DEVELOPING AND IMPLEMENTING AN OBSTRUCTIVE SLEEP APNEA AND SLEEP STUDY PATIENT EDUCATION VIDEO IN A SLEEP MEDICINE CLINIC

A Dissertation
Submitted to the Graduate Faculty
of the
North Dakota State University
of Agriculture and Applied Science

By

Elizabeth Grace Ugelstad

In Partial Fulfillment of the Requirements
for the Degree of
DOCTOR OF NURSING PRACTICE

Major Department:
Nursing

March 2018

Fargo, North Dakota

North Dakota State University
Graduate School

Title

DEVELOPING AND IMPLEMENTING AN OBSTRUCTIVE SLEEP APNEA AND SLEEP STUDY PATIENT EDUCATION VIDEO IN A SLEEP MEDICINE CLINIC

By

Elizabeth Grace Ugelstad

The Supervisory Committee certifies that this ***disquisition*** complies with North Dakota State University's regulations and meets the accepted standards for the degree of

DOCTOR OF NURSING PRACTICE

SUPERVISORY COMMITTEE:

Heidi Saarinen, DNP, FNP-C
Chair

Dean Gross, PhD, FNP-C

Kelly Buettner-Schmidt, PhD, RN

Daniel Friesner, PhD

Approved:

April 10, 2018
Date

Carla Gross, PhD, RN
Department Chair

ABSTRACT

Patient education is the catalyst to raise patient competence in self-care and health management and may be the most important action performed by healthcare providers as they seek to empower patients towards better health outcomes (Bastable, 2016). The purpose of this project was to offer providers in a midwestern urban clinic specializing in Sleep Medicine a more effective means of disseminating education to patients potentially diagnosed with Obstructive Sleep Apnea (OSA) in a timely, efficient, and effective manner. Objectives of this project included the following: demonstrate technological caring through development of an evidence-based audiovisual patient education modality on OSA in congruence with the organization's Learning Services and evidence-based practice; provide the Sleep Medicine providers an evidence-based audiovisual patient education modality on OSA in an online format linked within the organization's established patient-provider communication system; elicit consistent Sleep Medicine provider utilization of the OSA patient education video on OSA; and provide educational caring to Sleep Medicine patients through the implementation of the OSA patient education video in Sleep Medicine provider practice. The project was conducted in close collaboration with the clinic providers and Learning Services with development of an evidence-based OSA patient education video to implement in practice. The video was accessible for patient review at home utilizing an online patient-provider communication program. The project assessed provider utilization of the OSA educational video. The provider distribution of computer keyboard surveys was 24%. However, of the computer keyboard surveys collected, Sleep Medicine providers offered the video to 74% of new consults. Of the patients who were offered the video, 90% were receptive to viewing the video. The Sleep Medicine providers also offered qualitative and quantitative feedback on video content, offering suggestions for video

change and insight for practice use. The findings pointed to a need to further hone the video content and delivery method. Furthermore, the findings suggested providers were likely to utilize the patient education video and patients were receptive to the patient education video. Utilizing the findings of the project, patient use of education videos could be a future study in this practice site.

ACKNOWLEDGEMENTS

I would like to thank the providers and staff at the Sleep Medicine clinic where I implemented this project. You are a delightful group of professionals and provide phenomenal patient care. I could not have completed this project without your help. I would also like to express my deep gratitude to Heidi Saarinen, my dissertation chair, academic adviser, and mentor. Thank you for your unwavering personal and professional support. You have taught me life is not about reaching a goal, but rather about who we become – and the lives we touch – in the process.

I would also like to thank my parents, Bruce and Sheri Ugelstad, for their continual support through this educational endeavor. Not every girl in the world has parents who support them to pursue both their academic and personal dreams, and I am so thankful mine do. Amy Olson, your words of encouragement keep me learning and growing. Ashley Macy, your late-night commuting calls and encouragement to be brave in following God's plan for my life have spurred me on in pursuit of this degree. Nicole Ugelstad, you inspire me to be the confident person I have been created to be and I am so grateful to have you in my life. And to the family, friends, classmates, and coworkers who are too numerous to name, know I thank God for each one of you. I am blessed beyond measure to have been supported by you all.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

CPAP.....Continuous Positive Airway Pressure

CPR.....Cardiopulmonary Resuscitation

DOT .....Department of Transportation

HIPAA .....Health Insurance Portability and Accountability Act

HPV.....Human Papillomavirus

IRB.....Institutional Review Board

NDSU.....North Dakota State University

OSA.....Obstructive Sleep Apnea

HHS.....United States Department of Health and Human Resources

INTRODUCTION

Patient education is the catalyst to raise patient competence in self-care and health management and may be the most important action performed by healthcare providers as they seek to empower patients towards better health outcomes (Bastable, 2016). As patient competence and confidence in self-care is improved through proper patient education, patient health outcomes are impacted. Kearney, et al. (2011) found patients who attended a preoperative class reported they felt prepared for surgery and were able to better control their post-surgical pain than patients who did not attend the class. In a study by Bergin, et al. (2014), patients who received patient education on incentive spirometry use – a breathing exercise to prevent postoperative complications – had lower pain levels and a shorter length of hospital stay when compared to their cohort who did not receive the education. Hypertension patients who received patient education from nurses have experienced a marked decrease in blood pressure along with increase in medication treatment compliance (Hacihasanoğlu & Gözüm, 2011). Such evidence points to the importance of patient education and the imperative nature of properly developing patient education as it leads to direct impact on patient outcomes. Despite the plethora of evidence on how patient education helps improve patient care and outcomes, providers often encounter barriers which hinder the patient education process. These barriers may be anything from time to assemble evidence-based patient education to lack of knowledge of current evidence on patient education. Regardless of the type of barrier, efforts to improve patient education in an evidenced-based way should be a priority for providers to improve patient care and outcomes.

Sleep Medicine is an emerging field with limited evidence and recommendations published for patient education. However, utilizing evidence from other fields and specialties can

provide an evidenced-based approach to patient education for Sleep Medicine patients. Multiple studies conducted in various patient populations and practice settings support the use of patient video education, as will be discussed in the literature review. This clinical dissertation further supports evidence supporting the patient education video on Obstructive Sleep Apnea (OSA) and details the implementation of video education into practice at a Sleep Medicine Clinic in a midwestern urban location.

Background and Significance

Importance of Patient Education

Grady (2011) suggests patient education is one of the most important factors enabling patient self-care and management. Implementing patient education with an organized approach can lead to enhanced patient understanding of health knowledge (Kim et al., 2012). Along with improved health knowledge, patient education has also been linked to improved patient satisfaction (Stalker & Elander, 2015).

Formal patient education is linked to improved patient outcomes, including feelings of better preparation for surgical interventions and better control over levels of pain postoperatively (Kearney, Jennrich, Lyons, Robinson, & Berger, 2011). Proper patient education on incentive spirometry (a breathing exercise to decrease surgical complications) led to a decrease in both patient levels of pain and length of stay (Bergin et al., 2014). Additionally, nursing implemented patient education has been shown to increase medication treatment compliance and decrease patient blood pressure (Hacihasanoğlu & Gözüm, 2011). These, and other current evidenced-based literature articles, support the delivery of patient education in a variety of formats from conventionally written and verbal to more modern electronic delivery methods. Regardless of the

chosen educational format, the implementation of evidence-based patient education interventions should be of upmost importance to providers who wish to improve patient outcomes.

Beyond patient outcomes, implementing patient education can improve patient satisfaction with their healthcare provider. With recent changes following the Affordable Care Act, patient satisfaction has financial implications for providers (James, 2012). Utilizing effective patient education and communication techniques may increase patient perception of disease understanding and thereby increase satisfaction with their healthcare provider (Wright Nunes et al., 2011).

While the aforementioned research and other recent literature supports the delivery of patient education in various forms to increase patient outcomes in a variety of patient populations, relatively little research has been conducted on patient education specific to the area of Sleep Medicine. This is most likely due to the emerging nature of Sleep Medicine as a field. However, applying broader evidenced-based knowledge of patient education to the Sleep Medicine population may enhance the delivery of patient education in this patient population. Doing so could lead to improved outcomes in the target population as patient education has been demonstrated to improve outcomes in other patient populations.

Nursing's Impact on Patient Education

Grady (2011) argues for nurses to equip patients with effective self-management strategies so the patient may maintain their independence and functioning along with their mental and physical health. Such self-management strategies will require effective and efficient patient education modalities to improve patient outcomes. Nurse-led patient education interventions have been shown to increase patient adherence to treatments, leading to improved quality of life (Chen et al., 2015). Nursing patient education interventions have also been shown

effective in improving patient adherence to medication and lowering patient blood pressure (Hacihasanoğlu & Gözüm, 2011). As part of the interdisciplinary team, nursing as a profession can make valuable contributions to patient education and improve patient outcomes. As health care providers desiring to optimize patient care, patient outcomes, and patient satisfaction, advanced practice nurses should be involved with the development of patient education. Advanced practice registered nurses are capable of leading successful patient education interventions. A pilot study found oncology patients who received oral and written patient education on the benefits of hospice and advanced directives from advanced practice registered nurses had an increased quality of life when compared with patients who did not receive the patient education (Dyar, Lesperance, Shannon, Sloan, & Colon-Otero, 2012). Note, the previous study was originally planned to be a complete study but was changed to a pilot study when participants overwhelmingly requested not to be in the control cohort, but rather in the patient education cohort. Advanced practice registered nurses can implement successful patient education interventions and should seize the opportunity to do so as a part of their scope of practice to achieve better patient outcomes.

Barriers to Patient Education

While providers strive to provide the best to their patients, they encounter barriers to providing care and patient education. One barrier to patient education is patient health literacy levels. Health literacy is "the degree to which individuals can obtain, process, and understand the basic health information and services they need to make appropriate health decisions" (Institute of Medicine, 2004). The United States Department of Health and Human Resources (HHS, 2008) states over half of patients in the United States have an intermediate health literacy level, meaning they can perform health related tasks such as read and comprehend a prescription label.

The HHS also recognizes that nearly one in five patients in the United States has a basic level of health literacy, meaning he or she can perform health related tasks such as reading a straightforward pamphlet and recall information. While the HHS does not recommend any specific grade level for health information, they recommend presenting health information in a straightforward manner and offering it in a manner that is easily accessible. Furthermore, they acknowledge the importance of offering non-print health materials as a source of valuable health information along with healthcare provider recommendations (HHS, 2008). The Agency for Healthcare Research and Quality recommends providing materials at a fifth or sixth grade reading level as a universal precaution in consumer health education to promote understanding of most audiences (Brega et al., 2015).

Providers may struggle to provide patient education in formats patients find easy to understand. While providers may see low health literacy in patient populations as a barrier to obtaining, processing, and understanding patient education, recent literature suggests patients receive some benefit from patient education provided, regardless of the patient's level of health literacy (Eckman et al., 2012). This points to the importance of providing proper patient education to help increase patients' knowledge of health conditions, even if the patient has a low health literacy level.

Beyond low patient health literacy, another perceived barrier to patient education is time. Providers often feel pressed for time when caring for multiple patients during their day. A recent study by Hemsley, Balandin, and Worrall (2012) interviewed multiple nurses who had worked with clients who had special communication needs. Some participants cited a lack of time as a barrier to providing adequate patient education. However, the study also described the utilization of patient communication tools, such as a communication board, optimized patient-nurse

communication for those patients who had special communication needs (Hemsley et al., 2012). This study points to the need to utilize resources to their fullest extent to overcome the time barrier faced by healthcare providers today.

Video Patient Education as Effective Modality

Patient education has traditionally been offered in a variety of formats ranging from written and verbal to electronic. When choosing a patient education modality to utilize, providers must consider which modality would be suit their practice and patient needs. While verbal and written patient education may be appropriate to offer during an in-office visit, other modalities may need to be considered to reinforce the patient education out of office.

Offering a patient education video to patients for review at their convenience prior to their appointment has been shown to improve patient knowledge comprehension and patient satisfaction (Kim et al., 2012; Stalker & Elander, 2015). Patient video education in conjunction with written information has also been shown to be more effective than written health information alone (Wilson et al., 2015) and has also been shown to have effects on patient satisfaction, patient experience, and patient anxiety levels (Crabtree et al., 2012).When providing patients with health information to review as frequently as desired prior to, during, and after their consult, provider practice will be impacted as they empower patients with relevant health knowledge to be learned at the patient's pace. As will be discussed in depth in the Literature Review section of this paper, a variety of research studies have shown videos to be a successful modality for patient education.

Problem Statement

Providers in a midwestern urban clinic specializing in Sleep Medicine were striving for a more effective means of disseminating education to patients potentially diagnosed with OSA in a

timely, efficient, and effective manner. While the Sleep Medicine clinic offered written material describing OSA risks, signs, symptoms, and treatments available to give at initial patient consults, the providers did not have a more encompassing patient education in a formal modality to offer patients. The clinic serves a wide geographical patient population and diverse range of patients, presenting a challenge for providers when considering how to provide both the best care to the patient along with adequately educating them on their condition. Sleep Medicine patients at this clinic may have to wait anywhere from one to three months for a further polysomnogram (sleep study) evaluation and are at risk to forget pertinent facts about the medical condition for which they are being evaluated.

Sandberg, Sharma, and Sandberg (2012) studied the free recall (recall when prompted by an open-ended question) of participants. They found that healthy college-aged participants could free recall a mere average of 21.3% of the informational items presented to them after a one-time viewing of a five-minute informational video, mimicking an anesthesiologist's verbal patient education on a surgery and anesthesiology instructions. The authors suggested providers offer important information in a variety of modalities to help patients remember important information. Offering patients additional educational modalities on OSA could improve Sleep Medicine patients' retention of health information. The review of patient education through multiple patient education modalities is more effective for teaching patients than utilizing one singular modality (Stalker & Elander, 2015; Wilson et al., 2015).

At an informal meeting on April 21, 2016, providers at the midwestern Sleep Medicine Clinic expressed a wish to further develop patient education modalities in their current practice. With the desire to enhance patient outcomes and satisfaction, multiple providers at the clinic verbally expressed their wish for development of patient education on a variety of sleep health

topics, acknowledging additional development of patient education would make their current practice more efficient. Patient education can improve patient outcomes, lending urgency for the development of further patient education beyond the expressed desires of the Sleep Medicine providers. Patient education is a large part of nursing practice (Bastable, 2016); thus, at all levels of care, nurses should be concerned about the organization's development of patient education.

As will be discussed in the literature review, a strong case was made for the development of additional OSA patient education modalities. Providing patient education in an audiovisual format has been shown to be an effective and would enhance current provider patient education practice on the topic of OSA for immediate use. This may result in increased patient satisfaction and improved patient outcomes.

Needs Assessment

An informal needs assessment discussion was conducted during a Sleep Medicine Provider meeting in April of 2016. A provider within the chosen facility had approached the coinvestigator to help with the development of an OSA patient education video. The Sleep Medicine provider was looking for ways to improve the patient education process. The providers had previously developed a patient education pamphlet. However, the providers questioned whether a pamphlet was the best way to provide health information and were searching for cost-effective options to effectively convey the OSA health information. The providers acknowledged they would like to offer the potential video in various settings – as a link on the patient's online organizational medical chart (with patient-provider communication capabilities) available to the patient for viewing at their convenience, as a DVD in the patient waiting room at the Sleep Clinic, and perhaps on a tablet or computer in the patient exam room while the patient is waiting for the provider to enter the room. All such situations would enable the patient to receive basic

education on OSA allowing time for the patient to ask questions about the condition during the appointment with the provider. However, to hone the utilization focus, the patient education video was developed with the intent to post a video link to the patient's online organizational patient-provider communication application and be utilized after the consult appointment, depending on the patient situation and needs. All nine Sleep Medicine providers gave verbal feedback that additional patient education was needed and that an educational video would be well-suited to the patient education needs of the department. They acknowledged a patient education video could be an effective way to convey health information and could make their practice more efficient. Multiple times throughout the meeting, providers expressed their enthusiasm at the prospect of the development of this patient education.

Since all providers indicated they wanted a video, a survey ascertaining more specific feedback from the Sleep Medicine providers was conducted July 12, 2016 (see Appendix B). In this needs assessment, all the Sleep Medicine providers (n=9) stated they would like to have some form of patient video education to utilize in their practice. All providers indicated on the survey they would utilize a patient education video on OSA in their practice. Two providers indicated a binder with comprehensive OSA education would be their second option. Furthermore, all the Sleep Medicine providers acknowledged a patient education video on Obstructive Sleep Apnea would make their practice more efficient. The providers indicated they would utilize the video in a variety of ways. The two most occurring responses on the needs assessment were the items "played for patient during/after provider visit" (n=8) and as "link sent on [organizational online patient-provider communication application] for the patient to review at home prior to the sleep study" (n=6). Three providers indicated they would be interested in playing the video for patients in the waiting room. One provider noted if the video was to be

played in the waiting room before the patient visit, the Sleep Medicine Clinic should have at least two computers in the waiting room with headphones or available with closed captioning for the patients to view these videos before their appointment. Pertaining to the content of the patient education video, providers indicated they would like to include pathophysiology, symptoms, risk factors, diagnosis, sleep study, and treatment. More specifically, one provider's needs assessment response indicated he/she would like the pathophysiology to be "basic," and that complications of OSA should be included in the video. Another provider noted "simple is better," stating additional videos may be needed to cover further topics. All providers (n=9) indicated they would utilize such a video in their adult patient populations. Most providers (n=8) responded they would use the educational video with patients requiring evaluation for Department of Transportation (DOT) referrals. DOT patients are frequently referred based on certain criteria from the exam (increased neck circumference, elevated Epworth Sleepiness scale scores, or obesity) and undergo sleep studies before seeing a Sleep Medicine provider. In such cases, providers thought having a patient education video on OSA and sleep studies might be useful for patients to review before their sleep study and bridge a gap in knowledge until they could see a Sleep Medicine provider. Some providers (n=5) responded they might use such a video with the parents of children; however, one provider noted a separate video would need to be developed for pediatric patients and their parents. All the Sleep Medicine providers (n=9) indicated a patient education video on OSA would improve patient education in their practice with one provider commenting "This will be very helpful in our practice and will be beneficial for patients." All responses to the needs assessment indicated positive feelings for a patient education video on OSA. Since patients potentially diagnosed with OSA require a sleep study,

the inclusion of information on sleep study procedures was agreed to be included as a part of the OSA patient education video.

