PURPOSE: To compare the cost-effectiveness of different intra-ocular lens (IOL) materials (Hydrophobic acrylic, Polymethylmethacrylate (PMMA), Hydrophilic acrylic and Silicone) implanted after cataract surgery with reference to Nd:YAG laser capsulotomy and Nd:YAG-related complications in four European countries (France, Italy, Germany and Spain). SETTING: A retrospective review of 1,525 patients (eyes), aged 50 to 80 years, operated with phacoemulsification for cataract in 1996 or 1997 in 16 surgical centres (4 per country). METHODS: The study was conducted using a cost-effectiveness approach. Medical charts were reviewed to collect retrospective information during the 3-year period following cataract surgery in order to identify patients who underwent Nd:YAG laser capsulotomy post-operatively. Clinical data were combined with unit costs assessed by experts for Nd:YAG laser capsulotomy and their complications. A cost-effectiveness ratio (cost per patient without Nd:YAG laser capsulotomy intervention) was estimated in relation to each IOL material used in each of the four European countries. RESULTS: Hydrophobic acrylic, specifically Acrysof, was the most cost-effective IOL material in all the countries except Germany where it was second. PMMA had the best ratio in Germany, was second in Spain and only third in Italy and France. Silicone was second in France and ranked third in the other countries,

while hydrophilic acrylic had the worst ratio overall in all countries. CONCLUSIONS: Cost-effectiveness ratios of hydrophobic acrylic (Acrysof) were better than those of other types of IOL materials used in most of the countries. Sensitivity analyses were performed to vary the base case analysis to demonstrate the economic importance of the assumptions. In all cases, hydrophobic acrylic IOL material was shown to be a highly cost-effective option.

1: Br J Ophthalmol. 2005 Aug;89(8):1017-20. Related Articles, Links

Comment in:
Br J Ophthalmol. 2005 Aug;89(8):931.

Duration of self assessed benefit of cataract extraction: a long term study.

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AIM: To investigate how long patients' improved visual function lasts after a cataract extraction. METHODS: Patients' self assessed visual function was evaluated using the Catquest questionnaire both before and 6 months after a cataract extraction. The study population consisted of 615 patients undergoing a cataract extraction during 1995-2002. A final follow up with a new questionnaire was performed in 2003, between 1 year and 8 years after surgery. RESULTS: 445 (72.4%) patients were alive at follow up and agreed to participate in the study. The number of subjects still showing improved visual function after surgery decreased with longer follow up. After 7 years, 80% had improved visual function compared with before surgery. 50% of all originally operated subjects were alive 7 years postoperatively and enjoyed better visual function than they had done before surgery. Ocular co-morbidity in the operated eye or self assessed poor visual function before surgery was significantly related to deteriorated visual function at follow up. CONCLUSION: The number of subjects who experienced improved visual function after a cataract extraction decreased over the course of time postoperatively. Presence of ocular co-morbidity was significantly related to worsened function.

1: Curr Opin Ophthalmol. 2005 Jun;16(3):191-4. Related Articles, Links

How to interpret a healthcare economic analysis.

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PURPOSE: The purpose of the review is to present guidelines to help the clinician to interpret healthcare economic analyses and review pertinent recent analysis in the ophthalmic literature. RECENT FINDINGS: There are four variants of healthcare economic analyses: (1) cost-minimization analysis; (2) cost-benefit analysis; (3) cost-effectiveness analysis and (4) cost-utility analysis. Cost-utility utility analysis has assumed an increasingly important role in healthcare, with increasing number of analyses occurring in the peer-reviewed ophthalmic literature. These include cost-utility analyses of cataract surgery in the first and second eyes, amblyopia treatment, and cost-utility analyses encompassing the vitreoretinal interventions of the following: (1) laser photocoagulation for exudative macular degeneration; (2) laser treatment for diabetic retinopathy; (3) laser photocoagulation for branch retinal vein obstruction; (4) diabetic vitrectomy; (5) treatment of proliferative retinopathy of prematurity and (6) treatment of retinal detachment associated with proliferative vitreoretinopathy. As an increasing number of cost-utility analyses become available they will provide the information system for the practice of value-based medicine, or medicine based upon the patient-perceived value conferred by interventions. SUMMARY: Increasing numbers of cost-utility analysis in the ophthalmic literature suggest that ophthalmic interventions, including vitreoretinal interventions, are cost effective. Cost-utility analysis is a major tool in value-based medicine, the practice of medicine based upon the patient-perceived value conferred by healthcare interventions.

