

From Paper to Computer Documentation: One easy step?

by

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Abstract

One of the struggles in a rural state is providing quality medical care irrespective of where an individual lives. The Intensive Care Unit where I am currently employed transitioned in 2005 to the VISICU eICU® system. The eICU® system allows the tertiary medical center ICU to provide back up and resources to the ICUs in affiliated outlying facilities. The system uses monitors, computer software (eCareManager™) and cameras (with audio and visual capabilities) allowing staff at a remote location to assist staff at the bedside. Components of the eCareManager™ computer documentation system include ‘The Source’ an up-to-date patient care resource and a shared documentation system that can be accessed by staff at the bedside and remote location simultaneously. The difference between an electronic medical record and the eICU® system is



the cameras and two way audio systems in the patients rooms that allows the remote center to be in direct communication with the staff providing care at the bedside.

Key Words: Computer documentation; intensive care; nursing documentation; generational differences; remote ICU

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Introduction

Florence Nightingale realized the importance of formal nursing documentation, in order to facilitate clear and thorough nursing communication between and among caregivers (Turpin, 2005). Today's electronic medical record (EMR) should help to facilitate this communication, yet in the 21st century nursing documentation continues to have limited value in communicating our contribution to improving the patients' outcome and nursing research. The Intensive Care Unit (ICU) I work in transitioned from paper to computer nursing documentation in October 2005; this paper provides an overview of the system, how different generations view the computer and the difficulties that continue when using an EMR several years later.

Nursing Documentation

Thorough nursing documentation is a precursor to good patient care, an important part of clinical documentation, and provides a vessel for efficient interdisciplinary communication and cooperation. (Ammenwerth, Mansmann, Iller, & Eichstädter, 2003) Computer technology

is increasingly being relied on to improve efficiency, the quality of care and the accuracy of documentation (Korst, Eusebio-Angeja, Chamorro, Aydin, & Gregory, 2003) Hospitals reimbursement is also positively or negatively impacted by nursing documentation, which means that unlike other professionals, what nurses document or leave out impacts the bottom line (Sonnenberg, 2007). Requirements for documentation continue to increase because of risk management issues, practice standards and the changing requirements of external regulatory agencies including Medicare and the Joint Commission (Barr, 2002). It can be overwhelming for bedside nurses to comply with these changing requirements irrespective of documentation format.

About The Unit

I currently am employed in the Intensive Care Unit (ICU) of a 600 bed tertiary medical center in New England. The 46 bed unit is made up of three smaller units; my unit is the dedicated Pediatric Intensive Care Unit (PICU), although depending on the pediatric census adult patients are also admitted. In 2005 administration within our facility introduced the VISICU enhanced ICU (eICU®) program. This program is an EMR which includes several computerized systems that collect, store and display a variety of patient information (McLane, 2005) and also monitors patients from a remote site. One of the struggles in a state with a large rural population is making quality medical care available to everyone irrespective of location, for a reasonable cost (Weinstein & McNeill, 2001). The VISICU program allows this tertiary medical center's ICU to assist the rural ICU's to provide quality care to their patients.

Like most ICUs my unit is made up of three generations of staff including early Baby Boomers (born between 1943 and 1960), Generation X, (born between 1961 and 1980) and Generation Y (born after 1981) (Hu, Herrick, & Hodgin, 2004). Each generation has different ways of working and communicating, attitudes to life and technology and beliefs about change. These differences are manifested depending on the numbers of the different groups employed within a unit. My unit like most places has the highest percentage aged between 40 and 49 (35 percent), with about 9 percent aged under 30 years old (Nursing Workforce, 2001). Hu et al. also found that 26.7% of the Silent Generation and Baby Boomers rated computers as complicated and even frightening. This is compared to Generation X and Y who were born during the information age, who are more comfortable with computers and believe ‘computers are there friends’” (Kupperschmidt, 1998).

In my unit documentation was previously done using charting by exception. This means that assessments are done, questions are asked, and that the answers or data does not need to be documented if it is negative or meets a set of previously identified criteria (Frank-Stromborg, Christensen, & Elmhurst, 2001). The advantages of documenting by exception are that it is faster and reduces repetitive paperwork. Additionally changes in a patients’ condition were immediately identified and if information was not documented the nurse did not appear negligent as it was assumed to meet predetermined criteria. The disadvantage is that without clear guidelines or corresponding flow sheets the nurse will be seen to have not met the identified standard of care (Frank-Stromborg, et al.).