Project Description

This project entailed performing a Sleep Medicine provider needs assessment prior to drafting an evidence-based patient education video on OSA and sleep study procedures to elicit provider feedback assessing what was most pertinent to include in the video and what would be the initial needs for video delivery (Appendix D). The drafted patient education video was created by the coinvestigator based on a previously approved OSA brochure currently used by the department. This video draft was presented to the Sleep Medicine providers for review and proposed changes were made to the video. Following the provider feedback, the edited video draft was proposed to Learning Services and approval sought for production of the video. After approval was obtained for video production, Learning Services produced the proposed video in congruence with organizational policy. Learning Services also solicited feedback from enterprise wide Sleep Medicine providers, as the video had to be available enterprise wide to best suit the needs of the organization. After the video was available for use in practice, the Sleep Medicine providers were educated on how to implement the OSA patient education video into their practice and a four-week pilot video implementation was initiated while providers were surveyed on utilization in practice. Following the four-week pilot video pilot, providers offered feedback on video utilization and content, formally concluding the project.

Project Purpose

The purpose of the project was to provide the Sleep Medicine providers at a local Sleep Medicine clinic with an evidence-based patient education video on OSA and sleep studies as a tool to enhance patient education in practice. As patient education has been linked with improved patient outcomes, this project sought to impact provider practice to enhance patient health care delivery. A patient education video on OSA gave the Sleep Medicine providers an evidenced-based medium of patient education to effectively reach clients with pertinent health information. The OSA and sleep study patient education video was available to the patient for additional viewing through an online link and was offered at the discretion of the provider. The video could be used repeatedly, as patients were able to view at any time they wanted to review the information. Providers offered the video to clients they felt would benefit from reviewing OSA and sleep study information. In turn, offering a patient video for at home viewing could potentially increase patient retention of information, as evidence suggests providing patients with educational material for at home review can increase their retention of the information (Wilson et al., 2010). The video supported patient education handouts provided by the Sleep Medicine clinic, thus increasing the opportunities for the patients to learn. This project was desired by the Sleep Medicine providers as they seek to offer the best patient care possible.

Project Objectives

Since evidence supports the implementation of a patient education video that would both serve the department needs and positively impact patient care, this project focused on the development and implementation of such a video on OSA for the Sleep Medicine Clinic. This video was developed in congruence with Learning Services. Additionally, to ensure the utilization of the patient education video in practice, provider satisfaction with the end-product

was essential. These things considered, the project objectives for this DNP clinical dissertation were as follows:

1. Demonstrate technological caring through development of an evidence-based audiovisual patient education modality on Obstructive Sleep Apnea in congruence with the organization's Learning Services and evidence-based practice by May 2018.
2. Provide the Sleep Medicine providers an evidence-based audiovisual patient education modality on Obstructive Sleep Apnea in an online format linked within the organization's established patient-provider communication system by May 2018.
3. Elicit consistent Sleep Medicine provider utilization of the OSA patient education video on Obstructive Sleep Apnea by May 2018.
4. Positively impact Sleep Medicine patients through the implementation of the OSA patient education video in Sleep Medicine provider practice by May 2018.

Timeline of Project Phases

Table 1

Project timeline

Phase/Time Frame	Activities of Phase
Phase 1: March 2016-April 2016	Established relationship with the Sleep Medicine providers; established relationship with the organization's Learning Services; developed outline for OSA patient education video
Phase 2: May 2016-July 2016	Needs assessment conducted; Preparation of written Clinical Dissertation Proposal
Phase 3: August 2016	Organization's Graduate Nursing Student Proposal Meeting
Phase 4: October 2016	Clinical Dissertation Committee Proposal
Phase 5: October 2016-November 2016	Obtained the organization/NDSU IRB approval, worked with Learning Services to refine and approve OSA patient education video
Phase 6: November 2016-November 2017	Collaborate with Learning Services to develop patient education video
Phase 7: December 2017-February 2018	Implement patient education video pilot in Sleep Medicine clinic
Phase 8: February 2018	Evaluate Sleep Medicine provider clinical use of patient education video
Phase 9: March 2018	Clinical Dissertation Defense

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

In searching the current literature for educational approaches for the Sleep Medicine patient population, EBSCO, Cochrane, and gray literature searches yielded limited results. Key terms searched included the following: sleep, Obstructive Sleep Apnea, patient, education, teaching, adult, sleep, clinic, handouts, video, learning, and disorders. Sleep Medicine is a still emerging specialty with limited evidence-based research pertaining to patient education. However, using the limited evidence-based research pertaining to Sleep Medicine and, more specifically, OSA in existence along with evidence-based research in patient education yields a strong argument for the development of a patient education modality on the topic of OSA. This literature review establishes the link between patient education and the following: patient and provider implications; patient video education as an effective modality, and patient education evidence in the Sleep Medicine specialty.

Patient Education: Patient and Provider Implications

Patient Outcomes

Patient education is linked to patient outcomes. In a study of 150 post-operative joint replacement patients, patients who participated in preoperative education reported being better prepared for surgery and felt they were able to control their pain after surgery than those who did not (Kearney et al., 2011). The authors suggested implementing pre-procedure patient education as a part of a standardized approach to surgery to improve patient preparation for procedures. Bergin et al. (2014) examined the effects of preoperative incentive spirometry (a breathing exercise frequently utilized for surgical patients) education for total knee and total hip replacement patients. In this study, researchers found patients who received incentive spirometry preoperative education had fewer postoperative pulmonary complications, fewer non-

postoperative pulmonary complications, and a slightly shorter length of stay. Though the authors did not speculate as to why this might be, they did note that any such intervention, which may decrease the length of stay and thus decrease patient medical cost, is worth further review (Bergin et al., 2014).

Brown et al. (2016) examined the effects of a patient educational program on bariatric surgical patients. Qualified participants read a sixteen module patient education booklet on a variety of food and health related topics (calories, healthy options, motivation, exercise, food options, thought process, lifestyle changes, etc.) in paper or online format before undergoing various bariatric surgeries. The multi-disciplinary bariatric clinic found the percentage of clients who failed to attend their first postoperative appointment decreased from 12.1% to 2.1% after the patient education intervention. Interestingly, the clinic also saw clients lose an average of 9.1 pounds more than average patients who underwent this procedure and did not participate in the patient education at one-year post intervention. This evidence points to the drastic difference structured patient education can make not only on patient physical outcomes, but on attendance to follow up appointments, which impacts both patient care and provider work flow.

Another study examined the use of web-based pre-operative patient education, including a patient video education, on orthopedic patients (Van Eck, Toor, Banffy, & Gambardella, 2018). Ninety patients were placed in the control group to receive routine perioperative instructions and eighty-seven were placed into the group receiving both routine pre-operative instruction along with web-based perioperative instruction. Twenty-eight of the eighty-seven participants selected to receive web-based patient education were also selected to receive patient video education through the web-based education system. The researchers discovered patients who received the web-based education had increased satisfaction with their surgical recovery. However, the

authors did not find a difference in satisfaction scores between patients who received web-based patient education and web-based patient education with patient video education. The authors speculated simply having additional modalities may increase patient satisfaction, while that modality could be offered in a variety of formats. Though these findings do not blatantly support the development and implementation of patient video education, they do support the further development of patient education modalities to offer patients. In turn, additional patient education modalities may increase patient satisfaction with treatment outcomes.

Additionally, researchers examined patient education satisfaction patients undergoing lung cancer surgery (Oswald et al., 2018). Patients received information from their cancer specialist nurse, their respiratory physician, their thoracic surgeon, and a preoperative assessment nurse. In addition, patients were also provided a lung surgery handbook and DVD. Oswald et al. (2018) found patients felt well prepared for surgery but felt less well informed during the recovery process. The authors suggested offering a website with written and audiovisual information could be a valuable addition to patient education approaches and extend education to be readily accessible to patients at their convenience.

While these research studies were conducted with specific patient populations, the authors point towards the link between proper patient education and the impact on positive patient outcomes. This evidence suggests patients may be better prepared and have optimized outcomes when properly educated before an intervention. For the purposes of this project, these studies clarified the importance of providers offering robust patient education to improve their patient outcomes. Offering OSA education online prior to their sleep study may enhance their understanding of the sleep disorder, leading to better follow up and adherence to treatment regimens.

Patient Treatment Adherence

While patient education may directly affect patient outcomes in some settings, other settings do not have such direct evidence. In certain fields, such as Sleep Medicine, patient outcomes may be more indirectly linked to patient treatment adherence. Interestingly, current evidence links patient education to increased patient treatment adherence, as will be discussed in this section.

In a survey of over 10,000 people with a history of elevated cholesterol levels, Wei et al. (2013) examined characteristics of patients who were and were not compliant with statin therapy – a medication therapy commonly utilized to lower cholesterol levels. Of the thousands of people surveyed, patients were categorized as former statin users or current statin users. Of those who were former statin users, or "discontinuers," individual factors of significance were those of black ethnicity, having a household income of less than $50,000 annually, high prevalence of side effects, and utilization of the internet to research medication effects. What is of interest is the patient satisfaction level with the education given by the provider between the former and current statin users. In the study, 83% of current statin users reported satisfaction with their provider's education of cholesterol treatments compared to only 65% of former statin users. The authors noted that after multivariate adjustment, there was an increased probability of adherence for patients who were satisfied with the patient education delivered by the provider. Though this study does not explain the nature or quality of the patient education provided to each individual patient, it does suggest patient education and patient satisfaction with their provider plays an important role in patient treatment adherence (Wei et al., 2013).

Another study evaluated the effectiveness of anti-hypertensive patient education and in-home monitoring nursing intervention on patients with hypertension. Hacihasanoğlu and Gözüm,

(2011), divided 130 participants into three groups: Group A, Group B, and Group C. Group A received only patient education on medication adherence and blood pressure monitoring; Group B received patient education on medication adherence and healthy lifestyle behaviors and blood pressure monitoring; and Group C received no patient education, only blood pressure monitoring. Pre- and post-tests examined systolic and diastolic blood pressures, medication-adherence self-efficacy scale, health-promoting lifestyle profile, and body mass index of the three groups. While the educational interventions in lowering both systolic and diastolic blood pressures and improving both medication adherence self-efficacy and health-promoting lifestyle profile scores in Groups A and B were statistically significant, Group C did not experience significant differences in these areas. More interesting is the reported adherence to medication regimen for those prescribed with medication amongst the groups. Prior to intervention, Group A reported a 25% adherence; Group B reported a 22.5% adherence; and Group C reported a 27.5% adherence. Post-intervention, Group A reported an 80% adherence; Group B reported an 85% adherence, and Group C reported 42.5% adherence (Hacihasanoğlu and Gözüm, 2011).

Not only do the findings of this study demonstrate an effective nursing intervention and the valuable contributions of nursing to the interdisciplinary team, they also demonstrate the importance of patient education in medication adherence. For the purposes of this project, this study established both the significant contribution nursing can make to patient education and the impact of patient education on treatment adherence. Additionally, this study demonstrates the importance of providing patient education to promote treatment adherence.

Provider Implications

Healthcare providers educate patients for moral and ethical reasons, patient outcomes, and financial incentives. Depending on the clinic setting and billing process, salaries for some

clinic providers may be based on the volume of patients seen daily in practice. However, with the implementation of the Affordable Care Act, national trends push towards a pay-for-performance for providers, partially based on patient outcomes and patient satisfaction (Centers for Medicare & Medicaid Services, 2013). Regardless of the reimbursement model currently utilized, patient satisfaction plays a role in both volume-based reimbursement models and pay-for-performance models (James, 2012). For providers whose salary is based on the volume of patients seen, patient satisfaction plays a large role in word-of-mouth referrals and the individual patient's plan to stay with providers to increase or maintain volume of patients seen. For providers whose salary is pay-for-performance based, patient satisfaction is more measurably tied to their salary. Either way, providers are forced to examine their patient's satisfaction with the care provided to them (James, 2012). Patient education is linked with higher patient satisfaction with providers, making patient education an issue pertinent to providers.

In a study of almost 400 patients with chronic kidney disease, patients were surveyed for perceived and objective knowledge of disease along with their satisfaction with the knowledge provided to them by their health care provider. Wright Nunes et al. (2011) found patients who were satisfied with their provider's communication of the chronic kidney disease process had increased levels of perceived chronic kidney disease knowledge. In this study, objective chronic kidney disease knowledge was not linked to patient's satisfaction with provider's communication. However, from this we may learn that patients who are satisfied with their provider's communication – including the satisfaction with patient education given to them by their provider – also feel they understand their disease process.

Patient experience and preparation can also be improved through different modalities of patient education. Researchers at the Washington University School of Medicine compared

patient anxiety levels, patient satisfaction, patient perception of preparation, and patient pain levels after viewing an educational video outlining preoperative, operative, and postoperative expectations (Crabtree et al., 2011). The authors found patients who watched the video and had preoperative discussion with their surgeon had better overall satisfaction with their surgical experience, thought they were better prepared for surgery, and reported lower levels of anxiety than those who only had preoperative discussions with their surgeons (Crabtree et al., 2011). This study is an example of how an increase in patient satisfaction can be increased while perception of treatment and anxiety levels can be decreased when patient video education is utilized in conjunction with one-on-one patient-physician discussion.

Barriers to Patient Education

Patient learning does not necessarily take place when the provider instills motivation and demonstrates initiative, but rather it takes places when the educator removes obstacles to learning and enhances the learning process (Bastable, 2016). Obstacles to learning can be anything from lack of time, access to reliable health information, or low patient health literacy. Current literature reveals pertinent findings on the impact of patient education despite barriers.

Low patient health literacy is a direct barrier to a patient's ability to understand health information. However, current evidence suggests patient education may enable patients to experience improved outcomes despite low levels of health literacy. Eckman et al. (2012) studied the impact of a patient education video and written information on patients with lower and higher health literacy levels. One hundred and seventy participants at risk for or with Coronary Artery Disease were categorized as having lower or higher health literacy levels based on their Rapid Estimate of Adult Literacy in Medicine score. Participants were either given a patient education booklet "Living with Coronary Heart Disease – Doing Your Part" and watched a thirty-minute

patient education video presenting similar information as the booklet or just reviewed the booklet. While the study did find that the educational intervention prepared at a fifth-grade literacy level improved patient outcomes, they also found that patients' Coronary Artery Disease knowledge improved – regardless of the type of educational intervention or their baseline health literacy level (Eckman et al., 2012). For the purposes of this clinical dissertation, this study shows the importance of providing patient education – regardless of format – to patients of all health literacy levels to improve health knowledge.

Another barrier to patient education is time. In interviews with fifteen hospital nurses, a recent study suggests time to be both a barrier and facilitator to communication with patients who have developmental disability or complex communication needs (Hemsley et al., 2012). Some nurse participants described themselves as being extremely busy with high patient workloads. Having a patient with increased communication needs demanded more time than some participants felt they had to give. The authors suggested allowing more time, prioritizing communication, understanding the patient's individual communication style, and applying adaptive strategies as approaches to communication with patients who have additional communication needs. From this study, the importance of having adaptable patient communication techniques to utilize in practice is shown. Adapting to individual patient's needs can be an important facilitator to patient communication and patient education.

Patient Education: Video Modality

Videos and Health Literacy

Beyond the realm of Sleep Medicine, numerous other specialties have found patient educational videos to be an effective modality for patient education to improve health literacy.

Patient education has been shown to help improve health literacy. Therefore, weight is given to the importance of patient education development.

Wilson et al. (2015) utilized a video to depict cardiopulmonary resuscitation (CPR) and resuscitation preference options along with an educational pamphlet and a routine code status discussion with physician to an experimental group. Though the authors did not provide details of the video development and targeted literacy level, they found the experimental group who watched the video had a better understanding of CPR terminology when compared to the control group who received only an educational pamphlet and routine code status discussion with physician. Forty-two percent of participants in the video group could accurately name more than two components of CPR compared to eighteen percent in the control cohort. Though the study was conducted in an acute-care intensive care unit, the findings may be transferable to a larger patient population – including those in the Sleep Medicine population. These findings suggest video education is more effective than traditional pamphlet educational handouts, not only in teaching patients, but also in helping their families obtain, process, and understand this vital health information.

When first learning about any medical condition, including OSA, many medical and treatment terms must be understood. A recent study of patients from two low-income clinics found patient education videos to be an effective method for teaching health terminology to patients with severe lack of prostate health terminology comprehension (Wang et al., 2015). Researchers utilized animations along with medical terms in a patient education video to educate patients on prostate associated health terminology. Participants in this study had an average of a 7^{th} to 8^{th} grade literacy level and showed significant gains in their prostate health terminology after watching the patient education video. This study shows video-based interventions utilizing

visual graphics and medical terminology can be effective in increasing the health literacy levels of patients with lower literacy levels.

Additionally, another study found combining written and video patient education elements can impact health-related quality of life on patient with various levels of education when compared to providing written education alone for the pain management of hemophilic patients (Stalker & Elander, 2015). Participants of both groups (written and written/video education) were analyzed in three categories: high school-only education, further education, and higher education. Of the three categories, those with high school-only education showed significant improvement in their mental quality of life after receiving both the written/video education when compared to their mirror cohort who received only written education (Stalker & Elander, 2015). At baseline, high school-only participants showed significantly lower mental quality of life. After the written/video education, the mental quality of life levels rivaled those of the more educated cohorts. While pain is subjective, and hemophiliacs are a very specific patient population, this study suggests video patient education can have significant impact on patients with lower education levels leading to subsequent increase in mental quality of life as videos help obtain and process health information pertinent to patients.

Some evidence suggests that not only do patient education videos increase health knowledge, but they can instill a sense of urgency in addressing an issue. A researcher developed an “informative and brief” 12-minute video explaining advance directive documents, current policies, benefits, and limitations of advance directives and showed this video to inpatient and outpatient adult cohorts (Toraya, 2014). Prior to the video, 28.9% of participants had discussed their advanced care health wishes with their physician. After the viewing of this informational patient education video, 78.6% of patients reported plans to complete advanced directives.

Participant comments on post-video surveys indicated a changed perspective, an increased understanding of advanced directives, and sense of confidence and urgency in discussing these issues with both their family and providers. This evidence shows a brief and informative patient education video can both change perceptions of health-related issues and increase awareness and urgency in taking action on serious health care issues.

Videos to Target Various Patient Demographics

Not only have videos been shown effective in improving patient health literacy, patient video education has been shown effective in providing education to various patient demographics. A study examined a patient video education as a tool to educate patients greater than 60 years old before performing transforaminal epidural blocks (Kim et al., 2012). The study found patient video education to be more effective than written education to provide treatment explanation to older patients on risks and benefits prior to obtaining consent for procedures in a pain clinic (Kim et al., 2012). When attempting to educate various age demographics in the target population patient cohort, it is important to consider that patient video education may be a better option than conventional paper education for those of various ages within the cohort.

Other evidence suggests written patient education and video patient education to be equally effective in a college-aged cohort. A study of 200 university students found both written and video education interventions to have equal outcomes when educating college-aged patients on the Human Papillomavirus (HPV) and the benefits of HPV immunization (Krawczyk et al., 2012). Both the written patient education group and the video education group had significantly higher knowledge about HPV and had increased intentions to receive the HPV vaccination. This evidence leads us to recognize the equal effectiveness of a patient video education modality. In light of rural populations in the Midwest, offering patients video education through an online

venue may have similar effectiveness in teaching patients about OSA, albeit more convenient to patients than providing written material in a provider's office. Additionally, the availability of a video for at home viewing makes health information more accessible and convenient for patients.

