




Vocera Communications:
Vocera Benefits Study at Belfast Health and
Social Care Trust Emergency Department





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Executive Summary

In an effort to improve patient flow and internal communications, Belfast Health and Social Care Trust (BHSC), in Belfast, Northern Ireland, deployed the Vocera Communications System in its emergency department in December 2007. The Vocera Communications System is an innovative wireless platform that enables instant voice communications among mobile hospital workers. To evaluate the benefits of the System at BHSC, Vocera Communications commissioned an independent consulting firm to conduct pre- and post-implementation studies.

Data was collected before and after implementation through a combination of interviews with hospital staff members, observational research, questionnaires, activity data, and anecdotal evidence. Key determinants of System benefits included: improvements in patient care and safety; savings in clinical time; process efficiency improvements; reduction in delays; and clinician satisfaction.

An examination of study data revealed significant findings resulting from Vocera's integration:

- **Nurses contended that Vocera improved patient care and safety.** Nurses at BHSC agreed that Vocera enabled them to spend more time at patients' bedsides and resulted in fewer interruptions when providing care. Particularly during busy times, nurses indicated that Vocera directly, and positively, affected patient care and safety.
- **Time savings were substantial among hospital stakeholders.** An estimated 11 hours of clinical time per day, or more than 4,000 hours annually, became available across medical and nursing disciplines as a result of Vocera's adoption. This time savings represented roughly 4 percent of the total time that clinicians spent in the hospital.

- **Nurses and doctors experienced fewer interruptions when spending time with patients.** In fact, 60 percent of nurses and 40 percent of doctors reported a reduction in the frequency of interruptions, which could distract from patient care and compromise patient safety.
- **Vocera produced a time savings of two hours daily by expediting patient turnover.** Prior to implementation, the study determined that two hours were lost per day waiting for bed managers to respond to pages. In enabling process improvements, Vocera nearly eliminated the need to page bed managers and expedited the process of patient turnover through instant contact with bed managers, anywhere and anytime.
- **Ninety-eight percent of hospital staff reported improvements in internal communication.** Additionally, questionnaires measuring satisfaction in time spent communicating with colleagues documented a staggering 167 percent increase in satisfaction among doctors and a 100 percent increase among nurses following Vocera's implementation.
- **Satisfaction scores among doctors and nurses improved in each category analysed.** Doctors and nurses reported significantly greater satisfaction with regard to internal and external communications, frequency of interruptions when with patients, and time spent with patients. The cumulative results indicate increases in satisfaction levels by 56 percent among doctors and 40 percent among nurses.

Vocera's impact on expediting communications, saving clinical time, and increasing satisfaction among clinicians at BHSC is both measurable and highly significant. Clinicians agreed that Vocera has quickly become the communication tool of choice in the emergency department.



Background

About Vocera

The Vocera Communications System consists of two key components: the Vocera System Software and the Vocera Communications Badge (Figure 1). Vocera System Software runs on a standard Windows server and houses the centralised system intelligence: the call manager, user manager, and connection manager programs, as well as the Nuance speech recognition software and various databases. The Vocera Communications Badge B2000 is a wearable device weighing less than two ounces that enables instant two-way voice conversation. Features of the badge include:

- Voice controls, enabling users to answer incoming calls hands-free while multi-tasking
- Intelligent system software, which eliminates the need to memorise phone numbers and allows workers to call associates by name, function, or group
- Conference calling, broadcast messages, and voice mail messaging, which facilitate group communication
- PBX integration, enabling users to make and receive calls directly from the Badge through the internal phone system

Through the hospital's wireless network, the Vocera Communications System allows in-building mobile workers to communicate instantly while performing their job functions within the hospital.

About Belfast Trust

Belfast Health and Social Care Trust is located in Belfast, Northern Ireland, and provides a range of healthcare and social services to people throughout the country. A conglomerate of six hospitals, Belfast Health and Social Care Trust employs 22,000 staff members and serves 500,000 people per year.

