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Moving Beyond the Device: Key Lessons in Creating a Positive Patient Experience for a Remote Foot Health Program

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Abstract

The burden of diabetic foot ulcers is largely underappreciated, even by the healthcare community. Living with advanced, complex chronic diseases can be challenging for the patient and often requires additional time and resource utilization by the provider. The use of novel technology within medicine should be focused on fostering excellent experiences, thereby promoting satisfaction and ultimately, quality care. Using a remote foot temperature monitoring program, we have learned that 3 strategies support positive experience including: design for ease of use, patient and provider support, and continuous process improvement. Further key points include: (1) foot ulcers and amputations are a significant source of morbidity, mortality, and decreased quality of life for people living with diabetes; (2) remote patient monitoring innovations in technology can help connect patients, healthcare providers, and data; (3) technology should serve as an extension of the patient–provider trust relationship and help improve systemic efficiency; and (4) future considerations for successful patient experiences must also address healthcare disparities and promote health equity.

Keywords

patient engagement, patient experience, patient feedback, patient satisfaction, diabetes, remote patient monitoring, remote temperature monitoring, diabetic foot ulcer

Introduction to the Issue

Diabetic foot ulcers (DFUs) affect 18.6 million people worldwide and 1.6 million in the United States annually, contributing significantly to morbidity, mortality, and healthcare costs. DFUs, as nonhealing wounds, precede 85% of amputations. The 5-year mortality rate for people with DFUs is 30%, rising to over 70% after amputations above the foot. Currently, the American Diabetes Association reports that a diabetes-related amputation occurs every 3.5 min in the United States. Those direct costs reach $9 to $13 billion annually.[1]

Prevention is crucial to reducing the burden of DFUs. Wound recurrence is a major challenge, with 42% of healed ulcers recurring within a year.[1] However, up to 75% of DFUs are preventable with strategies like patient education, therapeutic footwear, routine foot care, and daily at-home foot temperature monitoring.[2]

One historically rooted practice for DFU prevention is foot temperature monitoring. The use of thermometry in the diabetic foot first emerged in the 1970s and is now recommended as best clinical practices by several international organizations, including the International Working Group on the Diabetic Foot.[3] Three pivotal studies have examined the successful impact of identifying temperature asymmetry "hot spots" and recommending interventions for the prevention of recurrent DFU.[4] While the science behind the technology is proven extremely effective, the original form factor used was not patient-friendly and never gained significant adoption.

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Remote patient monitoring (RPM) programs have the promise of connecting patients, providers, and data toward better outcomes and cost-benefit. While our successful experience is with DFU prevention using an innovative remote temperature monitoring (RTM) mat, the lessons learned are potentially applicable to incorporation of technology within all fields of medicine, regardless of setting.

Key Factors for Consideration

There have been significant changes in healthcare delivery recently due to a variety of influences, including a global pandemic, a paucity of specialty healthcare providers, and an aging population with multiple comorbidities. RPM connects patients to providers outside the traditional care setting using digital devices such as blood glucose meters, weight scales, blood pressure monitors, and foot temperature monitoring tools.[5] When evaluating RPM interventions and success, both patient and provider experiences are vitally important considerations.[6]

A novel approach to RTM has been introduced in the past decade by Podimetrics (Somerville, MA) using the SmartMat™ Program. Patients enrolled in this RTM program step on a temperature-sensing mat that obtains a thermal scan of the feet in 20 seconds. Scans are monitored for temperature asymmetry, which could predict impending complications. The asymmetry "hot spot" serves as a prompt for clinical queries and intervention recommendations by nurses. Escalations with clinically relevant and actionable data are sent to providers when necessary. The successful patient experience associated with the RTM program appears related to 3 key strategies: design for ease of use, patient and provider support, and continuous process improvement.

Strategy 1: Design for Ease of Use

Ease of use can be defined as "the ability of a user to readily and successfully perform a task with a product without the need for an advanced explanation and/or the instruction manual."[7] The SmartMat Program is an innovative, easy-to-use form factor for RTM. Studies for ease of use, engagement, and adherence were conducted prior to pursuing the mat format over other potential options such as socks, insoles, and open platforms. The SmartMat requires a patient to briefly step on the device while the rest of the process is automated. The mats connect cellularly; no Wi-Fi, smartphone, or app is required within the continental United States. In a study on the SmartMat Program efficacy and feasibility, Frykberg and colleagues found that the system was extremely effective in detecting 97% of impending DFU at an average lead time of 35 days. The authors also noted that 88% of participants reported the SmartMat was "easy to use," and 86% of patients achieved the target adherence level.[8] Furthermore, in a survey with 1155 responses in the fall of 2023, SmartMat users rated the average "Ease of Use" at 4.5 of 5. Thus, both in a clinical trial setting and through real-world experience, the program is proven effective, easy to use, and people stick with it.

