



8-1991

Effects of Interactive and Linear Video on Patient Understanding of Risks in Medical Procedures

Christopher P. Giuliano
Western Michigan University

Follow this and additional works at: <https://scholarworks.wmich.edu/dissertations>



Part of the Health Psychology Commons

Recommended Citation

Giuliano, Christopher P., "Effects of Interactive and Linear Video on Patient Understanding of Risks in Medical Procedures" (1991). *Dissertations*. 2013.

<https://scholarworks.wmich.edu/dissertations/2013>

This Dissertation-Open Access is brought to you for free and open access by the Graduate College at ScholarWorks at WMU. It has been accepted for inclusion in Dissertations by an authorized administrator of ScholarWorks at WMU. For more information, please contact wmu-scholarworks@wmich.edu.



**EFFECTS OF INTERACTIVE AND LINEAR VIDEO ON PATIENT
UNDERSTANDING OF RISKS IN MEDICAL PROCEDURES**

by

Christopher P. Giuliano

**A Thesis
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Doctor of Philosophy
Department of Psychology**

**Western Michigan University
Kalamazoo, Michigan
August 1991**

**EFFECTS OF INTERACTIVE AND LINEAR VIDEO ON PATIENT
UNDERSTANDING OF RISKS IN MEDICAL PROCEDURES**

Christopher P. Giuliano, Ph. D.

Western Michigan University, 1991

Three methods of providing information relevant to informed consent where a vaginal birth after cesarean section was being considered were evaluated: (1) the traditional and common method (physician presentation), (2) Linear Video Tape (LVT), and (3) Interactive Video Disc (IVD). The traditional and common method of presenting information led to only limited acquisition of knowledge resulting in patients making less than fully-informed decisions. Both the linear video tape and the interactive video disc led to significantly greater understanding of the risks and benefits of the procedure than did the physician presentation. The interactive disc and the linear video tape were equally effective in providing information relevant to the informed consent process, but the interactive video disc was more often viewed as being helpful in the process of making an informed decision. Additional advantages of the interactive video disc as an aid in providing a legally valid informed consent were discussed.

INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

U·M·I

University Microfilms International
A Bell & Howell Information Company
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA
313/761-4700 800/521-0600

Order Number 9201558

**Effects of interactive and linear video on patient understanding
of risks in medical procedures**

Giuliano, Christopher Paul, Ph.D.

Western Michigan University, 1991

U·M·I

300 N. Zeeb Rd.
Ann Arbor, MI 48106

ACKNOWLEDGEMENTS

This thesis is lovingly dedicated to my daughters: Analisa, Melissa, Jessica, Emily, and Allison. They have sacrificed many hours, which could have otherwise been spent with their father, in order that this project be completed.

Special thanks are also due George Rakowsky for the generous loan of equipment, Jack Michael for his patience, and especially Bill Redmon for his sound and practical advice throughout the duration of the study.

Christopher P. Giuliano

TABLE OF CONTENTS

| | |
|---|----|
| ACKNOWLEDGEMENTS | ii |
| LIST OF TABLES..... | v |
| CHAPTER | |
| I. INTRODUCTION..... | 1 |
| Patient Education and Informed Consent..... | 1 |
| Problems With Current Practices..... | 3 |
| Computer Assisted Instruction as a Possible Solution..... | 4 |
| CAI and Informed Consent | 6 |
| Interactive Video Disc Technology..... | 6 |
| Informed Consent and Obstetric Delivery Options | 7 |
| Purpose of the Present Study | 9 |
| II. METHOD | |
| Subjects and Setting..... | 10 |
| Equipment | 10 |
| Physician Group 1..... | 10 |
| Physician Group 2..... | 11 |
| Independent Variable | 11 |
| Traditional Method | 11 |
| Interactive Video Disc | 11 |
| Linear Video Tape..... | 12 |
| Dependent Measures..... | 12 |
| Procedures..... | 13 |
| III. RESULTS..... | 15 |

Table of Contents--Continued

| | |
|--|-----------|
| Pre-Intervention Knowledge..... | 15 |
| Effects of Intervention..... | 16 |
| Patient Evaluation..... | 17 |
| IV. DISCUSSION..... | 20 |
| APPENDICES | |
| A. VBAC Questionnaire..... | 25 |
| B. Background Information..... | 29 |
| C. Subjective Evaluation..... | 31 |
| D. HSIRB Approval..... | 33 |
| BIBLIOGRAPHY..... | 35 |

LIST OF TABLES

| | |
|---|----|
| 1. Means, Ranges, and Percent of Total Possible for Pre-test Scores of Patients Electing to Undergo VBAC..... | 15 |
| 2. Means and Standard Deviations (SD) for Pre-test, Post-test and Gain Scores | 16 |
| 3. Means and Standard Deviations Associated with the Pre-test, Post-test, and Gain Scores for Probed and Unprobed Items | 18 |
| 4. Percentage of Subjects Rating the LVT and IVD on Five Characteristics..... | 19 |

CHAPTER I

INTRODUCTION

Patient Education and Informed Consent

The need for effective patient education has become increasingly important as consumer-conscious patients have become more demanding in terms of their right to know the risks, benefits, and alternatives when medical treatment is sought or recommended. Patients also have become more willing to sue their physicians and related health care providers when the results of treatment have not measured up to the patient's expectations. This has resulted in a dramatic increase in the number of malpractice cases, many of them bearing directly on how well the patient was educated or informed about the risks, benefits, and alternatives to the procedure undertaken (Brittain, 1988; Rosoff, 1981).

Patient education is particularly important when the physician's legal responsibility to obtain informed consent is of interest. Meisel and Roth (1983) have identified five components that must be present for a legally valid informed consent. They are: (1) disclosure to the patient of any risks, benefits, and available alternatives when considering a procedure; (2) determination of legal competence to give consent; (3) understanding by patient of the information that is provided; (4) voluntariness of consent; and (5) decision of the patient as to whether a particular procedure should be accepted or rejected.