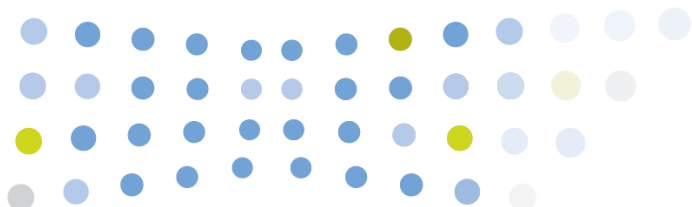
The Emergency Department at BHSCT's Royal Hospitals receives and treats more than 50,000 patients per year. Each day, the department staff treat an estimated 140 patients.

In December 2007, the department was relocated to an interim facility as part of plans to build a major, new critical care unit. Simultaneously, the Vocera Communications System was deployed to key emergency department staff to improve communication.

Figure 1. Vocera Badge



[Actual Size]





⚡ Approach

Measuring the full value of Vocera to the emergency department required capturing both quantitative and qualitative data. Consistent methods of data collection before and after deployment of Vocera included:

- Twelve in-depth interviews with key personnel; two-thirds of participants participated in both pre- and post-implementation interviews
- Clinically based observational research into day-to-day activities of key personnel
- Staff questionnaires completed by 43 staff members pre-deployment and 34 staff members following deployment; change in quantity due to junior doctors' rotation to new departments in the middle of the study period
- Activity data provided by the BHSCT
- Anecdotal evidence regarding the advantages and disadvantages of Vocera's deployment in the emergency department

Pre-implementation study data was captured for a period of a month prior to the deployment of Vocera. The Vocera System went live in mid-December 2007 at the same time that the emergency department was moved to a temporary facility. All emergency department doctors, nurses, ward clerks, bed managers, and medical secretaries received training to use Vocera. Two months following deployment, in mid-February 2008, post-implementation data was collected for a period of one month.

Since the temporary facility, where the post-implementation data was collected, featured an improved layout over the previous facility, this contribution to workflow and productivity was appropriately factored into the study results. The results account only for improvements directly resulting from the deployment of Vocera in the emergency department.

⚡ Terms

- *Senior Sister* — most senior level nurse, responsible for managing all nursing activity
- *Sister-in-Charge* — senior nurse in charge of a particular shift
- *Staff Nurse* — junior nurse

⚡ Study Findings

Upon capturing and evaluating data, findings related to five key indicators:

- Improved patient care and safety
- Savings in clinical time
- Process efficiency improvements
- Reduction in patient delays
- Increased clinician satisfaction

Improved Patient Care and Safety

According to the questionnaire results, more than half of sisters believed Vocera enabled them to spend more time with patients. Likewise, 40 percent of doctors and 60 percent of nurses reported experiencing fewer interruptions with Vocera when caring for patients. Especially during busy times, clinicians reported that this additional, focused time caring for patients directly corresponded with improved patient safety.

In their own words, emergency department clinicians revealed how Vocera has contributed to patient care and safety:

“Patients get more doctor time.”

— Clinical Director of the
Emergency Department

“The patient I was accompanying for a CT scan suddenly became very ill. I was immediately able to call the emergency department for backup from my Badge.”

— Staff Nurse

“When an ambulance radios in with an emergency, I can use Vocera to locate all staff needed so that they are in place, ready for arrival.”

— Sister-in-Charge

“I can immediately be contacted for an emergency even if I'm not on the floor.”

— Doctor

“Some equipment from a ward was needed urgently when a patient suddenly became unwell. One of my nurses was in that ward, so I was able to call her to bring what was needed as a priority.”

— Sister-in-Charge

“No one who has [Vocera] doesn't like it.”

— Senior Sister



Savings in Clinical Time

Observations of key personnel prior to implementation of Vocera led to the identification of three major opportunities for the System to provide time savings. For clinicians, these frequent, time-consuming activities included:

- Leaving clinical areas to make or receive phone calls
- Physically searching for resources or colleagues
- Waiting at the nurses' station to use the telephone

Analysis of a combination of questionnaires and observational data indicated that Vocera led to a significant reduction in time spent performing these activities. According to questionnaire responses, 100 percent of physicians and 96 percent of nurses reported that Vocera had decreased the time they spent contacting colleagues in the emergency department (Figure 2).

