SCIENTIFIC REPORT

Effects of presentation method on the understanding of informed consent

T H Moseley, M N Wiggins, P O'Sullivan

Br J Ophthalmol 2006;**90**:990–993. doi: 10.1136/bjo.2006.092650

Background/aim: Knowledge of which presentation methods impart the most information to patients can improve the informed consent discussion. The purpose of this study was to determine if the comprehension and recall of the informed consent discussion varied with presentation method.

Methods: Randomised, prospective study at the University of Arkansas for Medical Sciences. 90 freshmen medical students were randomly assigned to one of three groups and separately went through an informed consent on cataract surgery. Group A heard an informed consent presentation. Group B was shown diagrams while hearing the same presentation. Group C heard the consent and then watched an informational video on cataract surgery. A 10 point multiple choice quiz was administered after the presentation and repeated again 1 week later.

Results: Scores from each group were averaged as number correct out of 10 questions. For same day scores, group C scores (7.70 (SD 1.24)) were significantly higher than group A (6.39 (1.63)). One week testing revealed that group C (6.96 (1.62)) recalled more between the two time periods and scored significantly higher than groups A (5.15 (2.11)) and B (5.54 (1.64)).

Conclusions: This study found differences in the participants' ability to recall facts based on the manner in which the material was presented. It clearly demonstrated that the use of visual aids improved the ability to remember facts and risks associated with cataract surgery beyond a verbal presentation alone. It also showed a benefit of the repetition of information as provided by audiovisual presentations that can be used in conjunction with the physician-patient discussion.

Informed consent represents a significant portion of physician-patient communication. An active surgical ophthalmologist may engage several patients a day in the informed consent process. This can often lead to a discussion that is mechanical and far removed from its actual intent of educating the patient regarding the important facts and risks of their particular surgery. To emphasise the importance of the informed consent discussion, one need only survey current malpractice claims to see that informed consent is second only to documentation as the most frequent risk management issue for physicians.¹ Sources agree that better communication increases patient satisfaction and in turn can decrease the number of malpractice suits.^{2–6}

To gain a better understanding of what patients learn from the informed consent discussion, Priluck *et al* performed a survey of patients undergoing retinal surgery. Their study revealed that while 97% of patients thought the informed consent was satisfactory, only 57% passed a post-informed consent quiz.⁷ Furthermore, despite being given the

information beforehand, 75–86% denied ever hearing the information reflected in the questions that were missed.

Are there methods of presentation that can improve informed consent? The literature has numerous studies which have attempted to answer this question by looking at variables such as the consent form's reading level, the amount of written detail presented, the length of the form, whether the information was presented verbally or in a written form, the age of subjects, etc.^{8–12} Our study specifically asked if there was a difference in a person's ability to recall information concerning the informed consent for cataract surgery between a verbal presentation alone and a verbal presentation with visual aids or a verbal presentation followed by an audiovisual aid.

METHODS

After obtaining approval from the University of Arkansas for Medical Sciences institutional review board, 90 volunteers from the University of Arkansas for Medical Sciences freshmen medical school class were randomly assigned to one of three groups by colour coded cards. To avoid issues of coercion in this population, no identifying information was collected. This particular group was selected to ensure a homogeneous educational background with little to no prior knowledge of cataract surgery. All three groups were presented with the same scripted verbal presentation of informed consent for cataract surgery. The presentation described the definition and effects of cataracts. It also presented the risks, benefits, and non-surgical options of cataract surgery as well as a detailed description of the procedure.

Groups A and C heard the verbal presentation without the use of visual aids (fig 1). At the completion of the talk, group A was excused from the room, and group C was shown a 13 minute video presentation produced by the American Academy of Ophthalmology entitled "Understanding Cataract Surgery."¹³ The informational content of the video presentation covered the same information as the scripted talk.

In a separate room, group B was exposed to the same scripted verbal presentation, but were also shown diagrams during the talk. To avoid providing unequal amounts of information between groups, no questions were entertained from the participants.

To assess the effectiveness of the informed consent process, we developed a 10 item, multiple choice quiz (appendix). To access the validity of the questions before the study, the quiz was administered to ophthalmologists and non-ophthalmologists without any pre-quiz presentation. Questions answered correctly by non-ophthalmologists were rewritten and administered to other non-ophthalmologists until the questions could only be answered correctly by chance alone. These results ensured that the items could discriminate between those with and without knowledge about cataract surgery. Care was also taken in the development of the quiz

Figure 1 Presentation methods. Group A heard only the verbal presentation; group B heard the presentation while being shown visual aids; group C heard the presentation without visual aids, then saw the informational video concerning cataract surgery.

to ensure that the content of all questions was separately covered in the verbal presentation and in the video presentation.

Immediately following the conclusion of each group's initial presentation, students received the 10 item quiz (immediate post test). Each student retained the colour coded card for later group identification. One week later, without any presentation, the same quiz was re-administered (delayed post-test) to all three groups. The cards were then collected with the quiz to identify the original group of the student. The students were informed that a second quiz would be given 1 week after the first quiz and instructed not to discuss the quiz with their classmates. However, they were not told the second quiz would be identical to the first.

The individual scores for each subject were added together by group and an average group score was obtained for both the immediate and delayed post-tests. The group results were then analysed using two one way analysis of variance for the immediate and for the delayed scores. Significant one way results were followed with a Tukey HSD post hoc test with p set at 0.05.

RESULTS

Scores from the test given immediately following the presentation and 1 week later are shown in table 1. We were able to follow up all but seven (7.8%) of the students. Overall, there was a significant difference among the three groups on the immediate post-test ($p = 0.006$). Post hoc tests indicated that for same day testing, the verbal only group (A) had significantly lower scores than the group receiving verbal and video (C). Results of the 1 week later, delayed post-test indicated a significant difference across groups ($p = 0.001$) with post hoc tests indicating that the students in verbal only (A) and verbal plus diagrams (B) scored significantly lower than those students in verbal plus video (C). The students in the verbal plus video (group C) dropped less than a point between the two quiz administrations while the other groups dropped more than a point, indicating that group C had

statistically forgotten less between the two time periods than did the other two groups.

DISCUSSION

Obtaining informed consent is a common procedure in all ophthalmology offices. Although all consent processes have a verbal component, in a busy clinical setting, finding visual aids or diverting patients into another room to watch an informational video can be time consuming. However, patients anxious about surgery may not fully process the information they hear. Aside from the legal ramifications, a poor understanding of the procedure can lead to unrealistic expectations or feelings of anger if complications should occur. Clearly, learning which methods of informed consent provide higher levels of patient understanding and recall is helpful.

Previous studies have examined many variables in an attempt to improve informed consent. Our study is unique in its design to expose a group to three methods of presentation, including an audiovisual aid. It is also unique in that our subjects were a homogeneous group of equally educated participants.

When applying our findings to patients, one must apply caution as the learning abilities and preferences of medical students may be different from those of a diverse group of patients. Further study in this area to explore the ability to generalise our data to patients is warranted. Our study also has other limitations. The students were grouped randomly and not separated to equally account for age, sex, educational record, or other factors in each group. Although this was necessary to avoid any suggestion of coercion in this unique, vulnerable population, the results could have been affected by these differences. Additionally, since the students were identified only by group affiliation, we were unable to match individual student scores for the two administrations. Also, we did have some attrition from the study, but the numbers were relatively small. We do note, however, that the largest number of non-participants on the delayed post-test were from the verbal only group. And finally, it should be noted that the quiz was derived from points that a physician would want the patient to remember. These may not be the same points that a patient, or our participants, would view as the most important, which could have had an effect on the results.

Our study indicates that there were differences in our participants' ability to recall information based on the manner in which the material is presented. It clearly demonstrated that the use of visual aids improved the ability of our participants to remember facts and risks associated with cataract surgery beyond a verbal presentation alone. It also showed a benefit to the repetition of information as provided in our study by an audiovisual presentation. It can be reasonably argued that the group watching the video had better information retention not only from the audiovisual method, but additionally from exposure to the information twice. This is an area that warrants further study. However,

Table 1 Results of the quiz after the presentation

Group	Immediate post-test		Delayed post-test	
	No	Mean (SD)	No	Mean (SD)
Verbal only (A)	31	6.39 (1.63)	27	5.15 (2.11)
Verbal plus still images (B)	29	6.90 (1.80)	28	5.54 (1.64)
Verbal plus video (C)	30	7.70 (1.24)	28	6.96 (1.62)
p Value		0.006		0.001

The value of each test score is the average number of correct answers out of 10 questions.

from a clinical recommendation standpoint, obtaining repetition by allowing the patient to view a video before sitting down with the physician for a one on one discussion makes practical sense.

Although we acknowledge that no method can reasonably discuss every conceivable complication of a surgical procedure, we believe that increasing a patient's understanding of a procedure with the use of diagrams or with the repetition provided by an audiovisual presentation will not only allow for a more informed decision concerning surgery, but will also relieve anxiety and improve overall satisfaction with the physician.

ACKNOWLEDGEMENTS

This work was supported in part by unrestricted grants from Research to Prevent Blindness and the Pat & Willard Walker Eye Research Center.

Authors' affiliations

T H Moseley, M N Wiggins, University of Arkansas for Medical Sciences, Jones Eye Institute, Little Rock, AR, USA

P O'Sullivan, University of California San Francisco School of Medicine, San Francisco, CA, USA

Conflict of interest: None of the authors have any financial interest in this manuscript.

Correspondence to: Dr Michael Wiggins, University of Arkansas for Medical Sciences, Jones Eye Institute, Little Rock, AR 72205, USA; wigginsmichael@uams.edu

Accepted for publication 9 April 2006

REFERENCES

- 1 **Weber P**. Malpractice: the lessons in other surgeons' woes. *Rev Ophthalmol* 2001;**8**:24–6.
- 2 **Beckman HB**, Markakis KM, Suchman AL, *et al*. The doctor-plaintiff relationship: lessons from plaintiff depositions. *Arch Intern Med* 1994;**154**:1365–70.
- 3 **Hickson GB**, Clayton EC, Githens PB, *et al*. Factors that prompted families to file malpractice claims following perinatal injury. *JAMA* 1992;**287**:1359–63.
- 4 **Levinson W**, Roter DL, Mullooly JP, *et al*. Physician-patient communication: the relationship with malpractice claims among primary care physicians and surgeons. *JAMA* 1997;**277**:553–59.
- 5 **Mavroforou A**, Giannoukas A, Michalodimitrakis E. *Medicine & Law* 2004;**23**:479–88.
- 6 **Shapiro RS**, Simpson DE, Lawrence SL, *et al*. A survey of sued and nonsued physicians and suing patients. *Arch Intern Med* 1989;**149**:2190–6.
- 7 **Priluck UJ**, Robertson DM, Buettner H. What patients recall of the preoperative discussion after retinal detachment surgery. *Am J Ophthalmol* 1979;**87**:620–3.
- 8 **Langdon UJ**, Hardin R, Learmonth ID. Informed consent for total hip arthroplasty: does a written information sheet improve recall by patients? *Ann R Coll Surg England* 2002;**84**:404–8.
- 9 **Shurnas PS**, Coughlin MJ. Recall of the risks of forefoot surgery after informed consent. *Foot Ankle Int* 2003;**24**:904–7.
- 10 **Stanley BM**, Walters DJ, Maddern GJ. Informed consent: how much information is enough? *Aust N Z J Surg* 1998;**68**:788–91.
- 11 **Dresden GM**, Levitt MA. Modifying a standard industry clinical trial consent form improves patient information retention as part of the informed consent process. *Acad Emerg Med* 2001;**8**:246–52.
- 12 **Kruse AY**, Kjaergard LL, Krogsaard K, *et al*. A randomized trial assessing the impact of written information on outpatients' knowledge about and attitude toward randomized clinical trials. The INFO trial group. *Control Clinical Trials* 2000;**21**:223–40.
- 13 **American Academy of Ophthalmology**. *Understanding cataract surgery: an educational DVD for patients*. American Academy of Ophthalmology, 2004.

APPENDIX

A 10 item multiple choice quiz concerning cataracts and cataract surgery. The quiz was administered immediately after each group was presented the information and again 1 week later. Correct responses are highlighted in bold.

- (1) The best time to remove cataracts is when:

- (A) The doctor tells you the cataract is ripe
- (B) Your vision is not 20/20 with your new glasses

- (C) **You cannot see road signs with your new glasses**

- (D) You can no longer read without your glasses

- (2) Cataracts can cause all of the following *except*:

- (A) **Sensitivity to sunlight**
- (B) Glare at night
- (C) Yellow-tinted vision
- (D) Difficulty reading

- (3) All of the following are true concerning cataracts *except*:

- (A) Cataracts may be treated with glasses for a while
- (B) Cataracts may make it seem you are looking through a smudged window
- (C) **Cataracts may make objects appear much smaller than before**
- (D) Cataracts may make it very hard to tell colours apart

- (4) All of the following are true concerning cataract surgery *except*:

- (A) **If cataracts do not run in your family, then your risk is low**
- (B) Cataracts always worsen over time unless treated
- (C) Improved vision is obtained after cataract surgery in most cases
- (D) Improves vision by removing the lens inside the eye

- (5) Which of the following concerning artificial lenses is true?

- (A) They may cause clouding of the cornea
- (B) They may cause a retinal detachment
- (C) **You may need a more powerful artificial lens as you get older**
- (D) It may cause an infection even years later

- (6) During cataract surgery:

- (A) A small incision is made in the centre of the clear part of the eye
- (B) The front clear part of the eye is removed, then replaced after the surgery
- (C) The cataract is removed after inserting an artificial lens
- (D) **The artificial lens is placed inside a capsule in the eye**

- (7) Which of the following statements about cataract surgery is *false*?

- (A) **Once inside the eye, a laser scalpel is used to properly shape the lens to the correct power**
- (B) A small incision is made in the front part of the eye
- (C) During the operation, a hole is made in the front portion of the lens capsule that holds the lens
- (D) During the operation, the cataract is gently vacuumed out of the eye

- (8) All of the following are risks of cataract surgery *except*:

- (A) **Regrowth of the cataract**
- (B) Clouding of the cornea

- (C) Retinal detachment
(D) Glaucoma
- (9) Which of the following could you have after cataract surgery?
- (A) **Droopy eyelid**
(B) Crossed eyes
(C) Strain on the other eye
(D) Infection on the white part of the eye
- (10) Which of the following statements is correct?
- (A) **Vision can become blurry even 1 year after surgery**
(B) Although 20/20 vision after surgery is not guaranteed, vision better than before surgery is guaranteed
(C) Once the operation begins, cataract surgery usually takes 1–2 hours
(D) Cataract surgery is routinely performed with a laser

Clinical Evidence—Call for contributors

Clinical Evidence is a regularly updated evidence-based journal available worldwide both as a paper version and on the internet. *Clinical Evidence* needs to recruit a number of new contributors. Contributors are healthcare professionals or epidemiologists with experience in evidence-based medicine and the ability to write in a concise and structured way.

Areas for which we are currently seeking contributors:

- Pregnancy and childbirth
- Endocrine disorders
- Palliative care
- Tropical diseases

We are also looking for contributors for existing topics. For full details on what these topics are please visit www.clinicalevidence.com/ceweb/contribute/index.jsp

However, we are always looking for others, so do not let this list discourage you.

Being a contributor involves:

- Selecting from a validated, screened search (performed by in-house Information Specialists) epidemiologically sound studies for inclusion.
- Documenting your decisions about which studies to include on an inclusion and exclusion form, which we keep on file.
- Writing the text to a highly structured template (about 1500-3000 words), using evidence from the final studies chosen, within 8-10 weeks of receiving the literature search.
- Working with *Clinical Evidence* editors to ensure that the final text meets epidemiological and style standards.
- Updating the text every 12 months using any new, sound evidence that becomes available. The *Clinical Evidence* in-house team will conduct the searches for contributors; your task is simply to filter out high quality studies and incorporate them in the existing text.

If you would like to become a contributor for *Clinical Evidence* or require more information about what this involves please send your contact details and a copy of your CV, clearly stating the clinical area you are interested in, to CECommissioning@bmjgroup.com.

Call for peer reviewers

Clinical Evidence also needs to recruit a number of new peer reviewers specifically with an interest in the clinical areas stated above, and also others related to general practice. Peer reviewers are healthcare professionals or epidemiologists with experience in evidence-based medicine. As a peer reviewer you would be asked for your views on the clinical relevance, validity, and accessibility of specific topics within the journal, and their usefulness to the intended audience (international generalists and healthcare professionals, possibly with limited statistical knowledge). Topics are usually 1500-3000 words in length and we would ask you to review between 2-5 topics per year. The peer review process takes place throughout the year, and out turnaround time for each review is ideally 10-14 days.

If you are interested in becoming a peer reviewer for *Clinical Evidence*, please complete the peer review questionnaire at www.clinicalevidence.com/ceweb/contribute/peerreviewer.jsp