The issue of informed consent has become increasingly important in the medical community as recent developments in case law have shifted the standards to which physicians must adhere in assuring that their patients have been adequately

informed. In the past, the “professional community” standard has been used to determine if a patient had been adequately informed. This standard specifies that “The duty of the physician to disclose, however, is limited to those disclosures which a reasonable medical practitioner would make under the same or similar circumstances” (Rosoff, 1981, p. 34).

In many states this physician-determined standard has been replaced by a patient-determined standard known as the “Reasonable Patient” standard. This standard focuses on the needs of the patient relative to his or her right to make an informed choice. In the landmark case of *Canterbury v. Spence* the issue was described as follows:

The root premise of the concept, fundamental in American jurisprudence, [is] that “[e]very human being of adult years and sound mind has a right to determine what shall be done with his own body...” True consent to what happens to one’s self is the informed exercise of a choice, and that entails an opportunity to evaluate knowledgeably the options available and the risks attendant upon each. (Rosoff, 1981, p. 38)

A Pennsylvania appeals court, in the case of *Cooper v. Roberts*, (cited in Rosoff, 1981) reflected similar sentiments. In discussing the issue of utilizing the “Professional Community” standard, the court stipulated that:

A more equitable formulation would be: whether the physician disclosed all those facts, risks and alternatives that a reasonable man in the situation the physician knew or should have known to be the plaintiff’s would deem significant in making a decision to undergo the recommended treatment. This gives maximum effect to the patient’s right to be the arbiter of the medical treatment he will undergo without either requiring the physician to be a mind reader into the patient’s most subjective thoughts or requiring that he disclose every risk lest he be liable for battery. (Rosoff, 1981, p. 39)

While the physician is legally responsible for insuring that the patient is adequately informed, the physician often is not the person providing the relevant information to the patient. Very often it is a nurse or patient educator who assumes these responsibilities, usually presenting information verbally and sometimes

augmenting this with written and/or visual material. Videotaped material also has been used to help patients understand procedures that they are about to undergo (Barbour & Blumenkrantz, 1978; Bracken, Bracken, & Landry, 1977). From the standpoint of providing an adequate informed consent, particularly with respect to patient understanding, several problems require attention.

Problems With Current Practices

Common methods of providing for patient education closely resemble those used in most schools, and consist primarily of the medical professional lecturing to a passive patient. This method of providing information presents a number of difficulties. First, it is uni-directional, with the health care professional providing the information and the patient fulfilling the role of recipient. Under these conditions the health care provider has no method of assessing the effect he or she may be having on the patient, unless the patient asks specific questions, or the provider asks questions designed to assess the patient's level of comprehension. Neither of these outcomes is very likely, and the resulting lack of interaction can lead to serious misunderstanding (Levoy, 1974).

This oral tradition of conveying important information is particularly prone to what Gilbert (1978) has called the "telling error" (p. 176). In Gilbert's (1978) words, "You commit the telling error when you think you have told people something, but when all you have really done is say something to them" (p. 176). This may be evident when the health care professional provides data to the patient, but the patient does not make appropriate use of the data in making treatment decisions. If the patient does not respond in some way to indicate understanding as a result of the interaction, then the "telling error" may have been committed.

A second difficulty occurs when health care professionals assume too much knowledge on the part of the patient. For example, the illiterate patient might well go undetected and be provided with written materials as part of the informed consent process. Health care professionals also may take for granted a basic level of patient knowledge that few patients actually possess. As a result, patients may misunderstand medical terminology used by physicians (Tring & Hayse-Allen, 1977) and experience difficulty interpreting non-technical terms commonly used by physicians (Wile et al., 1979).

In light of these difficulties, a third problem presents itself: The need to individualize instruction so that each patient can be knowledgeable enough to make an informed decision regardless of pre-existing knowledge or skills. Typically this issue has been addressed by providing information on an individual face-to-face basis, but may not prevent the problems cited above or assure that many patients will not have significant misunderstandings regarding procedures for which they are being asked to give consent.

These difficulties arise, in large part, from the fact that most patient education is conducted by medically-trained professionals who have limited training in educational technology (Chaisson, 1980; Cohen, 1981). As a result, more effective methods of insuring that patients understand the information presented in obtaining an informed consent are needed.

Computer Assisted Instruction as a Possible Solution

One potential solution that would have a number of advantages over current methods is the use of Computer Assisted Instruction (CAI). This technology provides a highly flexible way of presenting information and facilitating learning. CAI packages have been utilized in educational settings with some success and can take a

variety of forms. Mandell and Mandell (1989) cite five common forms of CAI: (1) drill and practice exercises, (2) tutorials, (3) simulations, (4) problem solving exercises, and (5) games, each with various advantages and disadvantages. The one feature that all CAI packages have in common, however, is the ability to require that the learner respond in some way to the program and that subsequent instructional information be, in part, determined by the learner's response. That is, CAI is interactive. This capacity for interactivity can be exploited to avoid the communication difficulties that occur when the informed consent process relies solely on the "one-way" communication between patient and provider.

For example, material can be programmed so that a few paragraphs of information are presented followed by questions designed to assess comprehension. If the learner responds in a manner indicative of understanding, the program continues with additional information. If the learner responds in a manner that suggests misunderstanding or confusion, the material can be presented again in the same form, or in a more detailed form. Thus, the provider is not put in the position of having to ask questions of the patient in order to probe for understanding, and the patient is not put in the position of having to ask the physician to repeat information in simpler terms.

The capacity for interaction that accompanies CAI also can guard against the "telling error." This error is virtually eliminated when the instructional materials are arranged so that the patient must make a response indicating that the information has been understood before continuing.