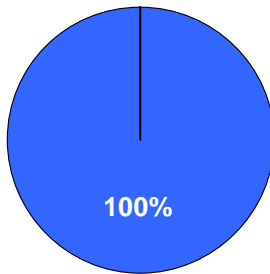
Prior to Vocera, clinicians spent roughly six minutes per hour making and receiving phone calls. Likewise, sisters typically spent 10 minutes per hour seeking resources and colleagues. Although the time spent on these activities has not been eliminated completely, study data suggests a time savings of 11 hours per day using Vocera. Annually, this amounts to more than 4,000 hours of clinical time saved. This time savings represented roughly 4 percent of the total time that clinicians spent in the hospital.

The financial value of this time savings depends upon how much overtime can be averted or ward staffing adjusted due to Vocera. Even without considering the potential financial value, the time savings experienced among clinicians can be devoted to spending more time providing patient care and less time conducting administrative tasks.

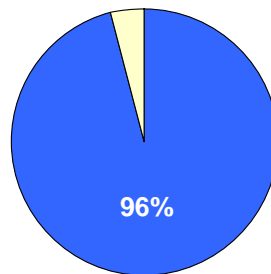
Figure 2. Questionnaire Responses

Has Vocera improved time spent communicating internally with colleagues?

Physicians

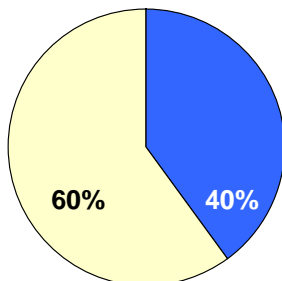


Nurses

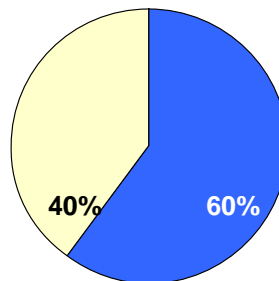


Has Vocera reduced the frequency of interruptions when spending time with patients?

Physicians



Nurses

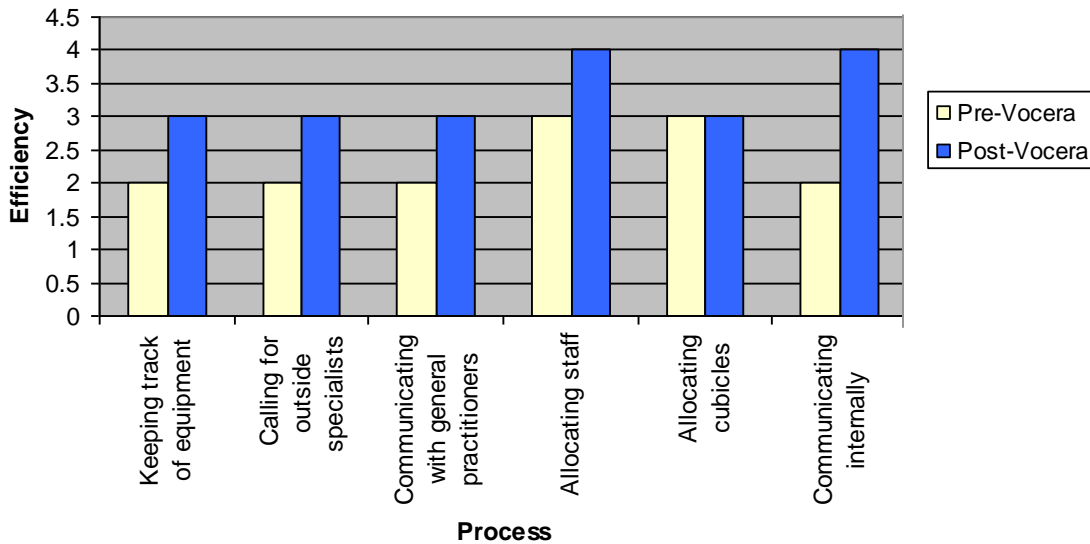


Process Efficiency Improvements

Improvements in process efficiency were determined through questionnaire responses. Nurses and doctors were asked to answer a series of questions both before and after Vocera's implementation. The vast majority of respondents indicated that many aspects related to workflow in the emergency department had improved.

