Implementation of Standardized Telehealth Follow-up to Improve Adherence to Positive Airway Pressure Therapy in Patients with Obstructive Sleep Apnea

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Abstract

Phase II Site: Keesler Air Force Base (AFB) Medical Center

Project Title: Implementation of Standardized Telehealth Follow-up to Improve Adherence to Positive Airway Pressure Therapy (PAP) in Patients with Obstructive Sleep Apnea (OSA).

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Background or Problem/Issue: After the global COVID-19 pandemic limited access to in-person activities, the Military Health System (MHS) called for increased utilization of telehealth methods to improve the access and quality of care for remote care of chronic diseases in the primary care setting.

Purpose: To implement a standardized evidence-based telehealth follow-up protocol for patients with OSA who have been prescribed PAP therapy that meets or exceeds the current standard of care.

Project Design: Clinical staff implemented a phone-based follow-up protocol and used a standardized coaching method to encourage patients to optimize adherence to PAP therapy, following the evidence-based follow-up protocol designed by Murase et al. (2020) as part of a process improvement initiative.

Analysis of Results: Comparison of baseline and post-implementation Epworth Sleepiness Scale (ESS) scores demonstrated a statistically significant improvement by an average of 3.9 points ($p < 0.0001$) in reported OSA symptoms and improved overall adherence to PAP use by 85 percent at one month.

Organizational Impact/Implications for Practice: Telehealth follow-up care protocols increase access to care and improve health outcomes for patients with chronic diseases in the primary care setting. A structured care approach was effective for increasing adherence to PAP therapy for OSA within the first initial months of use, which is indicative of long-term adherence and overall better health outcomes. Primary care practices should consider promoting the use of telehealth follow-up care in patients with newly diagnosed OSA and other chronic diseases that can be effectively and remotely monitored.

Introduction

Telehealth technologies include a spectrum of solutions that bridge patients to healthcare resources. In practice, this can be as simple as a phone call from a provider to a patient or a more complex web app that provides reliable health advice. Despite increasing availability and widespread interest, the use of telehealth services was not commonplace in the Military Health System (MHS) and larger United States (US) healthcare delivery system prior to the 2019 coronavirus (COVID-19) global pandemic (Wosik et al., 2020). Barriers to broader implementation largely centered around patchwork state and federal policies that govern licensing, credentialing, and reimbursement issues (Bowman et al., 2021; Lee et al., 2020). When the COVID-19 pandemic suddenly limited access to in-person activities, Congress enacted emergency authorizations to lift several of these legislative obstacles. The Defense Health Agency (DHA) responded in turn by releasing guidance to promote telehealth use within the MHS (Enhancement of Use of Telehealth Services in the Military Health System, 2022).

Utilization of telehealth proved crucial to continuing to care for patients in primary care settings through the peaks of the pandemic (Wosik et al., 2020). Patients and clinicians have quickly recognized the inherent value of virtual appointments, which can be conducted faster, at lower cost, and with greater convenience when compared to in-person clinic visits (Orlando, et al., 2019; Reed et al., 2020; Snoswell et al., 2021). Over time, group practice managers have noticed that access to care improves when telehealth is embraced, cutting down the number of missed or canceled appointments (Mahtta et al., 2021). Additionally, evidence collected in telehealth applications supports the use of telehealth appointments as providing equivalent or possibly even more clinically effective care than face-to-face appointments (Kooij et al., 2021; Murase et al., 2019; Snoswell et al., 2021). These positive outcomes have pushed DHA towards adopting policies that promote and expand the use of telehealth, but in many areas, have yet to be applied using any standardized approach.

The goal of this project was to find ways to improve chronic disease management via telehealth service optimization in a primary care clinic at a Military Treatment Facility (MTF). A review of the literature was conducted to find evidence for effective telehealth strategies that could be implemented without needing to invest in new equipment or other resources. These parameters guided our search to focus on improving adherence to use of positive airway pressure (PAP) devices and health outcomes for patients with obstructive sleep apnea (OSA).

Problem Synthesis

Nearly 40% of all deaths in the United States can be attributed to undermanaged chronic medical conditions related to access issues (Bowman et al., 2021). Healthcare underutilization, particularly undertreatment of chronic diseases, is a major problem in the United States and is a leading driver of healthcare costs. Telehealth interventions and digital health communication strategies have been introduced to address this issue and improve chronic care management, which could result in long-term improvements in healthcare quality and cost management. Increased utilization of telehealth leads to increased access to care with a resultant heightened likelihood of patients attending follow-up appointments (Mahtta et al., 2021). There is also strong evidence to support the use of telehealth to improve outcomes in chronic disease management (Aardoom et al., 2020; Alghamdi et al., 2019; DeNicola et al., 2020; Hanlon et al., 2017; Hu et al., 2021; Snoswell et al., 2021; Zhang et al., 2021) .

The convenience of telehealth provides more opportunities to assess and promote adherence to treatments as well as assist more patients in overcoming issues and barriers in their care. However, while telehealth care services in primary care have been increasingly utilized and have several benefits, there are also some limitations to consider. Barriers to technology including access and comfort using devices may affect patient and clinicians' ability to participate in telehealth visits (Bowman et al., 2021).

Access to reliable high-speed internet that is necessary for some forms of telehealth, like video conferencing, may be an issue in more rural or disadvantaged locations. Further, a lack of clear guidance and standardization deters clinicians from using telehealth more readily due to concerns it leads to decreased quality of care (Hah et al., 2019).

Obstructive sleep apnea (OSA) is a respiratory disorder where the airway is partially or completely blocked during sleep, causing the person to stop breathing multiple times throughout the night (Labarca et al, 2021). The prevalence of OSA nationwide is believed to be as high as 40% to 80% in patients with comorbid hypertension, heart failure, coronary artery disease, pulmonary hypertension, atrial fibrillation, and stroke (Yeghiazarians et al., 2021). However, the true prevalence is difficult to estimate because the condition is often underdiagnosed because symptoms, such as snoring and feeling tired during the day, can be mistaken for normal sleep behavior. Poorly controlled OSA can lead to a range of negative health outcomes, impaired cognitive function, cardiovascular disease, metabolic disorders, and even premature death. (Labarca et al, 2021; Moore et al, 2021). An informal survey conducted during the pre-implementation phases of this project found that our primary care providers believed their patients likely received inadequate follow-up after they were referred for a sleep study and received a diagnosis of OSA.

Treatment with positive airway pressure (PAP) respiratory devices is the mainstay therapy for controlling OSA, however, a 2020 study conducted by the Department of Veterans Affairs found that almost half of patients with reported low PAP adherence had not received proper follow-up care in 2020 (VA & OIG, 2020). Adherence and proper use of PAP are influenced by a multitude of factors and individual experiences. For example, common issues reported by patients include nasal congestion, gassiness or bloating, and discomfort due to a poorly fitted mask can deter patients from using their device despite the benefits of treating their symptoms. Adjustments to the mask size and type are also

not uncommon in the initial weeks of use. Studies examining adherence rates in PAP users found that the negative effect on long-term adherence caused by these issues can be mitigated if they are addressed early in the initial period of using the device (Hu et al., 2021; Murase et al., 2021). Hu et al. (2021) showed that reaching adherence and satisfaction with therapy early on, specifically within the first six months of PAP machine use, is a strong predictor of long-term PAP adherence rates.

Relevance to Military Nursing

The Veterans Health Association (VHA) spent an estimated $233.9 million dollars on OSA care for military veterans in 2018 alone, a 59% increase in cost in just a two-year timeframe. However, over the course of those two years, nearly half of the 255,000 veterans who received a PAP machine used the device less than half of the time they were intended (VA & OIG, 2020). Furthermore, it was determined in the same report that 50,900 of the 114,000 patients with low PAP adherence had not received proper follow-up care from their primary care provider.

Within the active-duty flier community, the institutional regulation that disqualifies operators requiring OSA treatment with PAP without a medical waiver (MOD-15) means that poor PAP device compliance can ground key military assets for months at a time. This can create a severe gap in mission capability, causing the costly problem of lost man hours and decreased productivity (Moore et al., 2021). To receive an aeromedical or other waiver for returning to duty, service members must demonstrate clinical improvement *and* at least 90 percent compliance with nightly use of their PAP machine over a 30-day period. If more than 10 percent (just three days) are missed at any point during this evaluation period, the 30-day timer starts over. This strict requirement is difficult for even the most diligent patients to meet without assistance. Therefore, in some active duty-only clinics, the practice of using virtual visits for close follow-up appointments to combat this issue was established prior to 2019 to ensure the expeditious return to duty status of its service members. These virtual

appointments serve as scheduled check-ins with the patient to assess their progress at prescribed intervals (United States Air Force, 2022). During these virtual encounters, clinicians and support staff may also help the patient troubleshoot any device issues. This has led to increased PAP adherence rates with improved return-to-duty times.

Telehealth continues to play a pivotal role within the MHS, which is reflected in the Defense Health Agency's current priority of ensuring a "*Ready Medical Force/Medically Ready Force*" (Military Health System, para. 4). The recommendations published by the Department of Veterans Affairs following the Inspector General's 2020 survey included utilization of existing technologies such as telehealth to monitor veterans' use of sleep apnea devices consistently and effectively to quickly identify individuals at risk of noncompliance with treatment recommendations (VA & OIG, 2020). To this effect, the aim of this process improvement initiative was to increase telehealth efficacy and efficiency in a primary care setting by implementing an evidence-based standardized OSA patient care plan following receipt of a PAP device. We hoped to identify whether current primary care outcomes were maintained or showed a noticeable change through evidence-based telehealth utilization.

Clinical Question

In patients prescribed PAP for the treatment of OSA in the FHC Clinic at Keesler Medical Center in Biloxi, MS, how does PAP follow-up care using phone-based telehealth protocol compare to traditional follow-up care affect PAP adherence and Epworth Sleepiness Scale scores over a six-week follow-up schedule?

Literature Review of Solution

Search Strategy and Results

The literature search described in this section follows the 2020 guidelines of the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) (Page et al, 2021). It was

conducted in PubMed and PowerSearch with the following Boolean operators and keywords: (obstructive sleep apnea" OR “OSA” OR "CPAP" OR "continuous positive airway pressure" AND teleconsult OR telehealth OR "telephone consultation” OR “video consultation" OR virtual OR telemedi* OR eHealth OR teleconsult*) AND (systematic review OR randomized OR randomised) NOT (telerehab* OR remote OR mHealth OR telepharm* OR async* OR reality). Results were filtered to display articles that described clinical trials published in English-language, peer reviewed journals between January 2000 and December 2021.

Our query identified two systematic reviews plus 13 original RCTs in PowerSearch. Ancestry search of the two systematic reviews revealed 46 additional studies that met our inclusion criteria. One additional systematic review was located in the PubMed query, from which 29 titles were extracted for further screening. Of the 75 total identified studies, 50 duplicates were removed, leaving 25 unique studies for screening by abstract (see Appendix A for the PRISMA flow diagram). Using Covidence (Veritas Health Innovation, 2015) systematic abstract screening software, articles were excluded if they did not provide an assessment of a telehealth intervention, the intervention evaluated telehealth as an add-on (rather than replacement) to usual care, and/or the intervention was focused on remote telemonitoring using automated processes. The remaining 20 articles were retrieved for full-text review. Studies were removed if they met any exclusion criteria. One study was excluded because adherence to CPAP was not a primary outcome measured, four were removed because the intervention was additive to usual care, and two were removed because the intervention was focused on continuous remote telemonitoring with automated feedback. This process resulted in 12 studies for final inclusion.

Solution Synthesis

The overall key findings from the review of literature supported increasing follow-up care after

PAP therapy initiation that is focused on improving patient experiences with PAP therapy within the first three to six months of initial use (Aardoom et al, 2021; Hu et al., 2021; Labarca et al., 2021; Murphie et al., 2019). Higher satisfaction consistently associated with better PAP adherence rates, decreased OSA symptoms as reported by ESS scores, and a higher likelihood that patients would still be adherent with PAP therapy at a one-year follow-up (Hu et al., 2021; Murase et al., 2021). Several methods of delivering follow-up care were investigated with positive results, including phone and videoconferencing-based visits to the use of wireless mobile applications that automatically linked data from the PAP device in the patient's home to their provider's inbox. To best meet the needs of our patient and population needs and resource limitations, our search was narrowed to focus on interventions that evaluated phone-based intervention strategies.

Our keystone article was published in August of 2021 by Labarca et al titled *Telemedicine interventions for CPAP adherence in obstructive sleep apnea: A systematic review and meta-analysis of RCTs.* This meta-analysis resulted in a review of 16 RCTs, which included adult patients with OSA, using any PAP device, along with the use of at least one telehealth intervention. The groups were allocated into a telehealth intervention and a control group and data were pooled and analyzed as the mean difference (MD) at 95% confidence intervals or at a risk ratio (RR). Evaluation of publication bias was included. The primary outcome was change to usage (in minutes) as well as the percentage of those patients getting four or more hours of PAP usage per night. Secondary outcomes included changes in ESS scores and BMI. A sensitivity analysis using a trial-level meta-regression analysis included the change in CPAP usage and the RR of CPAP adherence (≥ 4 hours) with any potential associations to six covariables: average number of follow-ups (months), average age of patient, average AHI at baseline, average ESS at baseline, comorbidities at baseline (hypertension, diabetes, obesity), and the specific telehealth intervention type. Of the 16 selected studies, six of them were related specifically to phone-

based telehealth interventions. The meta-regression report found phone-based interventions were associated with a significant improvement in the minutes of usage, but not in obtaining greater than four hours of usage each night (Labarca et al., 2021).

A full breakdown and review of the evidence we found in Appendix B. Overall, the literature search revealed data which consistently supports structured use of telehealth in place of in-clinic follow-up care by primary care providers to improve PAP adherence in patients with OSA. The data indicate that patients who received monthly follow-up care via telephone appointments performed just as well, if not better, than patients who received monthly face-to-face follow-up care (Aardoom et al, 2021; Labarca et al., 2021; Murphie et al., 2019). The evidence was strongest for showing improvements in adherence and patient reported OSA symptoms (e.g., decreased ESS scores) (Labarca et al., 2021).

Focus Areas

As noted in the review of literature, the use of telehealth in place of face-to-face care is to be considered an effective method to potentially improve CPAP adherence rates in patients with OSA. When we initiated this project, there were no standard operating procedures in place for assessing PAP adherence, so practices varied amongst providers. As expected, buy-in from key stakeholders was high in support of this project because of this deficiency and the obvious potential benefits to patient outcomes. After we discussed and collected feedback from the staff about the clinical issue, evidence for using standardized telehealth follow-up visits, and technological capabilities of the clinic, we agreed to work towards developing a phone-based follow-up protocol. At each visit, we ask providers to collect, at minimum, basic adherence data and information about issues or barriers to using their device. The overall goal of each encounter was to assist the patient in troubleshooting any problems that created a barrier to proper use. Success of this intervention was measured by examining the

following outcomes for change pre- and post-intervention:

- PAP adherence, defined as at least 70 percent of adequate usage each night (i.e., at least four hours effective CPAP use per night on average).
- ESS scores as reported by the patient.
- Patient-reported resolution of any problems/barriers to proper use.

Business Case Analysis

It was important to ensure that our project was both fiscally feasible and responsible. Investigating this problem, we identified how this project would impact the quadruple aim of military/medical readiness, population health and per capita cost. With the national estimate of OSA healthcare costs reaching a staggering $150 billion per year (Wickwire, 2021) and more specifically military veteran OSA management costs rising to $233.9 million in 2018 alone, a standardized process which improves PAP adherence (and therefore decreases associated OSA healthcare costs) was highly desirable. The Office of the Inspector General has estimated a cost savings of up to $39.9 million per year in veteran patients with OSA through implementation of alternative OSA management processes (Department of Veterans Affairs, Office of Inspector General, 2020). Our project aimed to aid this cause through application of telehealth appointments in place of face-to-face care for patients with OSA. Initial project costs were estimated to total $12,441.80 with costs coming primarily from personnel required to perform the work. No new equipment purchases were required by the clinic. Sustainment costs each year after this project's completion were predicted to be $1,746.92, with primary costs again stemming from personnel pay. When considering the scale of economic burden created by OSA, the projected project costs pale in comparison. A full business case analysis can be seen in Appendix E.

Organizing Framework

We determined that the Iowa Model Revised provided the most suitable framework to guide

the implementation of our project (see Appendix D). This model's foundational goal was to act as an application-oriented framework for the implementation of evidence-based practices in nursing to solve an identified clinical problem (Buckwalter et al., 2017). The Iowa Model was selected because of its strong adoption into both academic and clinical settings as well as its straightforward application which avoids unnecessary complexities (Lobiondo-Wood & Haber, 2018). The model emphasizes broad stakeholder involvement and input early in the planning process which is designed to elicit feedback that can avoid unforeseen issues later on in the implementation phase. Following this feedback and the specific needs of the organization, a systematic review of peer-review scientific literature is conducted hones in on what can be realistically accomplished in this setting. The Iowa Model is by nature a continuous process of self-evaluation and self-correction throughout the implementation and post-implementation phases, which promotes effective application of the best evidence as well as sustainment of good clinical practice in the specific environment in which it is applied. Following implementation, the model triggers the collection and dissemination of results, which then adds back to the body of literature that drives future practice change.

Project Design

General Approach

Our process improvement plan was developed following the design noted in the study by Murase et al (2020). The procedural steps were also based on the telehealth process used in the active-duty clinic discussed in the section above, *Relevance to Military Nursing*. Baseline patient data on selected outcomes was collected (see Appendix J) by chart review after institutional review board/human research protection program officer approvals were received (see Appendix N). Virtual appointments were first scheduled with each patient to reestablish care after the completion of their sleep and titration study. These appointments were used to collect missing baseline data and assess

their current needs. At the end of this appointment, two more virtual appointments were scheduled at approximately two-week intervals. During these appointments, providers were asked to collect, at minimum, the patient's ESS score, if nightly adherence was met, and statements about barriers to proper use of their device.

The Epworth Sleepiness Scale (ESS) is a simple eight-item survey of patient-reported OSA symptoms as seen in Appendix G that is advantageous for assessing OSA because it is easy and quick to administer over the phone. There is strong evidence to support that the ESS is a reliable tool because it demonstrates good internal validity and test-retest reliability and because it correlates with the severity of OSA as measured by the apnea-hypopnea index (AHI) (Paz Y Mar & Castriotta,2022). Adherence to PAP therapy was determined by asking for the patient's average nightly usage in a week. Depending on the capabilities of the machine used by each patient, this data was pulled from the machine directly or accessed through an electronic portal/mobile app. Consistent with published literature and recommendation from the American Academy of Sleep Medicine (AASM), we established a minimum usage of at least 4 hours of sleep for at least 70% of the days to be considered compliant with PAP therapy (Paz Y Mar & Castriotta,2022).

A custom clinical instruction manual (see Appendix I) was also provided to clinicians and support staff. This manual contained Tricare referral authorization information, contact information for local reputable DME vendors, common problems and solutions, and evidence-based coaching templates to encourage patients to optimize adherence. The providers were permitted and encouraged to delegate tasks to their clinical support staff and schedule in-person follow-up appointments at any point as deemed appropriate. At the end of the second virtual follow-up appointment, we asked providers to indicate whether the patient's previous issues with PAP were resolved, if their adherence goals were met, and if further care or other interventions were needed to address their needs.

Setting and Population

The 81st Medical Group (MDG) at Keesler AFB in Biloxi, Mississippi serves over 27,000 patient enrollees, while also directing the Coastal Mississippi Market which coordinates care for an additional 46,000 eligible Gulf Coast beneficiaries (81st MDG, n.d.). Their family health clinic (FHC) provides primary and preventative care, non-emergency acute care, chronic disease management, and physical health assessments to a population of adult patients (greater than 21 years of age) who are veterans, retirees and dependents of active-duty military. The patient population in this clinic ranks number one in the Air Forces for complexity in terms of the number of comorbid medical conditions per patient. Their staff at the time of this project included eleven providers (doctors, physician assistants, and nurse practitioners), five registered nurses, ten medical technicians, and three administrative support staff.

Procedural Steps

A trial of the telehealth follow-up protocol was organized into three overlapping phases: pre-implementation, implementation, and post-implementation (data analyses). During the pre-implementation phase, we briefed stakeholders about scope and goals of our project, its timeline as noted in Appendix C, and general project expectations (see Appendix H). Provider empanelments selected for inclusion were dependent on staff availability and feasibility of members to participate in this initiative, which was determined through shared decision making with clinic leadership. Our goal was to include between 15 and 30 functionally independent adult (greater than 18 years old) patients who were newly diagnosed with OSA and had no prior prescription for PAP therapy. We initially identified 32 eligible patients through screening, however, we concluded with 13 patients. Of the original 32 patients, 16 patients were excluded after additional screening determined they had an established diagnosis of OSA (i.e., were not newly diagnosed or new to using PAP therapy) and 3 were lost to follow-up and/or unreachable after three attempts.

After selection was completed, we met with each provider care team to explain project details and protocols, addressing any additional questions from staff. The aforementioned staff instruction manual (see Appendix D) was crafted that contained answers to commonly asked questions about Tricare eligibility, the referral ordering process, and recommendations for DME suppliers. It also contained solutions and advice for commonly reported patient issues and concerns as well as coaching strategies to encourage patients to optimize adherence to PAP therapy during their adjustment period.

Next, the implementation phase began as patients were contacted to establish care and assess needs. If ESS data was missing from the previous baseline data screening, it was collected now. If the patient was still waiting to receive their PAP device, we also assisted them in coordinating with a DME supplier to expedite this process. In these cases, an additional 4-5 days was added between the anticipated two-week follow-up appointment to allow time for their device to be delivered. Patients also received an intermediary follow-up appointment to ensure their device was delivered on time.

The first two-week virtual follow-up appointment was then performed to evaluate each patient's initial impressions and assess for any issues or barriers that may be keeping them from properly using their new PAP device. The patient was asked to obtain their nightly average usage times from their machine and to provide an updated ESS. Common barriers and solutions included assisting the patient in ensuring they had a properly fitted mask and interventions to facilitate comfort while sleeping. Feedback from the providers supported the usefulness of the instruction manual, and many offered additional information that was later added to manual for others to reference. All interventions were documented in accordance with clinic policy and a second two-week follow-up was scheduled at the conclusion of this appointment. The second virtual follow-up collected the same data on ESS and nightly adherence and assessed whether any issues they previously experienced were resolved. Providers also indicated whether their adherence goals were met and if further care or other

interventions were needed to address their needs. Data collection stopped after the second visit and further follow-up care was left to the discretion of the PCM.

