

A Qualitative Study of Physicians, Surgeons, Nurses, Clinicians, and Administrators Perception of Training to Learn Mandated Healthcare Informatics Tool Conducted at DC Veterans Affair Hospital

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Abstract

The Veterans Affair Department (VA) developed a medical informatics software application for managing all aspects of healthcare in the widely dispersed VA operation. VA manages more than 800 facilities that include hospitals, convalescent centers, tertiary care facilities, as well as many other facilities throughout the United States. Use of the medical informatics software application is mandatory for all personnel working at a VA facility. All personnel include specialists, generalists, nursing staff, clinicians, and administrators. The VA employs more than 80,000 employees throughout its facilities.

The health care informatics product built by the VA is Computerized Patient Record System (CPRS) and has more than 99 applications all available to all VA employees at all times. Additionally, CPRS provides multiple views of data. The multiple views include text, graphic, and imaging. Furthermore, all personnel can insert notes on patient interaction.

This paper reviews training procedures at one VA location in the District of Columbia, USA, using a qualitative interview approach to better understand the quality of training

perceived by the end-users for learning such a large application.

1. Introduction and Statement of the Problem

The Veteran's Affairs gained worldwide recognition for the health informatics system and is called the Computerized Patient Record System, hereafter referred to as CPRS. CPRS is used for medicine interaction, patient management, healthcare administration and many additional patient record-keeping activities. In addition, the promise of improved patient care, CPRS as a healthcare management system is designed to improve efficiency and effectiveness of healthcare givers. Healthcare givers include physicians, physician assistants, nurse practitioners, registered nurses, licensed practical nurses, nurse assistants, clinicians, and administrators. All of the health care givers use and have access to CPRS. An unknown question of CPRS is whether the program is achieving the tasks set forth in its adoption. These tasks include efficient and effective patient care by healthcare givers. In order for care givers to become efficient and effective in the practice of healthcare, the healthcare giver must be adequately

informed of the use and intricacies of the application.

In the CPRS system, there are 99 modules for patient care. These modules include pharmacological administration, vital sign recording, digital imaging, notes, medical alerts, to name a few. Many of these modules are hierarchical providing additional screens with further data.

All personnel at VA involved in patient care have access to insertion and retrieval of patient data. This requires training all personnel involved in patient care in the use of CPRS. With more than 172 medical centers, 551 ambulatory and community based clinics, 131 nursing homes, 40 domiciliary [2] [3] in 48 of the 50 United States and territories, employees assigned to patient care are quite large. Training of these employees becomes a formidable task.

The purpose of this research is to engage healthcare providers and administrators in qualitative research in the training offered at one VA facility to better understand whether the training needs are met from the perspective of the trainee – the persons using CPRS. This research is important to the field of information systems for supporting appropriate development activities that address technology, data, processes and people requirements to achieve the goals of the organization as supported by a well-trained and informed workforce. In this research, evaluating healthcare givers perception of success in achieving the organizational goals of efficient and effective healthcare through training is undertaken.

2. Purpose of the Study

The VA employs thousands of employees in the care and nurturing of veterans at more than 800 facilities throughout the United States. Those employed by the VA include full-time, contract, part-time employees, and medical personnel in training. Each of the VA facilities has its own training and education staff. The task of the training and education staff is to ensure that persons employed in the care and nurturing of VA patients are well informed of the operation and use of CPRS as well as responding to requests for support when needed. VA training department provides 24-hour call center support for CPRS questions.

CPRS is considered one of the applications transforming health services “through their direct involvement in the day-to-day processes of tens of thousands of doctors, nurses, and ancillary staff.” [1]. The transition from a department-centered approach to a patient-centered approach is one of CPRS’ strengths. Additional strengths of CPRS include work process shift from paper-based chart to computer-based charting, order entry, provider-entered electronic charting, progress notes, pharmacy data, orders, lab results, vital signs, radiology results, and transcribed documents and reports all in an easy to follow interface [1]. The application provides order checking, allergy checking, and clinical reminders for diseases such as hypertension and diabetes. CPRS is designed to allow providers to enter, edit, and electronically sign orders and documents. Between January to March 31, 2002 providers “directly entered 82% of 9.8 million medical orders” [1].

Furthermore, between the fall of 1999 and spring of 2002, “3.5 million notes and 7.2 million orders were entered” [1].

