Remote Patient Monitoring (RPM) in the Home:
Improving Outcomes in Older Patients with Multiple Chronic Diseases

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Abstract

Recent changes in healthcare focus on providing care of patients in the community-based setting with a goal of decreasing hospitalizations. Caring for older patients is complicated by the presence of multiple chronic medical conditions such as heart failure, hypertension, diabetes, and COPD requiring closer monitoring to prevent hospitalizations. Advances in technology are bringing the monitoring of specific physiological parameters to the patient home. Remote patient monitoring (RPM) is the collection of data, such as blood pressure, oxygen saturation, weight, and blood glucose, by the patient in the home and transmitting this data to a provider for review. Gilchrist's Elder Medical Care (EMC) program currently utilizes the use of RPM for homebound patients requiring closer monitoring of one or more chronic medical conditions. The goal of the program is to identify decline in the patient and treat the patient in the home, limiting the potential for hospitalization. Patients are identified for inclusion in the program by the primary care provider and enrolled in the program for a minimum of sixty (60) days. The program is administered in conjunction with a third-party provider who receives the transmissions and reports any physiological parameters outside set ranges, known as alerts. The use of technology, such as RPM, will continue to increase as payment for monitoring services increase. Studies indicate that patients, especially younger patients, accept various forms of telemonitoring for delivery of their care. Utilization of RPM in the home has promise to identify patient decline in a timely manner which can help promote positive outcomes.

Home Based Medical Care: Elder Medical Care Program

Home Based Medical Care (HBMC)
Primary care provided in private residences and assisted living facilities (ALF)
- Increase from 8.7% in 2011 to 10.1% 2014 for patients with 4-6 comorbidities
- Increase from 14.2% in 2011 to 15.7% in 2014 for patients with ≥7 comorbidities
- Hypertension, diabetes, dementia, heart failure and COPD most prevalent diagnosis
(Yao et al, 2018)

Elder Medical Care Program (EMC)
Started in 2014 in response to a shift in primary care needs of older patients

A team of physicians, nurse practitioners, social workers and support staff that provide care to patients in their home that have difficulty getting out to regular appointments for care.

Provide coordination of care between patient, specialist, home health agencies and other specialty services including a third-party provider for remote patient monitoring

Program provides service in major urban area covering three counties with patients in both residential and ALF settings

Remote Patient Monitoring (RPM)

Remote patient monitoring (RPM) is the use of specific devices to collect data (i.e. blood pressure, blood glucose, weight, heart rate, oxygen saturation) and transmission of the data to a remote agency or diagnostic center for review (American Telemedicine Association)

Benefits: Closer monitoring of comorbid conditions; patient's elevated awareness of their health; increased adherence to provider-prescribed treatments; transition of care opportunity