Other studies suggest written versus video patient education format of patient education is not as relevant as the availability of the materials for additional review. Researchers found short term recall was not significantly different between patients provided patient video education about asthma when compared to patient who received the same information in written format (Wilson et al., 2010). However, participants who were shown a patient education video along with written patient education had significantly higher recall after one week. While the researchers were not able to provide participants access to a video for review at home, participants who were provided with written education for home review had better recall than those who did not receive any education for at home review. Though the authors noted they did not have a patient education video for at home participant review, they hypothesized providing any materials for at home review can improve patient recall of information. This considered, providing the Sleep Medicine patients with a video which could be viewed at home may improve patient's accessibility of OSA information along with potentially improving their long-term recall.

Research conducted with dermatology patients suggest patients may prefer video education to other forms (Hawkins, Barilla, Williford, Feldman, & Pearce, 2017). Ninety patients scheduled to undergo Mohs surgery were divided into two groups: one group to standard provider education along with video education and the other group just to receive stand provider education. Of the patients who received the patient video education, ninety-eight percent of the patients reported they would like other doctors to use educational videos as a form of patient

education. The authors concluded using technological means, such as text-messaging, emailing, and patient education videos, can be a cost-effective and patient preferred means as for patient education.

Videos and Format Consideration

When considering in the implementation of a patient educational video, format of the information can be important. In a review of 20 different patient education videos, researchers analyzed the effectiveness of didactic presentation (or verbal/graphic presentation of objective information) and narrative presentation (or real people enacting scenes) of information. The researchers found didactic presentation of information can be effective in increasing health literacy, but suggested narrative presentation of information was more effective in modifying complex patient behaviors (Abed, Himmel, Vormfelde, & Koschack, 2014). For the proposed intervention, didactic presentation of material would be most appropriate as the Sleep Medicine providers wish to present information in a factual, objective way as the providers wish to increase patient knowledge rather than modify a specific behavior with the OSA patient education video. However, providing foundational patient education builds health knowledge which, in turn, may lead to behavioral modification along with improved patient outcomes.

Patient Education: Evidence in the Sleep Medicine Specialty

While research in the Sleep Medicine specialty is limited, some studies have been conducted pertaining to patient education. Evidence in the sleep medicine field points to the inclusion of an OSA patient education video as being part of patient's success with CPAP (Continuous Positive Airway Pressure), a mainstay in OSA treatment, adherence. Chen et al. (2015) examined two different educational approaches to patients with sleep apnea. They found a more intensive intervention inclusive of a sleep apnea patient education video, sleep apnea

patient education handout, nurse education, and home visit sessions to be more effective in increasing patient's adherence to CPAP use when compared to those who met with a sleep medicine physician alone (Chen et al., 2015). Such findings align well with the current practices of the Sleep Medicine Clinic, as providers at the clinic have already developed patient education handouts on OSA. While the Sleep Medicine Clinic is not planning to implement intensive nurse education and home visits, the addition of a patient education video would broaden their approach to patient education on OSA. Another study suggests patient video education on CPAP adherence along with physician discussion may increase adherence to CPAP therapy when compared to the control group to whom only participated in physician discussion (Basoglu, Midilli, Middilii, & Bilgen, 2012). Both studies suggest the addition of a patient education video may be a part of a Sleep Medicine patient's increase in adherence to treatment.

Interestingly, evidence shows males over fifty-two years, those with higher income, and non-high-school graduates have higher CPAP compliance than other patients in the OSA cohort (Somers, Peterson, Sharma, & Yaremchuk, 2011). The authors also hypothesized participants younger than fifty-two may be less likely to comply with CPAP therapy as they may be concerned with the stigma CPAP therapy has associated with advanced age. Furthermore, they noted those with higher income have increased CPAP compliance rates and speculated those who lacked a high school education may be more likely to take their provider's advice at face value and adhere to the therapy prescribed. The same study found those with an increased length of time between their initial visit and the time to receive CPAP to have a decrease in CPAP compliance. This finding points to a need to quickly diagnose, educate, and offer treatment to patients with OSA in order to increase their compliance with CPAP treatment (Somers et al., 2011).

Within the Sleep Medicine discipline, video patient education has been shown effective as a patient education modality. Wiese et al. (2005) found a fifteen-minute narrative video presentation of OSA as a disorder and CPAP compliance issues viewed at the initial patient visit significantly increased the rate of attendance at the follow up visit. In the study, 72.9% of patients who had viewed the patient education video returned for their follow-up visit compared to only 48.9% of patients who did not watch the video. This research demonstrates that video patient education is effective in reducing attrition in Sleep Medicine patients, thus increasingly the likelihood to follow up with provider appointments. Though this research is dated, it does lend to the limited patient education research in the Sleep Medicine field and is supported by findings from other fields of medicine in more current literature.

Theoretical Framework

The theory chosen for this project is Marilyn Anne Ray's Theory of Bureaucratic Caring. As there are many facets of input and approval needed to implement this project in the chosen organization, Ray's Theory of Bureaucratic Caring is appropriate. While the original theory is primitive, the updated theory utilized for this project provides a comprehensive approach to the aspects involved when caring for patients at an organizational level. The theory was used as the reference to guide project development and hone avenues of caring for patients in a large organizational setting. The theory was chosen for the fluid and comprehensive approach to caring for patients in a bureaucratic setting.

In her theory, Ray depicts all dimensions – ethical, spiritual/religious, economic, technological/physiological, legal, political, and educational/social – through which nurses may care for clients through a bureaucracy, or in this case, an organization (Smith & Parker, 2015). Furthermore, the theory and model are most comprehensive and realistic in recognizing all the

aspects utilized for input and output while providing evidenced-based "caring" through the Sleep Medicine clinic and its larger parent organization. This project required the use of all aforementioned dimensions for completion. The model guided the completion of this project in offering perspective on all facets to be considered through the course of this project (Figure 1). The figure depicts ways in which caring occurs in a bureaucratic or organizational setting. The arrows represent the bi-directional relationship flow between the patient – the object of caring at the center of the figure – and the nurses and others within the context of the organization (Smith & Parker, 2015). All avenues of caring are linked synergistically together, though they are fulfilling different facets of patient caring.

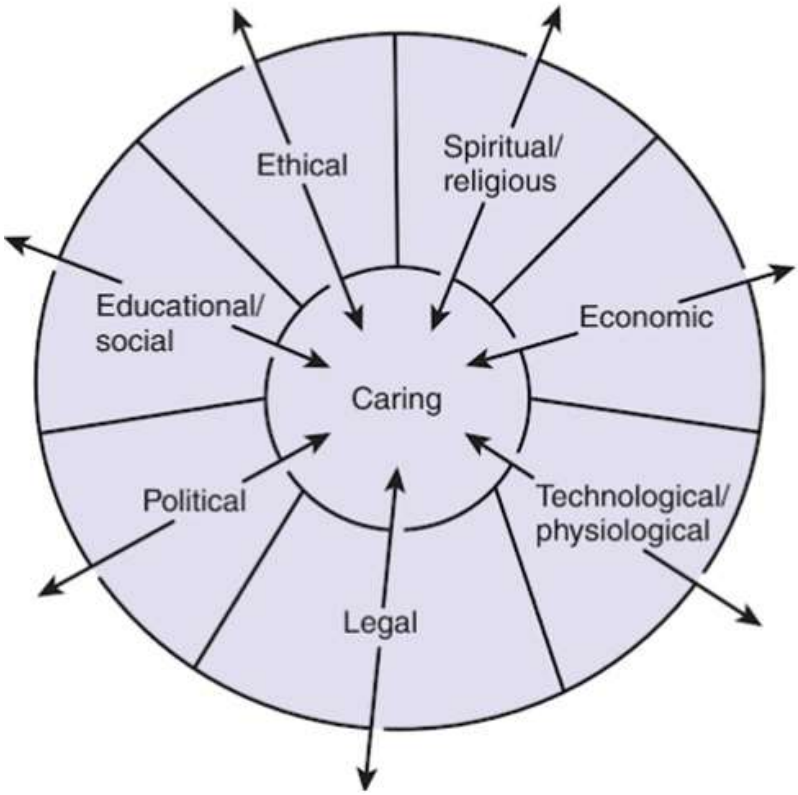


Figure 1. Ray's subsequent grounded theory of bureaucratic caring model (Alligood, 2017).

For this project, caring primarily occurred through technological/physiological and educational/social avenues in the development of the patient education video. However, political,

legal, and economic avenues were also considered to complete this project, as the organization's policies, copyright and publishing laws, and budget constraints were observed.

Ethical caring occurred as this project sought the best evidence-based way to provide patient education for the Sleep Medicine patients. Ethical caring was also observed as the inherent worth and dignity of patients was recognized in developing patient education that helped them better understand the OSA diagnosis and treatment options. Medical information was presented in an honest and straightforward manner, further demonstrating ethical caring.

Economic caring occurred as the video education is sustainable for years to come. This will make efficient use of provider time during patient consult. The cumulative effect of repeated efficient use of provider time during consult will have positive economic impact, which may enable to the organization to better care for their patients. Additionally, the video development and production were not of any direct cost to the Sleep Medicine clinic or the coinvestigator, nor was it of any additional cost to Learning Services. The organization has personnel employed for the specific purpose of developing such education and required these personnel produce the video if the video was implemented at one of the organization's clinics.

Technological and Physiological caring occurred as this project made use of available video technology to enhance patient care. The use of technology to reach patients with health information demonstrates caring towards the individual in a practical way. Providing patient education that is convenient and available for recurrent viewing shows care towards the patient and their individual learning needs.

Legal caring occurred as legal means were considered to develop the patient education in a way which adhered to organizational policy. Additionally, copyright laws were also observed

in the development of the educational video. The video adhered to all local and national legal standards, thus demonstrating legal caring to the patient.

Political caring occurred as this project considered the political relationship between the organization and the academic university through which the coinvestigator is enrolled. Adherence to the organization's requirement of approval from various Learning Services personnel and the organization's Video Governance Committee ensured the political relationship between the organization and the academic university were upheld. This project did not have any national or local political involvement of governmental agencies beyond the involvement of the Institutional Review Board which ensured adherence to ethical standards.

Educational and social caring occurred as this project provided advanced patient education to Sleep Medicine patients. Educational and social caring took place as the video is available for repeated viewing within a socially preferable medium of technology. The video enables the Sleep Medicine patients to be better educated on OSA and sleep studies, thus demonstrating care through an educational facet.

PROJECT DESIGN

The design for this project was developed in close collaboration with the clinic providers and Learning Services. The video content was developed by the coinvestigator using current evidence and professional knowledge. The video content was then proposed to both the Sleep Medicine providers and Learning Services for feedback (Appendix D). The patient education video content was guided by an OSA handout recently developed by a Sleep Medicine interdisciplinary team along with review of literature. Furthermore, the content was directed by the education guidelines put forth by Learning Services, in congruence with organizational patient education policy. The purpose of the video, learning objectives, benefits to the learner, and points to look for in the video were stated at the beginning of the video, as required by Learning Services. In congruence with current evidence, the information in the video was presented in a didactic format. The video was accessible for patient review at home, utilizing an already established organizational online patient-provider communication program. This project did not directly assess patient feedback or understanding of the video; rather this project focused on the development of an evidence-based patient education video for the Sleep Medicine providers to distribute at their discretion. Provider feedback and utilization of the OSA educational video was examined upon video development and implementation into Sleep Medicine provider practice.

Project Implementation

After the development of the video content by the coinvestigator and content consensus sought from the local Sleep Medicine clinic providers, the video content was proposed to Learning Services. After two meetings with Learning Services and extensive dialogue between the coinvestigator and various Learning Service personnel, the proposed video content was then

brought before the organization's Video Governance Committee, which approved the video to be produced. To best suit the needs of the organization, Video Governance Committee stated the video would need to be available for implementation organization wide at various Sleep Medicine clinics throughout the region. This caveat required the organization to alter the coinvestigator's proposed video content and that local, clinic-specific information be made more generic. While the coinvestigator was originally told the video could be made in 1-3 months, the process from start to finish including getting approval to make the video along with the actual production time was much longer than this, taking closer to nine months for the video to be produced.

Following the production of the OSA patient education video, the Sleep Medicine providers at the local clinic were educated via email on how to implement the video into their practice. Support staff were educated by the primary investigator how to support the pilot. The primary investigator answered questions, sent reminders to the providers in the clinic, and helped the providers with any roadblocks during the four-week pilot. Using a standard, programed preset phrase for provider efficiency, providers were able to send an online link with viewing instructions to patients whom they felt would benefit from the video via the organization's electronic patient-provider communication system. During the initial four-week implementation pilot, providers were surveyed on utilization of video via pen and paper surveys, placed on the exam room computer keyboard of each new patient (see Appendix C). The surveys ascertained if the video patient education was offered to the patient, if the patient accepted or declined the offer of the patient education video, and if the video simply was not applicable to the patient situation or clinical presentation. After the four-week pilot, verbal and written provider feedback was solicited during a Sleep Medicine provider meeting. At this time, the providers completed a

longer post-implementation survey (see Appendix E) on video utilization and offered written feedback on the video.

IRB Approval and Risk to Human Subjects

Prior to surveying the Sleep Medicine providers for the purposes of this project, all information, forms, and tools to be used were submitted and approval was sought from both the organization's institutional review board (IRB) and the NDSU IRB. Both boards declared this project exempt from qualifying as human research according to federal regulations (see Appendix F and Appendix G). Patients were not contacted or solicited at any point during this project by the primary or secondary investigators.

Risk to Subjects and Adequacy of Protection against Risks

Potential risks anticipated to providers include psychological discomfort when providing opinion publicly at provider meetings. However, this potential risk is no greater than offering feedback on any other organizational process improvement project. The Sleep Medicine providers used their discretion in providing the patient education video to adult patients whom they believe would benefit from viewing the video. All feedback for this project was strictly voluntary; participants could choose not to offer feedback or attend meetings at any time. No other perceived risks were noted to the project participants.

To adequately protect the participants against this risk, provider opinion and evaluation surveys were anonymous and contained in a confidential folder in the coinvestigator's possession in a locked space to protect the provider's privacy. Upon the completion of this project, the surveys were shredded to further protect provider privacy. Provider discussions on patient video were conducted in an open-minded and non-judgmental manner to prevent any mild emotional disturbance on behalf of the providers. No protection against risks for patients were planned as

no risk was posed to the patient for this project. The Sleep Medicine providers decided to distribute this video at their professional discretion to patients they felt would benefit from viewing this video. Providers were given a "Participant Information Sheet" (see Appendix H) in accordance with IRB requirements, outlining the rights of the providers to withdraw or withhold their opinion at any time. Patients could choose to view or choose not to view the patient education video as they desire.

Potential Benefits of Proposed Project

As established in the above literature review, patients better comprehend patient education presented in multiple formats to be viewed in the privacy of their home, closer to the time of the sleep study, and as many times as the patient desires. Another anticipated benefit may be consistency in patient education presented between providers. This project might reduce provider time spent developing an additional patient education modality. Practice efficiency for the providers might also be impacted, as educating patients may require less time and emotional resources from the provider when implementing the video after the consult. No additional incentives were used for this project to promote provider involvement. Patient retention of information may also be increased, as established in above literature review, which may improve patient outcomes. Additionally, patient attendance to polysomnogram studies and follow-up appointments may be increased, as established by current literature in other specialties. Accessibility to accurate health information is another potential benefit to the patient population.

Knowledge to Be Gained

After this evidence-based clinical dissertation, qualitative and quantitative data were collected evaluating provider utilization of the patient education video and provider feedback on the patient education video. The feedback provided by the Sleep Medicine providers may lead to

additional practice improvement projects at the discretion of Learning Services to further benefit endeavors for patient education in this clinic, and potentially transfer to other education modalities in the realm of Sleep Medicine.

Inclusion of Women, Minorities, and Children

The entire Sleep Medicine Provider population at the Sleep Medicine Clinic was included in this project. All providers were confidentially surveyed for their opinion of the patient education video. The Sleep Medicine provider cohort consists of six women and three men of adult age and all English speaking. The Sleep Medicine provider cohort consists of three Medical Doctors, two Nurse Practitioners, one Clinical Nurse Specialist, and three Physician Assistants. No children were included in this project. Providers were not asked to identify with a social, cultural, or ethnic background, or any other identifier which otherwise might allow them to be classified as a minority. Since the project does not target the providers but rather seeks to provide them with an evidence-based patient education video for their practice utilization, minority identification of the providers was inconsequential.

Data Collection

During this project, the Sleep Medicine providers' feedback was sought at multiple points. While highly technological surveys or data collection methods might have been used, the relatively small sample size of the providers at the Sleep Medicine clinic made pen and paper surveys the collection method of choice (Klabunde, et al., 2012). This method also allowed for any potential organizational concerns of computer malware or compromise of HIPAA protected information to be dismissed.

The initial informal Needs Assessment (Appendix B) and the Post Implementation Provider Survey (Appendix E) pen and paper questionnaires were offered to all providers during

previously scheduled provider meetings by the coinvestigator. Provider anonymity was protected as no provider identifiers were gathered on the pen and paper questionnaires. While the initial needs assessment was informal to assess the need for an OSA patient education video, a participant information sheet (Appendix H) was provided to the Sleep Medicine providers, fulfilling IRB requirements prior to the formal post-implementation survey. Providers also offered verbal feedback on video development and utilization during these meeting times. This feedback was documented by the coinvestigator and appropriately incorporated moving forward.

During the four-week pilot implementation of the video, assessment of provider OSA education video surveys assessed the utilization of the OSA video education in practice. Nursing and support personnel were provided with short, three question surveys to be placed on the computer keyboard prior to the Sleep Medicine provider visit with new patient consults. The clinic was also provided a collection box to collect the surveys after the providers had completed them. No provider or patient identifying information was collected on these surveys and the collection box was placed in the locked reception area. After the four-week pilot was completed, the computer keyboard surveys were collected from the Sleep Medicine Clinic and the feedback analyzed by the coinvestigator, with no other individuals having access to the surveys.

Congruence of the Project to the Organization's Strategic Plan

Published on the organization's website, the mission statement declares the company to be "Dedicated to the work of health and healing" (Sanford Health, n.d.). Furthermore, the organization proclaims their vision as "Improving the human condition through exceptional care, innovation and discovery" (Sanford Health, n.d.). Additionally, the organization acknowledges their corporate values to be the following: courage, passion, resolve, advancement, and family. Their promise to patients and employees is they will "Deliver a flawless experience that inspires" (Sanford Health, n.d.).