CAI also allows patients of varying skill levels to proceed through the material at a rate, and in language, that is consistent with their abilities. Technical terms can be explained in detail without using an inordinate amount of the health care provider's time; and specific instructions regarding interpretations of non-technical

terms can be given if the patient exhibits any evidence of misunderstanding. Thus, all learners who complete the program are more likely to gain roughly equivalent levels of understanding, regardless of pre-existing knowledge or skills; and their record of responses constitutes evidence that they understand the material.

CAI and Informed Consent

Within the context of obtaining a legally valid informed consent, CAI technology offers a number of advantages. First, a program can be arranged so that disclosure to all patients is standardized and complete. An incomplete disclosure could invalidate the informed consent on the basis of the first component identified by Meisel and Roth (1983). This could happen easily if a physician inadvertently fails to mention a risk associated with a procedure or neglects to advise a patient of all possible alternatives.

Second, by asking the patient to respond to questions regarding the information presented, and providing remedial information in the event that the patient answers the question incorrectly, understanding can be virtually assured. Thus, the legal validity of the informed consent can be assessed thoroughly.

Finally, a permanent record of the patient's responses can be generated to document the informed consent process, and serve as a valuable record in the event of a malpractice claim alleging an invalid informed consent. A record of patient responses also can be used by health care professionals in determining if additional, personal, instruction may be required to better inform the patient.

Interactive Video Disc Technology

While CAI applications have typically been text-based, advances in video technology have made it possible to incorporate segments of video into CAI

applications through the use of the Interactive Video Disc (IVD). The IVD is a data storage medium [not unlike the Compact Disc (CD) used to play music] that can be used as a peripheral device in conjunction with a computer. Video segments can be accessed randomly and, with appropriate computer software and hardware to control the IVD, an interactive CAI program utilizing video and audio, as well as text, can be used effectively with patients of any reading ability.

Although IVD technology has been available for over 15 years, its chief educational application has been in the areas of military and industrial training. This has likely been due to the relatively high costs of hardware as compared with other available alternatives and the fact that evaluations of interactive video have not shown it to be categorically superior to other modes of instruction (Bosco, 1986). Nonetheless, examples of the IVD technology can be found in a wide variety of applications, including language learning (Hancock, 1985; Hughett, 1984; Little & Davis, 1986), teaching special education teachers behavior management skills (Evans, 1985), university science instruction (Leonard, 1985, 1986; Zollman & Fuller, 1982), teaching social skills to handicapped students (Thorkildsen, 1985), word processor training (Yampolsky, 1983), and diagnosing math skills (Hofmeister & Thorkildsen, 1983). Little research has been done using IVD in the area of patient education (see Wilder, 1982 for an example of the use of interactive videotape), and only one IVD program has been produced specifically for the purpose of obtaining medical informed consent (Rakowsky, 1985).

Informed Consent and Obstetric Delivery Options

Sensitivity to a patient's right to determine what will be done to his or her body as reflected in recent case law and advances in medical knowledge concerning treatment options has made the issue of informed consent of particular interest to both

the obstetric patient (Trandel-Korenychuck, 1982) and the obstetrician who has both ethical and legal duties in this regard (Haire, 1975). This has become increasingly so since the National Institutes of Health (NIH) Consensus Committee on Cesarean Section recommended that: "In hospitals with appropriate facilities, services, and staff for prompt emergency cesarean birth, a proper selection of cases should permit a safe trial of labor and vaginal delivery for women who have had a previous low segment cesarean birth" (Lavin, 1983, p. 439). Thus, many women who have had a cesarean section may be able to choose between a vaginal delivery or a repeat cesarean section. This represents a significant change in thinking on the part of the obstetric community as they have steadfastly adhered to Edward Cragin's dictum, "Once a cesarean section, always a cesarean section" (cited in Lavin, 1982). The American College of Obstetricians and Gynecologists (ACOG) has published guidelines for vaginal delivery after cesarean section (VBAC) (cited in Lavin, 1983); and it has become increasingly clear that most women who have had a prior cesarean section can safely and successfully deliver vaginally, thus reducing the increased risks of mortality and morbidity associated with a repeat cesarean section, reducing the costs of the delivery substantially, and reducing the degree of interference with the normal birthing process (Lavin, 1982).

Given this knowledge, a valid informed consent becomes increasingly important for both the physician and the patient. And it is incumbent on physicians to provide the information necessary for patients to make an informed choice and decide on options that best suit their needs, pose the least risk, and offer the most benefit. Considering the prevalence of Cragin's dictum, the patient may be unaware that a VBAC is a viable option; and unless she is knowledgeable about the risks and benefits of each procedure in some detail, her choice would not be an informed one. Under such conditions, provision of sufficient information to insure that each option

is thoroughly considered may be a tedious and difficult task for the busy practitioner; and s/he also might be held accountable under these circumstances for failure to insure that patient consent was informed. A CAI program designed to provide the kinds of information needed to assure that the patient's consent was indeed informed could be a valuable tool: sensitive to the patient's need to be fully informed and helpful to the physician in fulfilling legal and ethical responsibilities with respect to informed consent.

Purpose of the Present Study

The purpose of the present study was to evaluate the effectiveness of three methods of providing patient education for the purpose of obtaining a legally valid informed consent when a VBAC was being considered: (1) the traditional method of provider-patient interaction with the provider informing the patient orally, (2) the use of a linear video tape (LVT) program designed to provide information relevant to securing an informed consent, and (3) an IVD designed to provide information relevant to securing an informed consent.