Barriers: Perceived difficulty of using the system or lack of benefit from using the system (de Veer, et al, 2015; Christodoulakis et al,2017); access to internet or mobile technology services; costs (both from provider and patient standpoint); concern regarding privacy issues (Christodoulakis et al, 2017); provider acceptance
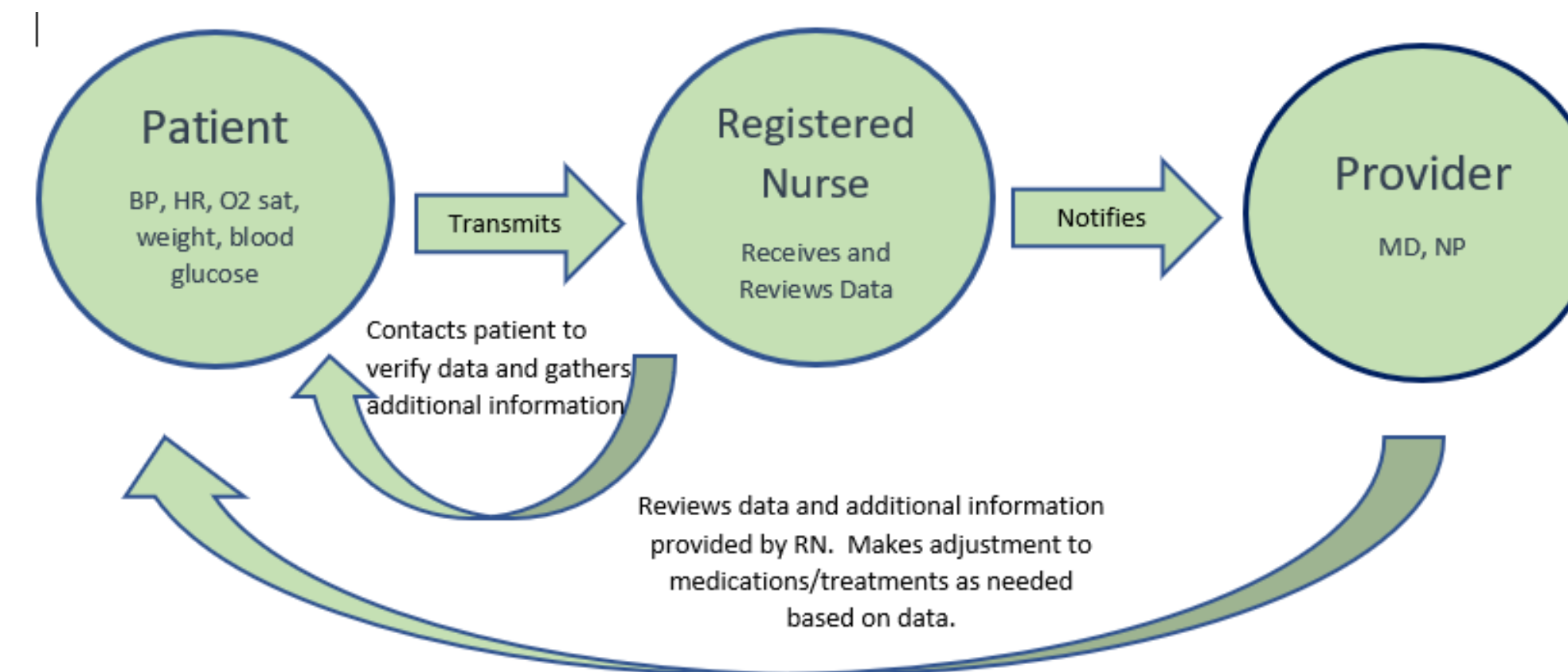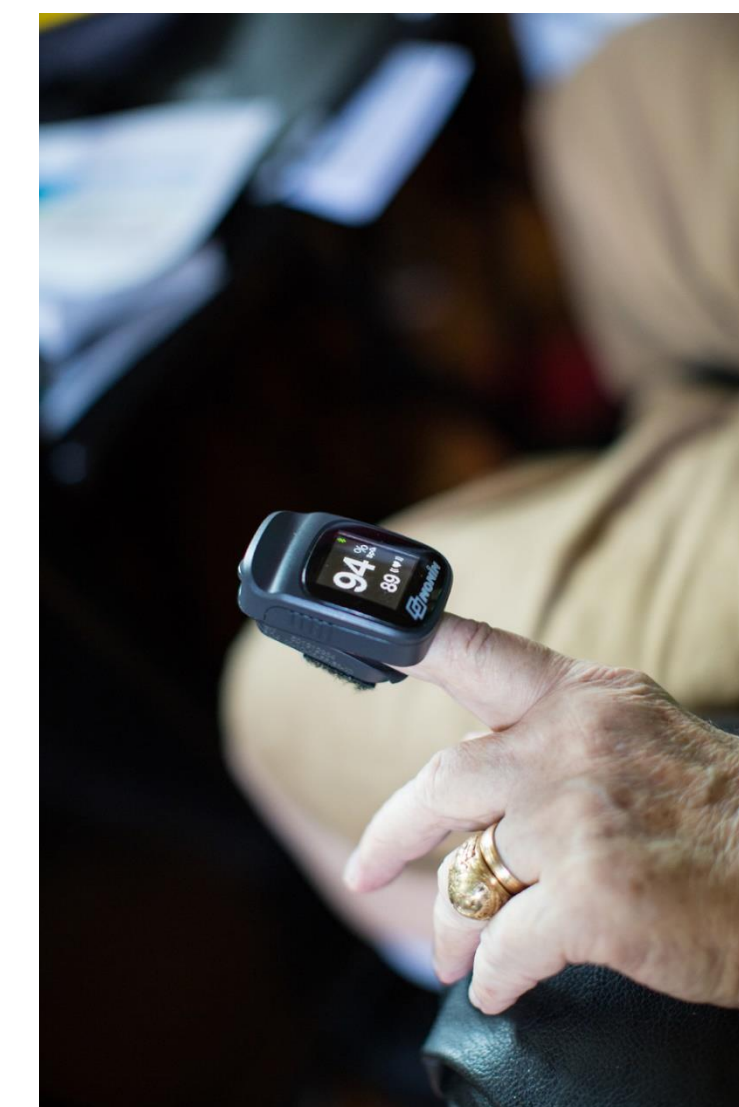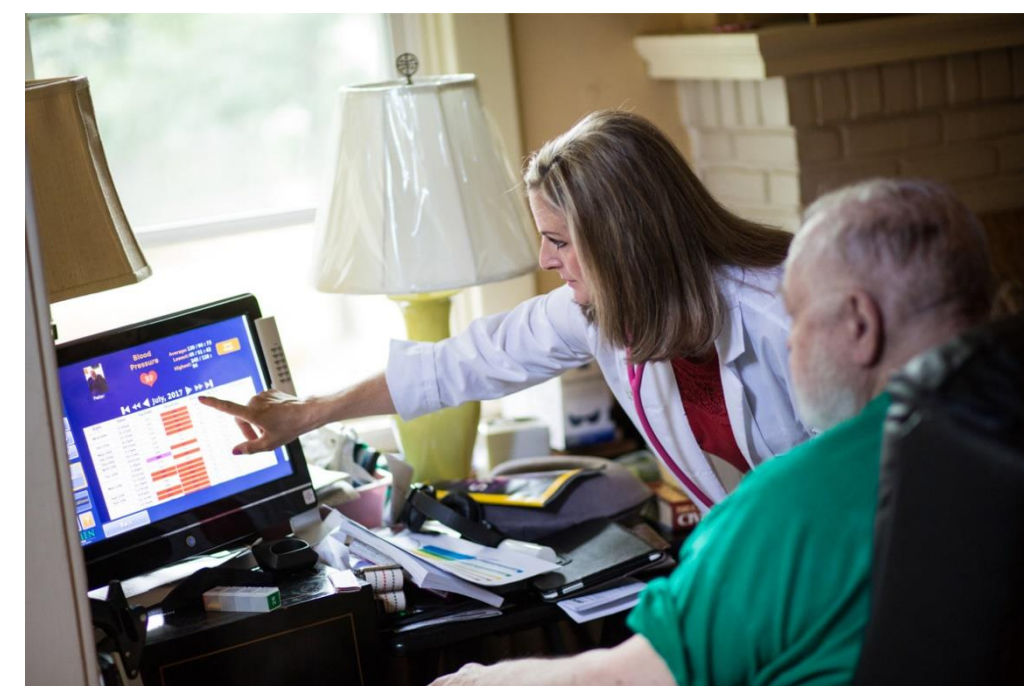
Case Discussion