In complete congruence with the organization's mission, vision, and corporate values, producing the evidence-based patient video education on Obstructive Sleep Apnea seeks to improve the health and healing process of the patients they serve. Offering OSA video patient education seeks to help "improve the human condition" as a part of both "exceptional care" and "innovation" (Sanford Health, n.d.). Adhering to the organizational values, a patient education video on OSA affirms the organization's passion, in caring for their patients; resolve, in adhering to excellence, efficiency, and purpose; and advancement, in pursuing growth and development. Sleep Medicine provider practice goals seek to enhance patient education, affirming the organizational strategic plan within the Sleep Medicine clinic. A patient education video was utilized as an effective patient education modality in adherence with both organizational and clinic goals.

EVALUATION

The evaluation focused on assessing the development of an online patient education video in Sleep Medicine utilizing qualitative and quantitative feedback. The project evaluation also elicited feedback on the process for product delivery, while also appraising if the educational video modality helped to improve technological caring supported by the evidence-based caring model. Data were gathered through qualitative and quantitative means through provider surveys and meetings. While some objectives specific to the needs of the facility were evaluated by a more subjective means, other objectives were evaluated by objective means.

The first objective "Demonstrate technological caring through development of an evidence-based audiovisual patient education modality on Obstructive Sleep Apnea in congruence with Learning Services and evidence-based practice by May 2018" was a outcome measure based on Ray's Theory of Bureaucratic Caring. As described earlier in this paper, Ray's Theory of Bureaucratic Caring focuses on the various facets of caring through a bureaucracy or organization. The facets adapted for this project specifically were technological/physiological, ethical, economic, legal, educational, and political, as discussed in the Theoretical Framework section of this paper. While the theory and associated model were effective for this project, a more structured implementation model might offer better direction for future projects.

Technological/physiological caring was evaluated as the video being successfully accessible through a previously established online patient-provider communication application, offering patients a technological means by which to be educated on Obstructive Sleep Apnea. Not only did the various facets of the Theory of Bureaucratic Caring guide the project, but careful evaluation of the current patient video education evidence by the coinvestigator, the primary investigator, and Learning Services directed development of the patient education video.

Furthermore, in the post-implementation meeting, the coinvestigator inquired if the patient education video enabled the providers to better care for patients through technology.

The second objective aimed to "Provide the Sleep Medicine providers an evidence-based audiovisual patient education modality on Obstructive Sleep Apnea in an online format linked within the organization's established patient-provider communication system by May 2018." The literature review and extensive Sleep Medicine provider dialogue with the coinvestigator ensured the content of the video was evidence-based. As the patient education video was developed with Learning Services, the Learning Services team was made aware of this objective. The feasibility of making the video available in an easily accessible online modality was of concern to the Sleep Medicine providers, thus lending to the importance of this objective. The objective was evaluated upon the completion of this project by the coinvestigator, Learning Services, and the primary investigator based on verbal discussions along with end video product online availability.

The third objective "Elicit consistent Sleep Medicine provider utilization of the OSA patient education video on Obstructive Sleep Apnea by May 2018" was evaluated with a post-implementation survey of Sleep Medicine providers. The survey intent was to examine how providers utilized the OSA video in practice and explore their thoughts on video content. Question five on the post-implementation survey "After viewing the patient education video, do you think you will utilize this video in your practice?" specifically helped with this objective evaluation. Question eight on the post-implementation survey "If you are not planning to implement the video, how could the patient education video have been improved for you to utilize in your practice? Explain:" also helped to evaluate reasons why providers were not planning to implement the video into their practice. Additionally, post-implementation survey

question nine “Regarding the development, presentation method, content or utility of this patient education video, please share any other thoughts or comments below:” allowed providers the opportunity to share any thoughts on the patient education video – including utilization – and contributed to the evaluation of this objective.

The post-implementation survey was pen and paper, similar to the needs assessment format. Even with the prominence of the internet, evidence suggests paper surveys may still be preferable to some physicians due to their portability (Klabunde et al., 2012). Considering the relatively small sample size of this population and the success of the completion rate of the paper needs assessment, this evidence-based approach was utilized to evaluate this objective at a Sleep Medicine provider meeting. Providers were emailed the post-implementation survey prior to the provider meeting and offered the option of printing and completing the survey prior to coming to the meeting. In addition, the computer keyboard surveys were collected during the four-week pilot to evaluate provider usage of the video. The staff would place a keyboard survey in the patient room prior to the provider’s visit with a new consult. After the completion of the patient visit, the provider would complete the computer keyboard survey and the nursing staff or providers would place it in a collection box for the coinvestigator.

The fourth objective “Positively impact Sleep Medicine patients through the implementation of the OSA patient education video in Sleep Medicine provider practice by May 2018” was evaluated by the coinvestigator in a Sleep Medicine provider meeting after the four-week pilot. The original intent in measuring this objective was to have the providers offer feedback on patients’ comments of how the video contributed to their overall care and to assess follow-up appointment attendance rates after video implementation. As Brown et al. (2016) suggested patient education may increase patients’ follow-up attendance, such evaluation would

have further explored the impact of the patient education video on patient follow-up attendance rates. Follow-up attendance may have improved with patient education; however, the timeline of the four-week pilot period was insufficient to evaluate this. While an extended pilot would have been ideal, the timeline post video production was incongruent with the coinvestigator timeline for an extended pilot. An extended pilot period of at least eight weeks would have allowed for providers to begin garnering patient response to the video at their follow-up appointment, as patients are typically scheduled for their follow-up appointments between 4-6 weeks. The coinvestigator would have recommended a three-month pilot to collect provider input regarding patient feedback in follow up visits. A three-month pilot would have lent more information to the evaluation of this objective, as provider feedback of patient impact could have been assessed.

RESULTS

Technological Caring

The first objective "Demonstrate technological caring through development of an evidence-based audiovisual patient education modality on Obstructive Sleep Apnea in congruence with the organization's Learning Services and evidence-based practice by May 2018" was based on Ray's Theory of Bureaucratic Caring, which incorporated technological caring as a facet of bureaucratic caring. The video was also developed in close communication with Learning Services. Through various communication means and two formal meetings with Learning Services, current evidence and outline for the video was discussed at length and drafts of the video were scrutinized prior to the development of the patient education video. While the coinvestigator presented the current evidence for patient video education, Learning Services personnel ensured the interests and policies of the organization were observed during the development and implementation of the video. The extensive nature of video development with Learning Services resulted in an end-product OSA patient education video which enabled Sleep Medicine providers to better care for their patients.

This objective solely focused on the successful development of an OSA patient education video. Through the development of patient education video, the coinvestigator was able to contribute to technological caring as outlined by Ray in her Theory of Bureaucratic Caring (Turkel, 2007). Ray's definition of "technological caring" includes "computer-assisted practice," which encompasses the modality and development of this patient education video. One key facilitator to the completion of the objective was the collaborative effort displayed by Learning Services. As the video was also produced in close collaboration with Learning Services and was successfully completed at the conclusion of this project, this objective is considered to be "met."

Providing an Evidence-Based Audio-Visual Modality

The second objective aimed to "Provide the Sleep Medicine providers an evidence-based audiovisual patient education modality on Obstructive Sleep Apnea in an online format linked within the organization's established patient-provider communication system by May 2018." Upon completion, the video was placed on the organization's web site and made available for public viewing. The web link to the video was supplied to the Sleep Medicine provider who leads technology support for providers within the department. This provider created a smart phrase for all Sleep Medicine providers to populate the video link into the patient visit summary for patients to view at home. The link was available both on the printed patient visit summary and the organization's patient-provider online communication application for viewing after the visit. As discussed previously, the video was developed in congruence with current evidence.

The video was successfully accessible through the online patient-provider communication application upon conclusion of the project, which was the original intent at the conception of this project. In the post-implementation provider meeting, two providers verbally spoke to the level of difficulty patients experienced trying to access the video – one key barrier to technological accessibility for patients. Though the link was available to patients in the online application after their appointment, accessing the link required patients to navigate through multiple screens to get to the video link. Though the link was printed on the patient visit summary and handed to the patient prior to leaving the appointment, the lengthy link was another key barrier to patients when considering ease of accessibility. Another key barrier to further honing the content of the patient education video was time. The incongruency of the coinvestigator academic timeline and the time required for the organization to refine the patient video content was a key barrier to the completion of this content refinement.

Though the organization may need to hone usability of the online link and video content, the link to the patient education video was successfully available to patients through the online patient-provider communication application. The coinvestigator and primary investigator did have a final meeting with Learning Services personnel to share findings of the computer keyboard survey, post-implementation survey, and provider meeting. Learning Services expressed their appreciation for these results and acknowledged areas of content to be honed. At the time of project conclusion, Learning Services did not have available video personnel to make the suggested content changes as the current personnel were busy developing other organizational videos. As technological/physiological caring was to be evaluated as the video being successfully accessible through the patient-provider communication application, this second project objective was considered by the coinvestigator, the primary investigator, and Learning Services to be "met."

Consistent Provider Video Utilization

The third objective "Elicit consistent Sleep Medicine provider utilization of the OSA patient education video on Obstructive Sleep Apnea by May 2018" was evaluated with both computer keyboard surveys (Appendix C) and a post-implementation survey of Sleep Medicine providers (Appendix E). The intent of the surveys was to examine how providers utilized the patient education video in practice. Both the computer keyboard survey and the post-implementation survey were pen and paper, similar to the needs assessment format, again based on evidence of portability preference for providers (Klabunde et al., 2012).

The computer keyboard surveys were collected for new patient consults during the four-week pilot period to evaluate provider usage of the video. Nursing staff would place the computer keyboard survey on the computer keyboard in the patient room prior to the provider's

visit with a new consult as a reminder to the provider to offer the video during the visit, if applicable. After the completion of the patient visit, the provider would complete the keyboard survey and the nursing staff or the provider would place it in a collection box for the coinvestigator to gather. Results from the pilot implementation of the video are as follows: two hundred ninety-four new patients were seen at the Sleep Medicine clinic between January 11 – February 9, 2018. Seventy computer keyboard surveys were submitted by the providers and collected from the new consults seen during that timeframe.

Of the computer keyboard surveys collected, 74% of patients seen (n=52) were offered the patient education video. The patient education video was not applicable to 17% percent of patients (n=12). The patient education video was not offered to 7% of patients (n=5). Of the patients who were offered the video, 90% indicated interest in viewing the video (n=47). Reasons noted for not offering the patient education video included time constraints (n=1), patient did not have at home access to patient-provider communication application (n=1), patient did not speak English (n=1) and patient did not have computer at home (n=1). One survey submitted was left completely blank with no information offered to contribute to results (see Figure 2 for graphical summary).

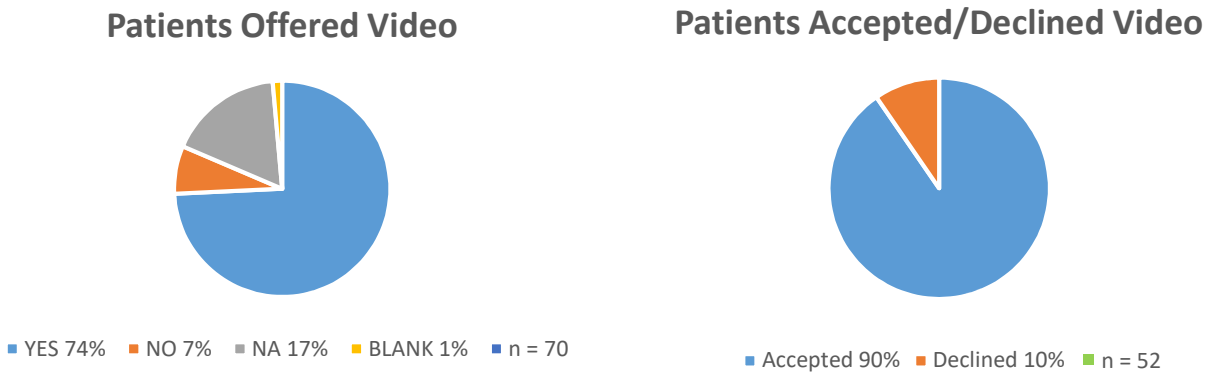


Figure 2. Summary of patient education video use during four-week pilot

A paper post-implementation assessment survey (Appendix E) similar to the needs assessment survey was also conducted to further assess the provider's utilization of the patient education video. The providers were asked both closed and open-ended questions regarding the video, offering the opportunity for providers to give feedback on the video and implementation process. Considering the relatively small sample size of this population and the success of the completion rate of the needs assessment, this evidence-based approach was utilized to evaluate this objective at a Sleep Medicine provider meeting. Two providers were not able to attend the meeting. These providers were offered the opportunity to submit their surveys at a later time. However, results were obtained from seven out of the nine providers at the completion of this project.

While three of the providers felt OSA pathophysiology, symptoms, risk factors, diagnosis, sleep studies, and treatments were adequately addressed in the video, others did not (Table 2). Feedback indicated the providers would like more "pictures and videos from the sleep center and lab" and suggested "more in depth – pictures, videos" would be helpful to patients. One provider wrote they would like to see "more dynamic pictures of our lab," and that the picture of the patient with a large facial mask CPAP "is scary – use nasal pillow" (another smaller CPAP mask configuration). Another provider thought the video displayed periods "too long with fixed picture (or text) as a speaker talked in background." One provider simply wrote "It's perfect at it's current version." Six out of the seven providers (86%) who submitted a post-assessment survey indicated the patient education video would enhance their practice. Four out of the seven providers (57%) indicated the video would increase their practice efficiency. Three providers planned to implement the video into their practice, while the rest of the providers indicated they "maybe" would implement the video into their practice – one provider clarified

"based on patient preference" in the margin. All providers (n=7) indicated they would use for their adult patients, while five planned to use for their DOT patients. All providers (n=7) would send the link through the online patient-provider communication application, while two would like the link to be printed on a brochure to hand to patients. One provider would like the video to be played in the waiting room. No providers gave reasons they were not going to implement the video into their practice, though one provider did suggest offering patients a separate card with a typed out video link in the blank area provided for this question.

The final question of the survey asked for other thoughts or comments regarding video development, presentation method, content, or utility of the patient education video (Table 2). One provider wrote "quality of the video and speaker were good overall; I would use other videos specific to CPAP/BiPAP, OAT, and Inspire HNS" (types of OSA treatments). Another provider contributed "same thoughts as our discussion – animation would be great and connecting real picture of our unit/equipment rather than the uncomfortable/old pictures." A third provider offered they would like to see "more visual content, relevant pictures." Additionally, a fourth provider thought having a virtual "tour" of the sleep room would be useful for patients and that having photos of the actual sleep room would be helpful. This provider also suggested addressing questions or common fears patients might have would aid patients in getting the most out of the experience. A final provider noted "link is far too long" but that the video offered "very good information; great tool for patients."

Due to the computer keyboard survey results indicating that 74% of new consult patients were offered the patient education video, video utilization by the providers seemed to be a success. One of the key facilitators to the evaluation of this objective was the cooperation and support of the support staff. The support staff at the Sleep Medicine clinic were accommodating

throughout the evaluation process, dispersing surveys and collecting surveys when asked. The providers were also eager to fill out their post-implementation surveys, offering valuable feedback for the coinvestigator on video development and implementation. A key barrier to the evaluation of this objective was the inconsistent disbursement of computer keyboard surveys, which may have led to biased evaluation discussed later. Though the providers did have some things they would like to see changed about the video and the implementation process, they did offer positive feedback indicating they planned to or may use the video in their future practice. Based on feedback from both the provider surveys and the computer keyboard surveys, this objective was considered to be "met."

Table 2

Post-implementation survey items with provider responses

Question	Provider Response(s) (n = 7)		
1. Did this patient education video meet your expectations in regards to each of the following sections? (Check all you felt were adequately addressed):	o Pathophysiology o Symptoms o Risk Factors o Diagnosis o Sleep Study o Treatment o Other:	86% 86% 100% 57% 71% 71% "Health risks from untreated OSA"	
2. How could the patient education video on OSA have been improved? Explain:	o "Too long with fixed picture or text as speaker talked in background. (eg. Couple in bed early in the video and "How are sleep studies performed," and "Things to bring to a sleep study," etc.)" o "More pictures/video would make it more dynamic. Pictures of our lab – confusing to see twin bed? CPAP pic is scary – use nasal pillow." o "More in depth – pictures, visuals" o "It's perfect at it's current version" o "Pictures and videos from our sleep center/lab" o "I would have like to see better pictures correlating with the pathophysiology, sleep study, and treatment portions. Having an actual picture of the sleep rooms, sleep technician hooking up a patient for the study process, and new mask styles would be easy pictures to have access to and could greatly enhance the perception of the video."		
3. After viewing the patient education video, do you think this video would enhance your practice?	o Yes o No	86% 14%	
4. After viewing the patient education video, do you think this video will increase your practice efficiency?	o Yes o No	57% 43%	
5. After viewing the patient education video, do you think you will utilize this video in your practice? (select one)	o Yes o Maybe o Probably Not o No	43% 57% 0% 0%	**One provider responded "maybe" and wrote "based on patient preference" in margin*
6. Now after viewing the patient education video, in what patient populations would you implement the patient education video? (select all that apply):	o Adult o DOT o Parents of children o Other:	100% 71% 14% (*no written responses*)	

Table 2. *Post-implementation survey items with provider responses* (continued)

Question	Provider Response(s) (n = 7)	
7. How would you anticipate would be the **most** useful way to utilize this patient education video in your practice? (Choose ONE):	○ Link sent to patient on MyChart before provider consult for DOT patients	0%
	○ Played in waiting room	14%
	○ Played for patient during/after provider consult	0%
	○ Link sent on MyChart for the patient to review at home prior to the sleep study	86%
	○ Other:	"Paper with website given to patient," "AVS" (After Visit Summary), and "Instructions on how to access video on a sleep center brochure"
8. If you are not planning to implement the video, how could the patient education video have been improved for you to utilize in your practice? Explain:	○ "Provide a card with website to have in exam rooms with other brochures or on the [organization's] designed OSA brochure"	
9. Regarding the development, presentation method, content or utility of this patient education video, please share any other thoughts or comments below:	○ "Quality of video and speaker were good overall. I would use other videos specific to CPAP/BiPAP, OAT, and Inspire HNS"	
	○ "Same thoughts as our discussion – animation would be great and connecting real pictures of our unit/equipment rather than the uncomfortable/old pictures"	
	○ "Link is far too long. Very good information. Great tool for patients."	
	○ "More visual content, relevant pictures"	
	○ "More patient interaction would be helpful, meaning a "tour" of a sleep room perhaps. Having the pictures specific to Sleep Medicine and how the study actually looks would really help not scare patients away, as the person in one slide looks uncomfortable with all the wires attached and the sleep mask looks so cumbersome, that it does not adequately portray what a patient can expect and might negatively impact some patients. We want to use the video to adjunct our education, help the patient remember what was discussed in the consult to remember for the study, and to have some questions (perhaps) fears addressed to make the most out of the experience and impact patient outcomes in a positive way. I would really appreciate having pictures taken of our sleep rooms and a hook-up process to improve the video to help patients."	

