

2012 VHA Employee Innovation Competition

Remote Ambulatory Management of Veterans with Sleep Apnea (687)

Facility: Philadelphia VA Medical Center

Station 642, VISN 04

Initial Idea Submitted by: Samuel T. Kuna, MD



Problem Statement

We propose to establish an innovative clinical pathway for the diagnosis and treatment of Veterans with obstructive sleep apnea who live in remote and rural areas.

- ❧ Obstructive sleep apnea characterized by the repetitive closure of the throat during sleep. It is more common than asthma and diabetes.
- ❧ Veterans with sleep apnea are at increased risk of hypertension, heart attacks, strokes, and motor vehicle and work-related accidents.
- ❧ In-laboratory overnight sleep testing, the current gold standard diagnostic test, is expensive and requires specialized facilities.
- ❧ There are only about 60 VA sleep laboratories nationally, limiting Veterans' access to the diagnosis and treatment of this disorder, especially those Veterans living in remote and rural areas.



Description of Idea

Use emerging technologies to improve access and quality of care for Veterans with sleep apnea

- ☞ Complete intake and follow-up sleep questionnaires securely online – eliminating paper forms.
- ☞ Instruct the Veteran how to perform the test at home using a DVD and illustrated brochure – replacing in-person instruction.
- ☞ Using an automatically adjusting positive airway pressure (autoPAP) device for treatment – eliminating the need of additional testing.
- ☞ Remote monitoring of treatment at home by data transmitted to a website by wireless modem attached to the autoPAP device – enabling timely collection of results.
- ☞ Follow-up provided by physician extenders conducting phone calls and clinical video teleconferencing – increasing efficiency and patient flow.



Strategic Goals

Provide Veterans with sleep apnea in remote and rural areas access to high quality specialty care by:

❧ Improving patient access to care.

- Decreasing patient wait times for in-person clinic visits.
- Eliminating Veteran's travel cost/time.
- Reaching Veterans living far from a sleep center.

❧ Reducing cost of care to the facility.

❧ Employing innovative technology to improve clinical workflow and quality of care.



Success Metrics

Use objective measures and validated questionnaires to evaluate the success of the remote ambulatory pathway:

- ❧ Assess improvement in functional outcomes (i.e., quality of life).
 - Daytime function will significantly improve.
- ❧ Monitor failure rate of home sleep testing.
 - Failure rate on home sleep testing will be less than 10%.
- ❧ Objectively measure patient adherence to autoPAP treatment.
 - Adherence to treatment will be adequate.
- ❧ Assess patient satisfaction with the care.
 - Veterans will be satisfied with their care.
- ❧ Assess Veterans' rating of their remote interaction with the sleep provider.
 - Veterans will express satisfaction with their interaction with the provider.



Impacts

The remote ambulatory pathway will improve quality of care for obstructive sleep apnea and reduce cost.

❧ Veterans will benefit by having improved access to care.

- Wait time for clinical evaluation and testing decreased.
- Cost and time needed to travel to a sleep center eliminated.
- Care available to Veterans living far from a sleep center.

❧ The VHA will benefit by reduction in cost of care.

- Physician extenders used to deliver care instead of sleep specialists.
- Innovative technology substituting for in-person care.
- Treatment of Veterans with obstructive sleep apnea will likely reduce their incidence of costly cardiovascular consequences and hospitalizations.



Approach

- ❧ Veterans referred to the sleep center with suspected obstructive sleep apnea will be contacted by telephone to enroll 75 patients.
- ❧ Patients with access to the internet will complete initial questionnaires using MyHealthVet.
- ❧ The sleep provider will review the responses and phone the patient to take a medical history and explain the proposed management.
- ❧ Patients will be mailed the portable monitor with educational and instructional materials, perform the home sleep test and return the monitor by mail for scoring and interpretation.
- ❧ Patients with obstructive sleep apnea will be prescribed an autoPAP device with wireless modem that will securely transmit data on patient use and how well the treatment is working to an already existing website.



Approach

- ❧ The autoPAP data on the website will be reviewed and the Veteran will be telephoned if use of the treatment is low, air leak is unacceptably high, or the sleep apnea is not adequately treated.
- ❧ During the phone calls, the sleep provider can recommend behavioral strategies to increase adherence, adjust the autoPAP settings remotely via the wireless modem, and recommend a home visit by the local therapist to provide a better fitting mask.
- ❧ The patient will complete follow-up questionnaires using MyHealthVet to assess improvement in quality of life, daytime function, satisfaction with care, and rapport with the provider.
- ❧ Follow-up phone calls with the sleep provider will be scheduled at 1- and 3 months.
- ❧ AutoPAP adherence and change scores on functional outcome questionnaires will be analyzed at the 3 month time point.