Strategy 2: Patient and Provider Support

Both patient and provider satisfaction are often a reflection of the support provided. Examples of patient support may include regular interactions and touchpoints for education, motivation, and feedback. Provider support may include simplification of workflow and using technology for more efficient clinic visits. RPM programs should add significant benefits without excessive time or resources burdened. Useful tools to assess satisfaction commonly include surveys but can also be measured by clinical outcomes, patient and provider retention, and engagement.[9]

The gold standard metric for customer experience programs is the Net Promoter Score (NPS). An NPS measures the loyalty of a product or service user by looking at the likelihood of recommendation or endorsement. An NPS is measured with a single-question survey and reported with a number ranging from −100 to +100.[9] According to Bain & Company, the creators of NPS, any positive number is good but greater than +20 is favorable.[10] Seeking NPS over 12 months between 2023 and 2024, Podimetrics surveyed and received responses to the question, "How likely are you to recommend using the SmartMat Program to a family member or friend with similar health issues?" Among several surveys, the NPS ranges were +43 to +50. The favorable scores were mainly attributed to the program's ease of use, its efficacy, and patient appreciation for the nursing staff's kindness.

Patient engagement encompasses the active involvement of patients in their healthcare journey, including shared decision making and self-management. With enhanced knowledge, engaged patients demonstrate greater adherence to treatment plans, improved quality of life, and contribute to reduced healthcare costs. As an example of our patient engagement support, we offer monthly educational webinars and report feedback in a newsletter format.

We have found that provider engagement is just as critical to success. To assess provider satisfaction from SmartMat Program prescribers, Podimetrics initiated a survey in 2023, yielding 132 responses. Overall provider satisfaction with the program was rated 9.4 of 10, while the program's quality received a 9.7 to 10 rating. Providers noted key benefits, including the added visibility between patient visits, assistance with triage to prioritize the most urgent patients, and the program's role as a motivator for both patients and providers to focus on preventive measures to avoid diabetes-related foot complications.

Strategy 3: Continuous Process Improvement

For an RPM program to be successful, continuous process improvement is required. The goal of process improvement

is to facilitate better quality of care and outcomes for patients. An environment and culture of continuous improvement is critical, as improving RPM programs is a persistent journey requiring iterations as the patient and provider needs evolve. The concepts of precision medicine and care personalization play important roles as well.[11] For example, Podimetrics collects ongoing, live patient feedback during outreaches from our patient-facing team members. A common, unprompted request from patients is the desire to view their scan feedback. To better understand the scope and prevalence of this need, we conducted further investigation. In May and June of 2024, a survey about the use of technology was sent to SmartMat users, yielding 3102 responses. An overwhelming number of respondents (94%) desire to view their scan data with regularity. Our teams are now dedicated to enhancing patient-centric feedback using technology and reporting.

In seeking feedback from a variety of vantage points at regular cadences, Podimetrics has gained valuable insight to help drive business decisions forward. We use industry-standard best practices for patient satisfaction, including consistent surveys, closing the loop within 48 hours, and acting upon feedback received.

Recommendations

Prevention of complications associated with complex, chronic diseases should include early adoption of innovative solutions. In the DFU prevention space, RTM is an effective tool. Specific recommendations to enhance the patient and provider experience include the development of a dedicated patient experience department and investing in those employees. Our Patient Experience Department has been critical for success. Focusing on expanding survey efforts, closing the loop throughout the patient and provider journeys, creating personalized messaging, and addressing potential barriers to adoption, satisfaction, and engagement with healthcare recommendations has proven effective with our solution. Unique initiatives we have designed include Patient Insight Panels and Employee Advisory Boards. It is important to hear not only from the users themselves but also from those within the organization closest to the user.

Conclusions

The goal of all RPM programs is to allow simple and seamless extension of healthcare directly into the patient's daily life. Patient and provider experience, especially as related to the incorporation of novel technologies, stands as cornerstones for the successful delivery of quality healthcare.[12]

In our experience with RTM for DFU prevention, ease of use, patient and provider support, and continuous process improvement are key benchmarks for success. By prioritizing these elements, positive experiences are fostered. Looking ahead, advancing technology and evolving patient expectations will redefine healthcare experiences. Embracing innovations present unique opportunities to optimize patient satisfaction and promote wellbeing.

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