Provide Educational Caring

The fourth objective "Positively impact Sleep Medicine patients through the implementation of the OSA patient education video in Sleep Medicine provider practice by May 2018" was evaluated by this coinvestigator in a Sleep Medicine provider meeting after the four-week pilot. The original intent to measuring this objective was to have the providers offer feedback on patient's comments of how the video contributed to their overall care and to assess follow-up appointment attendance rates after video implementation, as Brown et al. (2016) suggested follow-up attendance may improve with patient education. However, the timeline of the four-week pilot period was insufficient to evaluate this. One key barrier to the evaluation of this objective was time. While an extended pilot would have been ideal, the timeline post video production was incongruent with the coinvestigator's academic timeline for an extended pilot period, due to the unforeseen lengthened time of the video production phase.

In the post-implementation provider's meeting, one provider noted they did not expect to use this video as a substitute for the education they would provide during an appointment. However, they acknowledged they would implement this video to reinforce the education given during the patient appointment. By doing this, they might better care for patients as patients would have another means to review the information given during their appointment.

Though some providers at the meeting did indicate they thought the patient education video was a technological means to better care for their patients, this objective was unable to be evaluated to the full extent intended. Patient attendance rates to follow-up appointments were not examined during the course of the project. This leaves a future opportunity for further evaluation. Since this objective was not evaluated to the extent originally intended, the verbal feedback from the Sleep Medicine providers lends to the evaluation of this objective as "partially met."

DISCUSSION AND RECOMMENDATIONS

Interpretation of Results

The results of the computer keyboard survey and the post-implementation provider survey require clarity. Verbal discussion from the post-implementation provider meeting will be interpreted and discussed in this section. Interpretation of the results of these surveys will also be discussed in this section.

Computer keyboard survey results indicated 74% of new consult patients were offered the patient education video, demonstrating the providers will likely well-utilize the patient education video. These results implied the video may be utilized for many new patient consults, thereby having a positive impact on current Sleep Medicine patient education. However, as will be discussed in the limitations section, the poor completion rate of the computer keyboard surveys may lend to skewed results. Providers may have largely felt compelled to complete the computer keyboard surveys when they offered the video to patients rather than completing computer keyboard surveys on all new patients. The inconsistent placement of the computer keyboard surveys in patient rooms may have overestimated or underestimated actual provider utilization of video in practice.

Comments from the post-implementation provider surveys and the verbal provider discussion at the post-implementation meeting indicated the online web link of the patient education video was lengthy and difficult for patients to type into their internet browser. This was cause for difficulty in accessing the patient education video for patients. If patients had any difficulty accessing the online patient-provider communication application, the online web link provided on the printed after visit summary to the video was not easy to type into the patient's internet browser manually. The video was also not easily searchable on the organization's

website. Prior knowledge of the video along with the knowledge of how to navigate to the video's online location was needed to access the video, limiting the accessibility to the general patient population. In the post-implementation provider meeting, this was one concern echoed by providers when discussing accessibility of the video. This limited accessibility restricted the potential positive impact the video might have had on patients who could not access their online patient-provider communication application or had lost the link provided to them at their appointment. This concern was shared with Learning Services, who stated they did not have video personnel with time to make these changes to the video or the ability to make changes to the online link length/website placement at the time of project conclusion. However, one Sleep Medicine provider vocalized they would continue to partner with Learning Services to remedy these issues beyond the course of this project.

The post-implementation survey indicated three providers planned to implement this video into their practice, while four providers indicated they would "maybe" implement this video into their practice. While one provider clarified he would "maybe" implement dependent on patient preference, the intent to implement the video could be a limitation to the impact of this project. The post-implementation survey did ask providers for reasons why they would not implement the video if they were not planning to implement; however, no providers answered this question, leaving some ambiguity to the indicated "maybe" intent to implement.

Another consideration in the analysis of the results for this project was that the final video content was not the product the Sleep Medicine providers had envisioned (see link in Appendix D). Multiple times throughout the post-implementation meeting and reflected in the review of the post-implementation surveys was the finding that providers were disappointed with the visual content of the video. One provider stated in the meeting he felt the visual content of

the video should be more engaging. Multiple providers stated they would have liked to see more photos of the actual sleep center and sleep study patient "hook-up" process so patients could have a better visual of the procedure. The disappointment with visual content may have played into the provider's intent to implement the video into their practice – which in turn may have limited the impact of this project.

After the four-week video pilot, Sleep Medicine providers expressed verbal interest in the development of more videos. One provider said he would have liked to see an additional video describing the hypoglossal nerve stimulator specifically – a treatment modality which would require a variety of visual pictures to describe to patients. The development and implementation of this patient education video may lead the Sleep Medicine clinic to develop additional patient education videos in their practice. However, prior to development of future patient education videos, current patient education video distribution should be more closely examined. The utilization of other video usage surveys in place of the printed computer keyboard surveys is recommended. Consulting organizational information technology services to help track the provider distribution and patient viewing of the video would help guide future patient education video utilization and development.

Limitations

Some limitations to this project exist. The first limitation to the findings of this project was the limited response rate of the computer keyboard surveys. Data from the clinic indicated the Sleep Medicine providers saw two hundred and ninety-four new consults during the four-week video implementation pilot. However, during the four-week video implementation pilot, only seventy computer keyboard surveys were collected by the providers/support staff. While the results from these computer keyboard surveys was largely positive, indicating that as many as

74% of new consult patients were offered the patient education video, these results may have been skewed because of limited data collection. The reason for this limited collection of results was due to a couple different factors. During the four-week pilot, two of the regular Sleep Medicine clinic nurses were out of the office for an extended period of time with influenza. Per diem employees not consistently a part of the video pilot discussion were a part of the patient rooming process and may not have placed the computer keyboard surveys for every patient. Sleep Medicine providers were also engaged in rural outreach, lending to inconsistency in collection of surveys for initial consults. This may have impacted the results of the computer keyboard surveys as the number of surveys collected were only a small portion (24%) of the new patients seen during the four-week pilot, despite all providers indicating desire to use the video.

Another limitation to this project was the time for evaluation of video efficacy and evaluation of technological caring with patient population. While the initial intent of this project entailed evaluating the impact of the patient education video on patient attendance at follow-up appointments, the time required by Learning Services to develop the patient education video was much longer than anticipated. Originally, the coinvestigator was told video development could take one to three months. However, with the institution of an organizational Video Governance committee during the course of the project and multiple layers of organizational personnel to receive approval from, the projected time table for video development was extended to nine months. This led to a limited amount of time to evaluate efficacy of the patient education video. Similarly, the original evaluation plan entailed including provider perception of patients' reaction to the video at follow-up appointments. Again, the limited amount of time to implement a video pilot led to a lack of ability to evaluate the ability to technologically care for Sleep Medicine patients. With hindsight, the inclusion of personnel from Learning Services or Video Governance

committee on the clinical dissertation committee may have increased organizational buy-in to this project. Such buy-in may have helped the coinvestigator to more efficiently navigate the organization's video development standardization process, which evolved during the project course. If this project were to be replicated, including multiple layers of organizational personnel on the dissertation committee would be suggested.

Time was also a limitation for the ability to hone the content of video. Feedback from both the post-implementation survey and providers' meeting indicated multiple visual changes the providers would like to make in the content of the video. Providers would have liked to see an increase in graphics and animations to enhance the patient impact and visual appeal of the video. While this project had intended to offer the Sleep Medicine providers with a perfected patient education video, time was a limiting factor in the ability to produce a completely satisfactory video for the Sleep Medicine providers. Though this is a limitation, the project end offered providers a patient education video they were able to implement in practice.

The content of the video was also a limitation in this project. As evidenced by the provider feedback in the post-implementation surveys, the providers' disappointment with lack of visual content in the video may have hindered their desire to offer the video to patients. Evolving organizational requirements for patient education videos required the patient education video to be available enterprise wide, which was not the intent of the original patient education video. The Sleep Medicine providers wanted site specific information and visual graphics to be included in the video. However, due to organizational requirement, the information was changed to be more generic for enterprise use. The lack of site-specific information contributed to the Sleep Medicine providers' disappointment with the end-product and may have a negative impact on provider utilization of video.

Recommendations for the Clinical Site

With the largely positive results from the computer keyboard surveys and the post-implementation survey and provider meeting, it is recommended the clinical site continue to implement the patient education video in practice. However, due to the responses from the post-implementation meeting and survey, it is also recommended video content is honed and enhanced to better satisfy the providers' needs. More visual depictions of the Sleep Medicine center, the patient sleep study "hook-up" process, and the OSA pathophysiology should be included to help patients better comprehend pathophysiology and diagnostic processes. As suggested by the Sleep Medicine providers, adding such visualizations might help patients better comprehend the pathophysiology and diagnostic testing for OSA.

Next, patient response to the video should be examined as a part of the organization's strategic plan to "deliver a flawless experience that inspires" (Sanford Health, n.d.). Learning Services and Sleep Medicine providers should be involved in the process of this evaluation. One of the Sleep Medicine providers has verbalized interest in continuing to edit video content with Learning Services as a part of the provider's role within the clinic. The Sleep Medicine providers will need to continue evaluating the modified content of the video after the completion of this project if they so desire. Once the video content is honed, formal evaluation of patient response to the patient education video and patient compliance with follow up appointments should be evaluated in the form of patient surveys. While this is outside the time constraints and realm of this clinical dissertation, this expressed interest is encouraging, indicating the intent of this project continues and best patient education practice will continue to be honed. However, including practicing providers as a part of the Video Governance committee or more closely including practicing providers in video development would be recommended if more patient

education videos are to be developed or this video content is to be honed. Including practicing providers in the video development or honing process would ensure pertinent patient education information, including relevant visuals and graphics, are included in the patient education video. In turn, the end video product will be highly satisfactory to the practicing providers and will ensure the consistent utilization in practice.

Additionally, the application of this patient education video should be expanded beyond the confines of the Sleep Medicine clinic. This video could be applied in rural health care settings, where access to Sleep Medicine education is limited. Since the patient education video was developed for use within the enterprise, the video could be used in various clinics throughout the region where the organization has clinics in several rural locations. The video could also be utilized by primary care providers in urban settings who are looking to educate patients on OSA and sleep studies before sending them to their initial consult at the Sleep Medicine clinic. Furthermore, the video could be applicable for patient education in occupational health settings, where DOT patients are being referred to Sleep Medicine for evaluation of OSA.

As discussed with the Sleep Medicine providers in the post-implementation meeting, this project opens the possibility for further video development on other topics. The Sleep Medicine clinic serves a wide range of patients with a variety of sleep disorders. By successfully completing this project in the Sleep Medicine clinic, the Sleep Medicine providers may be empowered to create additional patient education videos because of this project. As they have been a part of the process to develop and implement the patient education video, this will not be foreign to them if they decide they want to design and implement additional educational videos.

Implication for Practice

The development and implementation of the patient education video during this project could have a variety of implications for practice. One implication for practice is the Sleep Medicine providers now have an additional patient education modality by which to educate patients. This offers the providers with an enhanced ability to educate patients. Though beyond the evaluation in this project, Sleep Medicine patients may better grasp OSA and sleep studies as a result of this project. Additionally, the video could have implications for additional practice realms such as Family Practice or Internal Medicine, as the video is on the organization's website for use by all specialties. Results from the computer keyboard surveys were shared with the Sleep Medicine providers and Learning Services after the project as a part of dissemination of the results.

Additionally, pertinent provider feedback from the post-implementation survey was shared with Learning Services. Sharing of the feedback from the project implementation process will enable Learning Services to hone the delivery of patient education. Pertinent results from both the computer keyboard surveys and the post-implementation survey were shared with the organization's Learning Services as a part of the dissemination of this project.

Furthermore, along with organizational dissemination of the project plan and results, the project plan was also offered at the following conferences and presentations in the form of a poster presentation:

- The 2017 NDSU College of Health Professions Poster Presentation conference
- The NDNPA 2017 Pharmacology Conference
- NDSU's 2018 Three Minute Thesis competition
- The 2018 NDSU College of Health Professions Poster Presentation conference

Beyond this specific patient education video and organization, this dissertation project may be of inspiration to other health care providers. In any number of specialties or disciplines, this dissertation could serve as a catalyst for development of patient video education. The findings of this dissertation, including both the computer keyboard surveys and the post-implementation surveys might help guide other health care providers to develop and implement patient video education in their clinical setting. A change in survey methods might better enhance the data collected. The coinvestigator plans to pursue publication of the project and results to further disseminate the findings in hope patient education processes may be positively impacted at other organizations. See Appendix I for executive summary.

Implications for Future Research

While this project focused on the development and implementation of an evidence-based OSA patient education video, additional data should be collected to ascertain knowledge of patient utilization of the video. Patient utilization along with the patient impact of the education video would contribute to professional patient education knowledge to hone the patient education process for a variety of facets. Additionally, by better honing development and utilization of such videos in the future, changes to the patient education video delivery such as a shorted video link may lead to a more effectively disseminated patient education video. Thus, patients could be better reached and educated not only on OSA or other sleep medicine topics, but on a variety of other health care topics.

Another area for future research is the patient technological caring component of this project and implications for patient care. Patients' perceptions of being cared for through technological means or satisfaction with technological care would have repercussions for the health care system, since patient satisfaction has implications for larger health care systems as

discussed previously. Further exploring these patient perceptions might lead to additional organizational changes in the patient education arena.

Application to DNP Roles

This project is proof doctorate prepared nurse practitioners can make valuable contributions as leaders in the formal patient education process. Doctoral prepared nurse practitioners are educated with an evidence-based background to be leaders in their fields, caring for patients both in practice and policy (NONPF, 2016). By implementing this project and disseminating the results through various avenues, it is the hope of the DNP candidate that other DNPs will be inspired to lead practice change in the arena of patient education. In Sleep Medicine or other specialty areas, the DNP nurse practitioner has the leadership education to lead patient care change to improve patient outcomes and patient care processes.

This project also demonstrates DNPs can be advocates for implementation of the most recent evidence-based practice. While current evidence is available to healthcare providers on every level of the healthcare system, DNPs have the research and leadership background to synthesize current evidence and articulate the need for practice change. Advocating for the optimization of patient care in the realm of patient education is something the DNP nurse practitioner is well-prepared to do (NONPF, 2016). It is the hope of the coinvestigator that other DNP nurse practitioners are inspired by this project to advocate for practice change in patient video education to enhance patient care.

Conclusion

This project entailed the development and evidence-based implementation of a patient education video on OSA and sleep studies at a Sleep Medicine Clinic in a midwestern urban location. As detailed in the literature review section of this paper, patient education is important

to improving patient outcomes. Patient education is an evidence-based method for conveying health information to patients. Additionally, patient video education is an evidence-based modality which may improve patient recall and understanding of health information along with improving overall patient satisfaction. The Sleep Medicine providers indicated such a patient education tool would be useful in their practice and would make their practice more efficient. Working with the organization's Learning Services ensured an evidence-based patient education video was implemented. This evidence-based dissertation project contributes to optimized patient education practice. The patient education video is useful to the Sleep Medicine providers in their practice and may be utilized for years to come.

REFERENCES

Abed, M. A., Himmel, W., Vormfelde, S., & Koschack, J. (2014). Video-assisted patient education to modify behavior: A systematic review. *Patient education and counseling*, *97*(1), 16-22. doi:10.1016/j.pec/2014.06.015

Alligood, M. (2017). *Nursing theorists and their work* (9th ed.). St. Louis, MO: Elsevier.

Basoglu, O., Midilli, M., Middilii, R., & Bilgen, C. (2012). Adherence to continuous positive airway pressure therapy in obstructive sleep apnea syndrome: Effect of visual education. *Sleep and Breathing, 16*(4), 1193-1200. doi:10.1007/s11325-011-0631-9

Bastable, S. (2016). *Essentials of Patient Education* (2nd ed.). Burlington, MA: Jones & Bartlett.

Bergin, C., Speroni, K., Travi, T., Bergin, J., Sheriday, M., Kelly, K., & Daniel, M. (2014). Effect of preoperative incentive spirometry patient education on patient outcomes in the knee and hip joint replacement population. *Journal of PeriAnesthesia Nursing, 29*(1), 20-27. doi:10.1016/j.jopan.2013.01.009

Brega, A,, Barnard, J., Mabachi, N., Weiss B., DeWalt, D., Brach, C., … West, D. (2015). *AHRQ Health Literacy Universal Precautions Toolkit, Second Edition.* (AHRQ Publication No. 15-0023-EF). Rockville, MD: Agency for Healthcare Research and Quality.

Brown, W., Burton, P., Shaw, K., Smith, B., Maffescioni, S., Comitti, B., …Nottle., P. (2016). A pre-hospital patient education program improves outcomes of bariatric surgery. *Obesity Surgery, 26*(9), 2074-2081. doi:10.1007/s11695-016-2075-6

Centers for Medicare & Medicaid Services. (2013). *Hospital outpatient quality reporting program.* Retrieved from: https://www.cms.gov/Medicare/Quality-Initiatives-Patient-

Assessment-Instruments/HospitalQualityInits/HospitalOutpatientQualityReportingProgram.html

Chen, X., Chen, W., Hu, W., Huang, K, Huang, J., & Zhou, Y. (2015). Nurse-led intensive interventions improve adherence to continuous positive airway pressure therapy and quality of life in obstructive sleep apnea patients. *Patient Preference and Adherence, 9*, 1707-1713. doi.org/10.2147/PPA.S90846

Crabtree, T., Puri, V., Bell, J., Bontumasi, N., Patterson, G., Kreisel, D., … & Meyers, B. (2012). Outcomes and perception of lung surgery with implementation of a patient video education module: A prospective cohort study. *Journal of the American College of Surgeons, 214*(5), 818-822. doi:10.1016/j.jamcollsurg.2012.01.047

Dyar, S., Lesperance, M., Shannon, R., Sloan, J., & Colon-Otero, G. (2012). A nurse practitioner directed intervention improves the quality of life of patient with metastatic cancer: Results of a randomimzed pilot study. *Journal of Palliative Medicine, 15*(8), 890-895. doi:10.1089/jpm.2012.0014

Eckman, M., Wise, R., Leonard, A., Dixon, E., Burrows, C., Khan, F., & Warm, E. (2012). Impact of health literacy on outcomes and effectiveness of an educational intervention in patients with chronic diseases. *Patient Education and Counseling, 87*(2), 143-151. doi: 10.1016/j.pec.2011.07.020

Grady, P. (2011). Advancing the health of our aging population: A lead role for nursing science. *Nursing Outlook, 59*, 207-209. doi:10.1016/j.outlook.2011.05.017

Hacihasanoğlu, R., & Gözüm, S. (2011). The effect of patient education and home monitoring on medcation compliance, hypertension management, health lifestyle behaviors, and BMI in

a primary health care setting. *Journal of Clinical Nursing, 20*(5), 692-705. doi: 10.1111/j.1365-2702.2010.03534

Hawkins, S., Barilla, S., Williford, P., Feldman, S., & Pearce, D. (2017). Patient perceptions of text-messages, email, and video in dermatologic surgery patients. *Dermatology Online Journal 23*(4), 1-3.