The present study addressed the following questions:

1. To what extent do VBAC patients understand the risks, benefits, and alternatives with respect to the procedure they have chosen when traditional and common methods of obtaining informed consent are used (that is, when oral communication with the physician is the primary method of educating the patient)?
2. To what extent does the introduction of LVT information enhance patient understanding over traditional and common methods of obtaining informed consent?
3. Is the IVD superior to the LVT in improving patient understanding of the risks, benefits, and alternatives associated with VBAC?

CHAPTER II

METHOD

Subjects and Setting

Subjects were 20 Caucasian obstetric patients who had a prior cesarean section, and who had been determined to be candidates for a VBAC by their obstetricians. The average age was 28.26 years (range 23-35 years) and the average years of education completed was 14.28 (range 12-18). Eighteen of the subjects had 1 prior cesarean, while one subject had 2 prior cesareans. With the exception of 2 individuals, none of the subjects had prior VBACs; one subject reported having had 1 prior VBAC, and one subject provided no demographic data regarding age, education level, or obstetric history.

Subjects were selected from 2 local obstetric practices on the basis of the physician's determination of appropriateness for the VBAC procedure. All subjects were seen between 26 and 36 weeks gestation. Sessions were conducted in a room designated for the research within the offices of each practice.

Equipment

Physician Group 1

Subjects who were patients of Physician Group 1 and who were shown the IVD version of "Vaginal birth after cesarean section: What you should know" (Rakowsky, 1985), viewed the program utilizing the following equipment: (1) Pioneer Laserdisc Industrial Videodisc Player with Remote Control Unit, (2) Panasonic 19 inch Color

Video Monitor. Patients of this physician group who viewed the LVT version of "Vaginal birth after cesarean section: What you should know" (Rakowsky, 1985), viewed the program utilizing the following equipment: (1) Panasonic 1/2 inch VHS Video Player/Recorder, (2) Panasonic 19 inch Color Video Monitor.

Physician Group 2

Subjects who were patients of Physician Group 2 viewed the LVT version of "Vaginal birth after cesarean section: What you should know" (Rakowsky, 1985) utilizing a 13 inch Toshiba color monitor and an RCA Selecta Vision VHS Video Player/Recorder.

Independent Variable

Traditional Method

All subjects had been identified by their physicians as candidates for the VBAC procedure and had discussed this option with their physicians during the course of their regular pre-natal care. Physicians provided information regarding the risks and benefits of the procedure as they determined necessary to aid each patient in making an informed choice.

Interactive Video Disc

The IVD version of "Vaginal birth after cesarean section: What you should know" (Rakowsky, 1985) was programmed so that brief segments of the program were shown, followed by a few multiple choice questions that functioned as probes of the subject's understanding. Subsequent video segments were contingent on the answers selected by the subject. If the subject answered all of the questions correctly for the

previous segment, the video proceeded with new information. If the subject answered a question incorrectly, the information relevant to that question was repeated and the question was asked again. Thus, each subject was required to answer all of the questions for each segment correctly before proceeding to the next segment. Each subject responded by pressing the appropriate numbered keys on the remote-control keypad.

Probes were in the form of multiple choice or true-false questions presented at the end of each of eight units of information. Of the twelve multiple choice questions utilized as probes, eleven of them allowed the patient to choose from three alternative answers. One multiple choice question presented the patient with six choices. In addition, there were four true-false questions for a total of sixteen probe questions.

Linear Video Tape

The LVT version of the program presented the same video and audio, in the same sequence as in the interactive version, but without the multiple choice questions and without the opportunity to review information presented earlier in the program.

Dependent Measures

Each subject completed a 31-item questionnaire designed to assess knowledge of the risks, benefits, and alternatives associated with the VBAC procedure. The questionnaire was constructed for the purposes of the present study (Appendix A). The questionnaire surveyed all of the items of information presented on the video program. If all items were answered correctly the subject obtained a score of 38 points. The number of points scored on this questionnaire prior to viewing the video program was assumed to represent the subject's knowledge resulting from the typical method of

providing information for the purpose of obtaining informed consent (i.e., physician presentation).

Upon the conclusion of the video program the same questionnaire was again administered. The gain score (post-test score minus pre-test score) was taken as a measure of the degree to which knowledge increased as a result of the video presentation.

The pre-post questionnaire was constructed so that half of the points (19) that could be obtained were relevant to the questions that had been used as probes in the interactive program (See "Interactive Video Disc" section above). Half of the points that could be obtained were relevant to material that had been presented but not probed during the interactive program. Thus three gain scores were obtained for each subject: (1) the gain score for probed items, (2) the gain score for unprobed items, (3) and the total gain score.

Subjective evaluations of the video programs were obtained by administering a five point rating scale with 5 being the most favorable rating and 1 being the least favorable rating. Subjects rated the video program on the following dimensions: Interest, Informativeness, Enjoyableness, Value, and Helpfulness. Subjects also were asked if they would have preferred that this information come directly from their physician, and were provided with the opportunity to add comments (Appendix C).

Procedures

Subjects were randomly assigned to either the IVD program or the LVT program. After assignment, the office staff member responsible for patient education escorted a subject to the appropriate room and positioned her in front of the video monitor. The following instructions were then read to the subject:

We are conducting an evaluation of educational materials designed to provide patients with information about the VBAC procedure. As a candidate for a VBAC we would like you to participate in this evaluation by viewing a video program and answering some questions about the program and your reaction to it. Before we begin we would like to know how much you already know about the procedure and would like you to fill out this questionnaire.

The subject was then asked to complete the pre-test questionnaire and to provide personal background information related to her age, level of education, race and history with respect to the VBAC procedure (Appendix B).

If the subject was to view the IVD program the following instructions were read:

You will be viewing a video program on the risks and benefits of the VBAC procedure. Throughout the program you will be asked to respond to questions pertaining to the material presented. You can respond by pressing one of the numbered keys on this keypad. Please do not press any of the other keys on the keypad. At the end of the program press the zero key to exit the program. Please do not review material at that time although the program allows you to do so.

If the subject was to view the LVT version of the program the following instructions were read: "You will be viewing a video program on the risks and benefits of the VBAC procedure. Please view the program in its entirety without stopping the program."

After viewing the entire program each subject was asked to complete a post-test questionnaire identical to the pre-test questionnaire, and to complete the subjective evaluation.

CHAPTER III

RESULTS

Pre-Intervention Knowledge

The pre-test performance of patients who had already decided to undergo the VBAC procedure was taken as a measure of their knowledge under the traditional and common methods of providing this type of information. Of the 20 subjects participating in the study, 14 had decided that they would undergo the VBAC procedure while 6 were undecided. This group of 14 subjects had a mean pre-test score of 12.86 and scores ranged from 0-26 points. Patients of Physician Group 1 who had decided to undergo the VBAC procedure had a mean score of 11.11 on the pretest. Patients of Physician Group 2 who had decided to undergo the VBAC procedure had a mean score of 16 on the pretest. The difference between these groups was not statistically significant ($t= 1.08$; $.1 < p \leq .375$). Table 1 summarizes the pre-test data for this group of subjects.

Table 1

Means, Ranges, and Percent of Total Possible for Pre-test Scores of Patients Electing to Undergo VBAC

| Physician Group | Mean Score | Range | Percent | <i>n</i> |
|-----------------|------------|-------|---------|----------|
| Group 1 | 11.11 | 0-26 | 29.24 | 9 |
| Group 2 | 16 | 10-21 | 42.11 | 5 |
| Total | 12.86 | 0-26 | 33.83 | 14 |

Thus, patients exhibited a great deal of variability in the amount of knowledge they possessed regarding the risks and benefits associated with the VBAC procedure and, on the average, responded correctly to only about 1/3 of the questions on the pretest.

Effects of Intervention

Table 2 presents the means and standard deviations for the pretest, posttest and gain scores for the LVT and IVD groups. Data in this table, and in subsequent statistical analyses, do not include one subject in the IVD group who was unable to answer any of the questions on the pretest.

Table 2
Means and Standard Deviations (SD) for Pre-test, Post-test and Gain Scores

| | Pre-test | Post-test | Gain |
|-----|-----------------------|-----------------------|-----------------------|
| LVT | Mean=13.7 SD=4.572 | Mean=31 SD=2.667 | Mean=17.3 SD=2.983 |
| IVD | Mean=10.3 SD=8.916 | Mean=31.7 SD=2.915 | Mean=21.3 SD=7.681 |

In order to assess the statistical significance of effects, a multiple regression analysis was done utilizing the post-test scores as the dependent variable and treatment condition (IVD or LVT) as well as pre-test scores as independent variables. This analysis produced an over-all F statistic and two partial F values. The partial F values were associated with each of the two independent variables and indicate

whether each made a significant contribution to the obtained values on the dependent measure.

The multiple regression analysis yielded an overall F value of 5.006 ($.01 < p \leq .025$), indicative of a statistically significant effect. Partial F values associated with pretest scores and treatment conditions were 9.604 ($p < .01$) and 1.92 ($p > .05$) respectively. Thus it can be seen that the significant overall F obtained was the result of the the large gains obtained by both groups when comparing pretest and posttest scores. The F value associated with treatment conditions was not significant, indicating that the IVD and LVT were equally effective in providing information to patients in the present study.

Table 3 presents the means and standard deviations associated with the pretest, posttest and gain scores for probed and unprobed items. Separate multiple regression analyses were conducted on the scores associated with probed items and unprobed items, to determine if there was a differential treatment effect based on the type of program presented. The overall F value obtained when conducting the analysis on scores associated with probed items was 2.678 ($.05 < p \leq .10$). The overall F value obtained when conducting the analysis on scores associated with unprobed items was 3.262 ($.05 < p \leq .10$). Neither of the resulting F statistics reached traditional levels of significance. Thus, while it might have been expected that subjects who were exposed to questions during the IVD program might have done better on the posttest items related to those questions than did the LVT subjects, this was clearly not the case.

Patient Evaluation

On the basis of the subjective evaluations completed at post-testing, there was little to distinguish the IVD from the LVT with one notable exception. Both programs

were evaluated as being moderately to very interesting, informative, enjoyable, and valuable. However, the IVD was more often rated as very helpful when compared with the LVT.

Table 3
Means and Standard Deviations Associated with the Pre-test,
Post-test, and Gain Scores for Probed and Unprobed Items

| | | Pre-test | Post-test | Gain |
|-----|----------|----------------------|-----------------------|-----------------------|
| LVT | Unprobed | Mean=7 SD=2.539 | Mean=16 SD=1.054 | Mean=9 SD=1.944 |
| | Probed | Mean=6.7 SD=2.497 | Mean=15 SD=2.055 | Mean=8.3 SD=1.829 |
| IVD | Unprobed | Mean=4.9 SD=5.159 | Mean=15.7 SD=1.871 | Mean=10.8 SD=4.577 |
| | Probed | Mean=5.4 SD=4.065 | Mean=16 SD=2.236 | Mean=10.6 SD=3.972 |

Table 4 presents a summary of the ratings provided by 9 of the subjects who viewed the IVD (one subject did not provide this information) and the 10 subjects who viewed the LVT. With respect to the IVD, all but 3 subjects rated the IVD as a 4 or 5 on the 5-point scale for all 5 dimensions. That is, they viewed the program as being very or more than moderately interesting, informative, enjoyable, valuable and helpful. One subject rated the program as moderately enjoyable. One subject rated the program as moderately valuable. One subject rated the program as having been less than moderately helpful.

All but one of the subjects rated the LVT as a 4 or 5 interesting, informative, enjoyable, and valuable. One subject rated the LVT as being moderately enjoyable.

