




OPEN ACCESS

A stakeholder meeting exploring the ethical perspectives of immediately sequential bilateral cataract surgery

Matthew Quinn ,¹ Daniel Gray,² Ahmed Shalaby Bardan,³ Mehran Zarei,⁴ John Sparrow,⁵ Christopher Liu^{3,6,7}

► Additional material is published online only. To view, please visit the journal online (<http://dx.doi.org/10.1136/medethics-2020-106412>).

¹Royal United Hospital Bath NHS Trust, Bath and North East Somerset, UK

²School of Social Sciences, Cardiff University, Cardiff, UK

³Sussex Eye Hospital, Brighton and Sussex University Hospitals NHS Trust, Brighton, UK

⁴Farabi Eye Hospital, Tehran University of Medical Sciences, Tehran, The Islamic Republic of Iran

⁵Bristol Eye Hospital, University Hospitals Bristol NHS Trust, Bristol, UK

⁶Brighton and Sussex Medical School, Brighton, United Kingdom

⁷Tongdean Eye Clinic, Hove, United Kingdom

Correspondence to

Professor Christopher Liu, Sussex Eye Hospital, Brighton BN2 5BF, UK; csliu@aol.com

Received 7 May 2020

Revised 22 July 2020

Accepted 28 July 2020



© Author(s) (or their employer(s)) 2020. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

To cite: Quinn M, Gray D, Bardan AS, et al. *J Med Ethics* Epub ahead of print: [please include Day Month Year]. doi:10.1136/medethics-2020-106412

ABSTRACT

Purpose The purported benefits and risks of immediately sequential bilateral cataract surgery (ISBCS) have been well described, yet the procedure remains controversial among UK ophthalmologists. As many of the controversies of ISBCS are underpinned by ethical dilemmas, the aim of this work was to explore the ethical perspectives of ISBCS from a variety of stakeholder viewpoints.

Method A semi-structured independent stakeholder meeting was convened at the Royal College of Ophthalmologists London headquarters in June 2018. In total, 29 stakeholders attended the meeting. The professional characteristics of stakeholders included but were not limited to: ophthalmologists (9), patients (5), religious leaders (4), ethicists (2), lawyers (2) and commissioners (1). Thematic qualitative analysis using methodology proposed by Braun and Clarke was conducted on the resultant transcript of the discussion.

Results Themes identified include: (1) beneficence and non-maleficence (patient benefits, patient risks, the uncertainties of risk, patient interpretation of the risk-benefit analysis); (2) autonomy (informed consent, the barriers to communication); (3) distributive justice (the allocation of resources: the individual vs the collective).

Conclusion This analysis provides a reference point for the ethical factors surrounding ISBCS. The stakeholders concluded that this approach was an ethical undertaking provided patient autonomy was appropriately attained. This requires a patient's interpretation of the risk-benefit balance, which must include an understanding of the low but unquantifiable risk of severe complications. A surgeon must aim to minimise risks through the adaption of accepted surgical protocols and by performing appropriate patient selection. Currently, cost savings to healthcare that may occur following the implementation of ISBCS should be considered a secondary benefit of the protocol.

INTRODUCTION

Epidemiological models based on ageing demographics estimate cataract surgery numbers to increase by 50% by 2035. Literature from the Royal College of Ophthalmologists (RCOphth) has reflected concern over the future demand on UK ophthalmologists.¹ New surgical efficiencies have therefore been sought to increase cataract productivity while maintaining excellent outcomes.^{1 2} Recently, a modified approach to the standard cataract surgery pathway, known as immediately sequential bilateral cataract surgery (ISBCS)

has been attracting interest. This procedure consists of operating on both symptomatic eyes at the same sitting.^{2 3}

The purported benefits of ISBCS have been well described in the literature, these include both direct patient and wider economic benefits.^{2 3} Many proposed risks of ISBCS are focused on the potential for bilateral complications, with bilateral endophthalmitis often cited as the primary concern for surgeons.^{3 4} Within the UK, ISBCS remains a controversial procedure and uptake by RCOphth members is low (13.9%).⁵ In 73 centres where at least one patient had undergone ISBCS, the overall rate was 0.4% of the cataract operations performed.⁶ Some commentators believe that for a routine elective procedure, ISBCS should not be undertaken as the potential benefits do not outweigh the potential harms of the protocol.⁷

The principle of not inflicting harm (non-maleficence) and promoting good (beneficence) form an integral basis for many theoretical approaches in medical ethics. In 1979, American Bioethicists Beauchamp and Childress proposed that ethical decision making required the consideration of wider aspects of equity and fairness (justice) and respect for an individual's free will (autonomy).⁸ Whereas Beauchamp and Childress described the 'classical' principles of medical ethics, this represents only one approach within ethical decision making.⁹ The utility of ethical debate exists in individuals balancing and weighing ethical considerations within context-specific scenarios. Individuals may also use the application of various personal moral standards to arrive at different conclusions.^{8 10}

Ethical considerations are often taken into account when implementing novel techniques into practice.^{11 12} As many of the controversies of ISBCS are underpinned by ethical factors, the aim of this work was to explore the ethical perspectives of ISBCS from a variety of stakeholder viewpoints. Additionally, it is our hope that the representation of a variety of expert and patient perspectives will guide the identification of future areas of research for ISBCS.