1: Cochrane Database Syst Rev. 2005 Jan 25;(1):CD004242. Related Articles, Links

Update of:

- Cochrane Database Syst Rev. 2004;(1):CD004242.

Day care versus in-patient surgery for age-related cataract.

Fedorowicz Z, **Lawrence D**, **Gutierrez P**.

BACKGROUND: Age-related cataract accounts for more than 40% of cases of blindness in the world with the majority of people who are blind from cataract found in the developing world. With the increased number of people with cataract there is an urgent need for cataract surgery to be made available as a day care procedure. OBJECTIVES: To provide reliable evidence regarding the safety, feasibility, effectiveness and cost-effectiveness of cataract extraction performed as day care versus in-patient procedure. SEARCH STRATEGY: We searched the Cochrane Central Register of Controlled Trials - CENTRAL (which contains the Cochrane Eyes and Vision Group Trials Register) on The Cochrane Library (Issue 3 2004), MEDLINE (1966 to July 2004), EMBASE (1980 to August 2004) and LILACS (July 2004). SELECTION CRITERIA: This review includes randomised controlled trials comparing day care and in-patient surgery for age-related cataract. The primary outcome was the achievement of a satisfactory visual acuity six weeks after the operation. DATA COLLECTION AND ANALYSIS: Although two trials are included in the review, adequate data were available for only one trial and

therefore pooling of data from studies was not attempted. A descriptive summary is presented. MAIN RESULTS: Two trials, involving a total of 1284 people, are included in this review. One trial reported statistically significant differences in early postoperative complication rates in the day care group, with an increased risk of increased intraocular pressure, which had no clinical relevance to visual outcomes four months postoperatively. The mean change in visual acuity (Snellen lines) of the operated eye four months postoperatively was 4.1 (standard deviation (SD) 2.3) for the day care group and 4.1 (SD 2.2) for the in-patient group and not statistically significant. The four-month postoperative mean change in quality of life score measured using the VF14 showed minimal differences between the two groups. Costs were 20% more for the in-patient group and this was attributed to higher costs for overnight stay. One study only reported hotel costs for the non-hospitalised participants making aggregation of data on costs impossible. AUTHORS' CONCLUSIONS: This review provides some evidence that there is a cost saving but no significant difference in outcome or risk of postoperative complications between day care and in-patient cataract surgery. This is based on one detailed and methodologically sound trial conducted in the developed world. The success, safety and cost-effectiveness of cataract surgery as a day care procedure appear to be acceptable but additional well-designed trials are required to confirm these perceptions.

1: Ophthalmic Epidemiol. 2004 Dec;11(5):369-80. Related Articles, Links

Economic cost of cataract surgery procedures in an established eye care centre in Southern India.

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PURPOSE: To estimate the direct and indirect costs of three cataract surgery procedures: extracapsular cataract extraction with intra-ocular lens implantation (ECCE-IOL), phacoemulsification (PHACO) and manual small incision cataract surgery (MSICS) using economic costing principles in a well-established eye care programme (Aravind Eye Hospital) in Tamil Nadu, South India during 2000-01. Previous literature suggests that PHACO and MSICS have similar effectiveness. METHODS: The average unit cost for each surgical procedure was calculated from the societal perspective using economic costing methods. Total annual provider's direct costs for each input to surgery were calculated and apportioned appropriately to different cataract surgery techniques using a 'micro-costing approach'. The patient's direct and indirect costs for each procedure were calculated by interviewing staff and patients and by using assumptions about prices for relevant cost items such as transportation, food, medicine, spectacles and economic productivity loss. RESULTS: Average provider's direct costs were highest for PHACO procedures (25.55 US dollars) compared to MSICS (17.03 US dollars) and ECCE-IOL (16.25 US dollars). The difference can be attributed to the cost of equipment and materials. Average direct and indirect patient costs were highest for ECCE-IOL (19.85