Team and Environment

An outstanding team has been assembled at the Philadelphia VA Medical Center to conduct the prototype:

- ❧ Sam Kuna, MD, project leader, is director of the VISN04 Eastern Regional Sleep Center that is accredited by the American Academy of Sleep Medicine.
- ❧ Sue McCloskey, NP will serve as the sleep center provider. She has extensive expertise in managing Veterans with sleep apnea.
- ❧ Pratima Pathak, MD will assist in administering the project.
- ❧ Diane Richardson, PhD, biostatistician at the Center for Health Equities and Research Promotion (CHERP), will analyze the results.
- ❧ Keith Davies, database manager at CHERP, will organize the results data into spreadsheets for analysis.



Team and Environment (cont.)

Other members of the team include:

❧ Jacqie Ferguson, Avery Anderson and David Ingram, the respiratory therapists in the sleep center, will be responsible for the home testing equipment (initialization, cleaning, downloading recordings).

❧ Gary Woodring, Chief of Prosthetics, will facilitate the set-up of the wireless modems for transmission of data from the home autoPAP units.

❧ Paul Robinson, Chief Information Officer, will assist with the informatics components of the project.

❧ Lynn Watson, Facility Telehealth Coordinator, will help organize the telehealth components of the project.

As indicated by the multi-disciplinary team, the project has strong institutional support. The Medical Executive Council at the Philadelphia VA Medical Center has endorsed the project and all needed equipment is currently in place.



Implementation

Our experience and plan of operation ensure the project's rapid implementation.

- ❧ Dr. Kuna, the project leader, will be responsible for the overall conduct of the prototype including patient selection, home testing, data collection and storage, quality assurance, analysis of the results, and dissemination of the findings.
- ❧ The team members will hold weekly meetings throughout the project to discuss progress in the study, any problems encountered, and changes to improve operations and data collection.
- ❧ The team has extensive experience using home sleep testing and autoPAP. Instructional materials for home testing have already been prepared.
- ❧ Dr. Kuna has experience using the wireless modem technology in his non-VA practice.



Timeline

	FY 2012: Q4			FY 2013: Q1			FY 2013: Q2			FY 2013: Q3			FY 2013: Q4		
	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	APR	MAY	JUN
Preparation of clinical materials	■	■													
Patient recruitment			■	■	■	■	■	■							
Data collection			■	■	■	■	■	■	■	■	■				
Data analysis										■	■	■	■	■	
Dissemination of results													■	■	■

- ❧ The first two months will be spent preparing clinical materials (electronic questionnaires, telephone scripts, case report forms), hiring a technologist and training therapists about the wireless modem set-up.
- ❧ Patient recruitment and data collection will begin in September 2012.
- ❧ The last patient will be enrolled in February 2013 and data collection will end in May 2013, at the time of the last 3-month follow-up.
- ❧ Analysis of the results will start in the last 2 months of data collection and continue to the next to last month.
- ❧ Preparation of reports and dissemination of the findings will occur in the last 3 months of the project.



Budget Narrative

- ❧ Salary support and benefits are requested for:
 - A full time clinical technologist (GS6, Step 1) to assist in day-to-day operations of the project. Responsibilities will include assisting with patient recruitment, equipment turnaround, and scheduling and preparing materials for the providers prior to their phone calls with the patients.
 - K. Davies, database manager, will prepare data spreadsheets for analysis (5% effort).
 - D. Richardson, PhD, biostatistician, will analyze the results (5% effort).
- ❧ Funds (\$750) are requested to cover the cost of the wireless modem calls to the manufacturer's server (\$5/patient/month x 50 patients x 3 months/patient)



Budget Proposal

Redacted



Challenges & Risks

- ❧ Not all Veterans will be able to participate in home sleep testing. A patient with two failed studies will be scheduled for in-lab testing.
- ❧ Not all patients will be candidates for treatment with an autoPAP device. Strong patient safety measures are built into the pathway to identify these patients so they can be scheduled for in-lab testing.
- ❧ Electronic sleep questionnaires need to be added to MyHealthVet/ Secure Messaging. If these are not available by the time the project is ready to start, paper forms will be mailed to the patients.
- ❧ Veterans may not return the portable monitors and modems. We have developed a successful process to retrieve the equipment.
- ❧ The remote pathway may only work in a subset of patients. In this case, the results will allow us to identify the characteristics of the patients who should be targeted and/or modify the pathway to increase its applicability.