3. VistA CPRS Currently

Since committing to build an electronic health care architecture in 1982, VHA migrated from Decentralized Hospital Computer Program (DHCP) to VistA CPRS by building an “Enterprise Architecture is the explicit description of the current and desired relationships along business and management processes and information technology” [1]. “VistA applications are built on a common data dictionary and database, and use the same core building blocks to provide functions such as security, device access, and communications” [1] as well as “perform functions in common with other health information systems such as laboratory, pharmacy, radiology, ADT, and scheduling” [1]. Originally released in 1996, VistA CPRS was “mandated nationally in 1999 and virtually all clinicians in the VA now use it” [1]. Much of the reason for mandating use of VistA CPRS nationally is recognition of the transient nature of VA patients and their care providers. As Brown et. al. found, “Of over 8.5 million 'active' patients in the master patient index, 1.1 million (13%) have information at two sites, 272,000 (3%) have information at 3 sites, and 1.5% have information at four or more sites” [1]. To further acknowledge the transient nature of patients, Brown et. al. discovered that “of the 8128 possible pairs of sites that could theoretically share information about a patient, 8124 pairs actually do” [1].

Within the VISN design, many care providers travel from one location to another requiring access to patient

data at each location visited. Using a standardized user interface and an interconnected system design, training of care providers at multiple sites is reduced if not eliminated. This saves organizational training dollars. For these many reasons, VistA is viewed as “an emerging national-scale health information system” [1].

4. VistA CPRS of the Future

VistA CPRS is facing several limitations. For instance, the VA is required to retain records for 77 years after the last patient visit. This 77 year limitation is in effect even if the patient dies [2] [1]. Care providers are requiring immediate access to all VistA records on-line. This requirement is placing great demand on the system requiring regular upgrades and enhancement to storage retrieval and retention systems [2] [1].

The VA’s requirement that all hospitals adopt data and communications standards that are open and publicly available may introduce security problems. Currently network reliability and bandwidth is site dependent and variable. The VA has mandated all hospitals have necessary bandwidth to carry the volumes of data of patient records to numerous locations [2] [1]. Currently, VistA permits local sites “to determine data dictionary entries for clinical data” [1] but this may prove too cumbersome as the need to exchange patient data increases.

A program introduced at the VA is ‘HealthPeople’ [2]. HealthPeople is a federal strategy resulting “in federal adoption of common data, communications, architecture, security, technical, software standards in federal

healthcare information systems and a growing core of shared software to be used within each federal healthcare provider agency” [2].

When the original health care informatics systems, DHCP, was first introduced it was a grassroots, skunk works development project designed to be flexible and adaptable to any of the decentralized VISNs of the Veteran’s Administration’s health care units. As development and acceptance has progressed, DHCP became instituted as VistA CPRS and more standardized work habits are employed. As Homer R. Warner, a leading researcher in health care/medical informatics stated, “medical informatics is 10% medicine, 10% computer science, and 80% sociology” [6].

With the knowledge that patients travel among VA facilities, and similarly, care providers travel among VA facilities, the need for a standard, uniform interface to minimize learning curve downtime and to alleviate training requirements becomes paramount. This study engages an interview process with representation from surgical, physician, nursing, clinician and administrative staff in their perceptions of training in the use of CPRS. The purpose of engaging in this study is to verify first-hand the benefits of training and any recommendations for training enhancement in the use and operation of CPRS. This study is seen as important as CPRS was developed in-house by VA staff in response to medical personnel requests. In this regard, it is proposed that the product should be easy-to-use, transportable, and intuitive requiring little to no support from training personnel.

5. The Study

The study was conducted at the District of Columbia Veterans Affairs Center in Northwest Washington, DC, USA. A solicitation for volunteers to participate in an interview-based research to discuss CPRS training was announced. No promise for any type of remuneration was made. Volunteers could select date, time, and place for the proposed interview. The interview was scheduled to last not more than 60 minutes. This time could be extended by the volunteer interviewee. A single question was proposed to engage conversation. The conversations were recorded using an Olympus 2000 digital recorder. Digital recordings were uploaded to a WAV file saved in MS Word, listened to several times to capture salient streams for training consideration. Each volunteer was offered a copy of their recorded interview. No volunteer requested a copy. Anonymity was assured.