US dollars), while the costs for PHACO and MSICS were identical (12.37 US dollars). ECCE-IOL had the highest total costs and MSICS had the lowest total costs from the societal perspective. CONCLUSIONS: Our results suggest that MSICS may have a lower societal cost than other options. Government and NGO hospitals providing cataract surgeries should invest in regular cost analyses, reviews of the literature on effectiveness, and formal cost-effectiveness analyses in order to plan economically efficient interventions. Considering the small incremental cost for providers (less than 1 US dollar), improved outcomes, and lower patient costs, we also believe that MSICS is an important technique to use in efforts to eliminate cataract blindness in India and this result may be generalised to other developing countries.

1: Int Ophthalmol. 2004 Mar;25(2):81-7. Related Articles, Links

Cost efficiency and cost effectiveness of cataract surgery at the Malaysian Ministry of Health ophthalmic services.

Loo CY, **Kandiah M**, **Arumugam G**, **Goh PP**, **John E**, **Gurusami B**, **Kumar TV**, **Karunakar TV**, **Azmi S**, **Lim TO**.

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PURPOSE: To determine the cost efficiency and to compare the cost effectiveness of conventional extracapsular cataract surgery (ECCE) and phacoemulsification at three hospitals of the Malaysian Ministry of Health (MOH). METHODS: Patient demography, pre-operative visual acuity, intra-operative complications, post-operative complications and post-operative visual acuity were recorded for two hundred and forty seven of the 400 patients who underwent cataract surgery during a 2-week period. The cost of surgery, which included capital, staff and overhead, and patient care consumable costs were assessed prospectively in 8 randomly sampled patients over a 3-month period. Cost efficiency refers to cost per cataract surgery. Cost effectiveness refers to cost per successful cataract surgery. This is estimated by the ratio of cost efficiency to the proportion of successful cataract surgery. Successful surgery was defined as best-corrected visual acuity (BCVA) of better than 6/12 at 3 months post-operatively. RESULTS: Proportion of patients who had post-operative visual acuity of 6/12 or better was higher in phacoemulsification group (94%) than in the ECCE group (81%). Conventional extracapsular cataract surgery with intraocular lens implant costs RM3442 (USD 905.79) and phacoemulsification with intraocular lens implant costs RM4288 (USD 1128.42). DISCUSSION: There was no significant difference in cost effectiveness between ECCE and phacoemulsification. The cost of cataract surgery in the MOH hospital was found to be high due to the high overhead costs.

1: Health Aff (Millwood). 2003 Jul-Aug;22(4):210-9. Related Articles, Links

Comment on:

- Health Aff (Millwood). 2001 Sep-Oct;20(5):11-29.

The uninsured and the benefits of medical progress.

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In a recent Health Affairs article, David Cutler and Mark McClellan found that new medical technology confers positive net benefits for several conditions, including heart attacks, cataracts, and depression. We estimate the extent to which uninsured Americans ages 55-64 use these technologies and compute access gaps for each. Based on Cutler and McClellan's net benefit estimates, we calculate that more than $1.1 billion is lost annually from excess morbidity and mortality among the uninsured population because of lack of access to new technologies for the treatment of these three conditions.

1: J Cataract Refract Surg. 2002 Oct;28(10):1742-9. Related Articles, Links

Cost-effectiveness of cataract surgery. Method to assess cost-effectiveness using registry data.