Hemsley, B., Balandin, S., & Worrall, L. (2012). Nursing the patient with complex communication needs: Time as a barrier and a facilitator to successful communication in hospital. *Journal of Advanced Nursing, 68*(1), 116-126. doi: 10.1111/j.1365-2648.2011.05722.x

Institute of Medicine. (2004). *Health literacy: A prescription of end confusion* [PDF document]. Retrieved from: http://www.nationalacademies.org/hmd/~/media/Files/Report%20Files/2004/Health-Literacy-A-Prescription-to-End-Confusion/healthliteracyfinal.pdf

James, J. (2012). Health policy brief: Pay-for-performance. *Health Affairs*. Retrieved from: https://healthaffairs.org/healthpolicybriefs/brief_pdfs/healthpolicybrief_78.pdf

Kearney, M., Jennrich, M,. Lyons, S., Robinson, R., & Berger, B. (2011). Effects of preoperative education on patient outcomes after joint replacement surgery. *Orthopaedic Nursing, 30,* (6), 391-396. doi:10.1097/NOR.0b013e31823710ea

Kim, S., Koh, W., Rhim, J., Karm, M., Yu, H., Lee, B., ... & Leem, J. (2012). Preconsent video-assisted instruction improves the comprehension and satisfaction in elderly patient visiting pain clinic. *The Korean Journal of Pain*, *25*(4), 254-257. doi:10.3344/kjp.2012.25.4.254

Klabunde, C., Willis, G., McLeod, C., Dillman, D., Johnson, T, Greene, S., & Brown, M. (2012). Improving the quality of surveys of physicians and medical groups: A research agenda. *Evaluation & the Health Professions, 35*(4), 477-506. doi: 10.1177/0163278712458283

Krawczyk, A., Lau, E., Perez, S., Delisle, V., Amsel, R., & Rosberger, Z. (2012). How to inform: Comparing written and video education interventions to increase human papillomavirus knowledge and vaccination intentions in young adults. *Journal of American College Health, 60*(4), 316-322. doi:10.1080/07448781.2011.615355

National Organization of Nurse Practitioner Faculties (NONPF). (2016). *White paper: The doctor of nursing practice nurse practitioner clinical scholar 2016.* Retrieved from: http://c.ymcdn.com/sites/www.nonpf.org/resource/resmgr/docs/ClinicalScholarFINAL2016.pdf

Oswald, N., Hardman, J., Kerr, A., Bishay, E., Steyn, R., Rajesh, P., … & Naidu, B. (2018). Patient want more information after surgery: a prospective audit of satisfaction with perioperative information in lung cancer surgery. *Journal of Cardiothoracic Surgery 13*(18), 1-5. doi:10.1186/s13019-018-0707-8

Sandberg, E., Sharma, R., & Sandberg, W. (2012). Deficits in retention for verbally presented medical information. *Anesthesiology, 117*(4), 772-779.

Sanford Health. (n.d.) *About Sanford Health.* Retrieved from: http://www.sanfordhealth.org/about

Smith, M., & Parker, M. (2015). *Nursing theories and nursing practice* (4th ed.). New Delhi, India: Jaypee Brothers Medical Publishers Ltd.

Somers, M., Peterson, E., Sharma, S., & Yaremchuk, K. (2011). Continuous positive airway pressure adherence for obstructive sleep apnea. *International Scholarly Research Network Otolaryngology, 2011.* doi:10.5402/2011/943586

Stalker, C., & Elander, J. (2015). Effects of a pain self-management intervention combining written and video elements on health-related quality of life among people with different levels of education. *Journal of Pain Research*, *8*, 581. doi:10.2147/jpr.S85741

Toraya, C. (2014). Evaluation of advance directives video education for patients. *Journal of palliative medicine*, *17*(8), 942-946. doi:10.1089/jpm.2013.0585

Turkel, M. (2007). Dr. Marilyn Ray's theory of bureaucratic caring. *International Journal for Human Caring, 11*(4), 57-70.

United States Department of Health and Human Services. (2008). America's Health Literacy: Why We Need Accessible Health Information. Retrieved from: https://health.gov/communication/literacy/issuebrief/

Van Eck, C., Toor, A., Banffy, M., & Gambardella, R. (2018). Web-based education prior to outpatient orthopaedic surgery enhances early patient satisfaction scores. *The Orthopaedic Journal of Sports Medicine, 6*(1), 1-14. doi:10.1177/2325967117751418

Wang, D., Jani, A., Sesay, M., Tai, C., Lee, D., Echt, K., ... & Master, V. (2015). Video-based educational tool improves patient comprehension of common prostate health terminology. *Cancer*, *121*(5), 733-740. doi:10.1002/cncr.29101

Wei, M., Ito, M., Cohen, J., Brinton, E., & Jacobson, T. (2013). Predictors of statin adherence, switching, and discontinuation in the USAGE survey: Understanding the use of statin in American and gaps in patient education. *Journal of Clinical Lipidology, 7*(5), 472-483. doi:10.1016/j.jacl.2013.03.001

Wiese, H., Boethel, C., Phillips, B., Wilson, J., Peters, J., & Viggiano, T. (2005). CPAP complicance: Video education may help! *Sleep Medicine, 6*, 171-174. doi:10.1016/j.sleep.2004.08.006

Wilson, E. A., Park, D. C., Curtis, L. M., Cameron, K. A., Clayman, M. L., Makoul, G., ... & Wolf, M. S. (2010). Media and memory: the efficacy of video and print materials for promoting patient education about asthma. *Patient education and counseling*, *80*(3), 393-398. doi:10.1016/k.pec.2010.07.011

Wilson, M., Krupa, A., Hinds, R., Litell, J., Swetz, K., Akhoundi, A., … & Kashani, K. (2015). A video to improve patient and surrogate understanding of cardiopulmonary resuscitation choices in the ICU: A randomized controlled trial. *Critical Care Medicine, 43*(3), 621-629. doi:10.1097/ccm.0000000000000749

Wright Nunes, J., Wallston, K., Eden, S., Shintani A., Alp, R., & Cavanaugh, K. (2011). Associations among perceived and objective disease knowledge and satisfaction with physician communication in patient with chronic kidney disease. *International Society of Nephrology, 80*(12), 1344-1351. doi:10.1038/ki.2011.240

APPENDIX A. APPLICATION OF PATIENT EDUCATION SCIENCE

Application of Patient Education Science in Video Development

Guiding Principle
Universal Precautions – We do not know who has limited Health Literacy.

Health Literacy is defined as:
"The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions." (Healthy People 2010)

Video development should include the same Health Literacy elements as in written materials.
- Use plain language
  - Assure script is at a 5th to 6th grade reading level.
  - Use one to two syllable words.
  - Refrain from medical jargon or limit to a minimal amount.
    - Need to explain medical terms.
  - Avoid use of acronyms.

Videos used for patient education
- Video length
  - 5-20 minutes in length.
  - Consider length of attention span.
    - Normal literacy ability – 8 minutes.
    - Low literacy – 4-6 minutes.
  - For videos over 8 minutes in length, incorporate an interactive activity with the learner every 5 minutes.
- Use culturally appropriate words and concepts.
- Emphasize what "to do" instead of what "not to do".
- Convey message in a story form.
- Include role modeling desired behaviors/outcomes.
- Assure text on the screen is presented long enough for the learner to read it.
- Develop the product keeping in mind your learner may not be able to read.

Before showing the video
- Inform the learner:
  - The video's purpose.
  - The topics learning objectives - What you desire they will learn.
  - How viewing the video will benefit the learner.
  - Points to look for in the video.

Sources:
Agency for Healthcare Research and Quality. (2010). Health Literacy Universal Precautions Toolkit. Retrieved from http://www.ahrq.gov/qual/literacy/.
Alexa T. McCray, PhD(March/April 2005) *Application of Information Technology Promoting Health Literacy* Volume 12 Number 2 pages 152-163.
Health Literacy from A to Z. Burlington, MA.: Jones & Bartlett Learning, LLC.
No Time to Teach: A Nurse's Guide to Patient and Family Education. Lippincott.

APPENDIX B. NEEDS ASSESSMENT

Provider Input: Patient Education Video on Obstructive Sleep Apnea (OSA)

1. What needs for patient education on obstructive sleep apnea (OSA) do you see enhancing your practice? (ie: patient binder, video, etc.) _____
2. Do you think you would utilize a patient education video on OSA into your practice? Yes / No
3. Do you think a patient education video on OSA could make your practice more efficient? Yes / No
4. How could you utilize a patient education video on OSA in your practice? (select all that apply)
   - o Link sent to patient on MyChart before provider consult for DOT patients
   - o Played in waiting room
   - o Played for patient during/after provider consult
   - o Link sent on MyChart for the patient to review at home prior to the sleep study
   - o Other:_____
5. What would you like to see included in a patient education video on OSA? (select all that apply)
   - o Pathophysiology
   - o Symptoms
   - o Risk Factors
   - o Diagnosis
   - o Sleep Study
   - o Treatment
   - o Other:_____
   - o Other:_____
6. In what patient populations would you see a patient education video on OSA being useful?
   - o Adult
   - o DOT
   - o Parents of children
   - o Other: _____
7. Would a patient education video on OSA improve patient education in your practice? (select one)

   Yes Maybe Probably Not No
8. Regarding the development of such patient education, what other thoughts would you like to share with us today?

APPENDIX C. ASSESSMENT OF PROVIDER OSA VIDEO USE

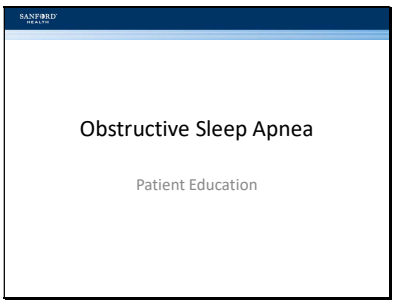
Provider OSA Patient Education Video Survey

☐ Yes ☐ No Did you offer the OSA patient education video to this patient?

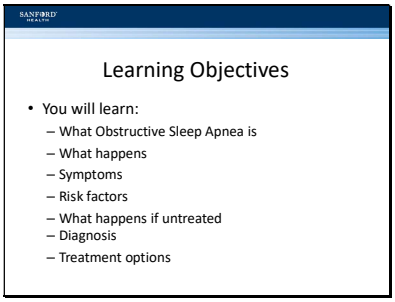
☐ Accept ☐ Decline Did the patient accept or decline the offer?

☐ OSA patient education video was not applicable for this patient

APPENDIX D. PROPOSED OSA PATIENT EDUCATION VIDEO AND FINAL VIDEO

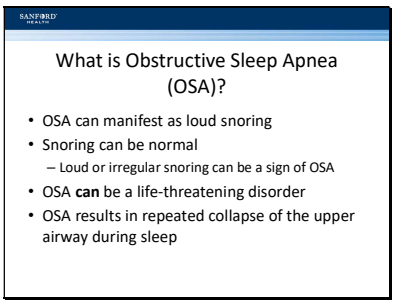


This video will discuss what Obstructive Sleep Apnea is and how it affects your sleep. The purpose of this video is to give you an overview of Obstructive Sleep Apnea.

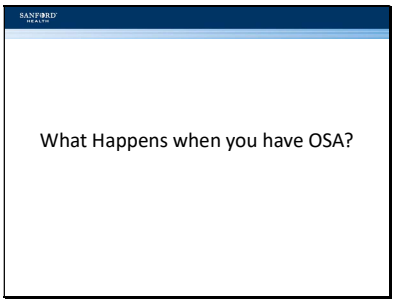


In this video, you will learn what Obstructive Sleep Apnea is, what happens when you have Obstructive Sleep Apnea, symptoms of Obstructive Sleep Apnea, risk factors for Obstructive Sleep Apnea, what happens if your Obstructive Sleep Apnea is left untreated, How Obstructive Sleep Apnea is diagnosed, and treatment options for Obstructive Sleep Apnea.

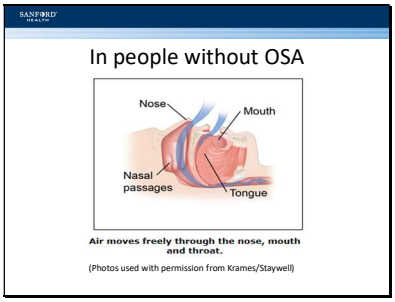
At any point in this video, look for things you would like to discuss with your health care provider



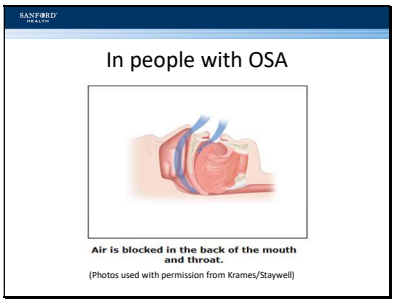
Snoring can mean you have a problem. However, snoring can also be normal. It does not always mean that there is a problem that needs to be fixed. If the snoring is loud or is not in a regular pattern, it can be more likely that there is a concern, as snoring can mean that you have obstructive sleep apnea. Obstructive sleep apnea, or OSA, can be life-threatening and can cause other health problems. For this reason, your health care provider may ask that you have your snoring checked out. OSA is when the muscles of the throat relax when you fall asleep and this can cause the tissue, and/or muscles of the throat and airway, to touch, which can cut off your air supply. This can happen repeatedly during your sleep.



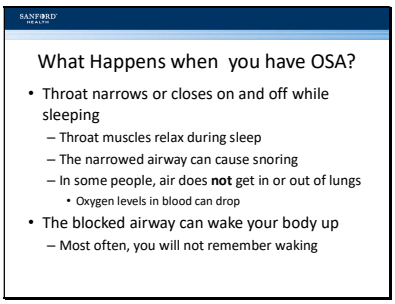
What really happens when you have OSA? What is going on?



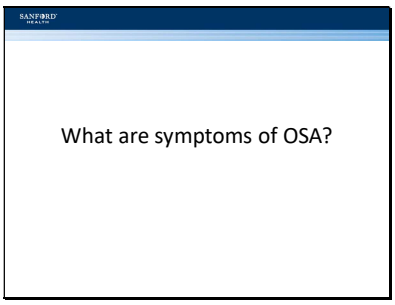
In people without OSA, the muscles and tissue in the throat and airway stay open enough to let the air move freely into the lungs while they sleep. At times, there might be *some* relaxation of the tissue that causes the tissue to vibrate and create a snoring sound.



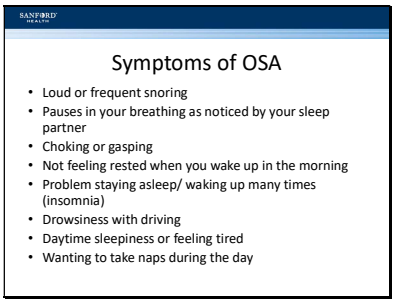
When people have OSA, the muscles and tissue in the throat relax to the point where the tissue in the throat touch. This cuts off your air supply, not letting air and oxygen into your lungs.



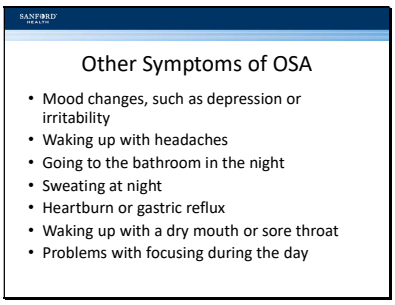
When the throat narrows (or closes) on and off during your sleep. Depending on how much the throat is narrowing, this can cause snoring that is normal or snoring associated with obstructive sleep apnea. This narrowing or closing of the throat can cause the oxygen levels to drop in the blood because your lungs cannot get the air and oxygen they need. When this happens, your body has to wake up due to the blocked airway and throat. Most often, you will not remember waking up, as this happens so quickly, and then your body falls back to sleep. This can be happening over and over while you sleep without you even knowing.



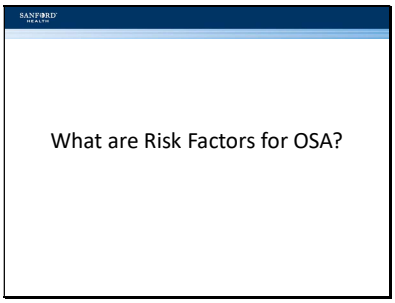
What are the symptoms of OSA? How can I tell if I might have OSA?



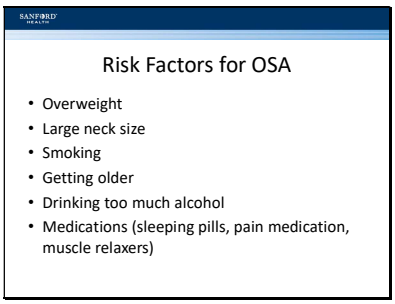
Commonly, your sleep partner may tell you that you have snoring. It is especially concerning if the snoring is loud or frequent. You may even notice waking yourself up because of snoring, choking, or gasping. If your sleep partner notices that you stop or pause in your breathing during your sleep, this can also be a sign that you might have OSA. Other symptoms you may notice in yourself can include not feeling rested when you wake up in the morning, problems staying asleep or waking up many times in the night known as insomnia, becoming drowsy when you drive, feeling sleepy or tired during the day, or wanting to take naps during the day, either on purpose or not on purpose. You might find that you fall asleep without meaning to during calm activities, such as watching television or during meetings or other social gatherings.



Other, more subtle symptoms you may notice are mood changes or irritability (such as with depression or anxiety), waking up in the morning or at night with headaches, having to go to the bathroom frequently during your sleep hours, sweating at night, heart burn or gastric reflux, waking up with a dry mouth or sore throat, or even problems focusing when you are awake.

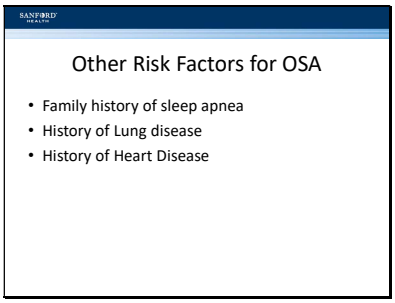


What are the risk factors for OSA? How do I know if I am more likely to have OSA?