The eICU® System

VISICU, a critical care information technology solutions company, developed the eICU® which allows hospital systems to develop an integrated critical care program, built on powerful technology that improves quality of care, operating efficiency, and economic performance. (eICU Solution, n. d.) VISICU views their eICU® program as being similar to the way airports use air traffic controllers and aircraft technology to keep aircraft passengers safe. The eICU® facility is a remote center, staffed with Intensivists (physicians board certified in critical care medicine) and experienced senior ICU nurses. The nurses provide 24 hour seven day per week assistance and the physicians are on site for 19 hours, beginning at noon and ending at 7 a.m., when attending physicians are beginning to make morning rounds in the hospitals (Nowlin, 2004). The unit and control facility are linked via telemedicine and computer monitors to each patients room so that staff can ‘camera in’ to a patient’s room to assess the patient or assist the bedside clinician. The technologies included in the system are: remote care tools, proprietary software, system architecture and care delivery.

Our eICU® system is currently installed in five hospitals with a sixth being activated next month, with a planned total of eight in the system by the end of the year. Currently there are 84 beds with eight being added with the new facility. There is a single physician at the center, two experienced ICU nurses (soon to be three), a secretary, the director and her secretary. The nurse patient ratio is approximately 1:30 and the staff monitors and reviews each patient’s information including vital signs using a bank of computer screens while they are on shift. The remote staff contacts the unit staff member with questions or concerns, or can camera

into the room to assess the patient visually and audibly as required. The benefit for the outlying hospitals is that they have an Intensivist and experienced ICU nurse to assist and act as a resource for unit staff, which improves patient outcomes, as both unit and remote staff monitor and provide patient care.

All users also have access to The Source, a VISICU resource that provides information on acute care dilemmas, patient specific recommendations (once the patient's clinical data is entered) and new information on treatments and drug alerts that is updated monthly (eICU Solution, n. d.). The eICU® solution also helps smaller partner hospitals meet the Joint Commissions' patient safety goals specifically number 16, which is focused on a patient's change in condition, requiring quick identification and treatment in order to improve patient outcomes (The Joint Commission, 2008). These facilities frequently transport patients to the tertiary care center. The eICU® allows both the receiving medical and nursing staff to review detailed patient information prior to the patient's arrival in the unit.

The remote care team uses tools which include video-conferencing and real time video provided by a camera in each patient's room. Immediately before the eICU® camera scans into a room, a doorbell is briefly audible notifying the staff and patient that the camera is on. The camera's zoom feature allows eICU® staff to assess visual and auditory cues e.g. diaphoreses and increased work of breathing through the lens. A microphone and speaker system allows two way communications with anyone in the room. A visual assessment can be matched up to the information provided by the monitors allowing staff to thoroughly assess the patient's condition.

Proprietary software comes under the title eCareManager™ and includes all patient documentation. ECareManager™ has a number of flow-sheets along with the patient profile where providers can quickly find information including patient acuity, physiologic and lab data, allergies, code status and today's plan of care. Both physicians and nursing staff at the center have instantaneous access to the charting system. Nursing documentation can be completed by either the bedside or remote nurse including vital signs, assessments and care; this is especially valuable when new admissions arrive or during a code.

Transition from paper to computer documentation

In preparation for our transition to computer documentation classes were held over several weeks, lasting four hours each in order for staff to learn the system. The sessions were interactive, which works well for Baby Boomers and Generation Xers as they both prefer to learn through doing rather than by listening. This was held several weeks prior to the implementation of the system, and super users who had additional training were assigned during implementation for support. Super users did not have a patient assignment but were available to staff who needed assistance during the transition, as management was aware of the immense learning curve that existed as staff became familiar with the system. This availability was maintained for the first week the system was in place. Currently we have help from the staff in the remote center who can answer questions, or unit staff with computer experience and expertise who mentor others.

