

Enabling Sleep Apnea Patient-Centered Care via an Internet Intervention

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Mechanism:	RFA: HS07-007: Ambulatory Safety and Quality Program: Enabling Patient-Centered Care through Health Information Technology (PCC)
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Target Population: Adults

Summary: Poor treatment adherence with continuous positive airway pressure (CPAP) therapy is well-documented. This project develops an integrated remote monitoring device and Internet-based portal for patients with obstructive sleep apnea syndrome (OSA) who are prescribed CPAP treatment. The project will evaluate the intervention's effect on patients' experience of care, CPAP adherence, and OSA outcomes.

OSA is a common sleep apnea and is caused by obstruction of the airway. It is treated with a CPAP flow generator, a machine that blows air at a physician-prescribed pressure into a facemask or nasal pillow. The team used the ResMed-developed ReStraxx Data Center (RDC), a Web site that obtains data from the CPAP flow generator via a wireless monitoring module that affixes directly to the CPAP unit. The objectively-measured adherence data from the RDC will be transmitted to both patient and provider and used as the central outcome measure to evaluate the intervention. The provider portal contains information including adherence, amount of air leaking, and number of apneas or hypopneas per hour. With this information, the provider can continuously monitor the patient's progress and make ongoing decisions about how to support the patient and/or alter his or her treatment plan.

The team organizes the data provided by the RDC into user-friendly pieces of information which are then provided to the patient through the Internet Positive Airway Pressure (i-PAP) patient portal. In addition, the portal contains tailored measures that patients can observe and allows them to add self-defined measures. The portal has a learning center with information on sleep apnea and the CPAP device, charts that provide objectively-measured adherence and efficacy data, self-tracked changes in weight, sleepiness, physical activity, and other user-defined factors over time. The learning center also contains self-assessment materials, including research surveys and a journal for self-documentation, a message board with a support network for CPAP users, and links to external sources of information on sleep apnea.

The project will conduct a randomized controlled clinical trial to evaluate the effects of the interactive portion of the CPAP treatment. Both the usual care group and the i-PAP patients will be provided with CPAP devices and education materials on OSA. The trial will evaluate the effect of having the Internet-based portal to facilitate the flow of information and communication between providers and patients in addition to the CPAP device. The team will evaluate whether and how the i-PAP intervention affects OSA-related outcomes, CPAP adherence, patient-centeredness of care, patient assessment of and satisfaction

with care, and patient activation. In addition, the team will examine indicators such as use of the Web site and frequencies and the nature of clinical contacts to understand the reasons behind any effects.

Specific Aims:

- Examine the effect of the i-PAP intervention compared to usual care on the patient's experience of the quality of patient-centered, collaborative care. **(Ongoing)**
- Examine the effect of the i-PAP Internet intervention compared to usual care on the level of CPAP adherence. **(Ongoing)**
- Examine the effect of i-PAP compared to usual care on OSA outcomes. **(Ongoing)**
- Perform a basic cost analysis of the i-PAP intervention compared to usual care, applying a micro-cost methodology of measuring the quantity of inputs used in the production of care and the unit cost of each. **(Ongoing)**

2010 Activities: The project online assessments were created and subjected to extensive validation procedures to ensure that the paper version of the questionnaire be accurately portrayed in the Web-based version. The validation procedures included verification of each item, the allowable responses, the flow and order of the questions within the questionnaire, the accuracy of the changes in items across baseline, post-intervention, followup visits, and troubleshooting of any problems when the test subjects took practice versions of the online testing. Online questionnaires were improved in several ways: font size was increased for readability; "hit" zones were enlarged to make response selection easier; online questionnaires were divided into two parts to allow a sense of completion for those who might find the survey lengthy; and an added progress bar at the top of the page for those wished to monitor relative time until completion. Once the online surveys were created, they were integrated to the Web site for patients, and a research administration page was created to allow project staff to track participants who were due to complete surveys and those who already completed them.

The basic flow of recruitment, enrollment, and intervention, along with assessments, are firmly in place. The Web site design is essentially complete. The team continues to consider adding functionality to the Web site in two areas and continues to review and update troubleshooting guide.

The team continued to work on cleaning the CPAP data. For various reasons some research participants ended up with more than one data download, so the team combined the excel files so there was one file per subject. The project had 210 CPAP data downloads at the time of the last report, 14 of which needed to have the data aggregated. Hand manipulation was required and double-checks were integrated into the process. In addition, the team attempted to reduce the higher-than-expected rates of uncompleted data on the questionnaire. Efforts to schedule more in-office appointments and maintain better contact helped maintain a 20 percent or higher questionnaire completeness rate.

Grantee's Most Recent Self-Reported Quarterly Status (as of December 2010): Project progress is mostly on track. Budget spending is roughly on target.

Preliminary Impact and Findings: A review of sleep apnea and CPAP Web sites identified more than 90 Web sites. The team coded 49 of them for descriptive and evaluative variables. The project team is reviewing the information for type of interactivity. Fewer than five Web sites had any interactive content and only one had graphical interactive content. Patients who engaged in the clinical aspect of the project are not as compliant with the Web-based assessment as would have been expected. The study team is

expecting to implement strategies to improve the 25 percent attrition rates.

Several manuscripts and book chapters were initiated and are expected to be published in 2011.

Strategic Goal: Develop and disseminate health IT evidence and evidence-based tools to support patient-centered care, the coordination of care across transitions in care settings, and the electronic exchange of health information to improve quality of care.

Business Goal: Implementation and Use