

# Nursing informatics

[Health & Medicine](#), [Nursing](#)



The concept of the call bell dates back to Florence Nightingale when she took the concept of the servant's bell and applied it to nursing. She provided the soldiers with bells to rings if they needed her, thus the nurse call bell was born (Stokowski, 2008). Over the years, the nurse call bell transitioned to a call light. Visual aids in the form of lights, some blinking, were added to the bell tone to assist in identifying patients in need. Today, with the technological advancements, the call bell has transformed into a patient call system with wireless device integration.

Many companies are in the market to put their patient call system with wireless device integration into large hospitals. Their sales pitch targets patient safety and patient satisfaction scores as key selling points. Rauland stresses how their Responder System improves Hospital Consumer Assessment of Healthcare and Provider System (HCAHPS) scores and has conducted research at a Columbus Regional Hospital that demonstrated this (Lanert, n. d. ). Advanced systems can include wireless alarm notification.

This technology is capable of sending notification of activated patient alarms directly to the wireless phones of assigned caregivers. The feature of wireless alarm notification, such as a bed alarms can initiate an earlier response and improve patient safety related to falls. Patient nurse call systems with wireless device integration are IP based systems with that integrate session initiation protocol (SIP) and voice over intranet protocol (VoIP) with wireless devices such as smart phones. This feature provides instant access to communication with patients, coworkers or other members of the health team.

These systems promise to streamline the response to patient calls, alarms, and emergency situations. Additional features of these systems include real-time location systems (RTLS) for locating staff, bed status notification, and nurse call system tracking that provides data on response times. A key feature of nurse call systems with wireless device integration is patient call routing. Patient call routing technology provides the caregiver with advance notification of the patient need and promotes an effective response. Patient calls are routed based on need and

sent directly to the appropriate assigned caregiver's wireless phone. For example, if the patient presses the button indicating the need for pain medicine; this call would be directed to the wireless phone of the nurse assigned to that patient. The nurse can answer the call and immediately address their need for pain medication. If the assigned nurse was unable to administer pain medication, a simple text to the phone of another nurse can be sent asking for assistance. This also can apply to requests for water or need to use the bathroom.

These requests would be routed to the technician or secretary phone. If a technician is in need of assistance for transfer, a simple text to a coworker requesting assistance can be made. Keeping the technician at the bedside prevents the patient from attempting to ambulate to the bathroom alone and risk injury. This feature improves efficiency and effectiveness of staff by utilizing the appropriate caregivers who can best respond to a specific need of a patient. Calls that are not answered by the initial recipient are automatically forwarded to the next assigned caregiver.

The nurse call system we currently have uses the tone and dome light to notify staff that a patient is in need. The room number is sent to the central console and chimes until it is cancelled either at the console or in the patient room. There is a phone at the console to speak to the patient to inquire about their need. The barrier to this feature is that you have to be near the console to see who is calling for the nurse, and to use the phone to answer the call. Another challenge with our current system is, not knowing what the patient needs until you have entered the room.

If a patient calls for pain medicine, nurses will typically enter the room to answer the call light and then turn around and leave to obtain the pain medicine. This situation is similar if a patient requests to use the bathroom. If a technician answers the call light and the patient needs help to the bathroom, they have to exit the room and find help if they require assistance. This work flow chart demonstrates our current process for responding to a call light for a request for assistance going to the bathroom. Locating the nurse or a staff member to assist in transfer can take a great deal of time, especially on larger units.

Also important to note is that during that time the patient may not want to wait and attempt going to the bathroom without help and be at risk for falling. In comparison the work flow for the same request from a patient is streamlined with the nurse call system with wireless device integration. The patient presses the button that is indicated for bathroom assistance. The call is sent directly to the phone of the assigned technician for that patient. The phone reads the patient's name, room number and the need of bathroom assistance.

The technician can answer the call via the wireless phone and notify the patient that help is on the way. At this point the technician could also remind the patient not to get up on their own, if they know the patient is at risk for falls. The technician enters the room to help the patient. If the technician determines that assistance is needed, a call or text page to an available staff member can be made right from the patient's room. The technician can then remain with the patient until assistance arrives, ensuring patient safety. When another staff member arrives, the patient is safely assisted to the bathroom.

There are many advantages of nurse call systems with wireless device integration. Improved communication among health team members, improved response time to patient needs, increased efficiency, and increased patient safety are a few advantages. It is important to also examine the cons of nurse call systems with wireless device integration. Cost is a big factor to consider. In addition to the nurse call system, mobile phones and integration systems would need to be purchased adding to the cost. The replacement cost of mobile devices due to loss or theft, may also be a negative factor.

Another challenge with the wireless device integration is being interrupted while provided patient care. Patients may not perceive this as a positive experience. In the presence of wireless alarm notification, alarm fatigue could be a disadvantage and should be reviewed and discussed prior to implementation. The planning process for selecting a nurse call system with wireless device integration is a complex process. Multiple systems have to

be considered simultaneously. Key stakeholders need to complete a thorough needs assessment and participate in the selection process.