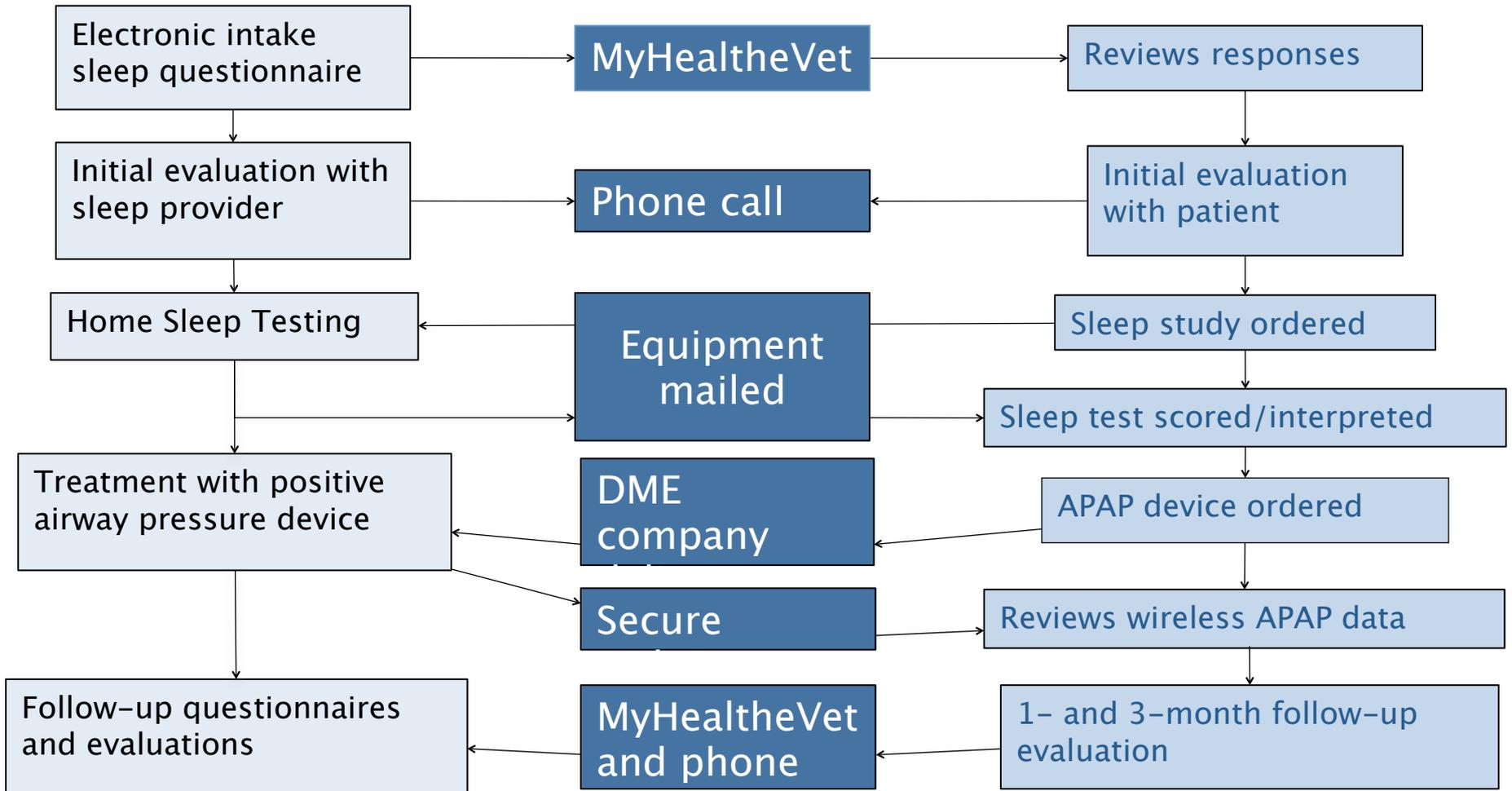


Supporting Diagrams: (Remote Ambulatory Sleep Apnea)

Veteran at Home

Linking Interface

Sleep Center Provider





What Do You Really think?

- ❧ Obstructive sleep apnea is recognized as a major public health problem.
- ❧ Many Veterans with sleep apnea are undiagnosed and excluded from care because of the limited number of VA sleep facilities.
- ❧ Recent technological advances should allow these patients to be diagnosed and treated without having to visit a sleep center.
- ❧ Our model increases Veterans' access to diagnostic testing by using emerging store and forward technologies to manage their health.
- ❧ A particular strength is our evaluation of the project using an objective outcome metric.
- ❧ The sleep center at the Philadelphia VA Medical Center is strategically positioned to develop this innovative model given its strong expertise in home sleep testing and use of autoPAP treatment.
- ❧ This ambulatory management pathway will be suitable for widespread implementation to reach Veterans in remote and rural areas.