



### Resistance of Nurses to Transition to an Electronic Medical Record (EMR)

by

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### Abstract

**T**outed as a solution for global access to health care records, patient safety and quality measures enhancement and support for the provision of evidence-based care, the advent of the electronic medical record began with less than rave reviews by all sectors of health care practitioners. Nurses, historically protective of their paper documentation, have demonstrated resistance to the transition from paper to computer. The reasons behind the difficulty with this transition are numerous, providing administrators and educators with both challenges and opportunities to expand the knowledge base and comfort levels of nurses. Methodologies to enhance computerization skills and staff involvement in the development and implementation of clinical software systems that serve as solutions to the problem of resistance deserve merit.

**Key words:** nursing documentation, resistance, informatics, electronic medical record

## Introduction

Once limited to technology involved in the direct care of the patients such as monitors, sensors and diagnostic equipment, technological advancements have grown exponentially in the area of healthcare data gathering, storage, retrieval and transmission. This has not happened accidentally but instead has been spurred by a 2004 United States Executive Order calling for a national effort to develop, coordinate and execute an infrastructure for health information technology. Outcome goals for this order include the provision of lower cost, quality, evidence-based care that is provided in an environment where health information is collected and available for use at the point of care, is safely and securely stored, and can be exchanged with other health care organizations as necessary (Saba & McCormick, 2006).

In a 2003 article discussing the issues of clinical practice in a computerized world, many of these same outcomes are echoed, specifically noting a "...seamless provision of care between providers" with the ability to have on-line resources for public health care information (Hughes, 340). This government initiative is transforming the way nurses provide care for their patients as they learn to integrate computerization into their daily routines. Adoption of computers in care and an electronic medical record (EMR) within healthcare organizations is no longer an option, but a necessity for safe and cost effective provision of care. Following an extensive review of available literature, this paper will explore potential barriers to the integration of the computer into bedside

nursing and offer multidimensional strategies to overcome these barriers.

## Statement of the Problem

Armed with an executive order, guidelines for expected outcomes and identified governmental leadership, it would appear, as a foregone conclusion, that healthcare organizations are able to successfully meet these standards within an organizationally prescribed timeframe. With software and processing advancements leading the way toward realization of the aforementioned outcomes of a universal EMR, the possibility for complications exists in the form of a human component in this process that could hamper the success of this implementation. That human component is found at the point of care, and thus begins this discussion of the resistance of nurses to transition to an EMR.

## Literature Review

In addition to the benefits of electronic health systems inferred from the US government outcomes of the President's executive order, similar benefits are also highlighted in articles by Harrison & Lee (2006), Orovioigoicoechea, Elliot and Watson (2007), Quinzio, Junger, Gottwald, Benson, Hartmann, Jost, Banzhaf & Hempelmann (2003) and Chambers (2002). Improvement in the quality of healthcare, efficiency in the use of resources, collaboration at all points of care, links between researchers, clinicians, and patients and partnerships among healthcare providers are among the direct benefits highlighted by

these authors in implementing an electronic health care system. Harrison & Lee (2006) additionally address the benefits for rural communities as the access to research, patient information, and telemedicine services increases. This consensus in the literature serves as a source of support for stakeholder acceptance of the need for a collaborative electronic medical record. Identification of this need is key in light of the substantial commitment on the part of the organization.

**A**n article by Ash and Bates (2005) depicts an organization's financial and resource investment for the development and implementation of an EMR as likely one of the largest that will be made in a five-year span of time.

In light of the significance of such an initiative, Hughes (2003) warns about the importance of considering "possible difficulties in obtaining stakeholders' approval in relation to information technology" (p.343). Kirkely and Stein (2004) postulate that many organizations face resistance from nursing staff, at least initially. Additionally, Kirkely and Stein (2004) indicate that inadequate research related to nurse's resistance has been done "despite recognition that user response largely determines the success of a technology implementation and the fact that significant resources are spent on strategic programs to promote acceptance" (p. 216).