Final vendor selection should include, visiting hospitals currently using these systems and providing open vendor presentations for health team members to provide input. It will be also important to identify any factors that could lead to work-arounds. Forecasting work-arounds would depend on the nurse call system with wireless device integration used and the functionality. One potential work-around would be if a staff member deliberately ignored a call sent to their phone knowing that it will be forwarded to the next assigned staff member.

The adoption of a nurse call system with wireless device integration can be challenging without an understanding of how people adopt innovation. Applying Rogers' Diffusion of Innovation Theory can help understand the process of how adoption of innovative technology is achieved through diffusion. Diffusion according to Rogers' theory is the process of how innovation is spread through channels of communication, over time, among a certain population (Rogers, 1983). Rogers identifies that individuals follow a five step process in making a decision to accept or reject an innovation.

According to Rogers " the innovation-decision process is the process through which an individual (or other decision-making unit) passes from first knowledge of an innovation to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision (Rogers, 1983, p. 20). Understanding the concepts and questions to address for each stage of the innovation-decision process can assist in steps to support strategies for implementation.

The first step is the knowledge stage where individuals obtain information about the innovation to develop an understanding of how it functions. Building a strong foundation of knowledge is important to support a favorable innovation-decision. Implementation should begin with easily accessible, hands on learning sessions regarding the patient call system with wireless device integration. This would be critical to ensure all staff gain the knowledge needed to understand the system and the benefits. The second stage according to Rogers' theory is the persuasion stage.

During this stage individuals form a positive or negative opinion about the innovation. Uncertainty that occurs during this stage may lead to an unfavorable attitude towards the new system. Identifying and training super users are a necessity for implementation. Incorporating super users during this stage could assist in persuading a favorable opinion by highlighting the advantages of the nurse call system and addressing uncertainties as they arise. The decision stage is the third stage in Rogers' theory. This is the stage in which individual decides whether to adopt or reject the innovation (Rogers, 1983).

This would be an opportune time for super users to reinforce the benefits of the patient call system stressing improved patient safety, patient satisfaction and communication. The fourth stage is the implementation stage when the innovation is actually used. During this stage it would be imperative to provide ongoing support to all staff. Nurse educators, super users and informatics technologists should be utilized as resources during the entire implementation and should be scheduled to include all shifts and weekend

coverage. Early successes of implementation should be highlighted during this time to promote positive thinking.

The final stage of Rogers' theory is the confirmation stage. The individual seeks to confirm the innovation-decision they previously made (Rogers, 1983). Support and feedback regarding the new nurse call system with wireless device integration should continue well after implementation to promote confirmation of adoption of the system. Rogers' theory also categorizes individuals based on their innovativeness. Rogers defines this as "the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than the other members of a system" (Rogers, 1983, p.

22). Rogers identifies five categories based upon rate of adoption of innovation: innovators, early adopters, early majority, late majority and laggards (Rogers, 1983). Innovators are those that quickly acknowledge new technology and adopt it readily. Early adopters are considered to be respected leaders with valuable opinions. According to Rogers, "This adopter category, more than any other, has the greatest degree of opinion leadership in most social systems. Potential adopters look to early adopters for advice and information about the innovation" (Rogers, 1983, p.

249). It would be important to identify these individuals and utilize them as super users to influence staff. The early and late majority identify the next two categories of adopters and according to Roger's theory account for 68 percent of the population. Both groups are conservative with risk taking. The early majority demonstrate willingness to follow and adopt innovation while



the late majority is more skeptical and less willing. Despite skepticism, the late majority can be impacted by peer pressure.

The role that the super user (early adopters) plays for both these categories is crucial. They can influence and lead the early majority and persuade the late adopters. The last of those to adopt according to Rogers are termed the laggards (Rogers, 1983). This group is opposed to change and resistance is evident. Their traditional values focused on the past. It is important to engage this group and provide opportunities to have their concerns heard. Allowing them to voice their concerns regarding the new nurse call system is important.

Rogers also identifies another variable in the rate of adoption, “ the characteristics of innovations, as perceived by individuals, help to explain their different rate of adoption” (Rogers, 1983, p. 15). The five characteristics of innovations are relative advantage, compatibility, complexity, trialability, and observability (Rogers, 1983). It is important to keep these factors in mind when planning education sessions for the nurse call system with wireless device integration. Advantages and compatibility of the nurse call system should be highlighted, while keeping the complexity minimized.

It will also be important to provide hands on learning experiences to promote trial and observation. Improving patient safety and patient satisfaction are at the forefront of hospital administrator’s minds to assure pay for performance reimbursement. Nurse call systems with wireless device integration provide the technology to respond to patient needs quickly and most efficiently and alert us to situations where patient’s safety is at risk. Innovation will continue

to advance all aspects of healthcare and drive quality and safety. Embracing innovative technology is a necessity for achieving success.