METHOD

Stakeholder meeting design and setting

For this independent meeting, we have defined stakeholders as: persons who may be directly or indirectly affected by a change in the protocol for

Table 1 Professional characteristics of stakeholder present

Professional capacity	Number of attendees
Healthcare professionals	
Ophthalmologist	6
Ophthalmologist and ethicist	1
Ophthalmologist of Muslim faith	1
Ophthalmologist and public health ophthalmologist	1
Ophthalmic nurse and patient	3
Optometrist	1
Other professionals	
Bioethicist	1
Bioethicist and political philosopher	1
Commissioner	1
Lawyer	2
Health economist	1
Religious persons	
Catholic priest	1
Academic of Jewish faith	1
Muslim chaplain and scholar	1
Rabbi	1
Lay attendees	
Lay trustee of the RCOphth	1
Lay member of the RCOphth	1
Medical student	1
Patient	2
Patient advocate	1
Total	29

RCOphth, Royal College of Ophthalmologists.

delivery of cataract surgery. The stakeholders selected participated as a collective group of non-author contributors, to assist in the identification of their ethical perspectives of ISBCS. Questions were formulated and distributed to stakeholders in advance following confirmation of attendance (online supplementary material). The questions provided were intended to elicit discussion of ethical topics, but not to provide the basis for analysis. The content of the questions was validated by three senior ophthalmologists, each with divergent views on ISBCS.

The meeting took place at the RCOphth London headquarters in June 2018. The meeting was semi-structured with discussions facilitated by an independent chair. All viewpoints represented were personal views and not necessarily representative of each stakeholder's respective organisation. The event was audio-visually recorded with consent from participants to publish the content in the public domain.^{13 14}

Stakeholders

Stakeholders were invited via email through purposive sampling. Where individual stakeholder's views of ISBCS were known a priori, attempts were made to select a mixture of participants both for and against the procedure. A total of 29 stakeholders participated. Key stakeholder groups included but were not limited to: ophthalmologists (9), patients (5), nurses (2), ethicists (2), lawyers (2), religious persons (4), optometrists (1), commissioners (1) and health economists (1). A full list of the primary professional capacities of the attendees is displayed in table 1.

Table 2 Themes and subthemes identified at the stakeholder meeting

Theme	Subtheme
1. Beneficence and non-maleficence	1.1 Patient benefits
	1.2 Patient risks
	1.3 The uncertainty of risk
	1.4 Patient interpretation of the risk-benefit analysis
2. Autonomy	2.1 Informed consent
	2.2 The barriers to communication
3. Distributive justice	3.1 The allocation of resources: the individual versus the collective

Data analysis

The data were transcribed using intelligent verbatim and imported into qualitative software organiser EnVivo12. The analysis was conducted using a 'bottom up' or inductive approach, using an open coding technique in which the themes developed were data driven. The approach to thematic analysis was conducted based on described protocol by Braune and Clarke.¹⁵ For validation purposes, the entire set of data was then re-coded independently by a second qualitative researcher (DG). The two coding transcripts were then collaboratively reviewed, and a final set of themes generated.

RESULTS

The ethical themes that emerged from the stakeholder meeting are described in table 2. The three primary themes include: (1) beneficence and non-maleficence; (2) autonomy and (3) distributive justice. The themes and their subthemes are discussed ahead, accompanying quotations from the meeting are available in the online supplemental material.

Beneficence and non-maleficence

Patient benefits

Patient-reported benefits centred on the perceived convenience offered by the ISBCS protocol. Patients reported that the fewer hospital visits, due to one pre-op assessment and one operation attendance, made the process convenient. The benefit of one recovery period permitted patients to return to prior commitments, such as work and caring responsibilities, sooner than the traditional protocol of delayed sequential bilateral cataract surgery (DSBCS).

Non-ophthalmologist health professionals reported issues with the traditional protocol that could be addressed by ISBCS. Nurses working with post-DSBCS surgical patients reported anisometropia to be an issue that was frequently observed. This had implications on a patient's quality of life during this period, and therefore was reported to directly factor in one nurse's decision to undergo ISBCS themselves. Ophthalmologists recognised the imposition of repeat hospital visits on patients' lives. Stakeholders recognised that repeat visits also had knock-on effects for patient's employment, or those acting as primary carers. One ophthalmologist highlighted how the geographical isolation of some patients amplified the direct patient benefits ISBCS offered.