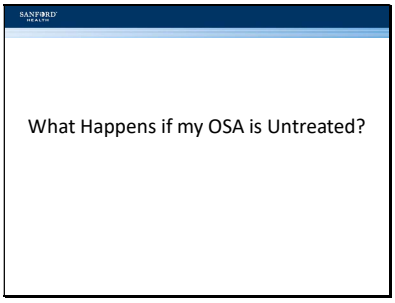


If you are overweight, you are at higher risk for having OSA. Weight loss always improves the severity of OSA, but it does not always cure OSA. You can still have OSA even if you have a normal weight. This is another reason we measure your neck, as a thicker neck (even if you are not overweight) can increase the risk that you have OSA. This is because there is more tissue that can relax and cut off your throat and airway. If you smoke, your chances of having OSA are higher. Even though young people and children can have OSA, getting older increases your chances of having OSA. Drinking more than 1oz of hard alcohol for women or 1.5 oz of hard alcohol for men within 3 hours of going to bed can cause or worsen OSA, as this relaxes the throat muscles

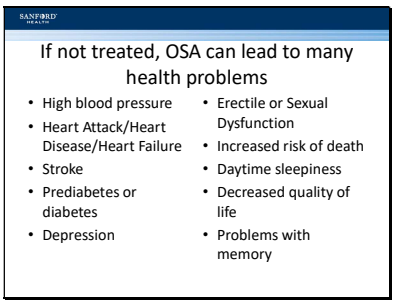
even more than normal. Certain prescription or over the counter medications can also cause or worsen OSA. Such medications include sleeping pills, pain medication, and muscle relaxers.



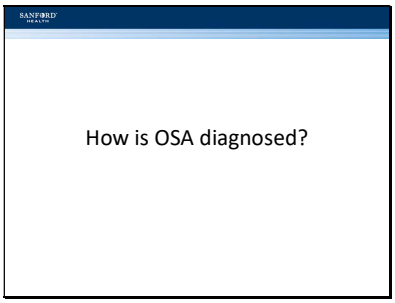
Other factors that can increase your risk of having OSA are having someone in your close family (parent, sibling, or child) with OSA. Having a diagnosis of a lung or heart disease can also increase your risk of having OSA.



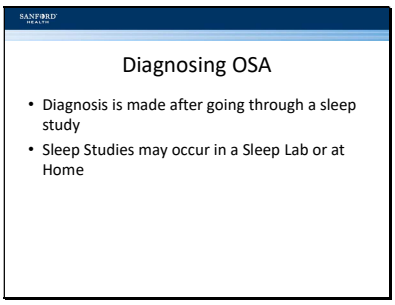
What happens if OSA is untreated and you decide not to do anything about it?



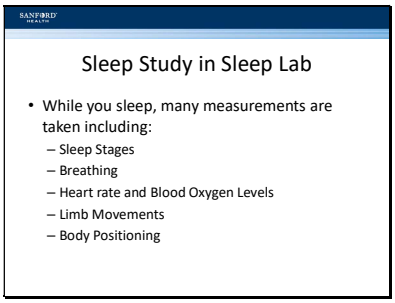
If not treated or not fully treated, OSA can lead to many health problems, such as high blood pressure (or needing more blood pressure medication to treat your current blood pressure), heart attack/heart disease/heart failure or problems with the heart rhythm (such as atrial fibrillation, Stroke, prediabetes/diabetes or problems managing blood sugars, depression and anxiety, erectile or sexual dysfunction, or increased risk of death. Other symptoms that can develop or get worse are feeling sleepy during the day, drowsiness while driving, decreased quality of life, or memory problems.



So, How is OSA diagnosed? How does a person find out if they have OSA

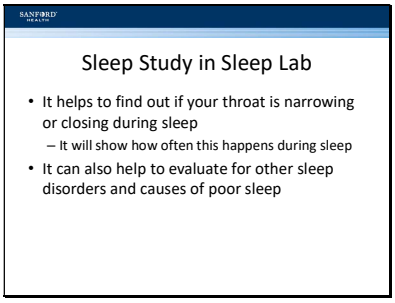


You can only know if you have OSA if you go through a test called a sleep study. These sleep studies might take place in a sleep lab or in your own home. This presentation goes over sleep studies in the lab. If your provider recommends a sleep test at home, you will receive specific instructions on how to do this and why this type of sleep study would be right for you and your specific case.

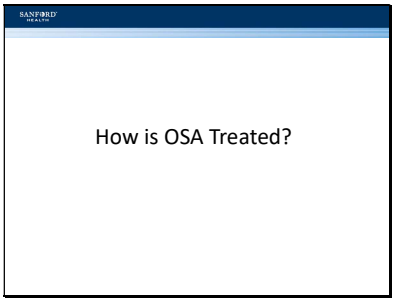


Sleep studies are not painful or uncomfortable. You will be set up with a time to come to sleep in our lab and the sleep technician will meet you out in the waiting room of the Sleep Medicine Center. At out main clinic, sleep rooms are set up like individual hotel rooms with a private bathroom. At outreach sites, set up of sleep room may differ slightly. The sleep technician will ask you to change into your sleeping clothes and then get the equipment attached to you. These wires and other equipment will help measure parts of your sleep that will help determine if you have OSA or not. The wires may have stickers that may go on your head, by your eyes, on your chin and throat, over your chest, and you might need some on your legs and finger. While you sleep, this equipment will help measure things such as your sleep stages, breathing, heart rate and blood oxygen levels, leg and arm movements, and body positioning, among other things.

- **Picture of Sleep Study Room Here*



The equipment during the sleep study while you sleep will help your provider find out if your throat is narrowing or closing during sleep, and how often this might be happening. The measurements also help your provider find out if you might have other sleep disorders that could be causing poor sleep. Please review the presentation on Sleep Study Information for more information regarding your sleep study.



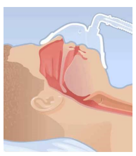
How is OSA treated? What can fix my OSA if this is what I have?

How is OSA Treated?

- The most common treatment is a machine that uses a mask to blow air in through the nose or through the nose and mouth at night. This is called Positive Airway Pressure (PAP) therapy
- PAP is usually the first treatment to try
- PAP keeps your throat open when you sleep

The most common treatment is a machine that uses a mask to blow air in through the nose or through the nose and mouth at night. This is called Positive Airway Pressure (PAP) therapy. PAP is usually the first treatment to try. PAP uses air pressure to keep your throat open when you sleep.

CPAP Video

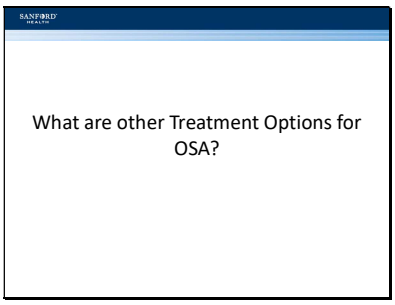


Source: https://www.youtube.com/watch?v=TdH0BvoDQ0Y&nohtml5=False

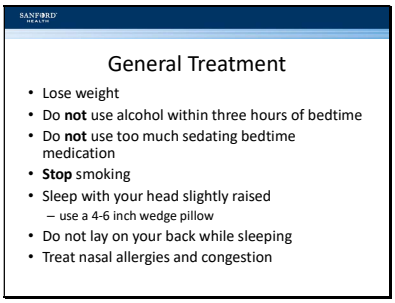
Types of PAP Therapy

- CPAP (Continuous Positive Airway Pressure)
  - Continual positive pressure pushes air into your lungs
- APAP (or AutoPAP)
  - Adjusts the positive pressure in response to changes like body position, sleep stage, and snoring
- BiLevel PAP
  - Positive Airway Pressure is given when you breathe in and less when you breathe out

There are different types of PAP therapy. Your provider will look at your sleep study results to figure out which type of PAP therapy is best for you. If you are having problems, sometimes you might have to switch to a different kind of PAP therapy to fix your OSA.

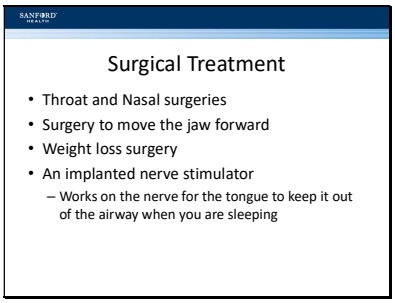


What are other treatment options for OSA? What else can I use?

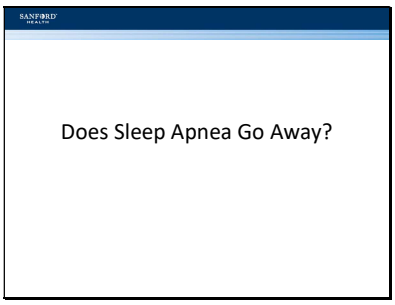


In general, losing weight always helps improve sleep apnea, though does not always cure it completely. Staying away from alcohol within 3 hours from bedtime is important. Alcohol relaxes the throat muscles, making the throat more likely to close and worsen sleep apnea. Sedating medication and continuing to smoke also can worsen sleep apnea. Discuss discontinuing any medication that is sedating and not needed long-term with your provider. Working to quit smoking will help improve your sleep apnea. Elevating the head of the bed using a 4-6 inch wedge pillow or not lying on your back while sleeping helps to improve sleep apnea by decreasing the pull of gravity on the structures in your airway. Treating allergies or congestion can also help snoring and breathing in general.

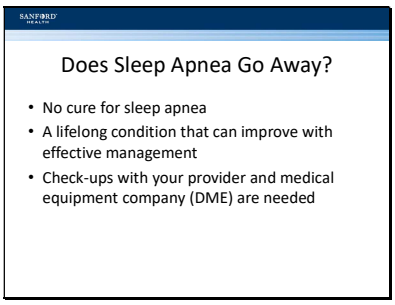
This is a device that fits over the top and bottom teeth and connects together to keep the jaw from falling back while you sleep to help air move through your throat better. There are two kinds: one commercially available at drug stores or online or custom-made through a dentist office.



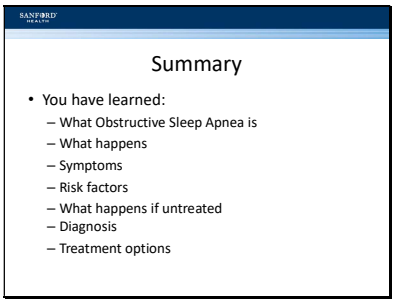
There can be different options for surgery. However, surgery is not the first choice for patients looking to treat only their sleep apnea for the first time. Please talk with your provider if you would like more information.



Does Sleep Apnea ever go away? Will this ever get better?



Nothing can cure or take the sleep apnea away completely. This is usually something that lasts the rest of you life and can improve with management. Weight gain or getting older are just some of the factors that can worsen sleep apnea and may need to adjust how you treat your sleep apnea. Getting regular check-ups with your provider and medical equipment company are highly recommended to make sure that your sleep apnea stays controlled so that you do not develop any of the problems that can happen if you do not treat or completely treat your sleep apnea.



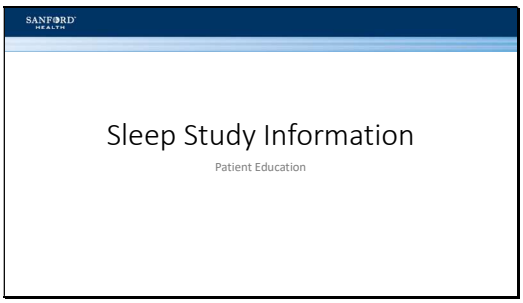
In this video, you have learned

what Obstructive Sleep Apnea is,

What happens when you have Obstructive Sleep Apnea, Symptoms of Obstructive Sleep Apnea, Risk factors for Obstructive Sleep Apnea, What happens if your Obstructive Sleep Apnea is left untreated, How Obstructive Sleep Apnea is diagnosed,

And treatment options for Obstructive Sleep Apnea

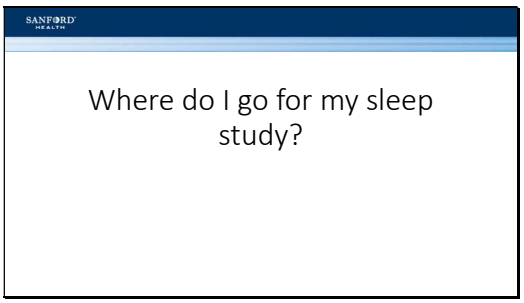
Even though OSA can be life long, you have taken a great step in being active in your health.

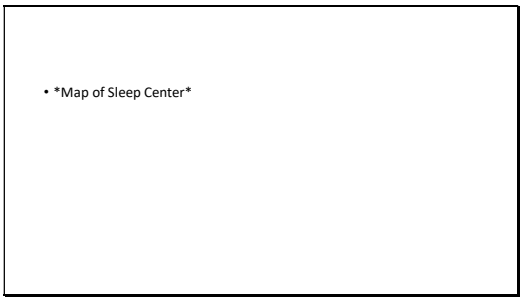


The purpose of this presentation is meant to help you to prepare for your sleep study or learn more about a sleep study that might be recommended in your situation. Please know the sleep study process described in this presentation may differ slightly from what you might experience, also depending on which location you are at, as this is the process for sleep studies at the Fargo location.

Some people may start out with a home sleep test. Home sleep tests are not for everyone, and there is very specific criteria in order to qualify for this type of sleep study in place of a sleep study in the lab. These criteria should be discussed with your provider in your clinic visit. This presentation only discusses the process for the sleep studies in a lab.

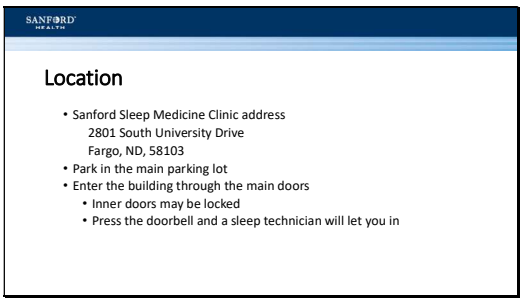
You may review this presentation over and over again and we do recommend reviewing the presentation close to the time of your sleep study so that you know better what to expect and can ask any questions you might have prior to that time.





Video clip of the front of the building after this slide showing the map of where the Sleep Center is located in Fargo.

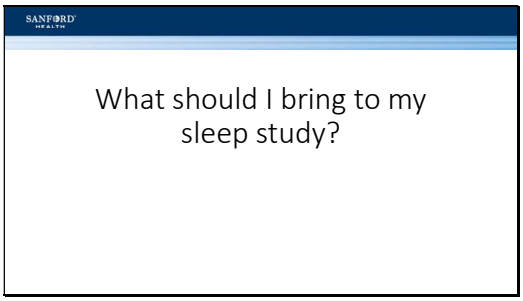
]

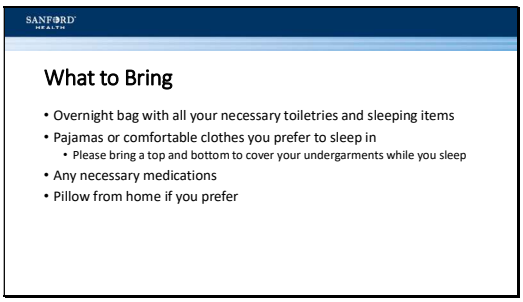


The Sleep Medicine Center is located at 2801 South University Drive. Fargo, ND, 58103. This is where you can expect to go for your sleep study, unless your provider tells you to go to another location, perhaps because this is closer to your home. You can ask your provider if there is a sleep study lab closer to your area in your clinic appointment.

(Maybe have a video clip of the parking lot and a person entering the building if able) You can park out in the main parking lot, east of the building, and come in the main doors. If the inner door is locked, there is a doorbell to the right, located on the north wall, that will alert the technician you have arrived. Come in and go up the stairs to the second floor and follow the signs to the Sleep

Center waiting room. The Sleep Technician will come to get you for your sleep study and show you to your room for the night. Once in your room, you will be oriented to the process and can change into your pajamas, or what you will be sleeping in for the study, unless you have already done so.

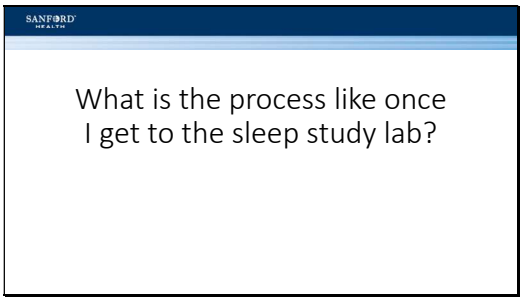


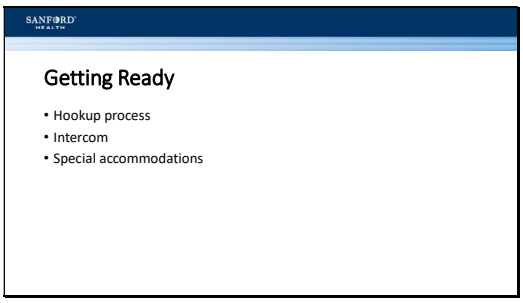


Please pack an overnight bag with all your necessary toiletries and sleeping items, such as a toothbrush and toothpaste, and pajamas or comfortable clothes you prefer to sleep in (top and bottoms please), and a pillow from home if you prefer. We want you to be as comfortable as you can away from home for your study. You should also bring all your necessary medications for the night of your sleep study and for the morning when you wake up from your sleep study.

It is fine if you need to bring items from home that might help you get to sleep better, such as a book, but discourage other items (unless indicated by another medical condition), that could possibly delay you from sleeping, such as snacks. Remember that the more sleep you get, the better

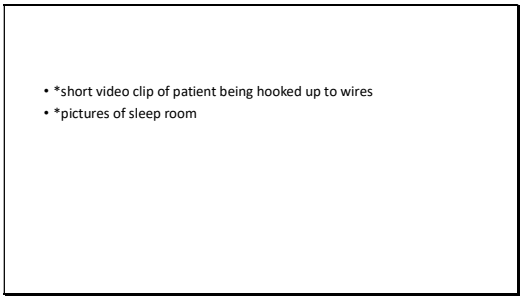
the results of the sleep study to figure out the source of your sleeping concern.

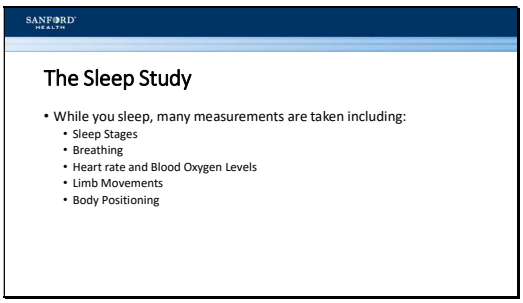




(Video clip if possible) The technician will explain the hookup process, such as where to place the wires that help us to monitor your sleep on the scalp, near the eyes, under the nose, over the chin, on the neck/chest/finger, and some on your legs. All these wires will connect to one portable box, so if you need to use the restroom at night you are able to do so by taking the whole box with you. There is an intercom above your head in the bed if you need to alert the sleep technician of a concern; once you are in the bed, you may push this if you have questions or if you need to speak with the technician. Please remember that sleep technicians may be helping 1 or 2 people through a sleep study, so will attend to your needs as soon as possible.