Not unlike reports in the United States, one author from the United Kingdom (UK) reports on negative attitudes from nurses in the clinical setting there as well (Chambers, 2002, p. 105).

There exists a clear relationship between users' views toward computerization and

successful implementation of computer systems as described by Chan (2006) and Oroviogicoechea et al. (2007). Numerous reasons for resistance to computerization exist, among them are feelings of "apprehension and fear"(Getty, Ryan & Ekins, 1999, p. 432), "anxiety" added by Jayesuriya (1998, p.189) and "interference with work flow and time away from the patient care work" (Ash & Bates, 2005, p.9) among the most notable. Several authors addressed the issue of time away from patient care as a barrier to computerization acceptance, however it is profoundly stated by Kirkely and Stein (2004):

**“Nurses do not resist technology itself. What they resist is the addition of one more item to their work day. A significant point of resistance may come down to the nurses’ fear that online charting will take more time than paper charting. The thought of adding one more task to an already frantic day can justifiably seem daunting (p. 21) ”**

Additionally, Kirkely and Stein (2004) speak to the nurses' comfort with and convenience of the paper documentation process.

Feelings of anxiety, apprehension and fear are identified within multiple contexts. These feelings may be directed toward the stability and reliability of the computer system (Oroviogicoechea et al., 2007), degree of difficulty in the electronic documentation process, changes in workflow processes, or lack of confidence in user skill level

(Alquraini, Alhishem, Shah & Chowdhury, 2007). With 41 per cent of current Registered Nurses over the age of 50 and only 8 per cent under the age of 30, it is easy to see that the majority of the current nursing workforce did not grow up in a technological age (United States Department of Health and Human Services, 2008).

**T**his lack of familiarity may also account for feelings of anxiety in adapting to the current technology. In contrast to the technology available in the 70's and 80's, Calvert, Rideout, Woolard, Barr and Strouse (2005) report that currently, 75 per cent of households with children have computers. There likely exists a correlation between computer usage and age.

### **Problem Analysis**

Stakeholder buy in, as mentioned earlier in this paper, is an important part of the planning process for any major organizational change. The involvement of nursing staff from the front lines of patient care in the process right from the beginning with software and program design and continuing through evaluation is advised (Oroviogioicochea et al. 2007). Harrison (2006) supports this view and emphasizes the necessity for computer training both initially during the initial implementation, and on an ongoing basis through continuing education. This enables staff members to be serve in future roles as software Super-users and may be useful to other staff in EMR train-the-trainer sessions or nursing unit resources. During the software development phase, these nurses will be able to provide insight into nursing practice, processes, and workflow (Hughes, 2003).

Benefits to nursing and patient care that can be realized from transitioning to an EMR system should be shared with staff from the onset. Among these benefits are enhanced patient safety, increased efficiency in nursing documentation, and tracking capabilities for patient outcomes (Nagelkerk & Vandort, 1998). Additional benefits of enhanced interdisciplinary communication, comprehensive information at the point of care, and cost effectiveness are realized.

Kirkely and Stein (2004) advise against overstressing enhancement in the documentation speed at the onset as initially more time will be needed in the documentation process until the nurses gain familiarity with the program (p. 220). While it may take longer to complete initial documentation for a patient, “an increase in the quality of the data and charting compliance” are often realized (Kirkely & Stein, 2004, p. 217). From a global perspective, nurses need to know the transition to an EMR is not just a replacement for paper documentation, but a care transition involving changes in processes and workflow that will assist them to do their job better (Ash & Bates, 2005).

This outcome was evidenced at St. Joseph Hospital in Washington. Following implementation and continued use of an EMR, a fifty percent reduction in documentation time was realized creating an additional 1.5 hours of additional patient care time per 12 hour shift (Kirkely & Bates, 2004). The importance of stakeholder buy-in pertaining to the transition to an EMR has been well described. While not specifically a software or hardware solution to the problem of resistance, inclusion of this concept in Information Technology (IT) development and implementation processes

has become a hallmark practice. This first step may actually be the most important as the fate of the implementation rests in the hands of the users.

