

Introducing an Outpatient Desensitization Protocol to Improve Continuous Positive Airway Pressure Adherence

Elizabeth Rivera, DNP, APRN, FNP-C

PROBLEM STATEMENT

- Untreated obstructive sleep apnea (OSA) has negative impacts to health including adverse cardiovascular (CV) complications and increased risk of CV mortality.
- One third of patients fail continuous positive airway pressure (CPAP) therapy in the first year.
- Specified desensitization programs designed to improve adherence through enhanced initiation experiences and close follow up can improve adherence to CPAP therapy.

PROJECT PURPOSE

- Project purpose: This quality improvement QI project was intended to improve adherence of CPAP therapy in the treatment of participants diagnosed with OSA and CVD to meet Centers for Medicare and Medicaid Services (CMS) standards of adherence over the first 12 weeks after initiation through a desensitization protocol and close follow-up.
- Overarching aim: To improve adherence to CPAP therapy within the first 90 days post initiation or re-initiation for patients with OSA and CVD to improve continued use of device and improve participant outcomes.
- Clinical Question: In patients with cardiovascular disease, does initiation of a desensitization treatment protocol for OSA in coordination with a close outpatient follow-up regimen with sleep medicine improve CPAP adherence compared to no protocol initiation/close follow-up over 12 weeks?

MODEL/NURSING THEORY

- The Plan-Do-Study-Act (PDSA) healthcare model was used as the framework for this project. This model focuses on using multiple rapid cycles to investigate a problem and then formulate a solution that is tested first on a small scale.
- Orem's Self-Care Deficit Theory of nursing focuses on the effect nurses have on changing negative patterns in health that patients are unable to change on their own.

METHODS

•Participants

Participants included all patients with OSA who also have CVD and require CPAP therapy.

•Setting

The setting for this QI project was a local outpatient sleep medicine clinic located in central Florida.

•Instruments/Tools

Adherence to CPAP therapy was measured using the CMS guideline of 4 hour/night for 70% of nights within the first 12 weeks proven by digital smartcard technology.

Epworth Sleepiness Scale (ESS):

- Used to assess self-report of daytime sleepiness in everyday activities and is scored on a 4-point Likert scale with scores >10 indicating excessive daytime sleepiness.

Patient Health Questionnaire (PHQ-9):

- A 9-item form used across many clinical settings to identify persons with depressive symptoms.

Generalized Anxiety Disorder 7-item (GAD-7):

- Used across many healthcare settings to identify persons with symptoms of anxiety.

Insomnia Severity Index (ISI):

- Used to assess insomnia quality, severity, and overall impact on daily life.

Short Form 36 (SF-36):

- A quality-of-life measurement tool utilized to assess patient perception of health and limitations pertaining to physical, mental, and social aspects. The SF-36 is broken into 9 categories with scores closer to 100% representing a better health state.

•Intervention and Data Collection

- Implementation of the desensitization protocol and close follow-up over 12-weeks for all patients with OSA and CVD.
- Documentation of de-identified data recorded in excel spreadsheet and stored in password protected computer.
- Data collection: questionnaire scoring, adherence measures gathered from digital smartcard technology.
- Qualitative data gathered from focus groups with key stakeholders held every 4 weeks. All information gathered logged and content analysis conducted to identify meaningful patterns.