Documentation of each interaction was in accordance with established policies and, at a minimum, documented the date of their next appointment, average nightly usage time, updated ESS score, and any patient-reported barriers to use. Project investigators updated an electronic tracker and monitored project progress throughout this phase. Additionally, at any point in the project, support staff or providers were encouraged to use their clinical discretion to request in-person care or potential additional telehealth appointments if warranted.

Data Analysis

We used descriptive statistics and received assistance from Keesler's biostatistician, who employed SAS software. Our primary outcomes were ESS score and PAP adherence in hours. Equal variance was assumed based on the project design. The null hypothesis assumed no difference between pre and post measurement. Standard deviation was calculated and presented using boxplots for each outcome variable. We used nonparametric statistical testing (paired t-test) for correlation and significance. A statistically significant change in pre and post outcomes was considered in the final determination of assessing the clinical significance and success of our initiative. Additional details regarding outcome variables can be found in Appendix F.

Potential Barriers

Prior to the initiation of this project, FHC patients received inconsistent follow-up care after being referred for a sleep study for a presumptive diagnosis of OSA. After a PCM referred the patient for a sleep study with a working diagnosis of OSA, it was assumed the patient would complete their sleep and titration study at an outside facility and then receive instructions from their sleep medicine provider to follow-up with their PCM for further instructions if a diagnosis of OSA was confirmed and

PAP therapy was recommended. Once the results of these studies were faxed from the sleep medicine center and reviewed by the PCM, the patient was notified by their PCM (or other support staff) when the DME order for a PAP device was placed. At this time, the patient would be provided with additional information and instructions on how to manage OSA with PAP therapy. In reality, follow-up care was highly variable and usually dependent on PCM practice or outreach initiated by the patient.

Admittedly, the referral authorization process to get a sleep study and PAP device is administratively intricate. For instance, many providers were not aware that the titration study was not automatically completed after the polysomnogram (sleep) study and that it required a separate referral authorization. Alternatively, the provider could specify they were requesting a "split-night" sleep-titration study which is performed in sequence under one authorization. Next, the receipt of the titration study was dependent on the sleep medicine clinic appropriately faxing the documents to the referral management center, who then uploads it into the patient's record and sends a notification in the EHR to the ordering provider. Once the titration study results were finally received by the provider and a DME order was placed, there was no standardized mechanism for notifying the patient. Some providers who directly call the patient themselves, some would delegate this to support staff, while others would assume the patient would be notified by the referral management center (as is the case in some other similar types of referrals).

Ordinarily, the clinic's case manager assisted in tracking the patients who were referred for a sleep study and helped coordinate follow-up care. This measure was effective for ensuring this part of the process went smoothly but it did not fully address the need to assess adherence after PAP therapy was initiated. In addition, the clinic lost their case manager abruptly in the months prior to the start of this project and was not able to secure a replacement until after its completion. In some cases, patients and providers were unaware that the titration study still needed to be completed, so weeks to months

elapse before it was conducted. This backlog prevented many patients from being eligible to participate in our initial trial run of the process because they were too far behind in the process to get their PAP device in time for the implementation phase.

Dissemination Plan

To disseminate the results of this project, a briefing was scheduled with key stakeholders and other interested clinical staff members. Due to the overall success of this project, the clinic's leadership team agreed to a continuity plan to sustain the protocol. This included the development of a Standard Operating Procedure and inclusion of the protocol in new provider staff training. Additionally, the instruction manual was expanded with the feedback obtained from providers during the project and this resource was shared with the facility in a shared cloud drive. We plan to present our project results at research symposiums and aim to publish the findings in peer-reviewed academic journals interested in articles on telehealth, evidence-based practice, and/or process improvement.

HIPAA Concerns/Ethical Considerations

The primary outcome of this project was the optimization of telehealth applications with increased efficiency and effectiveness in a primary care setting for care of OSA patients. Patient outcomes pre- and post-implementation were measured to grade success of telehealth application in this project, which required identifying patient cases with their outcomes. To ensure protected health information (PHI) was guarded, all hard copy information utilized for this project was stored in a locked container within a locked office for the use in this project only. All information for the duration of this project was stored on a secure database using a common-access-card (CAC)-enabled computer that was stored within a locked office that could only be accessed by the authors. All materials were shredded once data had been extrapolated. This plan ensured the disclosure of PHI involved no more than a minimal risk to the privacy of our patients.

Project Results

Of the 32 patients initially selected, 3 patients were removed due to inability to establish contact and 19 were removed because they met other exclusion criteria previously discussed. A total of 13 patients were included and completed all steps of this project. All 13 patients completed their sleep and titrations study within the past one to three previous months. However, none of these patients had yet received their PAP device due to confusion about how to order their device through a DME vendor, so zero percent had reached compliance to PAP therapy. The majority of time used to conduct the baseline visit was thus spent assisting patients through the DME ordering process. Other barriers to PAP use reported by patients at their 2- and 4-week follow-up visits were collected in subsequent follow-up visits. The responses were grouped into six general categories, which are shown in Table 2 and 3 below. The percentage of patients meeting adherence was tracked and are shown in Table 4.

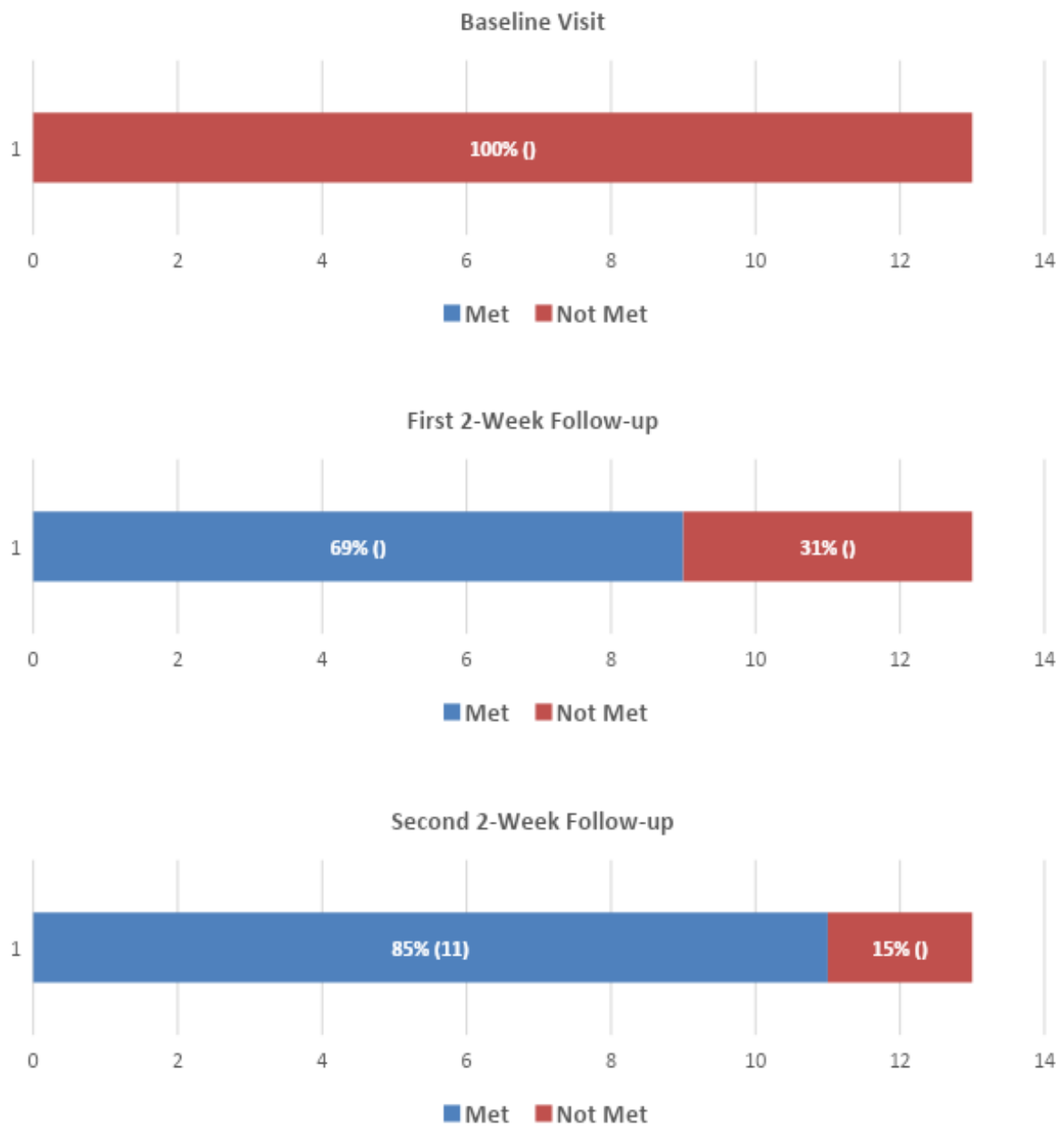
Table 1: Characteristics of Sample (N=13)		
Female	8	
Male	5	
Age in Years (Mean, SD)	**55.8**	***13.9***
<30, n(%)	1(8)	
31-40, n(%)	1(8)	
41-50, n(%)	1(8)	
51-60, n(%)	3(23)	
60+, n(%)	7(54)	
Severity of Obstructive Sleep Apnea		
Mild, n(%)	2(15)	
Moderate, n(%)	9(69)	
Severe, n(%)	2(15)	
AHI before CPAP, Mean(SD)	39.3	*20*
ESS at Referral, Mean(SD)	9.8	*4.1*
ESS after CPAP, Mean(SD)	6.1	*3.7*

Baseline and demographic data were examined (see Table 1). The AHI and ESS values were recorded during the retrospective chart review from the patient's sleep study report. The severity of OSA was assigned by the sleep medicine provider based on the apnea-hypopnea indices (AHI) severity and was also recorded from the patient's sleep study report. In later analysis, the baseline AHI showed a significant ($p < 0.01$) correlation with baseline ESS scores we collected, which provided internal validity for the use of the ESS score as a measurement of clinical significance and success of our intervention. The ESS score after CPAP indicates the average of ESS scores recorded at final follow-up.

Table 2: Barriers to Use Reported by Patients at First Follow-up (N=13)		
Supply/Vendor Issues (Accessory or Part Missing, Broken, or Improperly Fit) (n%)	6	46%
General Discomfort/Adapting to Using Device (n%)	5	38%
Side Effects (Dry Mouth, Bloating/Gassiness, Congestion) (n%)	4	31%
Acute URI (n%)	3	23%
None Reported (n%)	2	15%
Difficulty falling asleep (n%)	1	15%

Table 3: Barriers to Use Reported by Patients at Second Follow-up (N=13)		
None Reported (n%)	6	46%
Supply/Vendor Issues (Accessory or Part Missing, Broken, or Improperly Fit) (n%)	3	23%
General Discomfort/Adapting to Using Device (n%)	2	15%
Acute URI (n%)	2	2%
Side Effects (Dry Mouth, Bloating/Gassiness, Congestion) (n%)	0	-
Difficulty falling asleep (n%)	0	-

Table 4: Compliance to PAP therapy at Each Visit



The most common issue reported at initial follow-up was related to supply or device issues. This included missing accessories and poorly fitted masks. The second most common issue reported was discomfort due to wearing the mask (i.e., “getting used to wearing it”) or side effects from using the

device (e.g., nasal congestion, ear pressure, etc. Of the 13 patients who participated, only 2 patients reported no barriers to use at initial follow-up.

By the second follow-up call, 46 percent of patients reported no further issues. For the remaining patients with unresolved issues, 2 (15 percent) were related to continued discomfort from use or side effects, and 3 (23 percent) were related to device accessory problems. For the patients who continued to experience discomfort, further evaluation found that the issue could be resolved by changing the mask type (usually from nasal to a full-face mask) or by adjusting the pressure settings on their device. After the final follow-up, 69 percent of patients met adherence criteria as defined by an average of at least four hours of proper use each of the week.

Analysis of the Results

A pair t-test was used to compare baseline data on ESS scores. For average ESS scores, there was a statistically significant drop in the baseline and final values, with a mean difference of 3.9 points ($p < 0.001$). Adherence rates also improved from 0, to 69, and then 85 percent of patients meeting the minimum of 4 hours of use each night. Overall, the majority of patients who participated in this process improvement project met PAP adherence goals within the first 6 weeks of use. For the two patients who were not meeting adherence goals, one was due to a prolonged unrelated respiratory illness and the other was due to DME supplier issues. The supplier issue was later resolved by transferring the DME authorization to a different supplier in the local area.

The most frequent barriers to proper use reported by patients were related to common side effects and discomforts. These issues were successfully overcome in all cases with interventions initiated by the provider (e.g., prescription of a nasal decongestant) or by following the coaching advice provided in the instruction manual. Another common barrier reported was related to missing accessories or poorly fitting masks. For these issues, staff assisted the patients by contacting their

equipment vendor to request the proper equipment. When this occurred, extra time (2-3 business days on average) was added between the two-week follow-up period to allow time for the delivery of any items.

Another unexpected issue encountered in the implementation phase was finding multiple patients who were automatically referred to an out-of-state DME vendor. This was an issue because this vendor reported to patients that they would have to wait up to six months to receive their device due to supply chain issues and because they did not have local representatives who could assist patients in our area. Instead of waiting, we transferred these referrals to local DME vendors that were not experiencing supply chain issues and had adequate staffing to meet with our patients as needed.

Other factors contributing to baseline delays in care were related to the complex and somewhat opaque nature of the follow-up process after a patient was referred for a sleep study. These variations led to inconsistent patient and clinician expectations and no reliable means of ensuring that patients had received and were using their PAP machines. The virtual follow-up visits implemented through this project provided time to fully explain the entire process to the patient in manageable steps as well as make sure they were on track to appropriate treatment.

This project was not initially designed to address issues that occurred prior to the patient's initiation of PAP therapy, however, it ultimately addressed some of these difficulties as a byproduct. Providers and support staff were briefed in the pre-implementation phase about the sequence of referral authorization and how to optimize efficiency by ordering split-night sleep studies. Other recommendations were made on how to effectively track a patient's status between their initial referral for a sleep study and receipt of their results via the clinic's new case manager. Additionally, all providers agreed to standardizing their notification to the patient once results with a PAP recommendation were received and a DME order was placed.

Organizational Impact

The results of this project underscore the need for a clinic case manager to assist PCMs in monitoring and coordinating care for patients with chronic disease. As mentioned above, the largest setback that led to the greatest deficiencies in follow-up care occurred shortly before initiation of this project when the clinic lost their case manager and was unable to hire a replacement until after the project was completed. The unexpected loss of this key resource had an overall negative ripple effect on patient care leading up to the start of this project by causing a backlog in patients who were lost to follow-up. Because few others fully understood the entire administrative process of ordering a PAP device after a sleep study was completed, patients experienced significant delays in their care.

Our findings show strong support for the continued expansion of telehealth services in the MHS. We limited our project to phone-based telehealth care because of the characteristics of our population that indicated less comfort with other technologies and available resources, however, telehealth care has even greater potential when combined with features that enable remote monitoring and video conferencing. The optimization of telehealth care requires investment in technologies which support these services as well as additional time and resources for training clinical staff in how to use them proficiently.

Future Directions for Research and Practice

Research previously cited overwhelming support of the utilization of telehealth to increase access to care with a resultant heightened likelihood of patients attending follow-up appointments. Additionally, our project results support findings that indicated increased follow-up care leading to better adherence to therapies and treatment plans, regardless of whether they were in-person or virtual. Recommendations for future research in the standardized implementation of telehealth include broadening the topic set to include further research specific to telehealth follow-up for numerous

other common chronic diseases managed within the primary care setting (e.g., hypertension, hyperlipidemia, diabetes, asthma, etc.), as current literature remains limited. Additional available information on the safety and effectiveness of telehealth follow-up for these chronic diseases would provide further insight on how to best implement similar standardized processes in our primary care clinics. A second area of consideration for facilities with additional telemedicine resources at their disposal (e.g., video appointment capabilities), includes research on chronic disease follow-up care using alternative means versus strict telephone appointments which may provide useful information as to how to best utilize multiple communication modalities for optimal patient results.

Recommendations for practice specific to the telehealth follow-up care of patients with OSA are numerous. The intent of the following practice recommendations is to move toward a completely standardized process across all MHS facilities for the care of OSA patients. While making the recommended process improvements at one facility has proven successful through this project and shows clear benefit to its patients, to overcome the complexities of frequent military staff member movement from facility to facility we must push to maintain the same follow-up process within all MTFs.

To accomplish this, first we recommend that primary care providers be the only referring party for sleep studies and equipment. By decreasing variation in the referring party, it is more likely that patients will be provided the same standard of care. It was found during the implementation phase to be beneficial for the PCM to specify in their referrals they be split-night sleep studies. This ensured that once the diagnosis of OSA was made, the sleep center also included titration for their future PAP machine. By completing these two steps with the same referral, significant delays in care can be avoided for future OSA patients.

Second, we recommend that primary care clinic staff automatically schedule an initial follow-up

telehealth appointment approximately 3 to 4 weeks after a patient referral is placed for their sleep study to ensure that they are not lost to follow-up. Pending local resources and sleep study turn-around time, this may alternatively be scheduled as soon as the results of their titration study are received by the ordering provider. By implementing a standardized follow-up schedule such as this, providers are better able to communicate to patients what they can expect in the next steps of the process.

Additionally, this project highlighted the benefit of using a standardized text in sleep study and DME orders by staff members. Within this predetermined text, we recommend including a statement that clarifies that the ordering provider will place the DME order upon receipt of the titration study results. These easy-to-implement clinic referral phrases streamlined the early stages of this project and ensured that referral orders were not delayed by being returned for faulty or incomplete verbiage.

Finally, where possible, monitoring and coordinating telehealth follow-ups can and should be delegated to a case manager or other available trained clinical staff member. It is important to not solely rely on already overburdened primary care providers to complete these tasks that can be appropriately delegated. By utilizing standardized resources such as those included in this project, telehealth interactions do not require a level of clinical decision making above that of a nurse or medical technician. Minimal training and access to appropriate resources would be sufficient preparation for these members to safely conduct telehealth follow-up visits. Any patients experiencing continued concerns or problems despite follow-up should be deferred back to the PCM for further consideration.

Conclusion

The results of this process improvement project indicate that a standardized telephone-based follow-up protocol is just as safe and effective as in-person care, if not more, for monitoring and

coordinating care services for patients with newly diagnosed sleep apnea who are prescribed PAP therapy. These findings are consistent with data reported from previously cited studies that show telehealth can be used for monitoring therapy response for patients with OSA as well as many other chronic diseases. Telehealth visits can be more advantageous than in-person care because of the convenience to both the provider and patient. The use of telehealth services for follow-up chronic disease care should continue to be promoted and standardized across the MHS.

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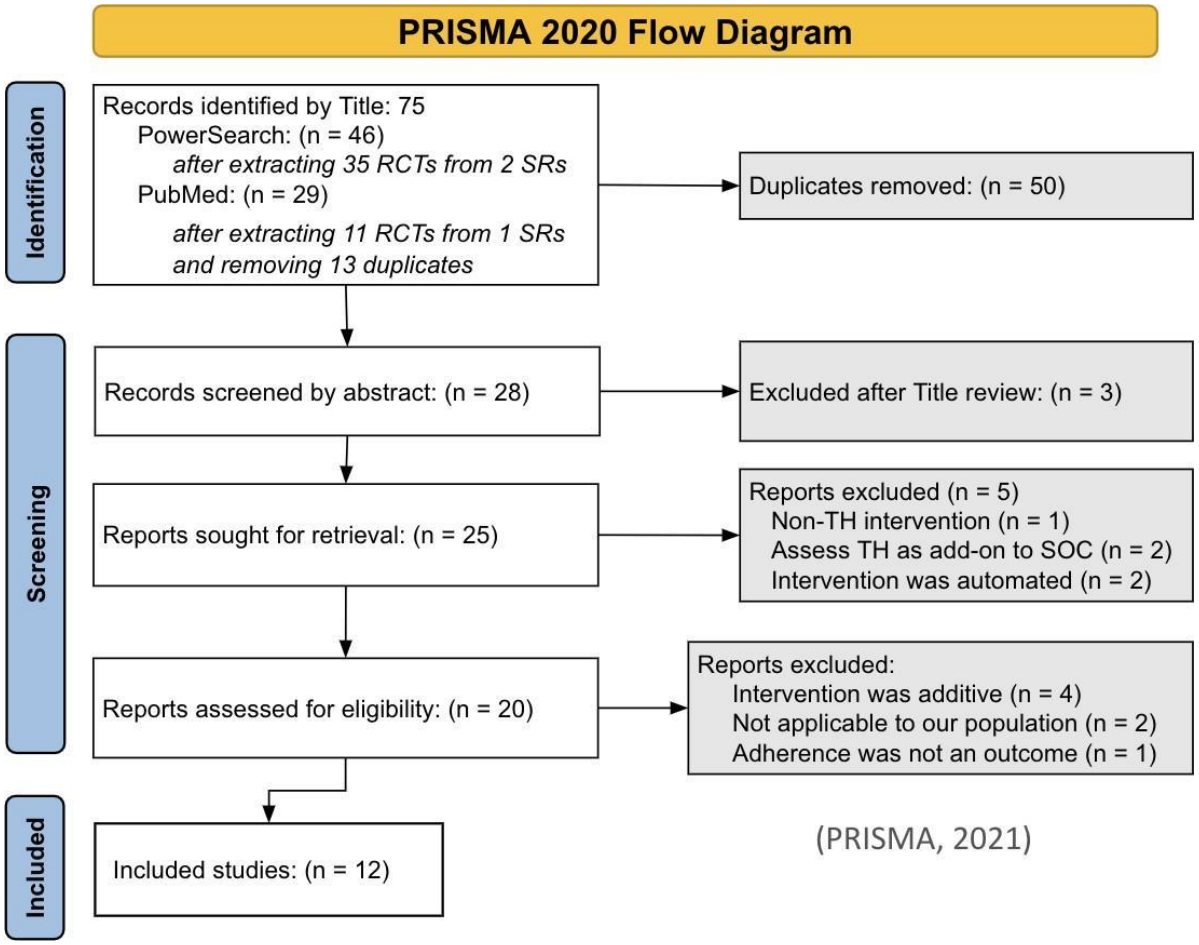
Appendix A

PRISMA Flow Diagram



INCLUSION CRITERIA	EXCLUSION CRITERIA
■ At least 18-years-old ■ Diagnosed with OSA as confirmed by polysomnography (PSG). ■ AHI demonstrates moderate to severe OSA. ■ Possession of a reliable telephone and the ability to independently operate it in a private location. ■ CPAP device that collects data on usage (in minutes/hours) each night and AHI (or like metric).	■ Any disorders which could impair the ability or cognitive function of the patient to safely participate. ■ Will be ineligible for care during 90-day implementation phase ■ Will be unavailability during the 90-day implementation phase (i.e., does not plan to be absent or otherwise unable to use their CPAP machine)

Appendix B

Evidence Table

CITATION	DESIGN	LVL	QUALITY
Labarca, G., Schmidt, A., Dreyse, J., Jorquera, J., & Barbe, F. (2021). Telemedicine interventions for CPAP adherence in obstructive sleep apnea patients: Systematic review and meta-analysis. *Sleep medicine reviews, 60,* 101543.	Systematic Review & Meta-Analysis of RCTs	1	Med
Hu, Y., Su, Y., Hu, S., Ma, J., Zhang, Z., Fang, F., & Guan, J. (2021). Effects of telemedicine interventions in improving continuous positive airway pressure adherence in patients with obstructive sleep apnoea: a meta-analysis of randomised controlled trials. *Sleep & breathing*, *25*(4), 1761–1771.	Systematic Review & Meta-Analysis of RCTs	1	Med
Aardoom, J. J., Loheide-Niesmann, L., Ossebaard, H. C., & Riper, H. (2020). Effectiveness of ehealth interventions in improving treatment adherence for adults with obstructive sleep apnea: meta-analytic review. J*ournal of medical Internet research, 22*(2).	Systematic Review & Meta-Analysis of RCTs	1	Med
Murphie, P., Little, S., McKinstry, B., & Pinnock, H. (2019). Remote consulting with telemonitoring of continuous positive airway pressure usage data for the routine review of people with obstructive sleep apnoea hypopnoea syndrome: A systematic review. J*ournal of telemedicine and telecare, 25(*1), 17–25.	Systematic Review & Meta-Analysis of RCTs	2	Low
Kooij, L., Vos, P. J., Dijkstra, A., Roovers, E. A., & van Harten, W. H. (2021). Video Consultation as an Adequate Alternative to Face-to-Face Consultation in Continuous Positive Airway Pressure Use for Newly Diagnosed Patients With Obstructive Sleep Apnea: Randomized Controlled Trial. *JMIR formative research, 5*(5), e20779.	RCT (non-blinded)	2	Med

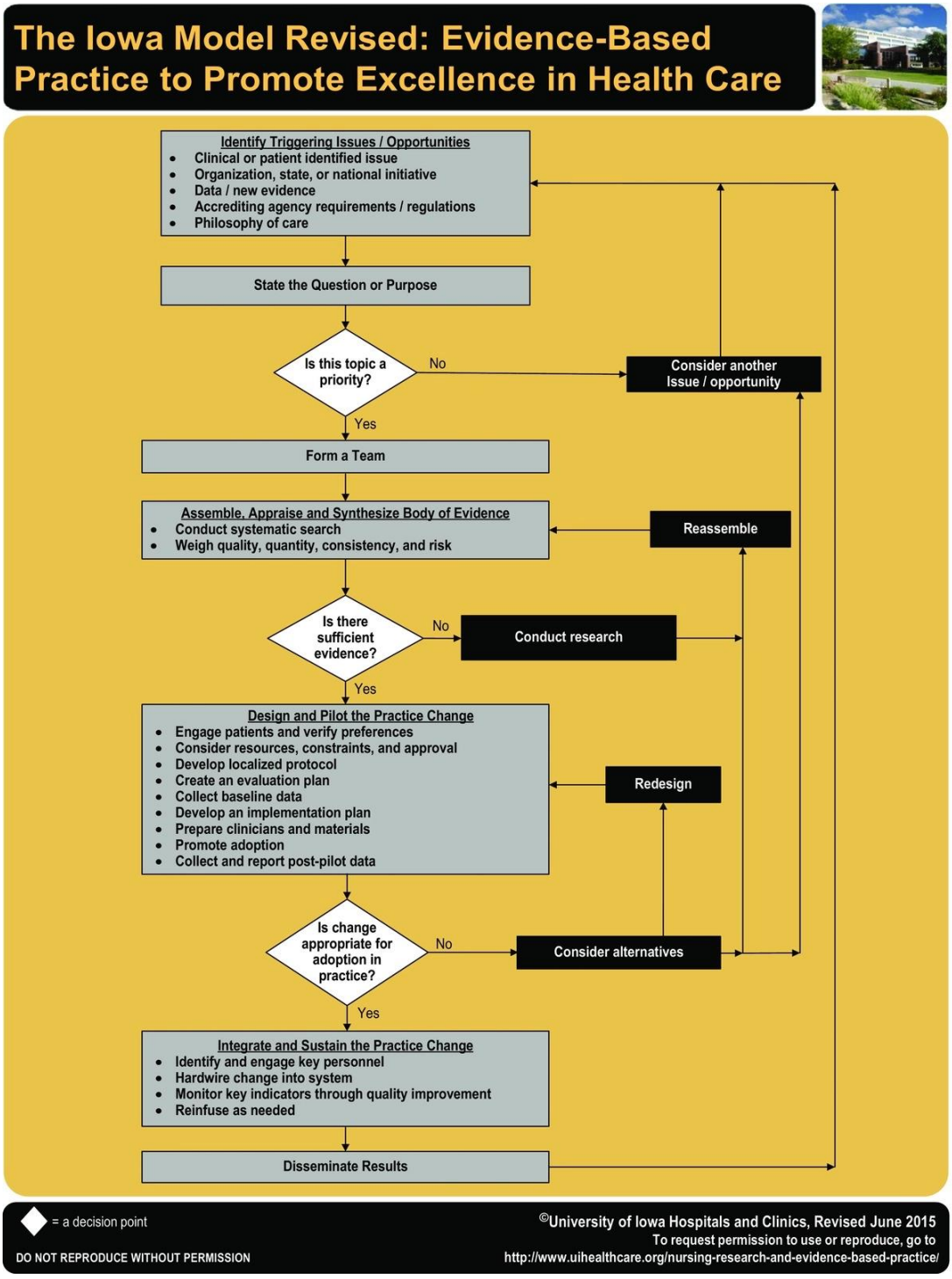
Appendix C

Project Timeline

	ACTIVITIES	WK
PRE-IMPLEMENTATION	o Provide staff education o Identify and recruit patients	1—4
PHASE 1	o Provide telehealthcare appointment o Collect baseline data on outcomes o Set goals with patient o Provide resources for common issues and troubleshooting problems o Schedule next follow-up appointment	4—8
PHASE 2	o Follow-up telehealthcare appointment o Collect additional data, assess adherence and other outcomes o Provide feedback, positive reinforcement & coaching to meet goals o Schedule next follow-up appointment of compliance goal was not	9—12
PHASE 3	o Continue follow-up telehealthcare appointments o Collect additional data on adherence and other outcomes o Reassess goals with patient o Provide/refer to additional care as needed	13—16
POST-IMPLEMENTATION	o Data analysis o Presentation of data	20 +

Appendix D

Framework Model



Appendix E

BCA Worksheet

BUSINESS CASE with VALUE BASED CARE ASSESSMENT
Proposed Title for Project/Initiative/Opportunity to Improve
Telehealth Interventions for Improving CPAP Adherence in Patients with Obstructive Sleep Apnea
Opportunity Statement *(Description of proposed project/initiative/opportunity to improve)*
The implementation of a validated and evidence-based telemedicine protocol for the management of a common chronic condition such as obstructive sleep apnea (OSA) in the Military Health System (MHS) will help to lay a foundation for all future primary care telehealth applications, through the optimization of this healthcare process and proper staff education as to its uses. Once this is achieved, it will be possible to assess various ways to apply this same telehealth process to the management of other chronic diseases as well as the improved care for active duty military members, with the intent to improve overall force readiness as well.
Business Opportunity/Objectives *(Prioritize listing – macro and micro objectives)*
Macro Objectives: The overall goal of this project is to optimize telehealth application by implementing evidence-based interventions to guide the selection of the most appropriate encounter type (i.e. face-to-face versus telehealth) in the management of OSA patients with CPAP. Micro Objectives: To meet the overall goal, we need to identify an appropriate evidence-based intervention for telehealth in OSA management, determine primary and secondary clinical outcomes based on research to measure the effects of our intervention, implement a standardized process for telehealth application in the care of OSA, educate providers on likely benefits of improved telehealth use, and increase patient willingness to utilize this less familiar healthcare delivery method.
Potential Impact of the Initiative/Project *(Identify outcome metrics & benchmarks/and how objectives align with Quadruple Aim, Value Based Care, and HRO goals)*

1. Quadruple Aim: Readiness to Military Force - Active Duty patients with a new diagnosis of OSA with CPAP require a headquarters approved aeromedical waiver to fly which requires 30 days of at least 90% CPAP adherence (MOD-15). Therefore, implementing healthcare delivery methods that may improve CPAP adherence rates could prevent 40-60 lost manpower days per flyer.
2. Quadruple Aim: Readiness of Medical Force - The 2019 global COVID pandemic illustrated the need for our medical force to be prepared to provide healthcare in various ways (Wosik et al., 2020).
3. Quadruple Aim: Population Health - Nearly 40% of all deaths in the United States can be attributed to undermanagement of chronic disease (Bowman et al., 2021). Proper utilization of an evidence-based protocol to manage chronic disease combats this (Stevens, 2013).
4. Quadruple Aim: Per Capita Cost - OSA is now identified as a major health burden and has a well-established correlation to additional chronic diseases, most notably cardiovascular disease which costs the U.S. healthcare system $214 billion annually as well as an additional $138 billion lost in job productivity (NCCDPHP, 2021).
5. HRO principle: Sensitivity to Operations - Understanding the current means of telehealth application at Keesler's Family Health Clinic, as well as their current management of patients with OSA is imperative in the design of a successful project.
6. HRO principle: Commitment to Resiliency - Through the utilization of the Iowa Model Revised as the chosen framework for this project, there will be numerous opportunities for revision as deemed necessary throughout this process, aiding a higher probability of project success (Buckwalter et al., 2017).
7. HRO principle: Deference to Expertise - Evidence-based practices (EBP) are established by national experts. The adoption of EBP into healthcare is vital to maximizing their valuable contributions to their fields of expertise (Stevens, 2013).

Alternatives (courses of action) chosen for Analysis
1. Implement a standardized telemedicine home monitoring protocol that is evidence based in the case of CPAP use for patients with OSA. 2. Implement a standardized OSA management process that is evidence based through replacing standard face-to-face follow-up care with telehealth visits. 3. *"Status Quo":* Continue current telehealth practices in Keesler's FHC with no change to the process.

Analysis of Alternatives	
Alternative 1:	Implement a standardized telemedicine home monitoring protocol that is evidence based in the case of CPAP use for patients with OSA.
Pros	**Cons**

- standardizes use of home monitoring equipment for CPAP adherence - implements an adjunct to face-to-face healthcare that patients can utilize from home	- requires patients to have appropriate monitoring equipment at home to utilize - requires technology necessary to collect home data - requires patients to be familiar with home monitoring technology
Alternative 2:	Implement a standardized OSA management process that is evidence based and replaces standard face-to-face follow-up care with telehealth visits.
Pros	**Cons**
- standardizes and ensures follow-up care for OSA patients with CPAP - standardizes telehealth application as well as the booking process - empowers patient to choose their healthcare delivery method - relatively cost-effective	- requires acceptance of change and learning a new process - requires dedicated manpower to prepare for project, initiate implementation, and review outcomes
Alternative 3:	*"Status Quo":* Continue current telehealth practices in Keesler's FHC
Pros	**Cons**
- no implementation of a new process - no requirement to train team staff - no cost involved	- no standardized practice in place - inconsistent appointment booking - no scheduled primary care provider follow up for patients using CPAP to treat OSA - poor patient satisfaction with telehealth practices
Assumptions	
- Patients are referred by primary care providers to sleep medicine to obtain OSA diagnosis. - Primary care providers also place referrals for durable medical equipment for patients to obtain CPAP machines - CPAP machines have the ability to detect how long the patient used the machine per night - Patients are sent back to primary care provider for continued OSA management once diagnosis has been	

made

- Primary care providers are following up with their OSA patients face-to-face 30-90 days after CPAP issuance as recommended by the VHA's sleep-related breathing disorder sourcebook (Department of Veterans Affairs, Office of Inspector General, 2020)
- There are a limited number of devices that patients on TRICARE/VA beneficiaries are eligible to receive,

allowing for more homogenous results during data analysis.

Recommendation and Rationale

Recommendation

Alternative 2: Implement a standardized OSA management process that is evidence based and replaces standard face-to-face follow-up care with telehealth visits to improve CPAP adherence, ESS scores and blood pressure readings.

Rationale

Practice recommendations for OSA management which included automated home monitoring methods would prove too problematic to obtain this technology, distribute it to appropriate patients, educate them on its use and then collect necessary study data, and pay for the cost of the new equipment needed per patient. Therefore, considering financial, resource and time constraints present at Keesler, this option was omitted. Our literature review shows strong evidence for the replacement of face-to-face visits with telehealth visits in the management of OSA with CPAP use (Murase et al., 2020). The use of CPAP adherence, Epworth Sleepiness Scales and BP are all reliable and measurable outcomes supported in studies noted throughout our search (Murase et al., 2020). By utilizing a process already implemented and validated to be good evidence-based practice, we will have the opportunity to standardize telehealth application in the management of OSA, as well as aim to improve the clinical outcomes previously noted.

Value Based Care - Investment Required by the Organization and the Associated "VALUE" or $ GAINED.

Personnel costs in the chart below were calculated based on the 2021 Military Pay Chart by rank with monthly pay broken down into an hourly wage based on a 45 hour work week.

Initial Cost Breakdown:

The number of hours required for initial project cost were estimated for one month of pre-implementation work upon arrival to Keesler, plus an additional three month time frame for project implementation, all with one work day per week dedicated for DNP students to work on this project (16 work days x average 9 hour work day = 144 hours). Hours charged for additional staff (e.g. HCI, GPM, etc) were roughly estimated and will require adjustment once we arrive at the site and gain a more detailed understanding of project needs per person.

Sustainment Cost Breakdown:

Sustainment costs were based on implementation of a quarterly chart audit of FHC OSA patients to

determine ongoing protocol use as well as OSA CPAP adherence rates. This will also help to address whether provider templates are adequately accommodated for OSA telehealth visits.

Personnel Requirements	**Hourly Pay Rate** *(average 45hr work wk)*	**Manpower Hours Required**	**Total Cost**
Initial Cost *(4-month period)*			
O-4/Maj (DNP Student)	$42.69	144	$6,147.36
O-3/Capt (DNP Student)	$36.82	144	$5,302.08
O-5/Lt Col (Healthcare Integrator)	$58.08	8	$464.64
O-1E/2d Lt (GPM)	$26.21	8	$209.68
(O-4/Maj + O-3/Capt) Initial Provider/Staff Project Education and Training	$79.51	4	$318.04
Equipment Requirements	N/A	N/A	$0
			Total Initial Cost $12,441.80
Sustainment Cost *(annually)*			
O-1/2d Lt	$19.58	72	$1,409.76
O-5/Lt Col (Healthcare Integrator)	$58.08	4	$232.32
O-1E/2d Lt (GPM)	$26.21	4	$104.84
Equipment Requirements	N/A	N/A	$0
			Total Sustain. Cost $1,746.92

Associated Value Gained:

In fiscal year 2018 alone, the VHA spent an estimated $233.9 million dollars on OSA care for military veterans, a 59% increase in cost in just a two year timeframe (Department of Veterans Affairs, Office of Inspector General, 2020). CPAP adherence is associated with improved health outcomes and decreased overall healthcare costs. A recent systematic review of the impact of OSA treatments on economic and monetary outcomes showed evidence of positive economic benefit (Wickwire, 2021). The Office of the Inspector General has estimated a cost savings of up to $39.9 million per year across veteran patients through implementation of alternative processes for OSA management. As OSA is now recognized as a major economic healthcare burden that is steadily worsening, the proposed initial ($12,441.80) and sustainment ($1,746.92) costs of this project are a worthwhile investment into the future of both telehealth and military management of OSA.

Risks and Mitigation Plan

Risks	**Plan**
1. Our project findings show evidence that telehealth appointments in the place of face-to-face follow up care for OSA have worse patient adherence rates.	1. Analyze variables/results for additional contributing factors that may not have been previously considered and determine their potential effect on results.
2. Low patient participation rates (potentially related to knowledge gap, discomfort with new technology, or preconceived negative perception of telehealth)	2. Analyze potential contributing factors (as noted in risk) and brainstorm additional methods to increase patient participation in telehealth opportunities.
3. Process implemented proves to be burdensome to staff with increased time/work/decreased provider satisfaction with telehealth appointments	3. Defer to the experts (i.e. providers themselves) through discussing process weaknesses/limits as well as gathering any recommendations they have for improvements.

Implementation Plan- The IOWA Model Revised

Phase 1:	Assemble, appraise and synthesize body of evidence
Milestone Description:	Conduct a systematic search. Weigh quality, quantity, consistency and risk.

Deliverables	Due Date	Accountable Person

1. PRISMA diagram summarizing literature review article search 2. Evidence table which includes descriptions of search findings 3. PICOT question 4. Data analysis table to include project variables	December 2021	Maj Laura Velasquez and Capt Rachel Woodlee
Resources Needed		
Computer and internet access to include search databases, library staff for search assistance if warranted, assigned course books and lectures for reference, Covidence to create PRISMA diagram, and time to complete the deliverables.		
Expected Level of Benefit		
Thoroughly reviewing literature for evidence-based processes on our topic will arm us with the knowledge to determine the most appropriate solution.		

Phase 2:	Design the Practice Change	
Milestone Description:	Consider resources, constraints and approval. Develop localized protocol. Create an evaluation plan.	
Deliverables	Due Dates	Accountable Person
1. Written project plan (draft) to include design of protocol 2. Business case analysis (BCA)	December 2021	Maj Laura Velasquez and Capt Rachel Woodlee
Resources Needed		

Computer and internet access, research compiled during literature review, assigned course books and lectures for reference, time to complete deliverables		
Expected Level of Benefit		
A clear, concise written project plan that outlines all major aspects of our topic and all previous deliverables along with inclusion of a project implementation plan for our chosen solution allows for thorough pre-planning, risk mitigation and solidifies a clear project direction. Completion of the BCA highlights benefits of the project to stakeholders and correlates to overall projected project value.		
Phase 3:	Pilot the Practice Change	
Milestone Description:	Collect baseline data. Prepare clinicians and materials and promote adoption. Implement practice. Collect post-pilot data.	
Deliverables	Due Dates	Accountable Person
1. Clinical outcome data results (i.e. CPAP adherence rates, ESS, BP) sorted/organized for review	September 2022	Maj Laura Velasquez and Capt Rachel Woodlee
Resources Needed		
Computer access with AHLTA/Genesis and CHCS accounts, contact with Keesler HCI to assist in obtaining accurate data based on ICD-10 and DME codes. Potential IT assistance if using analytic software.		
Expected Level of Benefit		
Data organization/analysis will help to determine whether any change in patient CPAP adherence, ESS or BP were noted during implementation with the new telehealth application method.		
Phase 4:	Integrate and Sustain the Practice Change	
Milestone Description:	ID and engage key personnel. Hardwire changes into system. Monitor key indicators through quality improvement. Reinfuse as needed.	
Deliverables	Due Dates	Accountable Person
1. Final written DNP paper with synthesized results as well as implications for clinical practice. 2. Organized project resources to provide FHC	November 2022	Maj Laura Velasquez and Capt Rachel Woodlee

with so that they may integrate/sustain process based on project results		
Resources Needed		
Support from key personnel to include clinic staff, facility leaders and school faculty. Computer access to clinic resources to add OSA process resources to. Time necessary to complete deliverables.		
Expected Level of Benefit		
Pending results of this project, by engaging key personnel in solidifying this new clinical process, we can create the new "status quo" for OSA management for this clinic which all incoming staff can be trained to as they arrive. The successful application of telehealth to this diagnosis could set an example for staff and potentiate further EBP-based telehealth improvement.		
Phase 5:	Disseminate Results	
Milestone Description:	ID and engage key stakeholders. Present project results and implications for practice along with resultant clinical recommendation.	
Deliverables	Due Dates	Accountable Person
1. Poster presentation to clinic and school staff, leadership and other stakeholders. 2. Submit project results and recommendations to MilMed/DHA best practice websites 3. Pursue publication	January 2023	Maj Laura Velasquez and Capt Rachel Woodlee
Resources Needed		
Poster, printing resources, details on submission process/requirements for MilMed/DHA best practice website, publication process/requirements, and leadership support.		
Expected Level of Benefit		
If anticipated findings of the project show that telehealth follow up for OSA with CPAP has consistent or better adherence rates than with face-to-face care, dissemination of this process to all MTF's could increase provider and patient confidence in telehealth use, as well as enable rapid MHS implementation of evidence-based care with potentially improved outcomes and decreased chronic care cost. Publication would further disseminate findings throughout the medical community to buffer promote telehealth		

applications based on current evidence.

NOTE: Modified from Harvard Business Review Press. (2011). *Pocket mentor: Developing a business case.* Boston: Author (pp 82-85).

Appendix F

Data Analysis Table

	NAME & MEASURE	DESCRIPTION	SOURCE	VALUE RANGE	LOM	COLLECTION PERIOD	STATISTICAL TESTS	DECISION RULE
IV	Telehealth Care (TH) in place of the Standard of Care (SOC) ***Measure Type:*** Process	3 templated appointments at set intervals over 3 months to evaluate TH interventions in place of SOC	EHR Genesis	1 = TH 0 = SOC	Nominal	Jul - Nov 22	N/A	N/A
DV	Adherence (≥4h/pm± ≥5d/wk) Usage/Night (min/hr) Epworth Sleepiness Scale (ESS) Scores **Measure Type:** Outcome	Adherence & Usage as reported by patient ESS as reported by patient	EHR Genesis	Use Time (min/hrs) ESS: 0-24	Ratio	Jul - Nov 22	Paired T-test	TH results in equal or better outcomes as SOC ($P < 0.05$)

Appendix G

Epworth Sleepiness Scale

How likely are you to nod off or fall asleep in the following situations, in contrast to feeling just tired? This refers to your usual way of life in recent times.

