Advantages Practices Experience Using Remote Monitoring;

A PRACTICE VALUE CASE STUDY

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ENHANCED CLINIC EFFICIENCIES ACHIEVED THROUGH IMPLEMENTATION OF REMOTE MONITORING OF PACEMAKERS

INTRODUCTION

Pacemakers are the most commonly implanted cardiac implantable electronic devices (CIED) and as such a preponderance of device clinic resources are devoted to pacemaker follow-up. Traditionally, pacemaker follow-up has entailed burdensome calendar-based in-office visits. Wireless remote monitoring enables the replacement of most calendar-based office visits with alert-driven follow-up to assess and manage specific issues.

Based on the extensive data supporting the use of remote monitoring, the Heart Rhythm Society (HRS) published a Consensus Statement in 2015 that makes remote monitoring a Class 1A recommendation.[1]

Despite the proven benefits of remote monitoring, adoption of remote monitoring has been slow. Only 29% of pacemaker patients use remote monitoring according to a recent large-scale nationwide assessment.[2] This paper will focus on systems and techniques used in our respective practices to successfully implement wireless remote monitoring of pacemakers and the resultant efficiencies in clinical operations.

TABLE 1. HRS CLASS 1A RECOMMENDATIONS

HRS CLASS 1A RECOMMENDATIONS	
DEVICE FOLLOW-UP PARADIGM	**DEVICE AND DISEASE MANAGEMENT**
A strategy for remotely monitoring CIEDs, combined with at least an annual in-person evaluation, is recommended over a calendar-based schedule of in-person CIED evaluations alone (when technically feasible).	Remotely monitor device for surveillance of lead function and battery conservation.
All patients with CIEDs should be offered some type of remote monitoring as part of the standard follow-up management strategy.	Remotely monitoring for early detection and quantification of atrial fibrillation (AF) is useful.

WHAT IS THE PRACTICE VALUE OF REMOTE MONITORING OF PACEMAKERS?

Aside from the established clinical benefits, there have been benefits to our practices from implementation of remote monitoring.

- **DELIVERING THE HIGHEST STANDARD OF CARE**
  Remote monitoring provides early access to clinically valuable information and is now the standard of care.

- **MORE EFFICIENT OPERATION**
  Remote monitoring can significantly reduce the need for in-person office visits while not compromising patient care.[3] This allocation of clinic work demands can free up time for providers to address more acute and consultative needs. By aligning health care providers by consultative care and acute care, it can enhance revenue generation and time efficiency.

- **PATIENT SATISFACTION AND CONVENIENCE**
  The most common complaints reported by patients about their experience with a physician do not involve physician knowledge or care. The majority of complaints involved customer service.[4] Poor customer service included poor communication (53%), long wait time (35%), practice staff (12%), and billing (2%).[4] Remote monitoring can minimize many of the practice patterns that drive patient dissatisfaction.

- **REIMBURSEMENT**
  Remote monitoring can be financially viable. In recognition of its value, the Centers for Medicare and Medicaid Services provide quarterly reimbursement for remote monitoring of pacemakers. Reimbursement requires documentation in the medical record of a full remote interrogation every 91 days. Wireless remote monitoring helps ensure that this requirement is met.

- **COMPLIANCE**
  Remote monitoring improves patient follow-up compliance through automation and alerts to the practice when a patient's device has not been online for a programmed period of time. This allows the practice to contact the patient and ensure that the patient is not lost to follow-up.

- **POTENTIAL RISK**
  If a pacemaker does not have remote monitoring capabilities, it does not meet the Class 1A guidelines for implantation.

  Practices may be exposed to risk if remote monitoring is not provided to patients with recalled leads or devices or patients who could potentially have early detection of early fibrillation, which could result in a stroke.

  A critical aspect in successful remote monitoring and minimizing risk is to engage the patient in a shared decision making process. Some practices use a document to outline the patient and clinic responsibilities. This process includes the patient expectations regarding connectivity of the remote monitor, rapid response to clinic calls and timely reporting of cardiovascular symptoms. In turn, a clinic's expectation is to rapidly review all high-level alerts, communicate with the patient, assure that remote monitoring is regularly scheduled, and help troubleshoot potential problems when scheduled remote monitoring data are not received.

  Practices that consider enrolling patients in remote monitoring should have trained professionals with protocols to act quickly, communicate effectively with patients and activate an appropriate plan of care.

TABLE 2. REIMBURSEMENT RATES FOR REMOTELY MONITORING PACEMAKER PATIENTS

CPT[‡]CODE DESCRIPTION	FREQUENCY OF REMOTE CHECKS	REMOTE 2017 MEDICARE RATES (NO SERVICE PROVIDER)	IN-PERSON 2017 MEDICARE RATES+
Remote Monitoring of a Pacemaker/CRT-P Professional: 93294 Technical: 93296	91 days	**$61.01** Professional: $34.35 Technical: $26.56 Work RVU: 0.65	**$38.04** Professional: $21.89 Technical: $16.15 Work RVU: 0.43

Physician work RVU: Accounts for the time, technical skill and effort, mental effort and judgment, and stress to provide a service. Source: CY 2016 Physician Fee Schedule final rule.

Assumption: Remote monitoring of pacemakers includes the evaluation of the battery, lead(s), capture and sensing function, heart rhythm, and programmed parameters that may be billed every 91 days. Remote monitoring of other recorded physiologic data are not included and can be reported separately every 31 days when coding criteria is met.

+Rates provided are global rates (professional and technical) for in-person interrogation device evaluation.

OVERCOMING BARRIERS

Given that remote monitoring has been demonstrated to be of value, it is fair to ask why studies have found that significant numbers of patients who receive devices with remote monitoring capabilities are not actually enrolled in remote monitoring. There are a lot of good reasons. From our experience, it is clear that implementation of remote monitoring involves more than implanting a device with remote monitoring capabilities and simply assigning a nurse practitioner the duty of reviewing patient reports on the web portal in his or her spare time. Successful implementation involves a rethinking of how services are delivered in the practice and that can be a challenging process. An in-depth discussion is beyond the scope of this paper, but we briefly discuss some of the barriers we have encountered.
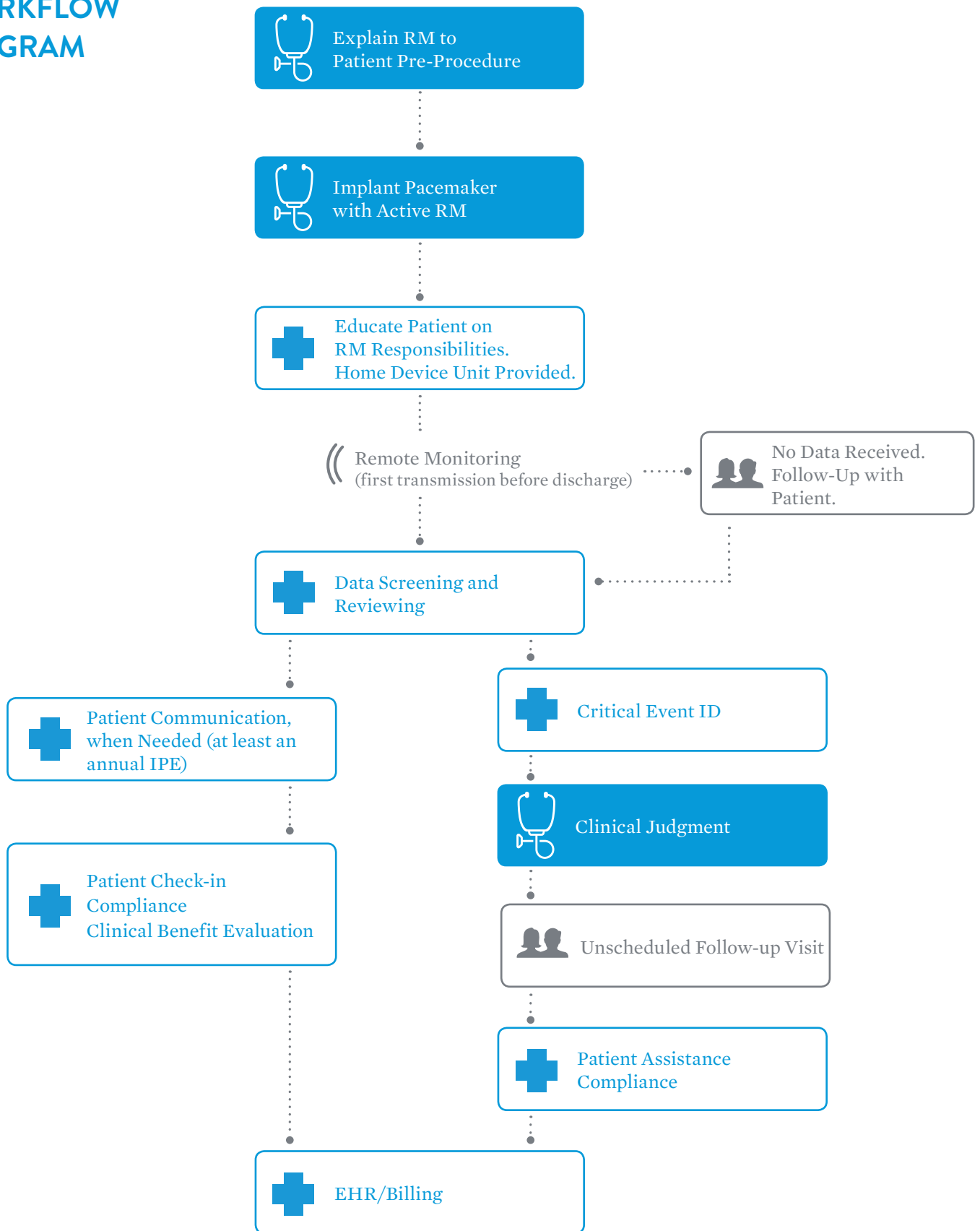
PATIENT-RELATED

TOPIC	HOW TO ADDRESS/IMPLEMENT
EDUCATION	Explain remote monitoring to patients in detail as it is unknown to patients and they may have concerns or confusion as to their role/responsibilities and how it works: • How patient confidentiality is maintained with remote monitoring • Why remote monitoring is beneficial to them • How it only monitors and parameters cannot be changed remotely • How they will be contacted in the event of an alert finding • Why visits are still important and needed for device programming; annual visits are still recommended

PRACTICE-RELATED

TOPIC	HOW TO ADDRESS/IMPLEMENT
ORGANIZATION	• Analyze patient flow from device referral, device transmissions, patient follow up, uploading to EHR and billing; wireless remote monitoring creates a long-term near daily link with patients so the system needs to be able to accommodate this scenario • Daily assessments of alerts with trained personnel of how to respond to various alerts • Administrative staff to communicate with patients, EHR and billing coordination • Invest upfront in staff with the plan of long-term dividends in more comprehensive patient management, steady long-term revenue and CIED center of excellence
WORKFLOW	• Develop protocols for rapid and appropriate handling of all degrees of alerts and missing transmissions (alerts range from low-level to high-level; staff should be trained to triage by alert priority and patient situation/history) • Program devices specifically to each patient so alerts are relevant (proper programming leads to significantly fewer low-priority alerts for staff to manage)
STAFF TRAINING	• Train remote monitoring staff on each manufacturer's system. This can parallel in-person device interrogations as same concepts apply • Require strong telephone-based communication skills including consistent follow-up to reach patients and troubleshooting conflicting findings over the phone • Retain remote monitoring trained staff as these skills are in high demand and staff retention can be difficult

WORKFLOW DIAGRAM

Explain RM to Patient Pre-Procedure

Implant Pacemaker with Active RM

Educate Patient on RM Responsibilities. Home Device Unit Provided.

Remote Monitoring (first transmission before discharge)

No Data Received. Follow-Up with Patient.

Data Screening and Reviewing

Patient Communication, when Needed (at least an annual IPE)

Critical Event ID

Clinical Judgment

Patient Check-in Compliance Clinical Benefit Evaluation

Unscheduled Follow-up Visit

Patient Assistance Compliance

EHR/Billing

KEY:
Physician
Health care professional
Administrative staff

KEYS TO SUCCESSFUL IMPLEMENTATION

CASE STUDY 1:
FROM SCHEDULED ROUTINE OFFICE VISITS TO ALERT-DRIVEN VISITS MANAGING THE VIRTUAL PATIENT IN A LARGE PRIVATE PRACTICE

SETTING

Cardiology Consultants of Philadelphia (CCP) is the largest independent cardiac practice in the U.S. with 91 cardiologists and 32 offices located in southeastern Pennsylvania.

BACKGROUND

CCP started using remote interrogation in 2003 when inductive technology first became available for patients with implantable cardioverter defibrillators. Today, remote monitoring is used almost exclusively in patients with all major types of CIEDS, including those with pacemakers.

Implementing remote monitoring at CCP involved a complete paradigm shift in the delivery of services to patients. We have markedly reduced regularly scheduled office visits which can be thought of as "well baby visits" and prioritized alert-driven "sick" visits. Most patients only have to come to the clinic for their annual in-person evaluation with the nurse practitioner.

Accomplishing this change involved designing a workflow to manage the "virtual patient", a patient who is streaming data but not being seen in the office. A related goal was to eliminate a separate device chart and to consolidate all of the patient's health information in the patient's individual electronic health record (EHR).

IMPLEMENTATION

We have a large practice. Originally, we tried to manage remote monitoring internally by hiring our own staff. We hired and trained technicians to do all of the steps involved in remote monitoring from enrolling patients, to calling people who missed transmission, to managing alerts, funneling the information into the EHR and then doing the billing. Initially, we also thought that we needed 24-hour coverage.

LESSONS

We quickly came to realize that we needed to breakdown every step of the workflow and assign responsibilities to the appropriate staff, including the device representatives. In-person patient education in the office at the initial consultation, at the bedside before implant, after implant, the day after surgery and pairing the device with a transmitter prior to discharge from hospital was key to patient compliance.

We learned that the data management was beyond what we expected. We had a lot of staff turnover and had to make provisions for employee time off. We found that the vast majority of alerts do not require an office visit and that around the clock coverage is not needed. We had to educate the staff on triage for remote monitoring and on what you want to know and when. In most cases, acting on the information immediately is not needed. However, we found that alert-driven visits almost always result in a clinical intervention as was demonstrated in the COMPAS trial.[3]

The lack of interoperability between manufacturer internet portals and programmers with our EHR has continued to be a barrier to seamless data management, as our practice prefers all patient data within our EHR system.

To reduce administrative management for remote monitoring staffing, we found it more effective to outsource specific clerical remote monitoring tasks to a third-party service. However, we are currently investigating bringing the entire workflow back in-house. This reversal in our plan has been spurred by the desire to avoid exposing patient data to a third party, improvements in the remote monitoring software that allows us to better understand patient compliance and the thought that with our accumulated knowledge that we could improve on the financial return of this service line were we to have total in-house control.

Remote monitoring provides early access to clinically valuable information and has enabled us to improve patient management in a financially viable way. Successful implementation of this service line involves creating the appropriate infrastructure to manage the "virtual patient".

CASE STUDY 2:

MANAGING THE VIRTUAL PATIENT WITHIN A LARGE HEALTHCARE SYSTEM AND MULTIDISCIPLINARY PRACTICE

SETTING

Intermountain Healthcare is a large non-profit healthcare system headquartered in Salt Lake City, Utah with 22 hospitals and more than 185 clinics. A total of 49 cardiologists across a full range of specialties provide services at the flagship hospital, Intermountain Medical Center. The hospital averages 25,000 in-patient admissions per year and performs 8,309 in-patient and 13,979 out-patient surgeries.

BACKGROUND

Intermountain Medical Center, as well as Intermountain Healthcare network, were early adopters of remote follow-up, starting 12 years ago with remote interrogation of ICDs. Today, at Intermountain Medical Center, the practice encompasses almost 10,000 patients with many types of CIED — approximately two-thirds of whom are followed with remote monitoring.

IMPLEMENTATION

The barriers to implementing remote follow-up have changed over time as physicians and patients have become more familiar with the technology and the technology has continued to advance. Many of the actions patients had to do are no longer issues, as the technology options have evolved.

Learning how to handle the massive amount of daily data was initially a challenge. All alerts and transmissions needed to be reviewed, appropriately analyzed by trained professionals, the correct action taken and then appropriate communication and follow-up with the patient performed.

Complicating these challenges were difficulties with appropriate billing and reimbursement for services. As the technology has been broadly adopted throughout much of the United States, refusal of payment for services has become rare when appropriate diagnoses and codes are entered.

LESSONS

We recognized that a higher level of medical knowledge was required to work efficiently in a high-volume remote monitoring clinic. We employed a team of nurses whose primary responsibility is remote monitoring and then trained them on all aspects of the process: scheduling, downloading and reviewing reports, forwarding alerts as appropriate, uploading data to the EHR and billing. There were some problems with integration into the EHR and it was a bit labor intensive to upload data into the patient's health record. We are in the process of adopting a middleware software system to automatically populate remote diagnostic fields into our electronic medical record to reduce the hand work involved in the data forms.

Our nurse device team is now trained and performs on a very high level with excellent consistency. Nurses review the transmissions and see to it that only significant events are sent urgently to the physician. Often, they can sort out things on their own. They are comfortable contacting patients and obtaining a history of symptoms that may have accompanied their alert event. We have bi-weekly conferences for continuous education of all device vendors and go over difficult tracings or alerts. We also earmarked funds for additional training.

We found that with our volume, a nurse will need to spend 3-4 hours a day on remote monitoring tasks and spend the rest of their time involved in clinical care primarily conducting in-patient CIED checks. The division of duties provides some variety to only handling remote monitoring responsibilities.

With 10,000 patients, we have learned how to set alert limits to minimize over transmissions and what types of alerts have to be acted on immediately. We have to remain patient-specific with device programming to enhance precision-based care.

We found that the strongest predictor of patient non-participation, other than phone issues, is failure to activate remote monitoring immediately after implant. The hospital setting after device implantation represents a unique opportunity to engage the patient. They are motivated because of the operation, a change in their health status and the introduction of an implanted electronic device. So for the past three years, almost all patients have their device paired before they leave the hospital. Patient acceptance of the technology is almost universal if we take time to appropriately educate the patient in the hospital and identify and remove any actual or perceived barriers. We also have found many patients are assured by the green light on the monitor sitting on their night stand, which represents their connection to us. Now, we have problems getting the patient to even come to the office at all. Remote monitoring is working.

CONCLUSIONS

Remote monitoring has been a lifeline to patients. Most of the time, arrhythmias are a marker of a worsening outcome. We can see patients early and start to impact mortality. At the same time, remote monitoring frees up our schedule to see more acute patients.

CLINICAL IMPLEMENTATION OF REMOTE MONITORING

- Providing access to remote monitoring to patients with pacemakers is a must. It is now a Class 1A standard of care.

- Successful implementation of remote monitoring does not require hiring a lot of new people or a lot of complexity. But, it requires rethinking the work flow in the practice. You need to look at every step along the way and make adjustments.

- Depending on the size of the clinic, a third party can provide support for many of the tasks involved in remote monitoring. However, someone in the clinic has to maintain strong oversight.

- Once you get the systems into place, remote monitoring becomes seamless and provides very valuable information. It is rewarding for the patient and for the practice.

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