**B**arriers, such as anxiety, apprehension, and fear, might even be exhibited prior to use of the computerized system.

Computer program and software development can offset these fears if they are developed keeping the following concepts in mind: ease of use, easy navigation, updated content, elimination of redundant data entry, compatibility with work activities and processes, ease of information retrieval, and required fields that will assure documentation compliance (Kirkely & Stein, 2004; Hughes, 2003; Lancaster, Mouldin, Gilbertson, Darden & Kittredge, 2005; Alquraini et al. 2007).

Computer programmers and software developers can keep these in mind in the early phases of development. Front-line staff, as stakeholders, will likely evaluate the program or software in the same way. “Initial experience leads to either a positive or negative attitude which tends to persist” (Getty et al., 1999, p. 437). For this reason, a users’ first exposure to the EMR needs to be a positive experience. Additionally, the EMR training and computer education provided are likely to be considered in much the same way.

Once stakeholder buy-in is accomplished, technology moves to the forefront of our consideration through a discussion about computer training. The underlying premise for training is the use of both software and hardware, to teach technology. In order to optimize the use of technology in training, steps must first be taken to identify the needs of the learner.

Several authors suggest the need for assessment of the user’s prior experience and

learning needs in order to construct training programs that not only meet their individual needs, but also build upon the experience and skills that they already possess (Getty et. al., 1999; Jaysuriya, 1998). Experiential learning is one of the four systematic approaches to teaching adults introduced by Brookfield, in 1995 that still holds true today. The remaining adult learning concepts included are “self-directed learning, learning to learn and distance learning” (Brookfield, 1995, para.12). “Using adult education techniques to expose nurses to computers in a positive learning environment lessens initial computer anxiety and enhances computer literacy” (Nagelkerk & Vandort, 1998, p. 20). It is unlikely that a training program can be developed in a one-size-fits-all model. Instead, a tiered approach is likely to benefit user groups of varying computer skill levels. Once the staff assessment of computer knowledge and skills is completed, the training method or methods to be used are selected. The self-directed learner may seek out their own training methods, or utilize prepared training, choosing to proceed at their own pace.

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Learning to learn is exemplified with the novice or beginner computer user. Basic typing, word processing, and keyboarding skills for the novice user may need to be developed. Hackbarth, Grover, & Mun (2003)

suggest the use of on-line, non-intrusive tutorials to create a fun, non-threatening learning environment with the intention of building confidence and decreasing anxiety (p. 228).

**T**yping tutorial software is available for purchase, and a variety of on-line programs are available for both typing and basic computer skills. Learners will gain experience working with scroll bars, radio buttons, point and click, and drop down arrows. This will prepare the clinician for navigation and data entry into an EMR. These basic tutorials should be instituted well before the actual EMR training. User comfort with the hardware, both mouse and keyboard, as well as navigating screens, and program components are critical for a successful transfer of skills to EMR use.

The next tier of learning beyond the novice level involves using newly acquired skills to work with programs such as Microsoft Word and Outlook. Additional typing, point and click, and navigation experience may be gained with the use of these programs. Many EMR software programs contain messages and scheduling components similar to those of Microsoft Outlook and most contain numerous areas where typing is required in text fields.

Finally, lessons in spreadsheet programs like Microsoft Excel will assist the clinician to gain understanding of data base structure, which is important to understand the storage and retrieval of data items collected in the EMR. Once competent with initial skills, training can move forward into the EMR system itself.

Distance learning can be utilized for any level and may be accomplished using a variety of

methods including web demonstrations and on-line classes.

Relating the computer concepts to the prior experiences of nurses provides a frame of reference for their current knowledge base and in turn, can help them to relax, and boost their confidence to move on to increased degrees of complexity (Nagelkerk & Vandort, 1998).