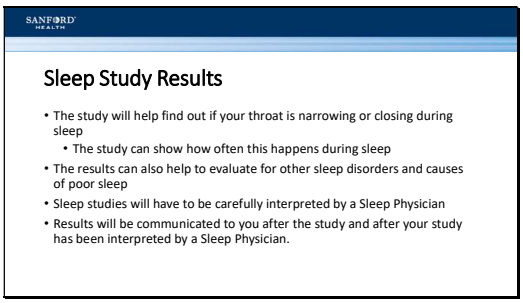
The whole hookup process will take 45 minutes to an hour. Any special accommodations, such as the need for a hospital bed the night of your sleep study, should have been discussed with your Sleep Provider prior to your sleep study. Once you are ready for bed, we encourage you to fall asleep as quickly as possible. A television is available if you need one in order to fall asleep, but will time out after a time in order to help you sleep as quickly as possible and not distract you from sleep. If you are taking a long time to fall asleep, your Sleep Provider may have ordered you a possible sleeping medication to use the night of your sleep study.





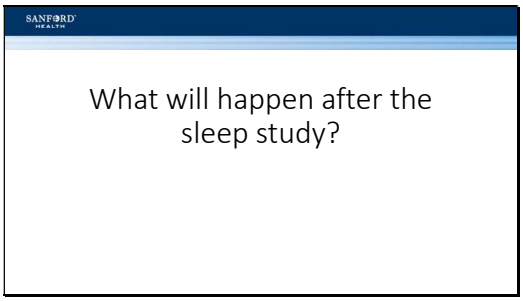
Sleep studies are not painful or uncomfortable. You will be set up with a time to come to sleep in our lab and the sleep technician will meet you out in the waiting room of the Sleep Medicine Center. At our main clinic, sleep rooms are set up like individual hotel rooms with a private bathroom. At outreach sites, set up of sleep room may differ slightly. The sleep technician will ask you to change into your sleeping clothes and then get the equipment attached to you. These wires and other equipment will help measure parts of your sleep that will help determine if you have a sleep disorder, such as obstructive sleep apnea or not. The wires may have stickers that may go on your head, by your eyes, on your chin and throat, over your chest, and on your legs and finger. While you sleep, this equipment will help measure things such as your sleep stages, breathing, heart rate and blood oxygen levels, limb movements, and body positioning, among other aspects of your sleep.

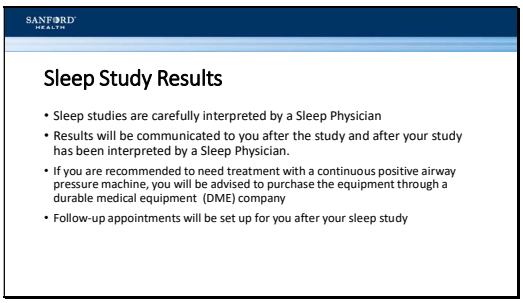
Some people worry that with all the wires and equipment, that they will get tangled up in the night. The wires are easy to move and move with you while you sleep. We know that this equipment might make you feel like you don't quite sleep the same as you do at home in your own environment, but the sleep that you get the night of your sleep study in the lab can be helpful in order to be able to determine if you have a sleep disorder that may require treatment or not.



The equipment during the sleep study while you sleep will help your provider find out if your throat is narrowing or closing during sleep, and how often this might be happening for concerns of breathing disorders during sleep, such as in obstructive sleep apnea. The measurements also help your provider find out if you might have other sleep disorders that could be contributing to poor sleep.

Sometimes, the whole night of your sleep is required to figure out if you have a sleep disorder or not. Other times, if your sleep disorder meets criteria right away in the beginning of the night during your sleep, we might be able to treat the problem that night. If you meet criteria right away for sleep apnea, for example, your sleep technician may wake you up the night of your sleep study in order to start continuous positive airway pressure, or CPAP, that same night in order to help you breath better during sleep. If CPAP was not started the night of your initial sleep study, you might still have a breathing disorder, such as sleep apnea, but we may need you to come back another night to determine best how to treat your specific sleep disorder.

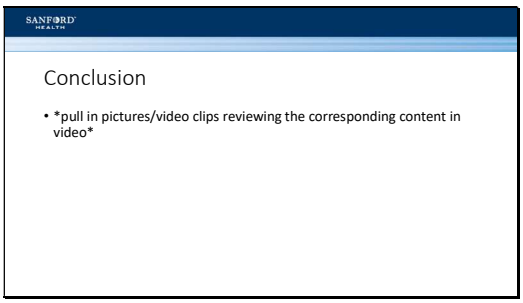




When you wake up in the morning, the sleep technician is not able to tell you your results right away. The study will be carefully interpreted by a Sleep Physician and you will be notified with basic results by the sleep technician within 1-2 weeks. When you get your results, that is when you would be notified if you need another sleep study. If you do meet the criteria for sleep apnea needing treatment with CPAP, you will be asked where you would like to purchase this equipment. The equipment is purchased through a durable medical equipment (DME) company. Your provider or sleep technician can provide you with a list of DME companies in your area to choose from in order to start treating your sleep disorder.

Once you decide on a DME company to obtain your equipment from, the DME company of your choice will contact you to set up a time to learn how to use the equipment, which usually takes about an hour. If you have any questions about the mask or machine that you got from the DME company, please contact the DME company as soon as possible, as they can help you right away.

Once you get your equipment, you may start using this at home. You will be set up with a follow-up appointment with a Sleep Medicine provider after your sleep study in order to go over the results in more detail and discuss how your equipment is working for you if any equipment is recommended from your results. If no equipment was recommended, you will still follow-up in an appointment with a Sleep Medicine provider to be set up after your sleep study to go over your results and find out if there were any other sleep disorders needing treatment.



In this presentation, we have discussed where to go for your sleep study and what you should bring to your sleep study. We also discussed what the Sleep Study process will look like and what will happen after the sleep study. This video may be reviewed closer to the time of your sleep study to refresh your memory on the information provided. If you have questions specific to your situation, feel free to address them with your Sleep Medicine provider or staff.

Link to the final video on organizational website:
http://www.sanfordhealth.org/health-information/videolibrary/video?id=54e39106-f2e8-3dbf-a3f4-cc0e6cf3c226

APPENDIX E. PROVIDER POST ASSESSMENT SURVEY

Provider Input: Patient Education Video on Obstructive Sleep Apnea (OSA)

1. Did this patient education video meet your expectations in regards to each of the following sections? (Check all you felt were adequately addressed):

   - o Pathophysiology
   - o Symptoms
   - o Risk Factors
   - o Diagnosis
   - o Sleep Study
   - o Treatment
   - o Other:_____
   - o Other:_____

2. How could the patient education video on OSA have been improved? Explain:

   _____

   _____

3. After viewing the patient education video, do you think this video would enhance your practice? Yes / No

4. After viewing the patient education video, do you think this video will increase your practice efficiency? Yes / No

5. After viewing the patient education video, do you think you will utilize this video in your practice? (select one)

   Yes Maybe Probably Not No

6. Now after viewing the patient education video, in what patient populations would you implement the patient education video? (select all that apply):

   - o Adult
   - o DOT
   - o Parents of children
   - o Other: _____

7. How would you anticipate would be the **most** useful way to utilize this patient education video in your practice? (Choose ONE):

   - o Link sent to patient on MyChart before provider consult for DOT patients
   - o Played in waiting room
   - o Played for patient during/after provider consult
   - o Link sent on MyChart for the patient to review at home prior to the sleep study
   - o Other:_____
   - o Other:_____

8. If you are not planning to implement the video, how could the patient education video have been improved for you to utilize in your practice? Explain:

   _____

   _____

9. Regarding the development, presentation method, content or utility of this patient education video, please share any other thoughts or comments below:

APPENDIX F. ORGANIZATIONAL IRB EXEMPTION NOTICE

STUDY00000975 is not human research

no-reply@huronclick.com

Mon 4/10/2017 2:05 PM

To: Ugelstad, Elizabeth <elizabeth.ugelstad@ndsu.edu>;

Template: IRB_T_Post-Review_NotHumanResearch

Notification of Not Human Research Determination

To:	Elizabeth Ugelstad
Link:	STUDY00000975
P.I.:	Elizabeth Ugelstad
Title:	OSA Patient Education Video
Description:	The committee reviewed this submission and assigned a determination of Not Human Research. For additional details, click on the link above to access the project workspace.

APPENDIX G. NDSU IRB EXEMPTION NOTICE

NDSU NORTH DAKOTA STATE UNIVERSITY

June 1, 2017

Dr. Heidi Saarinen
Nursing

Re: IRB Determination of Exempt Human Subjects Research:
Protocol #PH17212, "Implementing an Obstructive Sleep Apnea Patient Education Video in a Sleep Medicine Clinic"

Co-investigator(s) and research team: Elizabeth Ugelstad
Certification Date: 6/1/2017 Expiration Date: 5/31/2020
Study site(s): Sanford Health Sleep Clinic
Sponsor: n/a

The above referenced human subjects research project has been certified as exempt (category #2) in accordance with federal regulations (Code of Federal Regulations, Title 45, Part 46, Protection of Human Subjects). This determination is based on the original protocol submission with revised information sheet (received 5/31/2017).

Please also note the following:
• If you wish to continue the research after the expiration, submit a request for recertification several weeks prior to the expiration.
• The study must be conducted as described in the approved protocol. Changes to this protocol must be approved prior to initiating, unless the changes are necessary to eliminate an immediate hazard to subjects.
• Notify the IRB promptly of any adverse events, complaints, or unanticipated problems involving risks to subjects or others related to this project.
• Report any significant new findings that may affect the risks and benefits to the participants and the IRB.

Research records may be subject to a random or directed audit at any time to verify compliance with IRB standard operating procedures.

Thank you for your cooperation with NDSU IRB procedures. Best wishes for a successful study.
Sincerely,

Kristy Shirley

Digitally signed by Kristy Shirley
DN: cn=Kristy Shirley, o=NDSU, ou=Institutional Review Board, email=kristy.shirley@ndsu.edu, c=US
Date: 2017.06.01 09:51:04 -05'00'

Kristy Shirley, CIP, Research Compliance Administrator

For more information regarding IRB Office submissions and guidelines, please consult http://www.ndsu.edu/research/integrity_compliance/irb/. This Institution has an approved FederalWide Assurance with the Department of Health and Human Services: FWA00002439.

INSTITUTIONAL REVIEW BOARD
NDSU Dept 4000 | PO Box 6050 | Fargo ND 58108-6050 | 701.231.8995 | Fax 701.231.8098 | ndsu.edu/irb
Shipping address: Research 1, 1735 NDSU Research Park Drive, Fargo ND 58102

APPENDIX H. PARTICIPANT INFORMATION SHEET

Video Participant Information Sheet

Hello!

My name is Elizabeth Ugelstad and I am a DNP candidate in the School of Nursing at NDSU. I am working together with my advisor, Heidi Saarinen, on my clinical dissertation to develop an Obstructive Sleep Apnea (OSA) video for use in your clinic. The purposes of this clinical dissertation are as follows:

1. Demonstrate technological caring through development of an evidence-based audiovisual patient education modality on Obstructive Sleep Apnea in congruence with the organization's Learning Services and evidence-based practice
2. Provide the Sleep Medicine patients an evidence-based audiovisual patient education modality on Obstructive Sleep Apnea in an online format linked within the organization's established patient-provider communication system
3. Elicit consistent Sleep Medicine provider utilization of the OSA patient education video on Obstructive Sleep Apnea
4. Provide educational caring to Sleep Medicine patients through the implementation of the OSA patient education video in Sleep Medicine provider practice

At the conclusion of the video development, we will both solicit your feedback on the Obstructive Sleep Apnea (OSA) patient education video and examine your utilization of the OSA patient education video. The surveys will be less than ten questions. Anticipated time to participate in the feedback should be less than fifteen minutes, but is dependent on how detailed you would like your feedback to be.

Your participation is completely voluntary. If you are willing to take part in this study and offer your feedback, or have any questions, please feel free to contact Elizabeth Ugelstad – Elizabeth.Ugelstad@ndsu.edu if you have any questions.

If you have any questions about the rights of human participants in research or to report a problem, contact the NDSU IRB office at 701-231-8908, 1-855-800-6717 (toll-free), or ndsu.irb@ndsu.edu

Thank you for time and consideration,

Elizabeth Ugelstad, DNP-S
Email: Elizabeth.Ugelstad@ndsu.edu
Cell: 701-552-1828

APPENDIX I. EXECUTIVE SUMMARY

MARCH 1, 2018

SLEEP MEDICINE OSA PATIENT EDUCATION VIDEO

ELIZABETH UGELSTAD
NDSU DNP-S
Fargo, ND

SLEEP MEDICINE OSA PATIENT EDUCATION VIDEO

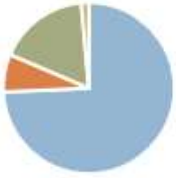
VIDEO USE JANUARY 11 – FEBRUARY 9, 2018

The Sleep Medicine Clinic had 294 new consults between January 11th and February 9th, 2018. Of the 294 new consults, 70 computer keyboard surveys were collected (24%) to assess provider offering the OSA video to new patients.

Surveys Collected of New Patient Consults

Surveys Collected 24% Surveys Not Collected 76% n = 294

Patients Offered Video



YES 74% NO 7% NA 17% BLANK 1% n = 70

Of the 70 keyboard surveys collected:

- The video was offered to 74% of patients (n=52)
- The video was not offered to 7% of patient (n=5)
- The video was not applicable to 17% of patients (n=12)
- One survey was blank (n=1)

Patients Accepted/Declined Video

Of the 52 patients offered the video:

- About 90% accepted the video offer (n=47)
- About 10% declined the video offer (n=5)

Accepted 90% Declined 10% n = 52

CONCLUSION OF VIDEO USE WITH NEW PATIENTS

- Sleep Medicine patients were receptive to the video when offered
- Barriers to offering the video included time constraints in the visit, patient did not speak English, patient did not have MyChart access, and patient did not have computer
- More data would need to be gathered to determine patient viewing of video and to gather patient feedback

Sleep Medicine OSA Patient Education Video

SLEEP MEDICINE PROVIDER VIDEO FEEDBACK

POST VIDEO TRIAL SURVEY

Provider Comments:

- "**More in depth – pictures and visuals**." Four out of the seven providers who responded to the post-implementation survey said they would like more pictures, visuals, and animations included in the video.
- "Too long with fixed picture or text as speaker talked in the background." One provider pointed to multiple times during the video where they believed the narrator spoke for too long without engaging visuals.
- "**It's perfect**." One provider liked the video just as it was.

86% of the Sleep Medicine providers thought this patient education video would enhance their practice.

Three providers acknowledged "yes," they planned to use the video into their practice. Four providers said they "maybe" would use the video – "based on patient preference," one provider clarified.

Providers suggested shortening the web link to the video to make it easier for patients to access. They also suggested adding the video web link to the OSA handouts they give to patients.

CONCLUSIONS BASED ON SLEEP MEDICINE PROVIDER VIDEO FEEDBACK

- Sleep Medicine providers suggest shorting the video link and making the video more accessible for patients
- The Sleep Medicine providers suggested maximizing visual content of patient video education
- As the Sleep Medicine providers indicated they were likely to utilize patient video education videos, developing and implementing patient video education into practice is recommended

Sleep Medicine OSA Patient Education Video

APPENDIX J. ELSEVIER PERMISSION TO PUBLISH RAY'S THEORY

RE: Obtain Permission – Book request

Jones, Jennifer (ELS-OXF) <J.Jones@elsevier.com>

Wed 2/22/2017 3:24 AM

To:Elizabeth Ugelstad <elizabeth.ugelstad@ndsu.edu>;

ELSEVIER

Dear Elizabeth Ugelstad
We hereby grant you permission to reprint the material detailed below at no charge **in your thesis** subject to the following conditions:

1. If any part of the material to be used (for example, figures) has appeared in our publication with credit or acknowledgement to another source, permission must also be sought from that source. If such permission is not obtained then that material may not be included in your publication/copies.

2. Suitable acknowledgment to the source must be made, either as a footnote or in a reference list at the end of your publication, as follows:

   "This article was published in Publication title, Vol number, Author(s), Title of article, Page Nos, Copyright Elsevier (or appropriate Society name) (Year)."

3. Your thesis may be submitted to your institution in either print or electronic form.

4. Reproduction of this material is confined to the purpose for which permission is hereby given.

5. This permission is granted for non-exclusive world **English** rights only. For other languages please reapply separately for each one required. Permission excludes use in an electronic form other than submission. Should you have a specific electronic project in mind please reapply for permission

6. This includes permission for UMI to supply single copies, on demand, of the complete thesis. Should your thesis be published commercially, please reapply for permission.

Yours sincerely

Jennifer Jones
Permissions Specialist

Elsevier Limited, a company registered in England and Wales with company number 1982084, whose registered office is The Boulevard, Langford Lane, Kidlington, Oxford, OX5 1GB, United Kingdom.

From: elizabeth.ugelstad@ndsu.edu [mailto:elizabeth.ugelstad@ndsu.edu]
Sent: 17 February 2017 00:10
To: Rights and Permissions (ELS)
Subject: Obtain Permission – Book request

Title: Ms Elizabeth Ugelstad

Institute/company: North Dakota State University
Address: 1616 31 Ave. S.
Post/Zip Code: 58103
City: Fargo
State/Territory: North Dakota
Country: United States
Telephone: 7015521828
Email: elizabeth.ugelstad@ndsu.edu

Type of Publication: Book

Book Title:Nursing Theorists and Their Work (8th Ed.)
Book ISBN: 9780323091947
Book Author: Martha Raile Alligood
Book Year: 2014
Book Pages: 104 to 105
Book Chapter number: 8
Book Chapter title: Marilyn Anne Ray

I would like to use: Figure(s)
Quantity of material: I would like to use Marilyn Anne Ray's Theory of Bureaucratic Caring Figures on specified pages of the text
Excerpts:
Are you the author of the Elsevier material? No
If not, is the Elsevier author involved? No
If yes, please provide details of how the Elsevier author is involved:
In what format will you use the material? Print and Electronic
Will you be translating the material? No
If yes, specify language:
Information about proposed use: Reuse in a thesis/dissertation
Proposed use text: I plan to publish and disseminate this figure as a part of my clinical dissertation for my Doctor of Nursing Practice through North Dakota State University. I have received consent directly from Marilyn Anne Ray for the use of this material.
Additional Comments / Information:
