Empowering Chronically Ill Patients and their Caregivers using Remote Monitoring Technology

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A medical neighborhood is a community comprised of patients, informal caregivers, (family and friends) and clinicians engaged in promoting positive health behaviors while enhancing satisfaction and improving patient-driven health care. This clinical community may help decrease emergency department visits, hospital admissions, readmissions, complication rates, and acuity of health issues while increasing clinician office visits because patients are more activated in their health.

Health information technology is expanding rapidly as medical groups in the United States continue to evolve. Remote monitoring technology can detect a patient’s disease symptoms earlier. This can lead to improved clinical outcomes, greater patient self-management, and less costly interventions. Interactive voice recognition (IVR) is a form of remote monitoring technology that enables the patient’s clinical team to intervene sooner when a patient’s symptoms worsen. Earlier treatment means a better outcome for the patient. By keeping patients in their chosen residence, this can lead to happier and healthier individuals while reducing the need for higher cost, more intensive care settings. This technology can also expand nursing capacity and help those struggling to manage their condition to better
understand what is happening with their health and promote more active management of their condition.

Chronic obstructive pulmonary disease (COPD) is an escalating public health problem and a cause of chronic morbidity and mortality. It contributes to substantial health service use and overall cost of care. COPD is an airflow limitation that is progressive and not fully reversible. Moreover, the toll of COPD can extend beyond the physical; feelings of isolation, depression, and loss of independence are common [1]. The National Heart, Lung, and Blood Institute estimates that by 2020, it will be the third leading cause of death in the United States.

Whereas 24 million individuals in the United States are estimated to have COPD, only 12 million are diagnosed and actively managed [2,3]. Early identification for diagnosis and treatment remains paramount to reduce disease progression and acute exacerbation. The 4 components of active management include (1) assessment and monitoring, (2) risk factor reduction, (3) management of stable COPD, and (4) exacerbation management [2,3]. Furthermore, patient education is important to help manage COPD and should include disease awareness, medication administration, lifestyle changes, and disease exacerbation recognition. Early exacerbation recognition can reduce hospital admissions, bed days, and emergency department (ED) visits, thus improving patient quality of life and decreasing cost of care. The current prevalence of COPD at our organization comprises approximately 21,000 individuals. COPD remains one of the top 10 diseases at our medical group that results in hospital admissions and 30d readmissions.

In 2008, we launched a patient-centered health management program for COPD patients with a focus on self-management; including, early symptom identification, using zones of COPD symptoms, and medication management for flare-ups. This program was supported by registered nurses who initially met with patients in the clinic and conducted follow up with in-person meetings and by telephone to ensure the patient understood their COPD self-management plan.

In 2011, we launched a pilot remote monitoring program using IVR technology to help expand clinical capacity and improve the application of user-friendly technology for older, chronically ill patients. Many of our patients have visual, auditory, and dexterity impairment. Therefore, it was imperative that the technology be easy to use, avoid burdensome set-up, not require battery changes, nor have monitor displays or internet connections. Additionally, we opted for patients to enter their symptoms onto their telephone keypads instead of speaking into a phone because of potential speech impairment due to wheezing that is common with COPD patients and could obscure symptom reporting. We wanted our health technology to be scalable and embraced by
as many older, chronically ill adults as possible. Moreover, we wished to evaluate the patient and clinical staff’s perceptions of this technology with regularly scheduled satisfaction questionnaires. After compilation of this survey, de-identified data was in composite form to patients and staff for their critical review.

The IVR survey calls are based on COPD symptoms corresponding to green, yellow, and red zones. Self-management strategies are emphasized, highlighting symptom recognition and action plans are based on the National Jewish Health Research and Science Program COPD self-management plan. The action plan consists of various colored zones indicating increasing severity of symptoms; these green, yellow, and red zones contain questions pertaining to 4 categories of COPD symptoms: breathing, sputum, thinking, and energy. The red zones indicate an emergent situation requiring physician intervention, whereas the yellow zone indicates symptoms of lesser severity that necessitate case manager initiation of the action plan. The green zone is baseline for the patient and does not require clinical involvement.

Patients complete the nine question survey weekly. These individuals enter their disease symptoms based on categories of COPD exacerbations. Patients answer the questions using their telephone keypad and their response is recorded by pressing 1, 2, or 3; these numbers respond to the green, yellow, and red symptom zones. The calls occur at noon, and if no response, there is a “back-up” call at 7:00P. The frequency of calling is either on Thursday or Monday and Thursday; this once or twice a week calling schedule is based on patient and clinician input. Reports are transmitted to clinicians in an actionable format; total score (9-27 total points); change greater than 2 from previous call, longitudinal trending, and no answer or an incomplete survey results are available to clinicians for evaluation and reaching out to patients within yellow and red zones.

Currently, at our organization, remote monitoring expands clinical capacity within our medical neighborhood. With this technology, 5% of the survey calls trigger nursing contact after every IVR survey. The program helps support the administration of emergency prescriptions whereby patients recognize worsening COPD symptoms and follow-up in either the urgent care center or their physician’s office instead of an emergency department visit or hospital admission. This helps keep the patient at their chosen residence, eases caregiver burden, and decreases unnecessary health utilization.

To further evaluate and refine the program, clinicians complete anonymous formal surveys every three months. The majority state that the IVR reports are easy to read and actionable; “we know which symptoms the patient is experiencing.” It also frees-up time and allows the staff to focus on patients who are more at-risk for exacerbation (“yellow and red zones”) than patients
who are in the “green zone” or regularly in a yellow zone to a particular question as this may be “normal” for them. The technology did not substitute a nurse call or face-to-face meetings with patients; it supplements clinical contact and helps expand clinical capacity.

Similarly, after every 3 months, patients and family members complete anonymous formal surveys that related the following results: the majority responding that they appreciated that the calls were easy, did not take too much time (~2-3 min) and helped them (family, caregiver, patient) become more involved in the patients’ healthcare. IVR technology encourages patients to monitor their own symptoms; it is more effective than our paper handout on “Zones of Symptoms.” IVR has encouraged patients to report exacerbation symptoms with survey, when before the system; a patient might have been hesitant to call their nurse.

Conclusions

Engaging patients to proactively manage their health is a hallmark of patient-driven care and plays a critical role in the design, construction, renovation, and maintenance of the medical neighborhood. Thus far, our IVR technology pilot program shows patients and family members recognizing exacerbation symptoms, improving treatment adherence, and decreasing hospital and emergency department visits. Moreover, this technology helps expand the clinical capacity of staff thereby reducing stress and permitting our personnel to focus on the most at-risk older patients and help improve their quality of life. As we progress forward, there remains scant information using these technologies to activate informal caregivers in the health care of a loved one. This may serve as food for thought as medical organizations strive to meet the communities’ aims of better health, better care, and reducing costs while improving clinical outcomes.

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References


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