Patient X: Female in her 70's with significant PMH of transverse myelitis with multiple sequelae, hypertension, edema, obesity

Placed on RPM after two hospitalizations within 1 month of each other for double pneumonia. Patient does daily monitoring of her blood pressure, heart rate and oxygen saturation.

Consistent monitoring data reveals systolic blood pressure high 90's to low 100's,heart rate in the 60-70s and oxygen saturations above 93%.

Patient had episode of elevated blood pressure (170/90's) consistently for two days. Registered nurse contacted patient both days and noted that the patient had changed her diet and had increased sodium intake. Patient also had increased generalized swelling, but otherwise was feeling at baseline. Provider was notified and contacted patient. Patient placed on three days of furosemide. Follow-up with provider after the three days of furosemide showed lower blood pressure and decreased swelling. Within a week, patient's blood pressure and edema back to baseline.

Combination of RPM, early contact by registered nurse with assessment of patient's condition along with treatment and follow-up with provider decreased the risk of hospitalization and allowed the ability to treat and maintain the patient in the community setting safely.

Future RPM Opportunities

Recent COVID pandemic has increased the use of all forms of telemedicine to include RPM

Additional research on the use of RPM to decrease hospitalizations

Research on the acceptance and use of technology among provider and patients

Integration of RPM data into electronic medical records

Billing for provider and the use of equipment (99453, 99454, 99457)

References

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Patient
BP, HR, O2 sat, weight, blood glucose

Transmits

Registered Nurse
Receives and Reviews Data

Notifies

Provider
MD, NP

Contacts patient to verify data and gathers additional information

Reviews data and additional information provided by RN. Makes adjustment to medications/treatments as needed based on data.