Patient risks

The risks associated with ISBCS formed a central theme of the meeting. Discussions initially focused on the 'minor' complications following ISBCS. Specifically, the inability for the protocol to permit the power of the second lens to be modified based on

the visual outcome of the first eye's surgery. Stakeholders agreed that large refractive errors were a rare occurrence following ISBCS, primarily due to technological advances in biometry accuracy. However, it was acknowledged that small refractive errors may still occur. Stakeholders highlighted that the shape of certain eyes predisposed patients to receiving an inaccurate lens power prediction. Therefore, this should be considered an exclusion criterion, as already stipulated in the National Institute for Health and Care Excellence (NICE) guidance. One ophthalmologist contended that the evidence base behind modifying the second lens power based on the visual outcome of the first eye was limited.

Stakeholders raised concerns surrounding how vulnerable populations would cope with minor complications that could arise following ISBCS. One complication specifically discussed was cystoid macular oedema (CMO), condition resulting in fluid build-up within the retina which may occur postcataract surgery. CMO and other minor complications, if occurring in in both eyes, could require two different treatment regimens of drops to resolve. The ability to successfully manage these treatments regimes and attend to usual activities of daily living with compromised vision could be an overwhelming task for some patients. Stakeholders felt that the ability of patients to self-manage minor complications should be a consideration by surgeons during the consent process.

Within the subtheme of 'patient risk' arose the duty of surgeons to minimise the harm to the patient. This principle was reflected by religious persons present and was emphasised by those representing Muslim and Catholic viewpoints. Stakeholders stipulated surgeons should only offer ISBCS if they had a good surgical track record, hospital safety record and adhered to accepted guidelines for the procedure. Medico-legal representatives also recommended doctors performing ISBCS adhered to NICE guidelines and maintained adequate exclusion criteria of high-risk cataract patients. However, it was acknowledged in certain situations it may be justifiable to deviate from the guidelines. Legal representatives highlighted that should a serious complication occur, there will likely be scrutiny of whether ISBCS was appropriate to have been offered for that case.

The uncertainty of risk

The uncertainty regarding the risk of severe sight-threatening complications, such as bilateral endophthalmitis, was discussed at the meeting. To estimate a risk of this occurrence, suggestions were made to analyse data obtained retrospectively from countries currently undertaking ISBCS. A data series following 100 000 patients undergoing ISBCS was described by one ophthalmologist. The results of this study found 12 patients experienced unilateral endophthalmitis, but there were no reports of bilateral infections. Stakeholders therefore stated that the risk of bilateral endophthalmitis is very low, provided that appropriate protocols are followed.

Due to the uncertainty associated with bilateral endophthalmitis, some religious members enquired to the possibility of designing future trials to fully quantify the risk. Ophthalmologists stated that as the incidence of severe complications was very low, designing appropriately large prospective trials to produce an accurate estimate is a difficult and expensive task. Debate surrounded how to accurately extrapolate the calculated risk of unilateral endophthalmitis, in order to produce an accurate estimate of the risk for bilateral endophthalmitis. One ophthalmologist treated them as independent variables, producing an estimate of the overall risk at 1 in 16 million. Another ophthalmologist did not agree with this approach, stating the factors

that predisposed the patient to endophthalmitis in the first eye would also be present in the second.

Patient interpretation of the risk-benefit analysis

As there is an uncertainty associated with certain ISBCS complications, discussions turned to the importance of a risk-benefit analysis and how it should be undertaken. Stakeholders highlighted a desire that the risk-benefit analysis should be a patient-centred decision, as each individual would attribute different significance to each material (personal) risk and benefit associated with ISBCS. As the benefits and the risks of ISBCS are born directly by the patient, stakeholders felt ethically it should fall to the patient's decision to undertake the surgery.

Stakeholders acknowledged that the weighing of statistics relating to the risks and benefits for any given procedure is an inherently difficult task. This is exacerbated in the case of bilateral endophthalmitis, where the exact risk cannot be accurately quantified. Therefore, stakeholders stipulated that surgeons should ensure that patients understood the implications of any decision made, and this discussion should be fully documented within the notes.

Ethicists and religious persons among the group were keen to distinguish the difference between risk and hazard. Although stakeholders considered the risk of bilateral endophthalmitis to be lower than unilateral endophthalmitis, the hazard of both complications are not equal. Stakeholders stated the individual and societal effect of a patient being rendered completely blind is inherently a more hazardous outcome than that of unilateral blindness. Therefore, emphasis was placed on effectively articulating this risk to patients in a comprehensive way.

Autonomy

Informed consent

The stakeholders expressed a united consensus for patient centred decision making. An aspect of this included the often-nuanced process of informed consent. This concept was particularly emphasised by those attending in a healthcare professional capacity. Stakeholders emphasised the consent processes for ISBCS mirrored that of the single eye procedure. However, the uncertain risks associated with ISBCS does make consenting a more involved process. Viewpoints from those representing a religious perspective echoed the importance of gaining informed consent. Specific distinctions were made to ensure information was represented accurately and with integrity, to gain a truly 'informed' consent.

Medico-legal perspectives highlighted the law's view of obtaining informed consent. One lawyer stated they considered the signing of a consent form on the day of surgery to be primary evidence of professional misconduct, implying the patient had taken the decision before contemplating the risks of the procedure. The concept of consent following the landmark court ruling of *Montgomery vs Lanarkshire Health Board* was raised several times throughout the meeting. The ruling included the stipulation that a doctor must counsel patients on the advantages of disadvantages of any reasonable alternative procedures, including procedures not being offered.

The barriers to communication

Stakeholders, both professional and lay persons, recognised that there were barriers in gaining a truly informed consent. Providing adequate information to ensure patients understood the risks and benefits of ISBCS was considered essential to make an informed decision. Issues around informed consent primarily linked to the ability surgeons to communicate information

adequately. Obtaining informed consent through satisfactorily communicating complex information was described as a generic problem across medicine. Stakeholders recognised the speed of patients to understand and weigh information is variable; patients should therefore be given adequate time to decide on options provided. This was compounded by the studies demonstrating that a patient's ability to understand and retain information in a stressful clinical environment was poor. Certain stakeholders also described how factors such as the cultural and educational backgrounds of their patients had to be taken into account when delivering information to ensure understanding. To tackle this, suggestions were made to modify the consent process to shift the burden of patient understanding out of the clinic, through the use of online applications designed to undertake the consenting process.

Distributive justice

The allocation of resources: the individual versus the collective

Stakeholders recognised that there was a disparity between the amount of resources a society spends on healthcare and the quality of healthcare the public wants delivered. Upholding distributive justice through conserving resources was described as one of the duties of a doctor. The health economist present discussed several studies that demonstrated a monetary cost saving for ISBCS. They concluded that based on current analysis, there was an estimated \$C500 of savings per patient when undertaking ISBCS compared with DSBCS. Disagreements arose over the strength of the current cost-benefit analysis available. One ophthalmologist stated a full economic analysis had not been completed, as the cost had not been offset against the financial effect of blinding a patient.

Some stakeholders suggested the potential economic savings to society that ISBCS offered was itself an important ethical consideration. These stakeholders recognised the importance of the ethical distribution of resources in an 'economic fixed-pot' such as the National Health Service (NHS) and felt there was a duty of doctors to produce the most efficient model possible. The proposed economic benefits should result in the procedure being offered more routinely to the appropriate patients. It was argued that although an initial small saving per operation (~£300) is predicted, the potential quantity of operations carried out could result in £30 millions of savings per year. Stakeholders recognised that the economic savings would be applicable to the NHS as a whole and were unlikely to be directly used within ophthalmology.

Other stakeholders argued that although financial benefits of ISBCS may exist, it is currently not a robust enough analysis to be an ethically viable consideration. Religious and patient perspectives expressed the desire for the patient to remain at the centre of the consultation, with the doctor acting as an advocate for the patient's best interest but not for economic savings. Stakeholders agreed that the overall economics of the procedure should not be a conscious factor for clinicians when consulting patients on an individual basis. It was highlighted by the commissioner that should future economic analysis reveal there was a significant savings for ISBCS on top of the discussed patient benefits, ISBCS would become the default option for appropriate patients. Stakeholders subsequently concluded that currently the decision should be deferred to the patient's autonomy and their personal risk-benefit analysis of the procedure.

DISCUSSION

This meeting aimed to discuss the ethical challenges of the currently controversial procedure of ISBCS, as perceived by

a group of 29 stakeholders. This meeting is unique, as there is currently no research that carefully evaluates the ethical considerations of ISBCS, beyond a risk-benefit analysis.^{3,7} The thematic analysis drawn from these data produced primary themes that echoed the previously described 'principles of bioethics' proposed by Beauchamp and Childress, these principles are considered non-hierarchical and in-tension with one another, therefore the utility exists in individuals balancing and weighing the prima facie duties within context specific scenarios.⁸ The ubiquitous application of these principles in education and professional guidance may explain the underlying utilisation of these principles by stakeholders.¹⁶ Maclin¹⁷ argues that even if not stated explicitly, these principles are invoked in ethical justifications within the medical field.