6. Study Participants

The study participants consisted of fifteen volunteers representing surgical, physician care, nursing, clinician, and administrative staff. Three volunteers from each category care provider agreed to participate. As the focus of the interview was CPRS training generally, and not specific tools within CPRS, this study size is deemed representative. Grant McCracken in the Long Interview finds that 12 interviews in a qualitative study are sufficient to capturing representative data. McCracken’s research found that twelve and more interviews reported preponderance of repeated data points

that became redundant and of little use. Therefore, based upon McCracken’s finding, the number of volunteers for this research was found to be sufficient.

The following table represents the numbered volunteers and the amount of time afforded each interview.

Classification	Volunteer	Interview Length (in minutes)
surgical	Surgeon 1	0:45
	Surgeon 2	0:23
	Surgeon 3	0:37
physician	physician 1	0:35
	physician 2	0:32
	physician 3	0:49
nursing	nurse 1	0:54
	nurse 2	0:62
	nurse 3	0:58
clinician	clinician 1	0:23
	clinician 2	0:48
	clinician 3	0:56
administrative staff	administrative 1	0:33
	administrative 2	0:46
	administrative 3	0:40

Table 1: Volunteer Classification and Interview Length

More than ten hours of rich text information was gathered from the fifteen volunteers. As an aside, we are not sure of the implications but it is interesting to note the nursing staff exhibited the longest interview times of all volunteer classifications.

All volunteers were advised of the recording of the session. One question was proposed to the volunteers with conversation continuing until the volunteer concluded the session. One

researcher conducted all interviews. This ensured validity of interview question and process.

The one researcher conducting the interviews was also responsible for transcribing the recordings. It was determined to allow the one researcher to conduct the interviews as well as transcribe the recordings to ensure consistency and reliability. In qualitative research, if additional personnel are engaged to perform parts of the process, training of the additional researchers is highly recommended to ensure reliability. By engaging one researcher to execute interviews and transcription saved the researchers time as well as guaranteed reliability.

The question proposed to all volunteers was “Given your experience with CPRS, what are your reflections on the quality, quantity, and relevance of VA training to support your interaction with your patient using CPRS?” The question was intended to stimulate responses. What are surprising are the uncovered results. We refer to these uncovered nuggets as the salient points.

As the focus of the research was to uncover potential training issues users of CPRS perceived, the idea of using one question focused on training was determined sufficient. Furthermore, as the interviews took place at the patient care facility, time away from patients and other duties had the potential to be distracting. Allowing the interviewees to focus on the one question demonstrated sensitivity to time requirements of the interviewee and promised opportunity for future research in other areas of CPRS usage.

7. The Salient Points

Qualitative research goal is to identify, isolate and explore salient points discovered through, in this case, the interview process. Unlike quantitative research where the research begins with an idea and extrapolates from the survey instrument whether the idea is supported or not using statistical analysis, qualitative research begins with no preconceived ideas and looks with hopes of serendipity to uncovering an unknown. In the case of this research, with the volunteer representative, the length of interview time, it was surprising to learn of a common thread discovered from review of interview recordings.

We learned that all classifications desired additional training. Overwhelmingly, the volunteers found that CPRS is a very large, very intense database of information. Due to VA's requirement to have all data available at all times to all personnel involved in patient care, the "myriad" of data becomes too much.

Surgeons request to see only surgical data relevant to care of patients. This refers to vital signs, reactions or changes in patient subsequent to surgery during the important recovery stage, typically the first 24 to 48 hours. Surgeons wanted to see only patient data for which they are responsible. In this regard, having access to all patient data in the surgical unit was of little interest to them. They wished to tailor the data screen viewing only their patient information.

Physicians, on the other hand, require more diverse data, but are less

interested in surgical information. However, they wish access to the data should they not be able to 'telephone' the lead surgeon. Physicians, in essence, wished to have the ability to 'tailor' the screen information to fit the 'need of the moment.' In short, physicians have a need for more system reporting flexibility. These interviewees desired the ability to 'at the push of a key' access non-routine data on patients.

Clinician classification includes dieticians, sociologists, psychiatrists and psychologists, as well as pharmacists. While not all of these classifications were represented in the interview, for the two represented (dieticians (1) and psychologists (2)), similar comments were received.

The clinicians, in concert with the surgeons, felt CPRS provided too much information. While it is 'nice to know' all patient data is available, the clinicians felt 'burdened' to have responsibility for all of this information. They, too, desired a phone number to call necessary medical personnel when requiring specific information rather than have access to the data for which clinicians had little responsibility.

