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## Presurgical Optimization Videos for Patients Undergoing Elective Spine Surgery

Megan Knetzer

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## **Executive Summary**

### **Introduction of the Problem**

Spine surgery is a common procedure and represents a major undertaking for patients who often feel unprepared going in to surgery. The orthopedic spine service at a large academic medical center in Missouri wanted to improve patient preparedness and education for surgery while minimizing the time burden of nursing staff. This project was designed to provide additional patient education preoperatively through videos they can watch from home. This allowed the patient convenience of timing, minimized impact and time burden on staff, and limited patient time in the office in compliance with current COVID-19 pandemic guidelines.

### **Literature Review**

Review of the current literature demonstrated the impact that spine surgery has on healthcare, with more than 199,000 elective lumbar spinal fusions performed in the United States and a total healthcare cost of \$10 billion in 2015 (Martin et al., 2019). Additionally, postoperative complication rates as high as 36% (Zanirato et al., 2017) and anxiety and depression rates of up to 33% (Strøm et al., 2018) contribute to patient stress and concern. Patients also have high expectations for presurgical education that are not being met (Rankinen et al., 2016).

Presurgical optimization, or prehabilitation, has been shown to improve patient reported outcomes and satisfaction, decrease costs of care and length of stay, and improve physical functioning (Maitra et al., 2020; Nielsen et al., 2010). Smoking cessation, nutrition, physical activity, and psychological status have all been shown as modifiable risk factors that can be addressed preoperatively to improve outcomes (Maitra et al., 2020). Nicotine use around the time of spine surgery has a detrimental effect on wound healing, non-surgical site infections, and can

lead to pseudoarthrosis in fusion surgeries (Lau et al., 2014). The use of Chantix, along with clinician support and counseling, has demonstrated effectiveness in nicotine cessation (Hajek et al., 2013; Stead et al., 2013). Physical exercise is very important in the success of a spine surgery. Despite this, up to 83% of spine patients do not get enough exercise, in part because they are afraid movement will hurt (Lotzke et al., 2018). Increasing exercise and activity can reduce pain, improve physical functioning, and improve patient reported outcomes before and after surgery (Lindback et al., 2018). Another factor that significantly increases complication rates and poor outcomes is malnutrition (Qureshi et al., 2018). This is especially concerning in high-risk groups such as diabetics or cancer patients. Supplementation with immunonutrition may be recommended for some high-risk patients in order to decrease complication risks (Banerjee et al., 2017). Pain management and coping skills are important for patients undergoing spine surgery. More than 50% of patients expect surgical recovery to be better than it was, with high rates of depression and anxiety (Maratos et al., 2012; Van der Horst et al., 2019). While medications can be prescribed to help with these symptoms, non-pharmacologic pain management techniques can be utilized by patients with high levels of efficacy and little risk of harm or side-effects (Andrews-Cooper & Kozachik, 2019). Non-operative modalities may include guided imagery, music therapy, gentle massage, cognitive behavioral therapy, and aromatherapy. There is a lack of data regarding nutrition and non-pharmacologic pain management in the setting of spine surgery.

## **Project Methods**

The purpose of this project was to encourage presurgical optimization of patients undergoing elective orthopedic spine surgery at a major academic medical center in Missouri by providing additional patient teaching information in the form of online videos. The goal was to

provide patients with quality information about optimizing themselves physically and emotionally for surgical stress. The videos could be accessed independently after their initial consultation with the surgeon, which allowed maximal time for the patient to make health changes prior to surgery. A secondary goal was to reduce the time burden of education for the clinical staff.

After both institutions determined the project to be a quality improvement project and IRB exempt, educational videos on nicotine cessation, physical exercise, nutrition, and pain management were developed using the current supporting literature. The content and outline were approved by the clinical site stakeholder, who is chief of the Orthopedic Spine Division. The videos were filmed by the project author who is a clinical nurse coordinator at the site. The videos were edited and approved by the marketing department for the target institution. The videos were uploaded to a private YouTube channel and were attached to a Google Forms survey developed for the project. Patients were given a handout with the link to the Google Form when they met the surgeon in clinic and surgery was recommended. The link was also sent via secure messaging in the electronic medical record to patients who were currently waiting for surgery. Demographic data was collected on all respondents and patients were asked to complete the survey for each video they watched. No personal identifying information was collected. Survey responses were collected over the course of six weeks.