The first ethical principle discussed was the consideration of beneficence and non-maleficence. The benefits and risks of ISBCS discussed by stakeholders, were similar to those described in literature.^{3,4} Stakeholders felt the direct benefits of ISBCS were centred on patient convenience factors, and the ethically important risk revolved around the potential for bilateral endophthalmitis and bilateral vision loss. Stakeholders stated that the risk of bilateral endophthalmitis was very low and could not be accurately quantified based on existing data. This is in keeping with conclusions made from a systematic review by Kessel *et al.*⁷ Despite the low risk, stakeholders felt the complication of bilateral endophthalmitis remained an ethically important consideration, as the potential hazardous outcome of complete blindness was so severe. The highly emotive nature of binocular blindness, combined with the inevitability of an occurrence based on high cataract incidence, may explain why stakeholders attributed weight to this complication.

Due to the nature of the hazards associated with the protocol, stakeholders felt it was imperative that the patient is placed at the centre of the consultation, so they can be supported to make an individual decision based on their interpretation of the risk-benefit analysis. A patient-centred risk-benefit analysis acts to preserve the principle of autonomy through recognising patients are not a singular population, rather each has unique life situations, goals and expectations.¹⁸ Often discussed at the meeting, was the ruling on consent law undertaken in 2015 by the Supreme Court in the landmark case; *Montgomery vs Lanarkshire Health Board*. The ruling highlighted changes in law that had been evident in GMC guidelines previously, on the evolution of medicine from a paternalistic to a patient-centred approach.¹⁹ The *Montgomery* ruling stipulated that during the consent procedure a doctor must make the patient aware of any material risks of the intervention, where material risk is defined as: 'any risk to which a reasonable person in the patient's position would attach significance'.²⁰ It could be argued the very low but theoretical potential for complete sight loss would always be a material risk to a 'reasonable patient', and therefore must always be disclosed.

The ethical importance of distributive justice factors was an area of debate at the meeting. The discussion illustrated the conflict between utilitarian and deontological approaches to the distribution of healthcare resources. Some ophthalmologist stakeholders viewed the dilemma from a utilitarian perspective. They sensed the financial cost-saving to society the ISBCS protocol provided was an important consideration, given the finite resources available within the NHS. This consideration is in contrast to literature that describes medical practitioners as primarily morally deontological in nature.²¹ The utilitarian perspective from stakeholders may have emerged from utilitarian-focused roles represented, coupled

with the consideration of the strain ophthalmology services are under, which is argued to drive clinicians to consider utilitarian perspectives.^{21 22}

In contrast, many patient and religious stakeholders focused on the deontological consideration of distributive justice. These stakeholders felt that clinicians considering the financial savings for ISBCS were no longer caring for the patient but caring for the system as a whole. Applying moral theory to resource allocation requires the reconciliation of the contrasting deontological and utilitarian perspectives. Within medicine, this is achieved by maintaining a deontological approach at the level of the patient-clinician interaction and considering the utilitarian perspectives at a 'higher level', such as through NICE committee evaluation.^{22 23} Stakeholders reached a general agreement that distributive justice benefits of ISBCS should not be an active consideration for clinicians when offering ISBCS at the individual level. Instead, this should default to the previously discussed principles of patient autonomy and the patient's interpretation of the risk-benefit analysis.

At the meeting there were variable interpretations and debate within some of the elicited themes (particularly benefits, risk and justice), highlighting the interaction between the diversity of moral theory unique to each individual. However, one moral value held by stakeholders was undeniably firm and permeated across backgrounds. That morally, patient autonomy with a focus on informed consent must remain at the forefront of ISBCS, this consent must be authentically 'informed' due to the nature of the risks involved. This consensus is the product derived from the other ethical principles debated and reflects the 'in-tension' play of the bioethical principles. However, this consensus may simplify the intricacies of a surgeon-patient relationship and therefore satisfying this condition alone is not sufficient for ISBCS to be considered an ethical undertaking. An ethical surgeon must also dutifully apply patient safeguards, stringent protocols, demonstrate surgical competence and perform appropriate patient selection. The surgeon must meticulously adhere to accepted surgical protocols such as those published by the international society of bilateral cataract surgeons.²⁴ All caveats must be satisfied for our ethical conclusion to inform clinical judgement.

COVID-19 ADDENDUM

Since the ethical meeting has taken place, the COVID-19 pandemic has resulted in profound ethical challenges across health and social care. In response to the pandemic, unprecedented reforms within the NHS have taken place including the widespread cancellation of elective operations and the rapid acceleration toward new technologies such as virtual consultations. This new world of 'minimal contact' healthcare may necessitate stakeholders to re-interpret the ethics of ISBCS in these evolving circumstances, both at an individual and population level. With the direct benefits of ISBCS centred on fewer visits to hospital, we may speculate how these factors would play into the way our stakeholders are constantly needing to adapt their risk-benefit analysis of the procedure. These new challenges add a further dimension to the complex ethical discussion of ISBCS.