RESULTS

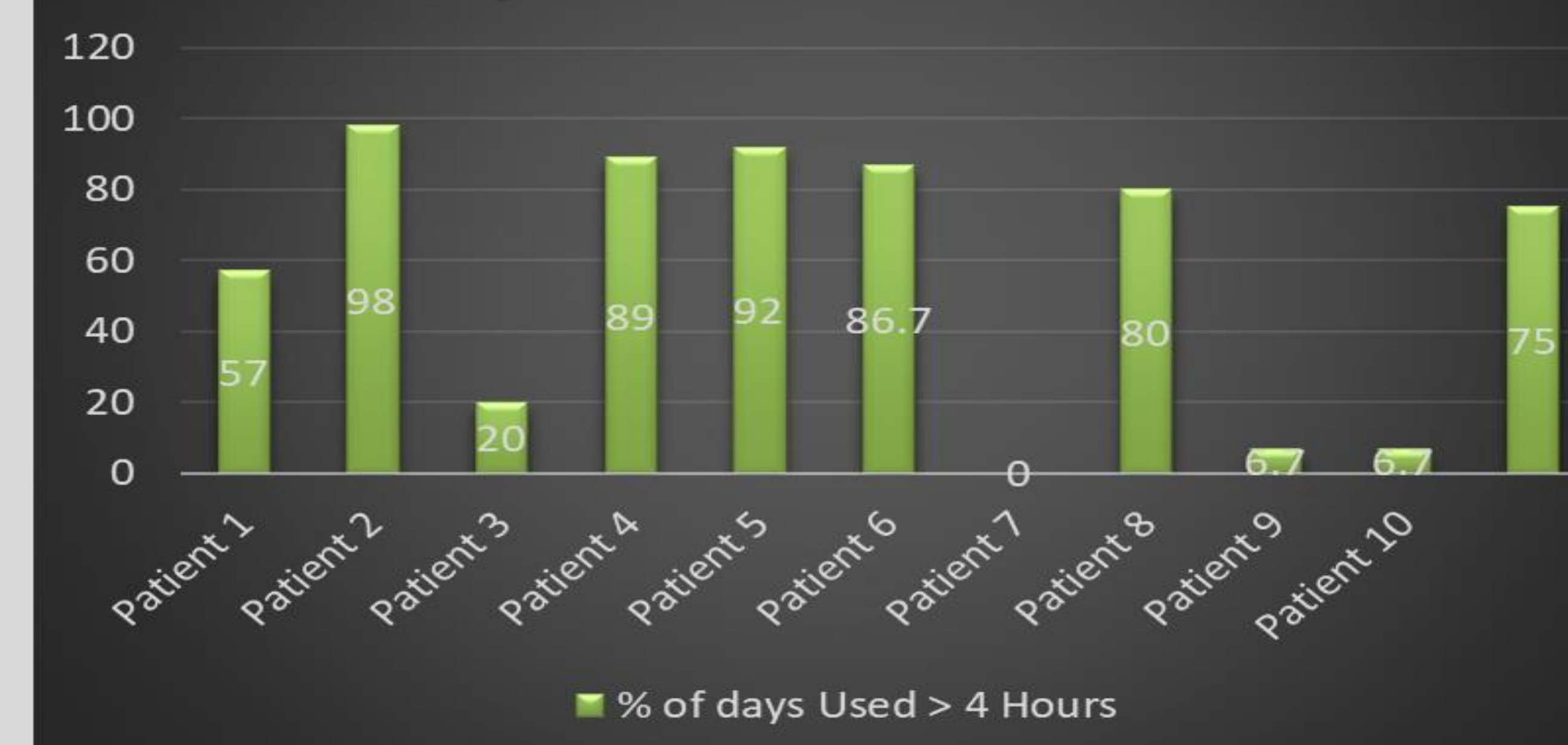
- Forty-six consecutive participants met inclusion criteria (57% male; mean age 62.02 ± 15.26 years; mean body mass index 32.35 ± 10.35 kg/m²; scored 7.24 ± 3.19 on a 10-point Likert scale of willingness to use CPAP). Eleven participants completed the elements of the QI project. There were 5 participant deaths prior to completion of the implementation phase unrelated to the intervention, 18 losses to follow-up, and 12 refusals to wear CPAP.

n=11

Questionnaire	Mean	Standard Deviation	Interpretation	
GAD-7	12.75	5.90	Moderate Anxiety	
ESS	11	5.98	Excessive Daytime Sleepiness	
PHQ-9	15.86	9.81	Moderate to Severe Depression	
ISI	19.63	7.23	Clinical Insomnia	
SF-36 Category	Minimum	Maximum	Mean	Standard Deviation
Physical Function	0%	35%	11.88%	11.63%
Physical Role Limit	0%	0%	0%	n/a
Emotional Role Limit	0%	100%	25%	46.29%
Energy/fatigue	0%	45%	21.25%	15.75%
Emotional Well-being	4%	88%	47.5%	26.48%
Social Function	0%	100%	51.56%	35.63%
Pain	0%	100%	35.31%	35.34%
General Health	0%	50%	30%	17.11%
Health Change	0%	50%	12.5%	18.90%

- Minimal changes were seen in questionnaire scoring at the end of the 12 weeks, which may be a result of the limited time they were adherent to therapy before the re-administration of the questionnaires.
- Of the 11 participants who completed the intervention, all were prescribed CPAP therapy previously but were not meeting adherence criteria prior to the intervention. Post intervention, 6 of the 11 participants met adherence criteria of 4 hours/night for > 70% of nights over a 30-day period in the first 12 weeks. Therefore, adherence to CPAP therapy was increased from 0% adherence to 54.5% adherence. Using McNemar's test on paired proportions, adherence data post intervention was proven statistically significant with p = 0.0313.

Table 1: Adherence Data at 90 days Post Intervention



DISCUSSION

- Implementation of a specified desensitization protocol including close follow-up in the first 12 weeks can improve adherence in participants who previously failed CPAP therapy.
- Close follow-up allows for enhanced educational opportunities, mask changes, mitigation of participant issues, and review of digital smartcard adherence data.
- The ESS, PHQ-9, GAD-7, ISI, and SF-36 provide valuable information on each participant's self report of symptoms, identification of mental health conditions that contribute to CPAP failure, and participants personal perception of health state.
- Secondary administration and improvement in questionnaire scoring may be better assessed 90 days after the participant has met adherence to CPAP therapy.

IMPLICATIONS FOR ADVANCE PRACTICE NURSING

- Advanced practice registered nurses (APRN) evaluate and manage care in 40% of OSA patients in the United States. There is potential to make a great impact on the recognition, evaluation, treatment, and adherence to treatment of patients with OSA.
- APRN providers can help OSA patients improve adherence to CPAP therapy.

SUSTAINABILITY

- Future projects include CPAP naïve patients with continued use of the elements in this QI project in the sleep medicine clinic.
- The sleep medicine clinic will continue the use of the desensitization protocol with close follow-up, use of questionnaires pre intervention and post 90 days after meeting adherence consistently, and integration of this QI project into other clinic locations.

REFERENCES



The use of a specified desensitization protocol with close follow-up improves adherence to continuous positive airway pressure therapy.