### **Evaluation**

There were 13 unique responses to the survey. There were eight additional duplicate responses which were removed from the data set. All 13 included responses to every video. The videos had an average view count of 21.25 views, ranging from 15 for Smoking Cessation to 27 for Exercise. Survey responses to video views averaged 64.4%. This disparity included surgeons

and staff who watched the videos before distributing to patients. It may have also represented unique viewers, as well as repeat views, by individuals who did respond to the surveys. In order to quantify the qualitative survey responses, a Likert scale was used to assign numeric value to each possible response with five being a strongly positive response and one being strongly negative response.

The majority of viewers identified as female (69.2%) while male gender patients made up the other 30.8%. No patients identified as transgender or non-binary. The most common age category was 36-50 with 4 of 13 responses. A bachelor's degree was the most common education level with n=6. Salary ranges of \$50,00-74,999 and \$74,999-99,999 were tied with 4 responses each. Median responses were used to develop a patient profile of the patient most likely to access the videos. Based on median responses, that patient is female, age 51-65, with a household income of \$75,000-99,999 who holds a bachelor's degree and is scheduled for surgery in 1-3 months. Knowing this profile will allow us to target the audiences most likely to access the information in the future.

In all cases, the higher rated the video, the more views it had. The smoking cessation video had the lowest number of views at 15 and was rated the lowest by patients at 4.48/5. One viewer reported the information was not presented clearly. The lower rating was particularly true in the category of changing habits before surgery, which had the lowest ranked score for any question in the survey. Conversely, it was the only video in which 100% of respondents strongly agreed that they would recommend the video to others. These results were likely a reflection of most patients having been instructed to quit nicotine before meeting the surgeon. By the time surgery was recommended and they received the survey, they may have already been tested for nicotine use per institutional guidelines. Therefore, this video was probably less applicable to the patient

population, resulting in less views and lower ratings. On the opposite end was the exercise video, which was both the most watched with 27 views and the highest overall rating at 4.83. Exercise is a common concern for patients before and after surgery and the higher view count may have represented repeated viewing by patients. Nutrition was the second most-watched video at 24 views and was the second highest rated at 4.69. One respondent felt strongly the information was not presented clearly while a different respondent was neutral about using the information to change their habits before surgery. Pain management and coping had 19 views and was ranked third at 4.62. One viewer strongly felt that the information was not clear, and there was one neutral response to each of the questions about changing habits for surgery and the information being helpful.

The overall rating of the videos was 4.65, indicating a very positive response from patients. The rate of positive responses was 94.6%, while 5.4% were neutral or negative. This corresponded to a standard deviation of 0.7. The weakest category rating was using the information to change habits before surgery (4.46). The strongest rating was in viewers' willingness to recommend the videos to other patients undergoing spine surgery (4.9). This is the most important rating in estimating the future success of the project.

The suggestions provided by viewers were also extremely positive. A large majority of patients, 92.3%, stated they would like to see more videos in the future. Suggestions for future videos largely focused on post-surgery care and recovery. One request was for how to prepare the home prior to having surgery. There was also one request for a video on patients for whom surgery was not recommended, presumably focusing on non-operative treatment. Viewer feedback focused on gratitude for producing the project. A few responses included how the patient will use the information they learned to initiate positive changes.

## **Impact on Practice**

This project was well received by patients and by medical staff. Patients reported that it helped augment the education that was provided by the spine nurses preoperatively, and the staff appreciated having a resource to refer patients to that saved them time from having to teach it. Shortly after this project launched, an interdepartmental committee was formed to develop further spine video education projects. Immediate projects in development through this committee include teaching videos for patients participating in new spine surgery rapid recovery ERAS protocols. The videos developed for this project are forming the foundation for those videos.

It will be important to make videos easily accessible for patients and to limit the time burden on staff in distributing them to patients. A few ways to increase access would be to include a section on video education on the practice website, include them on the Facebook page, and to launch a YouTube channel for the spine division. These would allow patients to access the videos directly without requiring staff to distribute specific links. Surveys could be attached as links on any of these platforms to continue data collection.

## **Conclusions**

Surgical optimization video education was well received by patients. It was easily understood by patients, helped them feel better prepared for surgery, and motivated them to make changes in their health habits prior to surgery. Patients expressed a desire to see additional videos largely focused on recovery. Further investigation is needed to see if the videos led to health changes before surgery or improved clinical or patient reported outcomes after surgery. Consideration could also be given to development of more extensive teaching videos encompassing diagnoses and surgical techniques.