On the dimension of helpfulness, ratings were evenly distributed across the scale. Two subjects reported that the program was not very helpful; 1 reported that it was less than moderately helpful; 2 reported that it was moderately helpful; 2 reported that it was more than moderately helpful; and 3 reported that it was very helpful. Thus, the 2 programs differed somewhat in terms of the number of subjects rating them as very helpful in deciding on treatment options, with the IVD more frequently rated as very helpful.

Table 4
Percentage of Subjects Rating the LVT and IVD on Five Characteristics

| | Interesting | | Informative | | Enjoyable | | Valuable | | Helpful | |
|-------------------|-------------|-------|-------------|-----|-----------|-------|----------|-------|---------|-------|
| | LVT | IVD | LVT | IVD | LVT | IVD | LVT | IVD | LVT | IVD |
| Not Very 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 11.11 |
| Moderate 3 | 0 | 0 | 0 | 0 | 10 | 11.11 | 0 | 11.11 | 20 | 0 |
| 4 | 60 | 55.56 | 20 | 0 | 70 | 66.67 | 30 | 33.33 | 20 | 33.33 |
| Very 5 | 40 | 44.44 | 80 | 100 | 20 | 22.22 | 70 | 55.56 | 30 | 55.56 |

While each subject was asked if she preferred that the information presented be given personally by the physician, not a single subject affirmed such a preference. One subject indicated that she found the video informative, but felt that it should not be used in lieu of personal communication with the physician.

CHAPTER IV

DISCUSSION

The results indicated that the introduction of either the LVT or IVD video presentation increased the level of patient knowledge relative to the standard presentation by a physician. At post-testing, both groups evidenced substantial gains with the LVT group achieving an average of 81.58% correct and the IVD group achieving an average of 83.42% correct. However, the IVD group did not perform significantly better than the LVT group.

The results of the present study suggest that current methods of providing informed consent are far from optimal. While it was not surprising that both the IVD and LVT increased patient knowledge, what was surprising was the degree to which subjects were unable to answer questions regarding the risks of the procedure they had elected to undergo. Subjects who had decided on the VBAC procedure were, for the most part, very poorly informed and had apparently made their decisions on the basis of limited knowledge. Most of the subjects (17) knew, for example, that a repeat cesarean might have to be performed to deliver the baby. However, only four subjects (20%) knew that a hysterectomy was also a risk, albeit an unlikely one. From the perspective of providing a legally valid informed consent, it should be of serious concern that 80% of subjects were unaware of this rather serious risk prior to viewing either video program.

The lack of difference between the IVD and LVT merits further consideration. One of the main advantages of the IVD is the ability to probe for comprehension and present remedial material if necessary. However, if no errors are made, the

advantages of the remedial capability of the IVD will not be observed. The fewer errors that subjects make, the more the IVD presentation should resemble the LVT presentation. In reviewing the errors made by subjects on probe questions during the IVD program, it became clear that subjects understood the material quite well without the benefit of remedial information. Of the nine subjects for whom this information was available, 2 subjects made 2 errors each, 5 subjects made only 1 error each, and 2 of the subjects made no errors at all. Thus, few subjects came in contact with the IVD remedial capabilities. This could, at least in part, account for the findings that the IVD was not clearly superior to the LVT.

Another important factor is subject motivation. One might expect that introducing probe questions would increase motivation considering that answering a question incorrectly is likely to be mildly aversive. Thus one might propose that the IVD should be superior to the LVT as a result of enhanced motivation. However, this factor may not have affected the groups differentially. Given the fact that all of the subjects were going to attempt a VBAC, and that the information presented was specifically related to the risks and benefits of the procedure, it would not be unreasonable to assume that motivation to learn the information was quite high for most of subjects. The subjective evaluations support this notion in that both programs were evaluated as being at least moderately interesting, informative, enjoyable, and valuable. Given a pre-existing high level of motivation, any additional motivation that might have been provided by the introduction of probe questions appears to have been negligible.

Another reported advantage of the CAI over other methods of instruction has been the degree of active involvement on the part of the learner (Mandell & Mandell, 1989). The present findings suggest that the degree of active participation may not be as important a factor as is generally thought. The IVD subjects were clearly active

participants in the program to the extent that they were required to answer questions in order to keep the program progressing. The LVT subjects, on the other hand, were clearly passive recipients of information. Yet no differences in learning were observed. Under the circumstances of the present study, level of active participation appeared to be irrelevant.

A final factor to consider is the educational level of the subjects. The patients involved in the study were highly educated individuals. As a group they averaged two years of college; some individuals had graduate training. All of these individuals were likely to be very competent learners even under less than optimal conditions. Such a well-educated population would be expected to benefit from the information presented regardless of method or specialized features of the IVD. This also might help to explain why so few errors were made when probe questions were presented on the IVD.

The one difference between the IVD and the LVT that did emerge was that the IVD was more frequently cited as being helpful in making the decision to undergo the VBAC procedure. The reasons for this difference are not clear. Most of the subjects had made their decision prior to beginning the study. One subject who rated the LVT as only moderately helpful in making her decision indicated that her decision had been made prior to viewing the video and therefore viewed the tape as less valuable than might have otherwise been the case. This also may have been the case for the others who rated the LVT poorly on this dimension, but they did not explicitly state such a reason.

The findings of the present study are consistent with data presented by Bosco (1986) in his review of IVD evaluation studies. He found that: "When the reported benefits involving the use of a statistical test were examined, benefits were most prevalent on user attitude and training time variables. They were less prevalent on

the achievement variable" (p. 8). Thus, the interactive nature of the IVD should not be expected to necessarily improve learning under all conditions, nor with all populations. In fact, some of the advantages that accrue from the IVD may have little to do with enhanced learning.

For example, the IVD provides advantages in terms of providing a legally valid informed consent that cannot possibly be obtained with the LVT. First, the IVD virtually assures that all of the probe questions are answered correctly in order to complete the program. Thus, there can be little question that the patient actually understood the material presented. The physician can be virtually assured that this aspect of a legally valid informed consent, as defined by Meisel and Roth (1983), has been adequately addressed. Second, the IVD program can keep a record of every question presented and every response made by the patient. It can also produce a hard-copy document containing this information that can be used to document the informed consent process in great detail. This document can be used to identify any areas where the patient may have experienced difficulty and need additional instruction. In addition, such a detailed document would constitute a valuable piece of evidence in a court of law should the legal validity of the informed consent be questioned. Given the current litigious nature of medical practice (Brittain, 1988; Rosoff, 1981), the IVD could prove to be a valuable tool in physician risk management as well as patient education.

While the IVD was not shown to be superior to the LVT on nearly all of the dependent measures utilized in this study, this should not be taken as evidence that the two media are equivalent in all important respects. The failure to find statistically significant differences may be related to any or all of the factors cited above. If, for example, the same material were presented to subjects who possessed less formal education, the findings might be quite different. A replication of this study with such

a group of subjects would therefore be of interest. Studies examining the differential effects of motivation on learning with the IVD would also be useful.

What can be said with some certainty is that the use of video information significantly enhanced the knowledge of patients when compared to the standard presentation by the physician, and that the IVD has the potential of providing an extra layer of safety for both patient and physician when informed consent is the issue.

Appendix A
VBAC Questionnaire

VBAC QUESTIONNAIRE

PATIENT# _____ DATE _____

FILL IN THE BLANKS OR CIRCLE THE CORRECT ANSWER.

1. UBAC stands for U _____ B _____ A _____ C _____.
2. If a woman has delivered a baby by cesarean section she must deliver all subsequent children by cesarean section. (True or False.)
3. The vertical or "up and down" cut performed during a cesarean section is called a _____ incision.
4. The _____ incision has a tendency to break apart, or rupture, during subsequent deliveries.
5. The horizontal or "side to side" cut performed during a Cesarean Section is called a _____ incision.
6. The healing of the _____ incision is much stronger than the _____ incision and is therefore less likely to rupture.
7. If a rupture should occur with a _____ incision the chances of a baby's survival are much better.
8. The direction of the scar on the women's abdomen is a good indicator of the type of incision she has had. (True or False.)
9. The best way for a woman to determine what type of incision she has had is to _____.
10. If a woman is having a UBAC she should:
 - a) expect an increased amount of _____.
 - b) be prepared for the possibility of _____.
11. The risk of the uterus rupturing during a vaginal delivery after a transverse cesarean section is about 1 in (50, 100, 500); and the chances of the baby dying from this are about 1 in (100, 500, 1000).
12. The chances of a baby dying from some other problem is (greater, about the same, lesser) for a UBAC delivery when compared to a repeat cesarean.

13. Since 1930 no women have died during a VBAC because of a ruptured uterus. (True or False)
14. If a rupture does occur during the VBAC a _____ may have to be performed in order to deliver the baby.
15. If a serious rupture occurs, and it cannot be repaired, a _____ will have to be performed. The chances of this happening are 1 in (100, 500, 1000).
16. A bloodless dehiscence involves a _____ separation of the scarline on the uterus.
17. The chances of a bloodless dehiscence occurring are about 1 in (50, 100, 500).
18. The main risks of having anesthesia during delivery are:
 a) lowered _____.
 b) _____.
19. Women who are anesthetized have just as good a chance of having a successful delivery as women who are not. (True or False.)
20. The drug _____ stimulates contractions and speeds up delivery.
21. The increased risk of rupturing the uterus when the above named drug is used is _____.
22. The advantages of VBAC over a repeat cesarean are:
 a) less interference with _____
 b) less chance of _____.
23. The major advantage of VBAC for the baby involves a reduction in the risk of _____.
24. Costs for a VBAC are about (1/2, 1/3, 1/4) less than costs for a repeat cesarean.
25. Of all women who enter labor after a prior cesarean, two out of (three, four, five) of them will successfully complete a vaginal delivery.
26. The chance of a transfusion reaction during an elective repeat cesarean is 1 in (100, 1000, 5000).
27. The chance of acquiring an infection from a transfusion is 1 in (100, 1000, 5000).

28. The vaginal birth has the (least, second highest, highest) risk of infection.

29. The planned cesarean has the (least, second highest, highest) risk of infection.

30. The planned vaginal delivery that ends up as a repeat cesarean has the (least, second highest, highest) risk of infection.

31. The major benefits of an elective repeat cesarean are that:

- a) _____.
- b) _____.

32. Which delivery option have you decided on?

- a) Repeat Cesarean.
- b) Vaginal Birth.
- c) Not Yet Decided.

Appendix B
Background Information

BACKGROUND INFORMATION

HIGHEST GRADE COMPLETED? 5 6 7 8 9 10 11 12
COLLEGE 1 2 3 4
GRAD SCHOOL 1 2 3 4

AGE _____

RACE _____

HAVE YOU HAD A PRIOR CESAREAN? _____
HOW MANY? _____

HAVE YOU HAD A VBAC BEFORE? _____

Appendix C
Subjective Evaluation

SUBJECTIVE EVALUATION

PLEASE RATE THE VIDEO PROGRAM YOU VIEWED BY CIRCLING THE APPROPRIATE NUMBER.