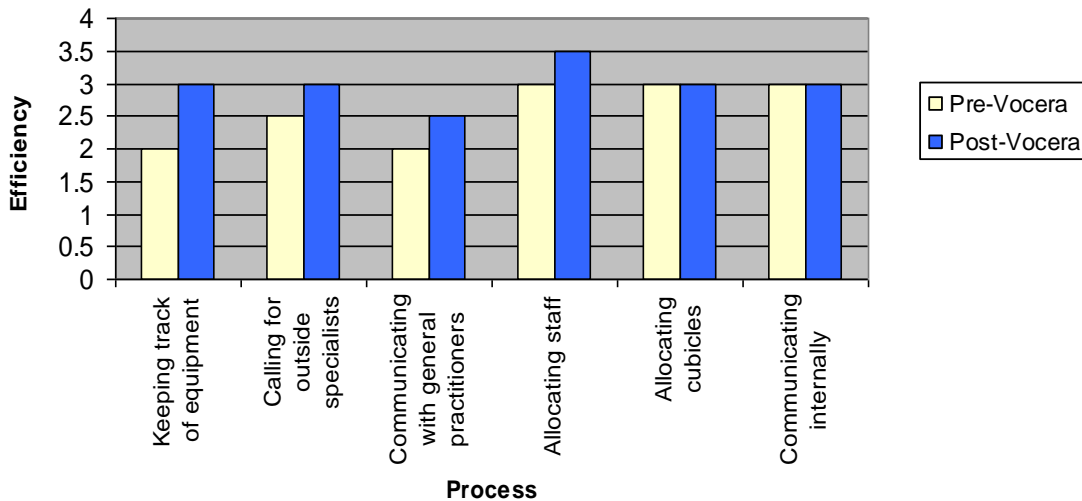
Physicians noticed a tremendous improvement in internal communication and notable improvements in keeping track of equipment, calling for specialists outside of the department, communicating with general practitioners, and allocating staff. No change was recognised in the cubicle allocation process (Figure 3).

Figure 3. Physician Perceptions of Process Efficiencies



Similarly, nurses noted improvements in keeping track of equipment, calling for outside specialists, communicating with general practitioners, and allocating staff. Like physicians, nurses indicated no change in the process efficiency of cubicle allocation. Yet, in contrast to physicians, nurses recognised no measurable change in internal communication (Figure 4).