CONCLUSION

This analysis provides a reference point for the ethical factors governing the often-controversial topic of ISBCS, for a select

group of stakeholders. The stakeholders concluded offering ISBCS to be an ethical undertaking when patient autonomy was appropriately attained. This requires a patient's individual interpretation of the risk-benefit analysis, which must include an understanding of the low but unquantifiable risk of severe complications. Ethically, a surgeon must aim to minimise risks through the adaptation of accepted surgical protocols and through performing appropriate patient selection. Based on current evidence, cost savings to healthcare that may occur following ISBCS may be considered a secondary benefit, whereas the primary benefit is centred on patient convenience factors. Stakeholders desired a future robust cost-analysis of ISBCS to take place within the UK health infrastructure.

Acknowledgements The authors would like to thank the stakeholder group who participated as non-author contributors in this ethical discussion. The authors would also like to thank the Royal College of Ophthalmologists for use of the venue.

Contributors MQ transcribed the meeting, performed qualitative analysis and took the lead in writing the manuscript. DG performed independent qualitative analysis. CL and JS devised the project, organised the stakeholder meeting and invited participants. JS attained funding for the project. CL and ASB wrote and reviewed the stakeholder questions, both participated in the stakeholder meeting. MZG provided specific ethical advice for input to the manuscript. Additionally, all authors provided significant contribution to the written work, rewriting sections where required with regular amendments to drafts. All authors approved the final version of the work.

Funding This study is funded by the National Institute for Health Research (NIHR) Programme for Applied Research grant RP-PG-0611-20013. The views expressed are those of the author(s) and not necessarily those of the NIHR or the Department of Health and Social Care.

Competing interests None declared.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement All data relevant to the study are included in the article or uploaded as supplementary information.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

ORCID iD

Matthew Quinn <http://orcid.org/0000-0002-8877-5024>

REFERENCES

- 1 The Royal College of Ophthalmologists. The way forward, 2015. Available: <https://www.rcophth.ac.uk/wp-content/uploads/2015/10/RCOphth-The-Way-Forward-Cataract-300117.pdf> [Accessed Feb 2020].
- 2 Singh R, Dohlman TH, Sun G. Immediately sequential bilateral cataract surgery: advantages and disadvantages. *Curr Opin Ophthalmol* 2017;28(1):81–6.
- 3 Grzybowski A, Wasinska-Borowiec W, Cloué C. Pros and cons of immediately sequential bilateral cataract surgery (ISBCS). *Saudi J Ophthalmol* 2016;30(4):244–9.
- 4 Chang DF. Simultaneous bilateral cataract surgery. *Br J Ophthalmol* 2003;87(3):253–4.
- 5 Lee E, Balasingam B, Mills EC, et al. A survey exploring ophthalmologists' attitudes and beliefs in performing Immediately Sequential Bilateral Cataract Surgery in the United Kingdom. *BMC Ophthalmol* 2020;20(1).
- 6 Buchan JC, Donachie PHJ, Cassels-Brown A, et al. The Royal College of Ophthalmologists' National Ophthalmology Database study of cataract surgery: Report 7, immediate sequential bilateral cataract surgery in the UK: Current practice and patient selection. *Eye* 2020;124.
- 7 Kessel L, Andresen J, Erngaard D, et al. Immediate sequential bilateral cataract surgery: a systematic review and meta-analysis. *J Ophthalmol* 2015;1.
- 8 Beauchamp TL, Childress JF. *Principles of biomedical ethics*. 6th edn. Oxford: Oxford University Press, UK, 2008.
- 9 Taylor RM. Ethical principles and concepts in medicine. *Handb Clin Neurol* 2013;118:1–9.
- 10 Gillon R. Ethics needs principles--four can encompass the rest--and respect for autonomy should be "first among equals". *J Med Ethics* 2003;29(5):307–12.
- 11 Ebbesen M, Jensen TG, Andersen S, et al. Ethical perspectives on RNA interference therapeutics. *Int J Med Sci* 2008;5(3):159–68.