This facility chose to implement the change to computer documentation without simultaneous paper documentation at 7 a.m. which is when paper flow sheets began for the new day. Another model of implementation is to complete simultaneous paper and computer documentation, but it was felt that the amount of documentation required in the ICU precluded this method. The staff found it stressful to transition, but as over 90% of the unit staff transitioned together during the first weeks, they were able to encourage and support each other, which made for a smooth transition. The average age of the nursing staff in our unit is over 40 years and they were therefore less familiar with computers, scared that they may make a mistake and lose all of their information. The super users encouraged their peers, and facilitated the smooth transition to eCareManager™ so that staff quickly gained confidence in the new form of documentation.

Documentation

This documentation system in appearance is very similar to our paper documentation in format, yet paper forms that are copied into computer programs aren't necessarily easy to complete (Turpin, 2005). A bigger impact is that the eCareManager™ documentation is by inclusion, which means that both positive and negative patient responses need to be documented (Frank-Stromborg et al., 2001). The eCareManager™ system is set up so that nurse's check boxes identify specific parameters such as if the pupils are equal and reactive, while also having the ability to document additional comments as required. The advantages of documenting by inclusion in the EMR include a more legible and thorough patient record, which in a court case may appear as more accurate and complete. The disadvantages include an

increase in time requirement by staff to document thoroughly. Nursing documentation in eCareManager™ consists of flow sheets; vital signs (including medication infusions and the Glasgow coma scale), intake and output, patient assessment and patient care.

One of the issues with nursing documentation generally which remains in the EMR is that nursing's contribution to patient care remains invisible. Program developers look for nurses to be involved in the development of nursing documentation. At this time the number of nurses with education in informatics or computer science is limited therefore most EMR software programs are developed without nursing input. This means as nurses we are still unable to develop codes or language that articulate 'what we do', which limits nursing's ability to use the EMR for research and more importantly hides our contribution to improved patient outcomes (Abbott, 2003).

The invisibility of nursing's contribution to improved patient outcome is an ongoing issue. Nursing models such as the Synergy Model by the American Association of Critical Care Nurses is one of the ways that nurses have attempted to articulate the important part they play in improving patient outcomes (Markey, 2001). One of the problems for nursing is that there is no standardized language, although the American Nurses Association and the International Council of Nurses are both developing a nursing language which will allow higher visibility, and may promote research using EMR databases (Cho & Park, 2006). Medicine has developed billing codes that allow identification of their contribution to the patient's outcome, although the codes do not capture the physicians' full contribution to the patient's recovery. Has this new documentation system made our contribution to patient outcomes more visible? Without the

use of a common language, along with the complexity of charting in the EMR leads me to believe that nursing's contribution continues to remain invisible.

Care plans in eCareManager™ are multidisciplinary and the unit managers have been rounding recently with the pulmonary group to encourage staff to enter the daily plan and goals in the system. One of the goals our unit has been working towards is to have the whole team round on the patient, so that nurse, family member, respiratory therapist and the medical team are present. This improves communication, through open discussion about the patient, in which all team members including the family participate. It ensures that both nursing and medical staff are aware of the plans for the day, and facilitates interdepartmental communication.

VISICU has listed the most common ICU issues in the care plan including sedation, analgesia, ventilation, nutrition and volume status (eICU Solution, n. d.), which allows staff to quickly enter the relevant data into the plan of care.

Patient Monitoring

While the majority of ICU patients are intubated and sedated, family members and those patients that are alert and oriented need to be introduced to the eICU® system. Explanations are provided to family members and patients as appropriate, regarding the reason for and benefits of eCareManager™. Having the cameras in the room, family and those patients awake are concerned regarding their privacy. The clinical nurse can provide reassurance and turn on the privacy indicator, the remote staff will not camera in to the room while it is on, this is especially important when a patient is bathing, or if family is visiting (Nowlin, 2004). When

the indicator is turned off, the remote staff will then resume camera assessments as required, the privacy indicator does not affect computer monitoring only camera assessments.

The eICU® system continuously trends the patients vital signs making the information available to be imported into the computer during documentation. The system also allows easy transfer of information such as intake, assessment data and care provided, and can all be copied from one documentation session to the next. This capability can save the nurse time if the data entered previously remains the same. The importance of reviewing the data for accuracy and completeness prior to saving is paramount. A nurse subpoenaed to give evidence in court whose documentation shows inaccuracy will have their entire documentation questioned as to its accuracy and thoroughness. An example might be the removal of the same peripheral intravenous catheter copied without editing every time the nurse documented. When it is busy it is easy to copy and save information without reviewing it thoroughly for accuracy which could lead to the documentation of erroneous information, making that nurse's documentation unreliable.