Even if you haven't done some of these things recently, try to work out how they would have affected you. It is important that you answer each question as best you can.

Use the following scale to choose the most appropriate number for each situation.

	Would never nod off 0	Slight chance of nodding off 1	Moderate chance of nodding off 2	High chance of nodding off 3
Sitting and reading				
Watching TV				
Sitting, inactive, in a public place (e.g., in a meeting, theater, or dinner event)				
As a passenger in a car for an hour or more without stopping for a break				
Lying down to rest when circumstances permit				
Sitting and talking to someone				
Sitting quietly after a meal without alcohol				
In a car, while stopped for a few minutes in traffic or at a light				

Add up your points to get your total score. A score of 10 or greater raises concern: you may need to get more sleep, improve your sleep practices, or seek medical attention to determine why you are sleepy.

Appendix H

Staff Meeting Itinerary

I. Introduction of DNP project members

II. Brief overview of project intent

III. Description of Keesler Family Health Clinic Problem Identified

IV. Review of literature review results and EBP recommendations

V. Overview of DNP project

- **a.** PICOT question
- **b.** Focus areas and Project Framework
- **c.** Brief overview of project design with introduction of staff materials

VI. Question/Answer session

VII. Conclusion

Appendix I

Instruction Manual for Clinics

FIRST FOLLOW-UP APPOINTMENT INSTRUCTIONS

1. The patient returns to the clinic with a recommendation for a CPAP machine.
    a. A TCON (or IBE) is created to the appropriate provider team with the recommendation letter attached.
    b. Follow established protocols to answer TCON.
2. During the call, inform the patient their DME order will be placed and explain the process of how it will be fulfilled.
3. Schedule their virtual follow-up appointment approximately 2 weeks after the date their new CPAP machine is expected to arrive.

Suggestions of items to review with the patient:

Using a new PAP machine can be frustrating at first, but it's important to stick with it. The treatment is essential to avoiding complications of obstructive sleep apnea, such as high blood, pressure, heart problems and daytime fatigue.
Common problems with PAP include a leaky mask, trouble falling asleep, a stuffy nose and a dry mouth. If the first PAP mask or machine doesn't work for you, you have other options. We can help work with your DME supplier to ensure the best mask fit and device for you.
Finally, regular visits to your sleep doctor are important as well. They can help troubleshoot problems and adjust settings, if needed. It can take a while to find the correct settings and get used to the mask. With time and patience, CPAP can positively affect your quality of life and health.

COMMON ISSUES & SOLUTIONS
This section covers common issues people face in the initial stages of use.
If you're having difficulties falling asleep with your CPAP machine, it's critical to know why. Are the straps too tight? Do the mask and hose keep you from your favorite sleeping position? Is the noise too loud?

FIT AND SIZING ISSUES:

- MASK STYLE
    - A full-face mask works well for those who breathe through your mouth during sleep. This mask style may work if you move around a lot in your sleep or sleep on your side but may make some people feel claustrophobic.
    - Nasal pillows that fit under your nose and straps that cover less of your face. These can feel less cumbersome and may work well if you wear glasses or read with the mask on.
    -
- MASK SIZE AND FIT
    - Make sure your mask fits well. If you must tighten the straps often to prevent air

leakage, the mask does not fit properly.

- A properly fitting mask shouldn't be uncomfortable or cause pain.
- Masks come in adjustable sizes. Read the instruction manual or ask you PAP supplier to show you how to ensure a proper fitting.
- You may need to adjust the size of your mask over time, particularly if your weight has changed a lot.
- If you develop skin deterioration or sores, such as on your nose, call us back promptly.

COMFORT ISSUES

- TROUBLE SLEEPING
  Start with good, general sleep habits:
  - Exercise regularly and avoid caffeine and alcohol 2-4 hours before bedtime.
  - Intentionally try to relax leading up to your bedtime. For example, take a warm bath, dim the lights, turn off screens.

- ACCLIMATIZATION TIPS
  - Try wearing just the mask for short periods of time while awake — for example, while watching TV. Then try wearing the mask and hose with the machine turned on during the day while you're awake.
  - Use your machine every time you sleep, including during naps. Stick with it for a few weeks to see if your mask and pressure feel right.
- CLAUSTROPHOBIA
  Feeling claustrophobic in the initial period of wearing your mask is not uncommon, and you can overcome it.
  - Locate the vent holes on your mask. These holes are there to make sure that you won't suffocate if the airflow from the machine were to cut off for any reason. If you can, try the mask on and breathe with the machine turned off. You'll notice that you're able to breathe in and out as carbon dioxide escapes from the mask– even when the machine is not running.
  - Most machines include a "ramp-up" feature, which allows you to start with low air pressure at first. As you fall asleep, the machine automatically increases the air pressure to your prescribed setting. Other machines are designed to automatically adjust the pressure while you're sleeping.
  - Relaxation exercises, such as progressive muscle relaxation, may help reduce anxiety related to PAP use.
  - Consider trying a different size or style mask.

- DRY OR STUFFY NOSE
  A leaky mask can cause problems. Make sure you have a good fit first.
  - Leaky masks can dry out your nose and irritate the skin. The mask can also direct air into your eyes if it sits too high on the bridge of your nose, causing them to become dry or teary.
  - Try using heated humidifiers, which attach to the PAP machine. Refer to your

machine manual or supplier for more information about how to use a humidifier with your machine.
- Try using a nasal saline spray at bedtime.
- A chin strap may help keep your mouth closed and reduce the air leak if you wear a nasal mask.

It's not unusual to sometimes wake up to find that you've removed the mask in your sleep. If you move a lot in your sleep, you may find that a full-face mask will stay on your face better. You may have removed your mask while sleeping because you were uncomfortable. Consider trying a different type of mask that may fit you better. You may be pulling off the mask because your nose is congested. If so, ensuring a good mask fit and adding a CPAP-heated humidifier may help. A chin strap may help keep the mask on your face. If this is a consistent problem, consider setting an alarm for a time during the night so you can check whether the mask is still on. You could progressively set the alarm for later in the night if you find that you're keeping the mask on longer.

Most modern PAP machines are almost silent. If you find that your machine's noise is bothersome, first check to make sure the machine's air filter is clean and unblocked. Something in its way may worsen noise. Ask your doctor or CPAP supplier how to properly clean your mask and hose.

If this doesn't help, have your doctor or CPAP supplier check the machine to ensure it's working properly. If the machine is working correctly and the noise still bothers you, try wearing earplugs or using a white noise sound machine to mask the noise. Placing the CPAP machine as far away from the bed as possible also may help make any machine noise less noticeable. Ask your doctor or CPAP supplier if extra tubing is available and right for your machine.

MORE ISSUES:

- CONTINUED SNORING

  Snoring is a sign that your machine is not working. You may need to increase your pressure or adjust the fit of your mask. Another indicator is your Apneic-Hypoxic Index (AHI). If your AHI is regularly above 5, it means your PAP machine isn't at the right pressure.
- PAINFUL GAS AND BLOATING

  Painful gas and bloating are side effects known as aerophagia.
  Aerophagia is a condition in which the person swallows air during a night of therapy, causing often painful bloating and gas when the person wakes up in the morning. Adjusting your CPAP pressure or trying a different style of mask could be the trick, but you may be interested to know that using a BiPAP machine may help you improve your aerophagia symptoms. A BiPAP has a higher pressure when inhaling, and then a lower air pressure when exhaling. Because the pressure drops when you exhale, you're less likely to swallow air while using a BiPAP. Find out more about how BiPAP can help aerophagia, check out this article from this blog.
- "I Feel Like I'm Choking on Air"

  At first, the feeling of breathing in the pressurized air can feel suffocating. By putting on the mask first, you'll be less likely to feel like you're choking on air. Try this:

  1. Attach your mask to your face, and get everything in place.
  2. Turn on the machine. You'll feel the pressure increase.

3. Begin to breathe normally.

ADDITIONAL RESOURCES

- TRICARE - Covered Services - CPAP Machine
  - Discusses eligibility for a regular machine and for a portable machine with batteries.
  - Referrals for portable CPAP devices must include this verbiage (e.g., the patient travels for work more than three days per month…)
- Recalls of CPAP devices (and other changes)
  - Some Phillips-brand devices were recalled due to possible risks of exposures to carcinogens. See their website for more information. Patients are eligible to have their devices replaced if they own the affected model.
- American Academy of Sleep Medicine (AASM)
  - Source of clinical practice guidelines and coding instructions
- CPAP Informational Websites www.sleepapnea.org
  - Information and helpful resources on sleep apnea and CPAP therapy from Philips Respironics www.sleepfoundation.org - Information about sleep, sleep disorders and sleep apnea from the National Sleep Foundation

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Appendix J

Data Points Collected

Project ID #:

Baseline ESS score documented? Y/N

(If applicable) Baseline ESS score (0-24):

Formal DX for OSA documented? Y/N

DME referral for PAP equipment placed? Y/N

DME referral fulfilled/Pt received PAP machine? Y/N

Follow-up appt with coding for DX OSA within 3 months of PAP receipt? Y/N (If applicable) Follow-up appt method: Virtual/Face-to-face

Follow-up ESS score documented? Y/N

(If applicable)

Follow-up ESS score (0-24):

Reported PAP usage per night (min/hours):

Adherence greater than 4hrs/night for 5d/week? Y/N

Appendix K

Team Mentor Agreement Form

Appendix B: Daniel K. Inouye Graduate School of Nursing
Topic Selection and Senior Mentor Agreement Form

DOCTOR OF NURSING PRACTICE PROJECT
Topic Selection and Senior Mentor Agreement Form

Graduation Year: 2023

Name(s) of DNP Project Student Team:

1. Maj Laura Velasquez	Phase II Site: Keesler AFB	AGCNS	☐	FNP	☑	PMHNP	☐	RNA	☐	WHNP	☑
2. Capt Rachel Woodlee	Phase II Site: Keesler AFB	AGCNS	☐	FNP	☑	PMHNP	☐	RNA	☐	WHNP	☑
3.	Phase II Site:	AGCNS	☐	FNP	☐	PMHNP	☐	RNA	☐	WHNP	☐
4.	Phase II Site:	AGCNS	☐	FNP	☐	PMHNP	☐	RNA	☐	WHNP	☐
5.	Phase II Site:	AGCNS	☐	FNP	☐	PMHNP	☐	RNA	☐	WHNP	☐
6.	Phase II Site:	AGCNS	☐	FNP	☐	PMHNP	☐	RNA	☐	WHNP	☐

DNP Project Topic Area: The use of telehealth services in the primary care setting in place in place of face-to-face services.

SENIOR MENTOR AGREEMENT STATEMENT:
I agree to serve as the **Senior Mentor** (Committee Chair) for the above DNP Student Project Team. As Senior Mentor, I agree to the duties and responsibilities outlined within the DNP Project Manual which include but are not limited to the provision of consultation and guidance supporting the entire DNP project journey and to ensure the DNP project is of sufficient rigor and demonstrates doctoral level scholarship to meet the requirements for USUHS GSN graduation.

