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# Animated video consultation for reducing pre-operative anxiety in dermatologic surgery

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## Abstract

Pre-operative anxiety is common in patients undergoing dermatologic surgery. This pilot study aimed to evaluate whether the addition of an animated educational video to conventional in-person surgery consultation helps to reduce pre-operative anxiety related to anesthesia, surgery, wound care, and post-operative pain in patients undergoing outpatient dermatologic surgery. Patients awaiting dermatologic surgery were randomized into groups with conventional consultation, or video with consultation prior to undergoing their procedure. The conventional consultation group received conventional consultation with the surgeon, whereas the video with consultation group received conventional consultation and a two-minute-long animated educational video. Intra- and inter-individual score differences were assessed based on baseline and subsequent surveys. Although not statistically significant, video with consultation group anxiety scores were lower than conventional consultation group across all categories. After crossing over, conventional consultation group patients reported statistically significant improvement in anxiety related to all areas except wound care, in which anxiety did not change significantly, although a trend toward reduced anxiety was seen. Animated educational videos during surgical consultation can reduce pre-operative anxiety related to anesthesia, surgery, and post-operative pain. Future studies should explore its benefit to clinical outcomes and overall surgical experience.

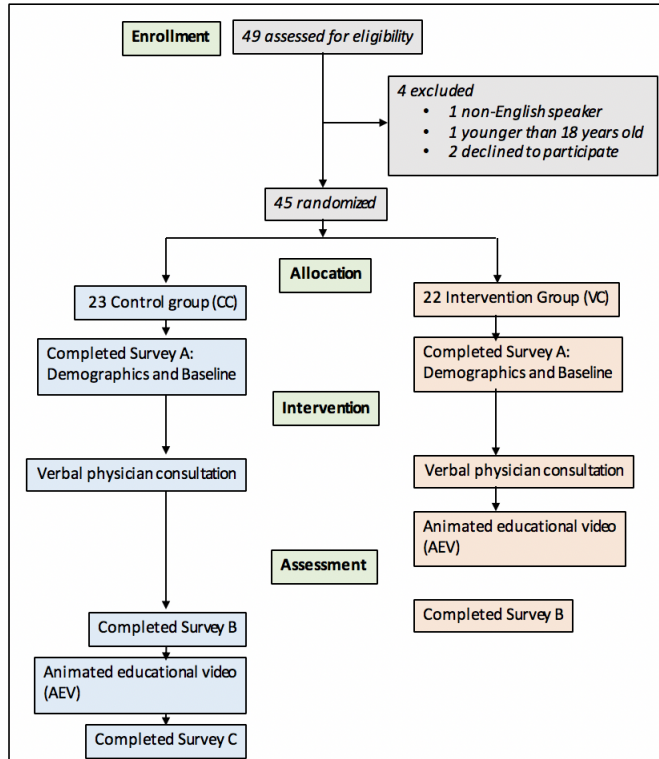
*Keywords: e-learning, peri-operative anxiety, pre-operative education, patient-centered outcomes, dermatologic surgery*

## Introduction

More than 75% of patients experience pre-operative anxiety [1]. While the effect of patient education on pre-operative anxiety and associated outcomes has been studied in surgeries involving general anesthesia or significant post-operative care [2, 3], its effect on pre-operative anxiety related to dermatologic surgery has not been studied. In this randomized controlled comparison study, we assessed the value of adding an animated educational video to conventional surgical consultation for reducing pre-operative anxiety in patients undergoing dermatologic surgery.

## Methods

This study was approved by the University of Arizona Institutional Review Board. Twelve-question surveys were modified from the Amsterdam Preoperative Anxiety and Information Scale (M-AP AIS), [1, 3] to assess pre-operative anxiety — Survey A ascertained demographic information and history of prior surgeries ([Supplemental 1A](#)), Survey B featured questions on pre-operative anxiety related to local anesthesia, surgery, wound care, and post-operative pain ([Supplemental 1B](#)), and Survey C was identical to survey B with added reflection questions on preferred consultation method ([Supplemental 1C](#)). Patients scheduled for dermatologic surgery were



**Figure 1.** Group randomization and study schema flow diagram.

recruited. Following informed consent, patients were randomized to either video intervention plus conventional consultation (N=22) or conventional physician consultation alone (N=23).

Upon arrival for surgery, both video with consultation and conventional consultation subjects completed Survey A. Video with consultation subjects received a conventional pre-operative physician consultation with one of two participating surgeons followed by a two-minute animated educational video covering anesthesia, excision, repair, post-operative wound care, and pain management (<https://youtu.be/x7ujWviMNXM>), and then completed Survey B (**Figure 1**). The physician consultations followed the same general script as the animated educational video. Following Survey A, conventional consultation subjects received routine physician consultation and completed Survey B. To ensure the conventional consultation group received the same quality of care, they crossed-over to watch the animated educational video, then completed Survey C (**Figure 1**). Intra- and inter-individual score differences were assessed. Mean scores were analyzed using paired and unpaired t-

tests. A P value <0.05 was considered statistically significant.

## Results

Of the 45 participants, three conventional consultation subjects (13%) and one video with consultation subject (5%) were first-time surgical patients. Compared to physician consultation alone, conventional consultation patients who crossed over to watch animated educational video reported significantly less overall anxiety (12.5 versus 10.1,  $P=0.014$ ) and anxiety directly related to surgical excision (3.1 versus 2.5,  $P=0.002$ ), with a decreased desire for additional information about the procedure (6.3 versus 4.9,  $P=0.036$ ). A trend toward reduced anxiety related to local anesthesia (2.9 versus 2.4,  $P=0.062$ ) and post-operative pain (3.4 versus 2.7,  $P=0.050$ ) was also observed (**Table 1**). Among conventional consultation participants, 11 (48%) preferred the combination of physician consultation with animated educational video, and 7 preferred the verbal explanation alone (30%). Of the 48% who preferred both verbal and animated educational video consultation, 10 (90%) believed that the visualization of the surgery helped with understanding the surgical process, and one participant (10%) reported that the animated educational video provided a step-wise approach to the surgery. Compared to conventional consultation subjects, video with consultation subjects had greater reduction in anxiety scores across all categories, with the most significant decrease in post-operative pain anxiety (24.7% versus 14.3% reduction) followed by anesthesia-related anxiety (13% versus 8.2% reduction), (**Table 1**).

## Discussion

In video with consultation subjects, the addition of animated educational video to conventional consultation led to significant intra-group reductions in overall anxiety, anxiety directly related to surgery, and desire for further information. Though not statistically significant, anesthesia and post-operative pain-related anxiety were decreased. The lack of statistical significance in inter-group

**Table 1.** Summary and Comparison of Responses.

	Anxiety Scale Score, Mean (SD) <sup>a</sup>					Anxiety Scale score reduction (%)			p-values	
	CC n=23 Survey A	VC n=22 Survey A	CC n=23 Survey B	VC n=22 Survey B	CC + AEV n=22 Survey C	CC% n=23 Survey B-A	VC% n=22 Survey B-A	VC decreased this % more than CC, from baseline (VC%-CC%)	CC vs. VC Survey B	CC vs. CC + AEV Survey C
Anesthesia-related anxiety	3.2 (1.7)	3.1 (1.8)	2.9 (1.5)	2.6 (1.4)	2.4 (0.8)	8.2	13.4	5.2	0.531	0.062
Surgery-related anxiety	3.5 (2.0)	3.0 (1.3)	3.1 (1.3)	2.5 (1.4)	2.5 (1.0)	11.3	15.2	3.9	0.188	0.002 <sup>b</sup>
Wound care anxiety	3.6 (2.0)	3.1 (1.5)	3.1 (1.9)	2.6 (1.1)	2.6 (0.9)	13.3	17.4	4.1	0.251	0.125
Post-op pain anxiety	4.0 (2.3)	3.7 (2.1)	3.4 (1.9)	2.8 (1.3)	2.7 (1.3)	14.3	24.7	10.4	0.220	0.050
Information desire component	10.0 (4.2)	12.0 (4.3)	6.3 (3.1)	5.1 (2.0)	4.9 (1.5)	37.1	56.5	19.4	0.129	0.036 <sup>b</sup>
Combined anxiety component	14.2 (6.8)	12.9 (5.8)	12.5 (5.9)	10.6 (4.3)	10.1 (3.1)	11.9	18.0	6.1	0.208	0.014 <sup>b</sup>

Abbreviations: VC, video consultation; CC, conventional consultation; SD, standard deviation

<sup>a</sup>Patient self-perception of anxiety ranged from 1 to 5, with 1 being not at all and 5 being extremely.

<sup>b</sup>Statistically significant finding ( $\alpha < 0.05$ ).

analysis may have been attributable to small sample size and prior dermatologic surgery experiences. Wound care-related anxiety showed the smallest reduction, which highlights a possible clinical care gap that should be more adequately addressed during pre-operative consultation.

A major limitation of our study is that anxiety was assessed in the short moments between patient arrival at the facility and their procedure, and it did not account for the anxiety a participant may have experienced prior to, or following the surgical appointment. In addition, our results reflect the benefit of our animated educational video and may not reflect the potential benefit (or lack of benefit) of other educational videos. Further investigations are needed to determine if the statistically significant intra-group reductions also represent clinically

meaningful decreases in anxiety, and to elucidate whether certain subgroups are more likely to benefit from pre-operative educational videos.

## Conclusion

Incorporation of an animated educational video to surgical consultation can reduce pre-operative anxiety related to anesthesia, surgery, and post-operative pain through patient education. Further studies are needed to determine whether the self-reported benefits of an educational video can translate into better clinical outcomes and overall surgical experience.

## Potential conflicts of interest

The authors declare no conflicts of interests.

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## Supplemental Material

### Supplemental 1A

#### Survey A: Pre-Consultation Questionnaire (for both CC and VC Groups)

Subject Number \_\_\_\_\_ Group Assignment: CC or VC

#### **Please check ONE answer that most appropriately describes you:**

#### **What is the highest grade at school or years in college that you have completed?**

- 1<sup>st</sup> through 8<sup>th</sup> grade
- 9<sup>th</sup> through 12<sup>th</sup> grade or GED
- 1 to 3 years of college
- 4 or more years of college

#### **Which of the following best describes your employment status?**

- Unemployed
- Employed full time (including self-employment)
- Employed part time (including self-employment)
- Student full time
- Student part time
- Retired

#### **Which one of the following best describes your previous experience with surgery?**

##### **(Check all that applies)**

- This is my first surgery ever
- I have had skin surgery within the past \_\_\_\_\_ year(s), \_\_\_\_\_ month(s)
- I have had surgery that require general or regional nerve block anesthesia in the past