Providing training in multiple sessions, as opposed to one marathon session, is advised. Spacing the time between sessions will allow the user to process the information they have learned. Providing practice stations that allow staff to practice on their own with structured feedback would foster their training and help to develop greater confidence (Nagelkerk & Vandort, 1998). It is important to encourage the staff to interact with the technology and provide this technology in a variety of hardware device forms such as desktop computers, laptops, notebooks, and smart phones.

User familiarity with specific types of hardware can contribute to increased compliance with use. New technology that is easily accessible and placed in convenient places encourages staff to become comfortable with the devices and the EMR software (Kirkely & Stein, 2004). An additional consideration for the success of the EMR transition lies in the user's confidence in the hardware or device they use, the software program, and the network system that houses the EMR. Access to dependable devices, programs without errors, and networks with negligible downtime will build trust in the system that they are to use as a tool to enhance patient care. Equally important is access to IT support. Whether this support is provided by designated super-users or trained IT

## Conclusion

professionals, this human factor cannot be replaced by a machine and is critical to successful implementation.

Stakeholder buy in is mentioned as a resolution to the problem of resistance early in this paper. The potential for ineffective stakeholder buy in as a roadblock can be combated with the methodology previously outlined. Additional roadblocks to the problem resolution that are outlined in this paper may include the diversity of the user's skill level in training sessions and substantial training hours needed by all staff to learn the electronic medical record program.

Assessment of the learner computer skills will likely reveal a significant range of skill levels across all intended users. This diversity of learners may provide a roadblock to training. Class size, skill mix, and the availability of a number of trainers may need to be adjusted to provide an optimal learning environment. Substantial training time will need to be provided regardless of skill level. To facilitate this training, additional staff may be needed to cover patient care during these sessions. A promising solution to this roadblock would be the scheduling of training sessions in four-hour blocks where staff could rotate from patient care to training. Additionally, training could be provided on regularly scheduled days off, although it is better to schedule training during regular work hours. Additional training sessions could be available for staff with a demonstrated lower computerization skill level.

The problem of nursing resistance to the transition to an EMR is not new. Literature from 2008 reiterates the same problem of resistance and its contributing factors of fear and anxiety as articles from the 1990s (Jayesuriya, 1998; Getty et al. 1999). Methodologies to combat this resistance include stakeholder buy in and a tiered computer training approach that follows adult learning theory and is designed to build upon the prior experience of the end user.

The use of technology in the training sessions should be matched to the learner's skill level. Typing and basic computer tutorials as well as components of the Microsoft Office Suite such as Word, Excel, and Outlook may be introduced to enhance the learning of concepts related to EMR software. This resolution to the problem is validated in the literature by Quinzio et al. (2003) noting from their experience that:

.. our data shows the strong influence of adequate training on many aspects of user acceptance. Users who felt that they had received appropriate training not only assessed themselves as better skilled in using the system compared with the group who perceived a lack of training but also rated the quality of the system in their workplace higher and thought that it was more user-friendly than did their colleagues with a perceived lack of adequate training (p. 970).

**A**nxiety related to competence level and fear of the unknown are universal human reactions documented in literature from the United States and United Kingdom. The provision of comprehensive computer training that is appropriate for the level of the learner is noted throughout literature as a favorable solution to the problem of resistance. With outcome goals of the EMR such as patient safety and provision of cost-effective, quality, evidence based care, it is apparent that all nurses will need to achieve a basic level of computer proficiency. Skiba (2004) provides a poignant closure to the discussion of nurses and the EMR transition:

Data driven informatics models developed to provide information and knowledge will be ineffective if nurses do not identify a need for the information, demonstrate the knowledge and skills to retrieve and evaluate the information, and have the wisdom to integrate research findings to support positive change in their practices (p. 312).

