

New Prescription for Improved Patient Outcomes: Chronic Disease Management with Automated Telephone Monitoring

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Chronic diseases are among the most prevalent and costly of all health problems in the United States¹. The pervasiveness of chronic disease accounts for three quarters of total national healthcare expenditures². Over 90 million Americans suffer from one or more chronic diseases, and they account for 7 of every 10 deaths.³

Chronic disease is recognized as a prolonged condition(s) that often does not improve and is rarely cured completely. Thrombosis, congestive heart failure, diabetes, depression and asthma, are just a few examples. If the monitoring for patients suffering from chronic disease is less than optimal, the repercussions can be extensive, ranging from adverse medical events or hospital readmission to, in some cases, death. Poor patient monitoring is frustrating, causes additional work and unnecessary stress for medical staff.

Medical health professionals know quality clinical information – which often involves continuous monitoring and treatment adjustment – is key to chronic disease management. For example, in the case of thrombosis, a chronic disease characterized by the development of clots in blood vessels, patients must maintain an optimal level of a blood-thinning agent in their bodies. Regular blood testing is required to assess the need for possible, and sometimes frequent, adjustments to their dosage of blood thinner. The high level of human interaction required for patient test scheduling, rescheduling test if patients fail to show up, communicating test results and dosage changes has led to optimal disease management that is often beyond what healthcare systems can afford.

Automated calling for effective disease management

As healthcare institutions endeavor to improve chronic disease management programs, more and more are shifting their focus to Interactive Voice Response Systems (IVRS) to assist with patient monitoring. IVRS are automated calling systems that deliver two-way, phone-based monitoring or education. They capture and store information that care professionals can analyze. Alerts can be provided when intervention is required. Implementations involving screening for disease symptoms and communicating changes to prescription dosages have also been performed successfully. Results show IVRS are making a significant impact on the overall improvement of chronic disease management.

These interventions are compelling because:

They streamline operations with no additional burden to resources: Traditional disease management, appointment reminder, and administrative phone calls require the time and effort of a nurse, administrator, or other staff at a high cost. The nature of call-back monitoring programs can cause workload to bottleneck for several reasons: (1) it may take several tries before patient contact is established, (2) patient follow ups and symptoms are not always collected in a standard, thorough manner, and (3) the nature of shift work and multiple attempts to establish patient contact can lead to incomplete profiles. These elements, along with the national shortage of healthcare staff, can cause the nurse call-back process to become convoluted and costly.

Healthcare institutions have used IVRS to make the initial call to assess a chronically ill's health status or notify patients of changes to their dosing. They can be programmed to retry patients until the call is answered by the patient. Once patient data is collected, it is consolidated and tracked, issues are flagged immediately. In a recently published study at the Ottawa Hospital Thrombosis Unit, in Ottawa, Ontario, the clinic looked at the effect of an IVRS on oral anticoagulant management. The clinic experienced an impressive 33% reduction in work load. Additionally, the independent study found the engagement

encouraged patient compliance. A 25% increase in appointment attendance was achieved when automated reminder scripts were incorporated.

Phone calls offer ubiquity and immediacy that complements the Web. While the Internet has made great strides in reaching a high percentage of the population, it is still not as ubiquitous as the telephone.⁴ The phone is a critical channel for reaching the growing senior population, of which only 52% of whom go online at least monthly.⁵ In addition to the phone's advantage in terms of adoption rates, outbound calling provides a degree of immediacy.

IVRS use highly advanced programs that recognize non-standard but otherwise correct responses. CallAssure™, by Vocantas Healthcare Solutions for example, has been chosen for use in a number of independent clinical studies because it uses high quality speech recognition software. Studies show computers are better than humans at storing and retrieving numerous items, making their accounts more accurate than a human's. Interactions with IVRS offer a higher rate of success because humans tend to lose track when sentence comprehension requires the storage of more than seven words. Healthcare professionals see that phone monitoring interventions are easily adopted by patients. They are free of devices and patients simply follow or respond to the prompts encouraged by the monitoring script. The healthcare industry can confidently adopt the telephone solution and become more innovative while increasing their reach in patient monitoring.

Patients prefer phone outreach. A study of automated patient assessments after outpatient surgery showed a high patient acceptance rate, where two-thirds of the patients expressed a preference for the automated system over a personal follow-up call. Patients remembering the automated call also reported the system easy to use (82%) and comprehensive (86%).⁶ Interestingly, patients felt that they could be more honest with the automated system, as there was no immediate judgment or bias associated to their responses.

Automated calls deliver high value and positive outcomes. Another independent study found that an automated system is just as effective as a human in communicating with thrombosis patients about frequent dosing adjustments required to prevent blood clots. CallAssure, the solution used in the independent study, kept thrombosis patients in the proper dosing range an impressive 80% of the time, up from the 56% more typically seen in the region.⁷ These results demonstrate simply dialoguing with the patient an overall patient compliance is encouraged. This will be displayed by continuing to their medication and remaining involved in their care plan. "Automated telephone systems have become fairly common in healthcare and other fields, but this is the first study to look at providing therapy instructions without human intervention," said the study's senior author Dr. Alan Forster. "We are very encouraged by these results and pleased that all our patients will now have an opportunity to benefit from this system."

The real victory in this study is the information gathered by the system showed healthcare professionals many of their patients in the monitoring program were in good condition. With calling and scheduling tasks addressed, healthcare professional could focus on the patients in need of hands-on care and expertise the most.

Healthcare professionals understand chronic illness can have a profound effect on a patient's physical, emotional and mental well-being. However, in many cases, deterioration in health can be minimized by effective monitoring. Patient outreach has proven to be the most effective method of patient monitoring. There is no better way to do that effectively than to use these intervention systems. Medical institutions should investigate incorporating IVRS into their monitoring and tracking operations. With more resources freed to focus on chronic disease management, skilled clinical resources can be put to better use with patient care rather than spending unproductive time trying to reach patients.

¹ CDC. Indicators For Chronic Disease Surveillance. MMWR Recommendations and Reports. 2004 September 10, 2004:1-6.

² Bodenheimer T, Wagner EH, Grumbach K. Improving Primary Care For Patients With Chronic Illness. JAMA 2002 Oct 9;288(14):1775-9.

³ CDC. Chronic disease prevention. Atlanta, GA: U.S. Department of Health and Human Services, CDC, National Center for Chronic Disease Prevention and Health Promotion; 2006 [updated 2006; cited 2006 December 13]; Available from: <http://www.cdc.gov/nccdp/hp/>.

⁴ According to the North American Technographics® Benchmark Survey, 2008, 86% of US households have a landline, and 81% have at least one mobile phone, while only 73% are online at least monthly. Penetration of the Internet in US homes is slightly lower, at 71%.

⁵ According to the North American Technographics Benchmark Survey, 2008, 52% of seniors (defined as those 64 and older) go online at least monthly.

⁶ Alan J. Forster et al. Automated Patient Assessments After Outpatient Surgery Using an Interactive Voice Response System. *American Journal of Managed Care* 2009 July; 14:429-436.

⁷ Natalie Oake MSc, Carl van Walraven MD MSc, Marc A. Rodger MD MSc, Alan J. Forster MD MSc. Effect of an Interactive Voice Response System on Oral Anticoagulant Management. *Canadian Medical Association Journal* 2009 180(9):927-33.