1= NOT VERY
3= MODERATELY
5= VERY

| | <u>NOT VERY</u> | | <u>MODERATELY</u> | | <u>VERY</u> |
|--------------------------------------|-----------------|---|-------------------|---|-------------|
| INTERESTING | 1 | 2 | 3 | 4 | 5 |
| INFORMATIVE | 1 | 2 | 3 | 4 | 5 |
| ENJOYABLE | 1 | 2 | 3 | 4 | 5 |
| VALUABLE | 1 | 2 | 3 | 4 | 5 |
| HELPFUL IN DECIDING ON OPTIONS | 1 | 2 | 3 | 4 | 5 |

WOULD YOU HAVE PREFERRED THAT YOUR PHYSICIAN PRESENT THIS INFORMATION TO YOU PERSONALLY? _____

COMMENTS _____

Appendix D
HSIRB Approval



Western Michigan University 34
Kalamazoo, Michigan 49008-3899

*Human Subjects
Institutional Review Board*

TO: Christopher Guiliano
FROM: Ellen Page-Robin, Chair *EP-R*
RE: Research Protocol
DATE: January 12, 1989

This letter will serve as confirmation that your research protocol, "Differential Effects of Interactive vs. Linear Video on Patient Understanding and Decision Making," has been approved at no more than minimal risk after full review with the qualification that no identifying data will appear on the forms provided to subjects.

In addition, it is expected that if the conditions of the study are subject to change, this office will be notified of those changes.

If you have any additional questions, please contact me at 387-2647.

BIBLIOGRAPHY

- Barbour, G. L., & Blumenkrantz, M. J. (1978). Video aids informed consent decision. Journal of the American Medical Association, 240, 2741-2742.
- Bosco, J. (1986, May). An analysis of evaluations of interactive video. Educational Technology, pp. 7-17.
- Bracken, M. B., Bracken, M., & Landry, A. B. (1977). Patient education by videotape after myocardial infarction: An empirical evaluation. Archives of Physical Medicine and Rehabilitation, 58, 213-219.
- Brittain, R. S., (1988, May). The three keys to malpractice prevention. Physician's Management, pp. 46-51.
- Chaisson, G. M. (1980). Patient education: Whose responsibility is it and who should be doing it? Nursing Administration Quarterly, 4, 1-11.
- Cohen, S. A. (1981). Patient education: A review of the literature. Journal of Advanced Nursing, 6, 11-18.
- Evans, R. J. (1985). Preservice special education: Interactive video simulation. Montgomery, AL: Author.
- Gilbert, T. F. (1978). Human competence: Engineering worthy performance. New York: McGraw-Hill.
- Haire, D. B. (1975). The pregnant patient's bill of rights. Journal of Nurse Midwifery, 20, 29.
- Hancock, R. (1985). Interactive videodisc for learners of French. Media in Education and Development, 18, 121-123.
- Hofmeister, A., & Thorkildsen, R. (1983, April). The application of videodisc technology to the diagnosis of math skills. Paper presented at the annual meeting of the American Educational Research Association, Montreal, Quebec, Canada.
- Hughett, H. L. (1984). Introduction to computer aided instruction in the language laboratory. Washington, DC: Office of Postsecondary Education.
- Lavin, J. P. (1982). Vaginal delivery in patients with a prior cesarean section. Journal of the American College of Obstetricians and Gynecologists, 59, 135-148.
- Lavin, J. P. (1983). Vaginal delivery after cesarean birth: Frequently asked questions. Clinics in Perinatology, 10, 439-453.

- Leonard, W. H. (1985, April). Biology instruction by interactive videodisc or conventional laboratory: A qualitative comparison. Paper presented at the annual meeting of the National Association for Research in Science Teaching, French Lick Springs, IN.
- Leonard, W. H. (1986, March/April). Development of high-technology science instruction: A case history of an interactive videodisc system. Paper presented at the annual meeting of the National Association for Research in Science Teaching, San Francisco, CA.
- Levoy, R. P. (1974). Telling isn't teaching. Journal of the American Podiatry Association, 64, 257-258.
- Little, D. & Davis, E. (1986). Interactive video for language learning: The autotutor project. System, 14, 29-34.
- Mandell, C. J. & Mandell S. L. (1989). Computers in education today. St. Paul, MN: West Publishing Company.
- Meisel, A., & Roth, L. (1983). Toward an informed discussion of informed consent: A review and critique of the empirical studies. Arizona Law Review, 25 ,(2), 265-346.
- Rakowsky, G. (Producer, Director). (1985). Vaginal birth after cesarean section: What you should know. [Interactive Videodisc]. Kalamazoo, MI: Video Branching Corporation.
- Rosoff, A. J., (1981). Informed consent: A guide for health care providers. Rockville, MD: Aspen.
- Thorkildsen, R. (1985). Using an interactive videodisc program to teach social skills to handicapped children. American Annals of the Deaf, 130, 383-385.
- Trandel-Korenchuk, D. M. (1982, November/December). Informed consent: Client participation in childbirth decisions. Journal of Obstetric and Gynecological Nursing, 379-381.
- Tring, F. C. & Hayse-Allen, M. D. (1977). Understanding and misunderstanding of some medical terms. British Journal of Medical Education, 7, 53-59.
- Wilder, E. J. (1982). The effectiveness of programed interaction in a videotape presentation (Doctoral dissertation, Fuller Theological Seminary, 1982). Dissertation Abstracts International, 43, 859B.
- Wile, M. Z., Wingenfeld, J. R., Ratner, C., Mesnard, J. E., Mack, L. P., Kastner, B. A., Hickey, J. R., & Dickoff, S. (1979). Physician-patient communication: Interpretations of non-technical phrases. Unpublished manuscript.
- Yampolsky, M. (1983). Word processor training on intelligent videodisc. Videodisc/Vidiotext, 3, 281-289.

Zollman, D., & Fuller, R. (1982). The puzzle of the Tacoma Narrows Bridge collapse: An interactive videodisc program for physics instruction. Creative Computing, 8, 100-109.