Figure 4. Nurse Perceptions of Process Efficiencies



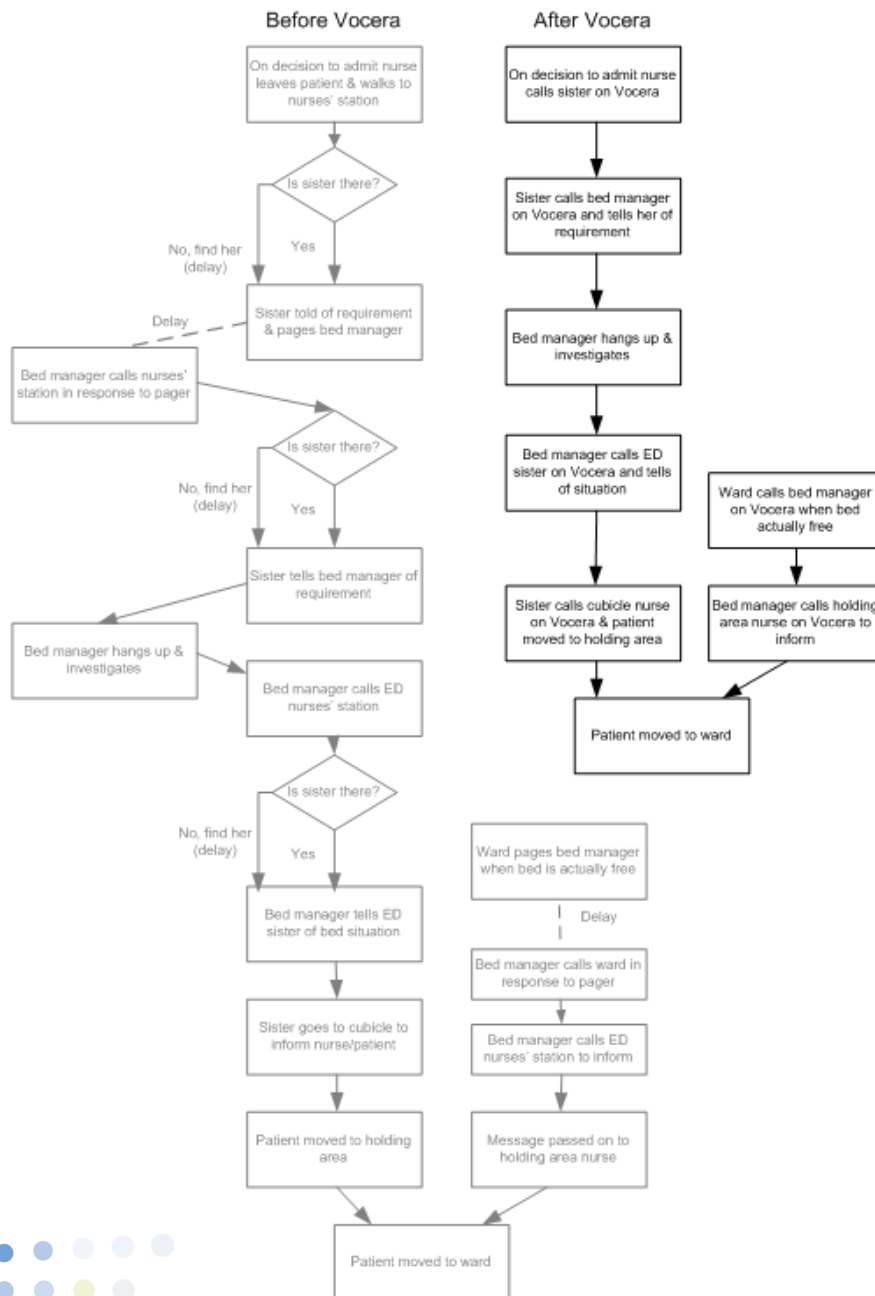


Reduction in Patient Delays

When a patient is admitted to the emergency department, a nurse must liaise with the hospital bed managers to locate an available bed. Prior to Vocera's implementation, the bed manager was contacted exclusively through the overhead paging system. Not only was paging disruptive to patients, but it was ineffective and time-consuming. An estimated two hours per day was lost waiting for bed managers to respond to pages, causing constant patient delays.

With Vocera, overhead paging to communicate with bed managers was nearly eliminated. By communicating with bed managers through the Badge, nurses directly contacted the bed manager, if available, or left a detailed message if the manager was occupied. Either way, the bed manager was able to take immediate action to expedite patient transfers while minimising delays (Figure 5).