- 12 Keskinbora KH, Keskinbora K. Ethical considerations on novel neuronal interfaces. *Neural Sci* 2018;39(4):607–13.
- 13 Liu C. The ethics of immediately sequential bilateral cataract surgery Part 1. Available: https://www.youtube.com/watch?v=_GnI8Y1RHGc [Accessed Feb 2020].
- 14 Liu C. The ethics of immediately sequential bilateral cataract surgery Part 2. Available: <https://www.youtube.com/watch?v=y99nqLFrINQ> [Accessed Feb 2020].
- 15 Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol* 2006;3(2):77–101.
- 16 Page K. The four principles: can they be measured and do they predict ethical decision making? *BMC Med Ethics* 2012;13:10.
- 17 Macklin R. Can one do good medical ethics without principles? *J Med Ethics* 2015;41(1):75–8.
- 18 Ronen GM, Rosenbaum PL. Reflections on ethics and humanity in pediatric neurology: the value of recognizing ethical issues in common clinical practice. *Curr Neurol Neurosci Rep* 2017;17(5):39.
- 19 General Medical Council. Consent: patients and doctors making decisions together. GMC, 2008. Available: https://www.gmc-uk.org/-/media/documents/Consent_English_0617.pdf_48903482.pdf [Accessed Feb 2020].
- 20 Montgomery (Appellant) V Lanarkshire health board (Respondent) (Scotland), 2015. Available: https://www.supremecourt.uk/decided-cases/docs/UKSC_2013_0136_Judgment.pdf [Accessed Feb 2020].
- 21 Garbutt G, Davies P. Should the practice of medicine be a deontological or utilitarian enterprise? *J Med Ethics* 2011;37(5):267–70.
- 22 Conway P, Gawronski B. Deontological and utilitarian inclinations in moral decision making: a process dissociation approach. *J Pers Soc Psychol* 2013;104(2):216–35.
- 23 Mandal J, Ponnambath DK, Parija SC. Utilitarian and deontological ethics in medicine. *Trop Parasitol* 2016;6(1):5–7.
- 24 International Society of Bilateral Cataract Surgeons. ISBCS general principles for excellence in ISBCS 2009, 2009. Available: <http://eyefoundationcanada.ca/wp-content/uploads/2020/05/2010-09-01-FINAL-ISBCS-SBCS-suggestions-from-ESCRS-Barcelona.pdf> [Accessed Jul 2020].

Supplementary table 1. Ethical Questions Provided to Stakeholders

List of questions we seek answers for by the end of the afternoon session:
What factors govern the ethics of immediately sequential bilateral cataract surgery (ISBCS) for bilateral visually significant cataract in adults?
Should the same ethics apply for bilateral laser refractive surgery, lid surgery, squint surgery, retinal detachment surgery, and intravitreal injections for wet age-related macular degeneration (AMD) which are done on the same day most of the time? AMD injections bear a higher risk of endophthalmitis, but two wrongs do not make it right.
What further evidence do we need to declare ISBCS no less safe than delayed sequential surgery or otherwise?
Should ISBCS prove to be overall better (convenience for patients carers and hospitals, more rapid visual recovery, benefit to health economy) and no less safe than delayed sequential surgery, does ethics govern that we should broaden the use of this method of delivery?
Should patients be given a choice: to decline ISBCS if offered? to have ISBCS if not practiced by their consultant / at their local unit?
How do we ensure patients receive correct information from doctors, the media and their friends and relatives so they are not scared off ISBCS or get lured into ISBCS with risks exaggerated or played down respectively?
Is it ethical for surgeons to decide themselves without giving this option to the patients?
Further is it ethical for surgeons to unconsciously exaggerate the risk of ISCBS because of being reluctant to think or do different than routine? Equally, is it ethical for surgeons to decide on behalf of their patients that a small risk of bilateral blindness for individuals is worth taking to save the health service money and make it run more efficiently / conveniently?
The only valid risk of ISCBS is bilateral endophthalmitis. The risk is very low. We know that there is nothing in the life without risk. Is it rational to avoid benefits of ISCBS because very unlikely risk of bilateral endophthalmitis, the risk of which is unlikely to be different from delayed sequential surgery? Remember first eye endophthalmitis can put a patient off second eye cataract surgery so beneficial surgery is delayed or never done.
How should doctors and commissioners balance the interests of the individual patients, public health, and societal interests given limited resources?
As it is the public who pay, should they be the ones who call the tune?
What ethics govern good for the many and harm to the tiniest minority?
How should we judge between option A with a little more safety with higher cost and discomfort and option B with saving money and being more comfortable with higher risk (real or perceived)? How can we determine the level of risk that we should not exceed for any operation?
Given the improved safety of cataract surgery, should ISBCS remain a taboo subject? If not how do we de-stigmatize it?