Dr. Healther Rivasplata	Heather Rivasplata Digitally signed by Heather Rivasplata Date: 2022.08.16 09:22:46 -04'00'	
Senior Mentor (Chair) Name (typed)	*(signature)*	*(date)*

Appendix L

CITI Certificates

Completion Date 13-Apr-2021
Expiration Date 12-Apr-2024
Record ID 42054654

This is to certify that:

Laura Velasquez

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

OUSD P&R Human Research
(Curriculum Group)
Biomed Research Coordinators, Clinical Coordinators, Study Coordinators & Research Administrators
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w3ed0e0cc-201f-499e-8b78-62a3bd9eaf90-42054654

Completion Date 15-Apr-2021
Expiration Date 14-Apr-2024
Record ID 42116165

This is to certify that:

Rachel Woodlee

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

OUSD P&R Human Research
(Curriculum Group)
Biomed Research Coordinators, Clinical Coordinators, Study Coordinators & Research Administrators
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?wf260029e-2bfe-4b1c-b22e-f29b9af8ab5e-42116165

Appendix M

USU Form 3202N

USUHS FORM 3202N
DANIEL K. INOUYE GRADUATE SCHOOL OF NURSING
EVIDENCE-BASED PRACTICE/PERFORMANCE IMPROVEMENT PROPOSAL

VPR Date Stamp

Project Number: GSN-61-13223 (VPR will assign)

Project Title: Implementation of Standardized Telehealth Follow-up to Improve Adherence to Positive Airway Pressure Therapy in Patients with Obstructive Sleep Apnea

SECTION A: STUDENT POC INFORMATION

1 Name (Last, First, MI): Velasquez, Laura, G Student E-mail: laura.velasquez@usuhs.edu

2 Home Address: 6[redacted] Cell Number: [redacted]

SECTION B: COMMITTEE CHAIR / SENIOR MENTOR INFORMATION

3. Name (Last, First, MI): Rivasplata, Heather

4. Telephone: [redacted] Fax: E-mail: heather.rivasplata@usuhs.edu

5. USUHS Building/ Room No.: E 1058

SECTION C: PROJECT INFORMATION

6. Attach the Abstract for the proposal, including the following sections: Site Location of the Project, Title, Authors, Background or Problem/Issue, Clinical Question/Purpose, Project Design, Anticipated Organizational Impact/Implications for Practice and also include the Proposed Timeline. Single space the abstract and use Times New Roman font, size 12.

7. Is this proposal related to an active research project of the Chair/Senior Mentor identified in Section B? ☐ Yes ☒ No
If yes, complete below; if no, proceed to Part 8.
Project Number: _____
Project Title:

Project Start Date: Project End Date: _____

8. Anticipated period of performance: Project Start Date: 9/1/2022 Project End Date: 3/1/2023

9. Performance Site(s): Keesler AFB

10. Does this project involve any classified information? (Contact the USUHS Security Office for guidance) ☐ Yes ☒ No

11. Do you have a funding source for this project? ☐ Yes ☐ No ☒ NA
If yes, specify the funding agency and the amount provided:

SECTION D: SIGNATURES

The following signatures attest to the validity of the above information:

VELASQUEZ.LAURA.GARRETT.1458313721 Digitally signed by VELASQUEZ.LAURA.GARRETT.1458313721 Date: 2022.04.05 09:21:06 -04'00'
Student (Project Point of Contact for the Group) (Signature and Date)

Heather Rivasplata Digitally signed by Heather Rivasplata Date: 2022.08.16 09:22:01 -04'00'
Chair/Senior Mentor (Signature and Date)

TRAUTMANN.JENNIFER.L.1074795443 Digitally signed by TRAUTMANN.JENNIFER.L.1074795443 Date: 2022.09.12 06:07:46 -04'00'
Chair/Program Director (Signature and Date)

Chair/Program Director (Signature and Date)

SEIBERT.DIANE.C.1084932279 Digitally signed by SEIBERT.DIANE.C.1084932279 Date: 2022.10.28 12:01:58 -04'00'
Associate Dean for Academic Affairs, GSN (Signature and Date)

DNP Project Director or PhD Director (Signature and Date)

SIMMONS.ANGELA.MARIE.1143313375 Digitally signed by SIMMONS.ANGELA.MARIE.1143313375 Date: 2022.10.28 08:26:45 -04'00'
Associate Dean for Research, GSN (Signature and Date)

ROMANO.CAROL.A.1032050294 Digitally signed by ROMANO.CAROL.A.1032050294 Date: 2022.10.28 11:46:34 -04'00'
Dean, DKI Graduate School of Nursing (Signature and Date)

In light of the above signatures, the project is approved.

WOODBERRY.MITCHELL.WAYNE.1060957114 Digitally signed by WOODBERRY.MITCHELL.WAYNE.1060957114 Date: 2023.02.23 10:41:04 -05'00'
USUHS Vice President for Research Date

USUHS Form 3202N (VPR) - Revised Sep 2015 v1.2
Previous versions are obsolete

Appendix N

MTF IRB Letter of Determination

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 81ST TRAINING WING (AETC)

EXEMPTION DETERMINATION OFFICIAL (EDO) REVIEW LETTER

Study #: FKE2023-0003E Submission Ref #: 954472

Submission Date: 11/14/2022 08:23:32 PM CST Determination Date: 11/15/2022

Principal Investigator: Laura Garrett Velasquez

Project Title: Implementation of Standardized Telehealth Follow-up to Improve Adherence to Positive Airway Pressure Therapy in Patients with Obstructive Sleep Apnea

Your study, referenced above was **determined** to be **EXEMPT** from DoD regulation 32 CFR 219 regarding the protection of human subjects.

32 CFR 219.104(d)(**1**) Research in Established or Commonly Accepted Educational Settings

If your study involves the use of data or biospecimens, then this approval alone does not authorize access to requested items. The final decision to release the requested data or biospecimens will be made by the manager of the repository, and this determination is only one factor the manager will consider.

You must notify this office if the project is altered in any way (e.g., changes in location, investigators, sample size, age of subjects, changes to the consent form or methodology, etc.), as the modification(s) might impact the exempt status. You are further advised that it is your responsibility to ensure you and your study staff adhere to the guidelines of the protocol.

The PI should notify their Public Affairs Office of any publications/ presentations resulting from this activity.

A signed Command Start letter **MUST** be obtained **prior to the commencement of research activities**. The local Human Protections Director will facilitate routing the Command Start letter.

Command approval is **REQUIRED** from each participating site **prior to the commencement of research activities**. Copies of the approvals should be sent to the local Human Protections Director.

The DHA Privacy and Civil Liberties Office (PCLO) requires the use of a Data Sharing Agreement (DSA) to access and use DHA data. **There is no set policy requiring the use of a DSA**. The DSA is an administrative control measure used by DHA. Contact DHA PCLO for guidance at DHA.DataSharing@health.mil or visit https://info.health.mil/cos/admin/privacy/Data%20Sharing%20Program/Pages/Home.aspx

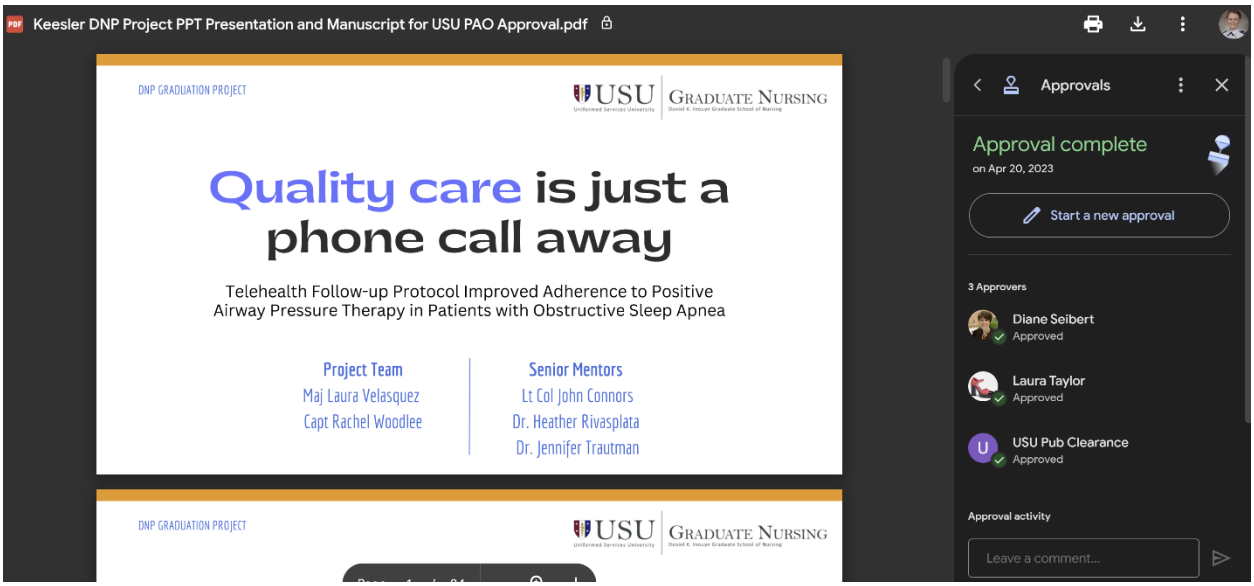
Should you have any questions, please feel free to contact the undersigned at earnest.m.mann.civ@health.mil.

MANN.EARNEST.M.JR.1047826469 Digitally signed by MANN.EARNEST.M.JR.1047826469 Date: 2022.11.15 16:27:42 -06'00'

EARNEST M. MANN
Exemption Determination Official

Appendix O

PAO Clearance/Level of Dissemination Classification



Appendix P

DNP Project Completion Verification Form

Appendix G: Daniel K. Inouye Graduate School of Nursing
DNP Project Completion Verification Form

DOCTOR OF NURSING PRACTICE PROJECT
Completion Verification Form

The DNP Project titled:

Implementation of Standardized Telehealth Follow-up to Improve Adherence to Positive Airway Pressure Therapy (PAP) in Patients with Obstructive Sleep Apnea (OSA)

was completed at: Keesler AFB

by the following student(s):

(type student name)	*(signature)*	*(date)*
Maj Laura Velasquez	VELASQUEZ.LAURA.GARRETT.1458313721 Digitally signed by VELASQUEZ.LAURA.GARRETT.1458313721 Date: 2023.04.25 10:14:26 -05'00'	
Capt Rachel Woodlee	WOODLEE.RACHEL.E.1392056137 Digitally signed by WOODLEE.RACHEL.E.1392056137 Date: 2023.04.26 13:03:22 -05'00'	

The DNP Practice Project Team verifies that the following components of the DNP project, accomplished by the above students, is of sufficient rigor and demonstrates doctoral level scholarship to meet the requirements for USUHS GSN graduation:

- Presentation of DNP project to the leadership/stakeholders at the Phase II Site,
- Abstract/Impact Statement (*Appendix F*), and
- DNP Project written report.

Verified by:

	(type name)	*(signature)*	*(date)*
Senior Mentor:	Dr. Heather Rivasplata	Heather Rivasplata Digitally signed by Heather Rivasplata Date: 2023.04.28 16:29:24 -04'00'	
Team Mentor:			
Team Mentor:			
Phase II Site Director:	Lt Col John Connors	CONNORS.JOHN.T.1122179830 Digitally signed by CONNORS.JOHN.T.1122179830 Date: 2023.05.01 10:27:44 -05'00'	

For RNA Students only *- add the following additional signature for final verification of project completion:*

RNA Project Director *(type name)*	*(Signature)*	*(Date)*

Form Version: 26 Aug 2017/30 Mar2020