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To develop a method to estimate the cost per quality-adjusted life year (QALY) gained with cataract surgery using large patient registries.Four centers in Sweden.Five hundred patients scheduled for cataract extraction in 1 eye at 1 of 4 centers in Sweden during March 1999 were asked to complete the EQ-5D, a preference-based quality-of-life instrument, and the Catquest, a disease-specific disability measure, before surgery. Multiple regression analysis was used to study the correlation between utility and visual acuity and/or disability and utility and QALY gain through the intervention estimated.Visual acuity and Catquest scores were available for 484 patients. The mean age was 76.1 years; the mean logMAR visual acuity was 0.59 in the surgical eye and 0.26 in the other eye. The mean Catquest disability score was 13.79 and the mean utility, 0.74. Utilities correlated significantly with visual acuity and disability scores, and the correlations remained significant when both were included in a regression model, indicating that the 2 measure different concepts. The hypothetical cost per QALY gained (discounted at 3%) was estimated at 45000 SKr (4500 US dollars) using the Swedish Cataract Registry.The results indicate that visual acuity and visual disability significantly affect utilities controlled for age and ophthalmic comorbidity. It is thus possible to use data on visual acuity and disability in large registries to estimate the cost-effectiveness of cataract surgery and to compare the cost per QALY gained with other health care interventions.

1: J Refract Surg. 2002 Mar-Apr;18(2):162-8. Related Articles, Links

Cost-effectiveness of the AMOArray multifocal intraocular lens in cataract surgery.

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PURPOSE: To compare the cost and outcomes of bilateral cataract surgery with the foldable AMOArray multifocal intraocular lens (MIOL) versus the foldable monofocal intraocular lens from the health care payer perspective. METHODS: A cost-effectiveness analysis was used to evaluate treatment with the MIOL compared to monofocal lens, using data from clinical trials, literature, expert opinion, and a review of the German health care funding and reimbursement system. RESULTS: The average total direct medical cost per patient (per procedure) with the MIOL was DM 1,774 compared to DM 1,716 with the monofocal lens (1DM = US$0.558 in April 1998). The MIOL was more cost-effective than the monofocal lens in terms of cost per patient (spectacle-free). Cost per patient without overall limitation in vision-related function and cost per patient without limited night vision were similar for both patient groups. The incremental cost of the MIOL for a one-point increase was DM 52 in the self-rated score "quality of vision," DM 82 in "satisfaction with day vision," and DM 115 in "satisfaction with night vision." CONCLUSION: The small additional cost of the MIOL was outweighed by the increased satisfaction with vision experienced by MIOL patients.

1: J Indian Med Assoc. 2000 Dec;98(12):748-51, 767. Related Articles, Links

Is refractive surgery justified?

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Refractive surgery may be defined as any kind of eye surgery in which attempt is made to produce a level of spectacle error that is accepted to the patient. Cataract surgery with lens implantation is the most often done refractive surgery on the eye. The following kinds of refractive surgery are being practised: With normal crystalline lens, phacic intra-ocular lens, surgery with cornea, using excimer laser, other newer techniques. Radial keratotomy is one procedure of refractive surgery with cornea. In this operation, radial cuts are made on the cornea starting near the edge of the pupil and reaching up to the limbus. Number of cuts vary from 4 to 24 depending upon the seventy of myopia. Its advantage is its cost effectiveness and can be performed in a remote area. There are two ways of excimer laser: photorefractive keratectomy (PRK) and laser assisted in-situ keratomileusis (LASIK). The processes are elaborated in the article. Before any refractive

surgery is performed, it is imperative that the whole of the eye receives full and detailed attention. The patient needs to be explained of the procedure. Utmost care should be taken to observe sterilisation of the instruments and the environment.

1: Acta Ophthalmol Scand. 2001 Apr;79(2):147-53. Related Articles, Links

Cataract surgery and effectiveness. 2. An index approach for the measurement of output and efficiency of cataract surgery at different surgery departments.