<p>We are already using three strategies to improve safety:</p> <ul style="list-style-type: none"> • Exclusion of high-risk eyes • Not to proceed with second eye surgery if first eye surgery lengthy or complicated • Re-scrubbing, re-draping and using new instrument sets and products from different manufacturers or bear different batch numbers <p>What else can be done to make ISBCS even safer?</p>
How should we decide which surgeons and units are good enough to offer ISBCS?
How do we maintain standards should ISBCS become common practice?
<p>We have identified the following areas for research:</p> <ul style="list-style-type: none"> • Patient experience in ISBCS and delayed sequential including psychology and fear, actual pathway on the day, postop discomfort and care • Surgeon and service experience including financial savings • Streamlining theatre staff preparations <p>What other areas would you suggest?</p>

Supplementary table 2. Stakeholder Quotations

Themes and Subthemes	Stakeholder Quotations
1. Beneficence and Non-Maleficence	
1.1 Patient Benefits	<ul style="list-style-type: none"> • <i>“Again, I see people that have had one done, the frustration where they haven't had their (second) eye done, they can't get the glasses, they have a lot of imbalance. And of course for me, the imbalance would have been very difficult for me to work.”</i> Patient and nurse • <i>“In fact, more often I have patients, before I even raise the subject, they are begging me – ‘please, will you do both on the same day’, one said ‘I can't face the journey’, another said ‘my husband has got dementia and I've got to arrange care, I'm not going to be able to cope to do it twice.’”</i> Ophthalmologist
1.2 Patient Risks	<ul style="list-style-type: none"> • <i>“Although intuitively, we feel it ought to make a difference, one would want to have strong evidence that there was a benefit from the ability to choose a second lens”.</i> Ophthalmologist and Public Health Ophthalmologist

- *“it's just a practicality, I think it can be quite unpleasant and difficult for the patient to deal with”* Ophthalmologist
 - *“You obviously have to take extreme precautions before you do it. So I'm not saying it's strict liability. But I do say that the issues of patient selection and technical performance will be very challenging if you have a problem.”* Lawyer
- 1.3 The Uncertainty of Risk
- *“So that's the sort of level of evidence that you're likely to get, but that's only one hundred thousand patients, we almost need one hundred million patients to really tell us what the risk is of having bilateral infections.”* Ophthalmologist and Public Health Ophthalmologist
 - *“If you've got an antibiotic resistant germ on your skin it will be in both eyes, if you open both eyes the risk is now become one in thousand. If you said the risk is one a thousand, and you say you're doing two eyes, you can either say that's one in two thousand or one in a million, and you can't really justify which those two figures you're using.”*
Ophthalmologist
- 1.4 Patient Interpretation of the Risk-benefit Analysis
- *“I don't think personally we can actually make that judgment for other people, we have to present as best the limited information we have and say what do you want.”* Ophthalmologist
 - *“When we talk to individuals on a routine one eye patient basis, we say its roughly 1 in 1000 chance you will lose your sight, nobody ever believes that will happen to them.”* Ophthalmologist
 - *“So the percentage of harm happening is perhaps the same, but the hazard or the severity of what will happen if a risk does occur, if the*
-

probability goes the wrong way, and these things is very important.”

Bioethicist and Political Philosopher

2. Autonomy

2.1 Informed Consent

- *“Consent is not just a consent, it has to be an informed consent. So if we involve the patient in all the scenario of the operation and give them the information, enough to make a firm decision then this from my point of view will be enough for the patient to make a decision whether to go ahead or to choose just one eye.”* Ophthalmologist of Muslim faith
- *“Now to me this (ISBCS) is a realistic and valid option, which some patients might not wish, but it is an option, and I think to withhold it is incorrect.”* Ophthalmologist

2.2 The Barriers to Communication

- *“One of the challenges is, how you deliver enough information for people to give informed consent, it’s a really complicated area for clinicians, with lots of different risks and hazards to consider, and I can’t pitch at how you could communicate that in a satisfactory way, to make a truly informed objective decision from a patient perspective.”*
Optometrist
- *“So you’ve got to find a way with people who are semi-literate, who don’t share the same language as the doctor, about all of the range of options that you could be offering them, including the ones that you are not offering them. And you have to do that in a way that records their understanding.”* Lawyer

3. Distributive Justice

3.1 The Allocation of Resources: The Individual vs the Collective

- *“There is a probable cost-saving to the NHS and there is a resource reduction, what we didn’t do is set against that the what if we blind the patient”* Ophthalmologist
 - *“And I think that's something we should change and try and expand it, so it's more performed more routinely, or offered more routinely to patients, because of this this reason we have to realise that we are sharing resources”* Ophthalmologist and Ethicist
 - *“We want doctors that fight from the individual patient and someone higher up telling them you're right but we can't do it because we care for the system.”* Rabbi
 - *“This brings in really the ethics of I think what everyone has boiled up to the surface of this brew, which is the individual and individual choice.”* Ophthalmologist and Ethicist
-