#### **Please circle the answer that comes closest to the way you are feeling today.**

##### **1. I am worried about the numbing injection**

Not at all    1        2        3        4        5 Extremely

##### **2. Numbing Injection is on my mind continually**

Not at all    1        2        3        4        5 Extremely

##### **3. I would like to know as much as possible about the numbing injections**

Not at all    1        2        3        4        5 Extremely

##### **4. I am worried about the surgery procedure**

Not at all    1        2        3        4        5 Extremely

##### **5. The surgery procedure is on my mind continually**

Not at all    1        2        3        4        5 Extremely

##### **6. I would like to know as much as possible about the surgery procedure**

Not at all    1        2        3        4        5 Extremely

**7. I am worried about wound care at home**

Not at all    1        2        3        4        5 Extremely

**8. Wound care at home is on my mind continually**

Not at all    1        2        3        4        5 Extremely

**9. I would like to know as much as possible about wound care at home**

Not at all    1        2        3        4        5 Extremely

**10. I am worried about pain after the surgery**

Not at all    1        2        3        4        5 Extremely

**11. Pain after surgery is on my mind continually**

Not at all    1        2        3        4        5 Extremely

**12. I would like to know as much as possible about pain after surgery**

Not at all    1        2        3        4        5 Extremely

**Supplemental 1B****Survey B: Post-Consultation Questionnaire (for both CC and VC Groups)**

Subject ID # \_\_\_\_\_

Group Assignment: CC or VC

**Please circle the answer that comes closest to the way you are feeling after your consultation with the doctor.****1. I am worried about the numbing injection**

Not at all    1        2        3        4        5 Extremely

**2. Numbing Injection is on my mind continually**

Not at all    1        2        3        4        5 Extremely

**3. I still would like more information about the numbing injections**

Not at all    1        2        3        4        5 Extremely

**4. I am worried about the surgery procedure**

Not at all    1        2        3        4        5 Extremely

**5. The surgery procedure is on my mind continually**

Not at all    1        2        3        4        5 Extremely

**6. I still would like to get more information about the surgery procedure**

Not at all    1        2        3        4        5 Extremely

**7. I am worried about wound care at home**

Not at all    1        2        3        4        5 Extremely

**8. Wound care at home is on my mind continually**

Not at all    1        2        3        4        5 Extremely

**9. I still would like get more information about wound care at home**

Not at all    1        2        3        4        5 Extremely

**10. I am worried about pain after the surgery**

Not at all    1        2        3        4        5 Extremely

**11. Pain after surgery is on my mind continually**

Not at all    1        2        3        4        5 Extremely

**12. I still would like to get more information about pain after surgery**

Not at all    1        2        3        4        5 Extremely

**Supplemental 1C****Survey C: Post-animation additional Questionnaire (for CC Group Only)**

Subject ID # \_\_\_\_\_    Group Assignment: CC only

**Please circle the answer that comes closest to the way you are feeling after watching the animated video.****1. I am worried about the numbing injection**

Not at all    1        2        3        4        5 Extremely

**2. Numbing Injection is on my mind continually**

Not at all    1        2        3        4        5 Extremely

**3. I still would like more information about the numbing injections**

Not at all    1        2        3        4        5 Extremely

**4. I am worried about the surgery procedure**

Not at all    1        2        3        4        5 Extremely

**5. The surgery procedure is on my mind continually**

Not at all    1        2        3        4        5 Extremely

**6. I still would like to get more information about the surgery procedure**

Not at all    1        2        3        4        5 Extremely

**7. I am worried about wound care at home**

Not at all    1        2        3        4        5 Extremely

**8. Wound care at home is on my mind continually**

Not at all    1        2        3        4        5 Extremely

**9. I still would like get more information about wound care at home**

Not at all    1        2        3        4        5 Extremely

**10. I am worried about pain after the surgery**

Not at all    1        2        3        4        5 Extremely

**11. Pain after surgery is on my mind continually**

Not at all    1        2        3        4        5 Extremely

**12. I still would like to get more information about pain after surgery**

Not at all    1        2        3        4        5 Extremely

**13) How would you prefer your doctor to explain the surgery to you?**

- A) Verbal explanation alone
- B) Animated video alone
- C) Both verbal explanation AND animated video
- D) I do not wish to receive either verbal explanation or animated video

**14) If you chose (B) or (C) as your answer for question 13 above, please provide the reason(s) why you would find the addition of an animated video to be beneficial in lowering your anxiety about the surgery (please select all that apply).**

- A) Visualization of the surgery aids in my understanding of the entire surgery process.
- B) The animated video aids my understanding of the anesthesia.
- C) The animated video provides a step-wise approach to the actual surgery.
- D) The animated video provides helpful tips in wound care after surgery.
- E) The animated video decreases my worries about discomfort/pain during surgery.
- F) The animated video decreases my worries about discomfort/pain after surgery.