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PURPOSE: To describe a model for comparing the performance of cataract surgery among ophthalmology departments in terms of economic efficiency. METHODS: An index approach for the measurement of outcome of cataract surgery is modeled. The index approach uses information about activities and difficulties in daily life as well as visual acuity and age. The change in activities and difficulties after surgery is expressed by changes in distances, and an overall index score is calculated as ratios of values to distances. Values to distances are estimated as solutions to linear programming problems. Index scores are calculated for two groups of patients, those with an ocular co-morbidity and those without. Economic efficiency is also estimated by use of an index approach. In the estimation of efficiency we use the calculated index scores of outcome of surgery as a measure of output of the ophthalmology department. Four different departments providing cataract surgery are compared. RESULTS: The studied departments showed differences to a great extent when traditional measures of cataract surgery outcomes were used. These differences changed when the outcomes were compared by use of index scores. When economic efficiency was calculated the difference between the departments was further reduced and only one department was considered inefficient according to the model. CONCLUSION: An index approach was used to study outcomes of cataract surgery and economic efficiency in four departments. This approach takes into account the complexity of cost in relation to feasible outcome. The ranking between the departments described by traditional methods turned out differently using the model.

1: Lancet. 2000 Jan 15;355(9199):180-4. Related Articles, Links

Comment in:

- Lancet. 2000 Jan 15;355(9199):158-9.

Cost-effectiveness of public-funded options for cataract surgery in Mysore, India.

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BACKGROUND: In India 3.8 million people become blind due to cataracts every year. We assessed the cost-effectiveness of public-funded options for delivering cataract surgery in Mysore, Karnataka State, India. METHODS: Three types of delivery of cataract surgery were studied: mobile government camps, walk-in services at a state medical college hospital, and patients transported in from satellite clinics to a non-governmental hospital. We assessed outcomes in a systematic sample of patients operated on in 1996-97 by follow-up at home; average costs by provider derived from actual expenditures during the year. FINDINGS: Almost half the patients operated on in government camps were dissatisfied with the outcome (34/70, 49% [95% CI 36-61]). More than one third were blind in the operated eye (25/70, 36% [25-48]). User satisfaction was higher with other providers (medical college hospital 82% [63-94]; non-government hospital 85% [72-93]), and fewer patients remained blind. Camps were a low-cost option, but the poor outcomes reduced their cost-effectiveness to US$97 per patient. The state medical college hospital was least cost-effective, at US$176 per patient, and the non-governmental hospital was the most cost-effective at US$54 per patient. INTERPRETATION: The government of India should review its policy for government camp surgery, and consider alternatives, such as transporting patients to better permanent facilities. India and other developing countries should monitor outcomes in cataract surgery programmes, as well as throughput.

1: Clin Perform Qual Health Care. 1999 Jan-Mar;7(1):23-7. Related Articles, Links

Inappropriateness of cataract extraction: an analysis in two Israeli hospital settings.

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OBJECTIVE: To assess and compare the appropriateness of cataract extraction in two Israeli regional hospitals. SETTINGS: Two Israeli hospitals located in different geographic areas. DESIGN: A randomized sample of 150 patients was drawn from a list of all patients who underwent cataract surgery at the two study hospitals during 1995. Detailed extraction of hospital medical records was performed. The appropriateness of cataract surgery was assessed using the Medical Review System, an interactive expert system that assesses the appropriateness of selected medical and surgical procedures. RESULTS: The rates of cataract surgery in the two hospitals were 0.54 and 0.59 operations per 1,000 population, respectively, and the age-adjusted rates per 1,000 population were 5.7 and 6.2, respectively. The percentage of patients with only light

perception or hand-motion perception in the operated eye before the operation was 62.2%, with no difference in the two hospitals. There was not a significant difference in the distribution of visual acuity before the operation; however, there was a significant difference in the distribution of visual acuity after the surgery. Rates of inappropriate surgeries in the two hospitals were found to be similar to the inappropriate rate in the United States (1.3%). The preoperative visual acuity of patients undergoing cataract surgery in Israel was inferior to the visual acuity of patients undergoing cataract surgery in the United States. CONCLUSION: To increase quality and cost-effectiveness in the Israeli medical system, future studies of this type are warranted in connection with surgical procedures.