Figure 5. Simplification of Bed Management Process





Clinician Satisfaction

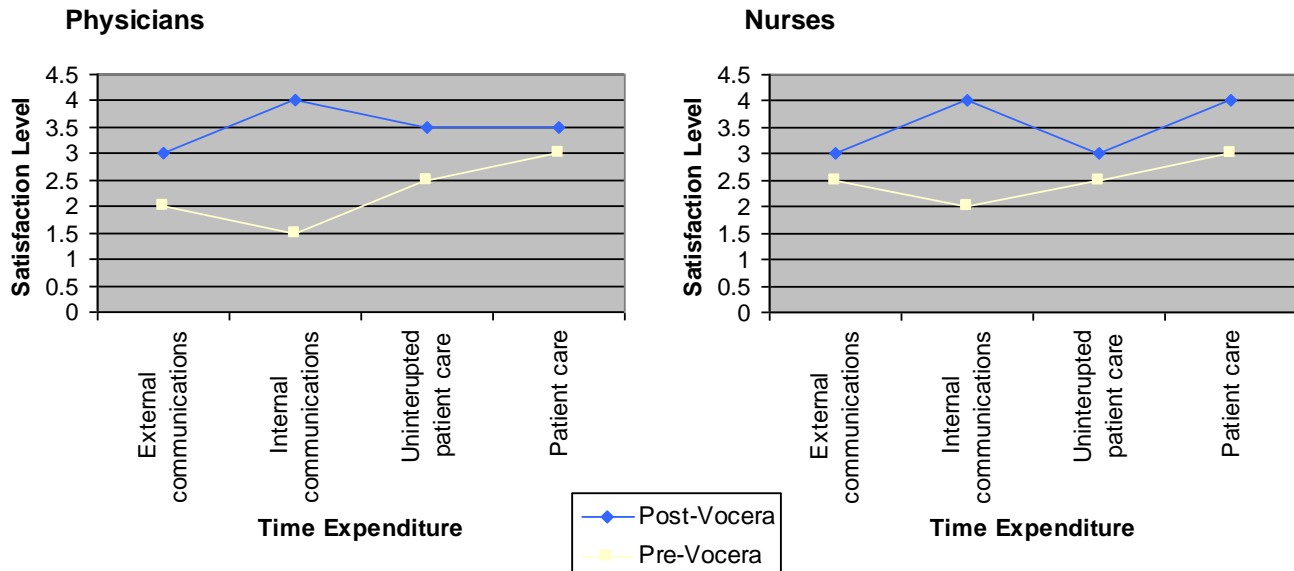
As evidenced by questionnaire responses and personal interviews, clinicians recognised a dramatic improvement in communications and asserted higher levels of job satisfaction as a result. The cumulative results were satisfaction levels which increased by 56 percent among doctors and 40 percent among nurses.

Specifically, satisfaction levels rose in each of the four categories studied for both physicians and nurses. Categories included time spent conducting external communications, facilitating internal communications, providing uninterrupted patient care, and delivering general patient care. Satisfaction levels were measured on a scale of one to five, with five indicating the highest level of satisfaction (Figure 6).

Among physicians, satisfaction levels associated with external communications increased by 50 percent while levels related to internal communications rose a staggering 167 percent following the implementation of Vocera. Satisfaction levels for providing uninterrupted patient care and time with patients rose 40 percent and 17 percent, respectively.

Similarly, satisfaction levels among nurses also rose dramatically after Vocera's deployment. Nurses reported a 100 percent increase in satisfaction when communicating internally with emergency department colleagues. Modest gains of 20 percent were associated with improvements in external communications and uninterrupted patient care while patient care improvements resulted in a 33 percent increase in satisfaction.

Figure 6. Satisfaction Levels



Conclusion

The study of Vocera's impact on the emergency department at BHSCT demonstrated time savings, workflow improvements, and increased satisfaction that were measurable and significant. Nurses and physicians alike agreed that Vocera was the communication tool of choice. Most importantly, clinicians recognised improvements in patient care and safety resulting from Vocera.

In the future, there are opportunities for Belfast Health and Social Care Trust to reap greater benefits from Vocera by deploying the System throughout the hospital to facilitate interdepartmental communication. Additionally, by utilising the full spectrum of Vocera functionality, the hospital has an opportunity to enhance the benefits provided by Vocera.

⌘ About Vocera Communications

Vocera Communications provides wireless communication systems enabling instant voice communication among mobile workers for leading institutions and companies requiring enhanced customer service, productivity, and teamwork. Vocera is installed in more than 20 percent of the “Most Wired and Most Wireless” hospitals. The company, based in San Jose, California, sells to customers in the United States, Canada, the United Kingdom, Australia, and New Zealand. For more information, please contact the company at 408-882-5100, or visit the Web site at www.vocera.com.

⌘ About Kinetic Consulting

Kinetic Consulting is a London-based firm that serves clients in health care, information technology, and the public sector. Kinetic Consulting administered the Vocera benefits study at Belfast Health and Social Care Trust in December 2007. A full report detailing the study’s results can be accessed at www.vocera.com. For more information about Kinetic Consulting, visit www.kineticconsulting.co.uk.

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