## References

- Alquraini, H., Alheshem, A., Shah, M. & Chowdhury, R. (2007). Factors influencing nurses' attitudes towards the use of computerized health information systems in Kuwaiti hospitals. *Journal of Advanced Nursing*, 57(4), 375-381.
- Ash, J. & Bates, D. (2005). Factors and Forces Affecting EHR System Adoption: Report of a 2004 ACMI Discussion. *Journal of the American Medical Informatics Association*, 12(1), 8-12.
- Brookfield, S. (1995). Adult learning theory: An overview. In A. Tuijnman ed. Oxford: Pergamon Press.
- Calvert, S. L., Rideout, V. J., Woolard, J. L., Barr, R. F., & Strouse, G. A. (2005). Age, Ethnicity, and Socioeconomic Patterns in Early Computer Use: A National Survey. *American Behavioral Scientist*, 48(5), 590-607.
- Chambers, M. (2002). Nursing Informatics and Practice Development. *Nursing Technology Research*, 7(2), 101-115.
- Chan, M. (2006). Investigation nurses' knowledge, attitudes, and skills patterns towards clinical management system: results of a cluster analysis. *Medical Informatics and the Internet of Medicine*, 31(3), 161-174.
- Getty, M., Ryan, A. & Elkins, M. (1999). A comparative study of the attitudes of users and non-users towards computerized care planning. *Journal of Clinical Nursing*, 8, 431-439.
- Hackbarth, G., Grover, V. & Mun, Y. (2003). Computer Playfulness and Anxiety: Positive and Negative Mediators of the System Experience Effect on Perceived Ease of Use. *Information and Management*. 40, 221-232.
- Harrison, J. & Lee, A. (2006). The Role of E-Health in the Changing Health Care

Environment. *Nursing Economics*, 24(6), 283-289.

Hughes, R. (2003). Clinical Practice in a Computer World: Considering the Issues. *Journal of Advanced Nursing*, 42(4), 340-346.

Jayasuriya, R. (1998). Determinants of Microcomputer Technology Use: Implications for Education and Training of Health Staff. *International Journal of Medical Informatics*, 50, 187-194.

Kirkeley, D., Stein, M. (2004). Nurses and clinical technology: Sources of resistance and strategies for acceptance. *Nursing Economics*, 22(4), 216-222.

Lancaster, C. J., Maudlin, M. P., Gilbertson, B. O., Darden, P. M., & Kittredge, D. (2005). How we changed from paper to online education: Teaching immunization delivery and evaluation. *Medical Teacher*, 27 (8), 682-685.

Nagelkerk, J., Ritola, P. & Vandort, P. (1998). Nursing Informatics: The Trend of the Future. *The Journal of Continuing Education in Nursing*, 29(1), 17-21.

Oroveogicoechea, C. Elliott, B. & Watson, R. (2007). Review: evaluating information systems in nursing. *Journal of Clinical Nursing*, 567-575.

Palm Beach Library System. (2008). *Mousing around: Moucercise!* Retrieved from: <http://www.pbclibrary.org/mousing/moucercise.htm> .

Quinzio, L., Junger, A., Gottwald, B., Benson, M., Hartmann, B., Jost, A., Banzhaf, A. & Hempelmann, G. (2003). User acceptance of an anesthesia information management system. *European Journal of Anesthesiology*, 20, 967-972.

Saba, V.K. & McCormick, K. (2006). *Essentials of Nursing Informatics*. 4<sup>th</sup> Edition. New York, NY: McGraw-Hill Co.

Senselang. (2001). *Senselang*. Retrieved from Balloon Games: <http://sense-lang.org/typing/games/balloon.php?key=EN> .

Skiba, D. (2004). Informatics Competencies. *Nursing Education Perspectives*, 25(6), 312. United States Department of Health and Human Services, Health Resources and Services Administration (HRSA). (2004). The Registered Nurse Population: Findings from the 2004 National Sample Survey of Registered Nurses. Retrieved from <http://bhpr.hrsa.gov/healthworkforce/rnsurvey04/>

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