Of all the volunteers, the nursing staff appears to require access to all data at all times. This classification of volunteers expressed frustration at having access to all the data, and being able to understand the data. However, they expressed exhaustion at the responsibility of access. They uniformly stated that they were called upon regularly to report on patient status to an in-calling physician, surgeon, and family members.

Responding to the variety of requests required this classification of care provider to have access to a variety of data and to interpret the data being careful to remain within the accepted medical profession boundaries of what could be reported to family members and what must be reported by medical doctors to family members. Alerts of a nature calling to attention reportable information was recommended by the nursing staff participants.

The administrative staff felt less burdened. They reported using only the CPRS modules of necessity and ignoring all others. As a result, this classification of CPRS users were satisfied with the level and amount of training offered.

In summary, all volunteers felt that they were over trained and under trained. The volunteers suggesting they were over trained in that they learned all of CPRS and did not want to desire to have the extent of training offered were the administrative and somewhat the clinician care providers. They expressed a sense of over training in areas of little concern in their level of patient interaction. This is evident when we consider the tasks of the administrative personnel. Mostly, administrative personnel scheduled appointments and verified appointments. Providing training in all modules of CPRS appears to have little benefit for this classification of care providers.

Clinicians, on the other hand, felt under trained in that they wished to have extensive hands-on experience in modules of particular importance to their job classification. In short, the clinicians felt burdened to know as much as they know about accessing surgical data.

Similarly, the surgeons did not want to know how to access patient psychiatric examination results. However, surgeons, in concert with physicians; recommended flexibility in designing and accessing data these classification of medical personnel desired at any given time.

Nearly all volunteers desired verbal communication with the medical care provider responsible for specific interaction – surgeon for surgical care, clinician for the specific clinical area, and so forth.

The exception to this comment was the nursing staff. While they felt they carried the largest burden in accessing all data for all care classifications, they understood and accepted their responsibilities for this level of access.

8. Implications for Training

The outcome of this research has implications for training. For the most part, the volunteers engaged in this research felt there was far too much training in areas of little relevance to the specific care given area and not enough training in the desired area. There were no comments on 24-hour access.

However, all volunteers desired some level of flexibility in designing or retrieving desired data. This has significant implications for the VA.

With any level of flexibility comes complication. Currently, the VA offers a standardized presentation. If adherence to requests by study participants is entertained by VA

management, the hardware requirements to satisfy study participant's observations could increase costs of operating the system dramatically. The bandwidth necessary to provide the level of flexibility requested could be quite expensive as well as increase technology support.

The VA training staff, in concert with the executive leadership, may want to reassess training at the VA.

Despite the volunteers focus on training and training requirements, it appears that another interesting finding surfaced in this research. That is the idea that some medical informatics systems can provide too much information.

9. Summary

This research visited one Veterans Affairs facility located in the District of Columbia, USA, to conduct an open-ended question interview with fifteen volunteers. The fifteen volunteers were solicited from various departments and clinics at the host site. The volunteers were assured anonymity and asked for not more than 60 minutes of their time to answer one question and discuss their response to the question. More than ten hours of recorded conversations was collected and analyzed. The analysis was directed towards locating and identifying consistent theme or themes uncovered during the interviews in all volunteer classification groups. There were five volunteer classification groups. A consistent theme found was the abundance of training in modules within the CPRS medical informatics application required for use by all VA

medical care employees. And similarly, the volunteers expressed a uniform desire to have more in-depth and detailed training in the modules of particular importance to their volunteer classification specialty area.

10. Conclusions/Recommendations/Limitations

The findings of this research have far reaching implications. Many institutions concerned with healthcare are investing in or exploring applications to improve efficiency and effectiveness of healthcare provisioning. Some the applications considered are large applications, such as the VA's CPRS product used throughout the more than 800 VA facilities. Other large healthcare facilities, such as Med Star, are investing in similar products built by Microsoft (Microsoft Azyxxi).

What was uncovered in this research is the burden of abundance of information many healthcare providers expressed from the large application made available. As medical care becomes more specialized will the need for particular application modules become a requirement? The implications from this research indicate this as a possible trend.

The limitations of this research lends one to suggest additional research is needed to better understand the implications for building large, comprehensive modular applications is having on the health care community. This research focused upon a small community within a larger networked system. However, the trend in healthcare is the amalgamation into hospital systems supported by

centralized healthcare informatics applications. Further research into the impact these larger systems are having on the healthcare provider community is recommended.

11. References

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