Computer Programs

Staff members in the ICU are required to use two different systems to provide care for their patient or patients. The medical center uses Sunrise Clinical Manager™ (SCM) by Eclipsys for computer order entry (CPOE), which is a separate system that does not interface with eCareManager. Staff are therefore required to sign into SCM to check orders and document medications, then to sign into eCareManager™ in order to complete vital signs, assessment and patient care. This slows down the documentation process and leads to double

charting as nurses sign off medications in SCM, as well as document them on the vital signs flow sheet, to provide a more holistic picture of the care received by the patient. Remembering passwords and to check orders frequently is a challenge to even the most organized and efficient nurse when the day is very busy. Using the two systems means that good interdisciplinary communication is vital so that orders and information is not missed.

The eCareManager™ system's ability to document on a minute by minute basis facilitates complete documentation during a code. This feature allows meds, shocks and other treatments to be documented at the time of administration, along with the data indicating the reasons why the treatment is required. The negative aspect of this is that the vital signs themselves are an average of the previous 5 minutes which means that if the patient's condition is unstable the data may be inaccurate as it is an average which is not as precise. The medication infusion library is set up with the most common medications identified on the vital sign flow sheet. Staff identifies the drug and concentration, enters the weight and after entering the dose the rate is calculated or if the rate is entered the dose will be calculated. Having both options is of great benefit during titration or an emergency as a dose verification mechanism when adjustments are frequently being made to medication infusions such as a vasopressor.

Off unit documentation

One of the recent changes is that we can now complete eCareManager™ documentation outside of the ICU during patient transports. On a transport (prior to the installation) I took an unstable patient to interventional CT scan, and was required to give blood. One of my frustrations was being required to document care such as vital signs on paper while off the unit

and then chart it again on the computer on my return. After discussing this with our unit management, eCareManager™ was installed in both the emergency and interventional CT scan as well as interventional radiology. While the system can not import the vital signs from the transport monitor, the nurse is able to continue documenting in the system while off the unit. The benefit for the nurse is the reduced documentation and time required dual documenting, and on return they continue documenting where they left off in the computer off unit.

Using this system we have not gone paperless as the goal of the eICU® system is to improve patient care (Bria, 2006). At the moment documentation is printed out by the secretary daily during the day shift for filing into the permanent record although it remains available in the computer record until the patient is discharged from the system. Currently any time a patient is transferred between beds their documentation is printed as it cannot be transferred within the system; there are plans to change this. One of the down falls is that the system is the large amount of paper when the flow sheets are printed. Another difficulty is reading computer printouts as information is on multiple pieces of paper and can be hard to follow. It is unlike reading the information on the computer where a person can simply move the cursor over or click on the box in which the data is written and the data will pop-up.

Initially when this system was instituted there was a lot of suspicion about the use of the camera. How it would be used and by whom? Unit staff was uncomfortable with the idea of being watched even by peers from their own unit. Bedside staff was reassured that remote staff is watching the patient and that the camera is only 'on' briefly and does not provide continuous video monitoring. At the tertiary care center there were also questions raised regarding the need for the units within this facility to use the system, as we have on site access to medical staff 24

hours per day seven days per week; staff asked how this would improve the quality of patient care? After three years with the system especially during busy times in the unit, staff will buzz the eICU® staff who will camera in and provide assistance as required. Staff are much more comfortable with having the camera ‘on’ in the room and working alongside the remote eICU® staff. Unit staff realizes that they provide bedside patient care, and continue to have the autonomy they had previously but now they have the added benefit of the remote staff being an extra set of eyes, providing assistance when requested.

System Benefits

Benefits of this system include the improved accuracy, legibility, timeliness and completeness of documentation. As regulatory bodies, payers and risk management requirements for documentation continue to grow, staff needs to be aware of the importance of their documentation. It is vital nurses are aware of the need for accurate and reliable information as they complete their patient documentation (Barr, 2002). Other benefits of the EMR include the ease of data retrieval, research and the ability for staff to have simultaneous access to the medical record in multiple locations (McLane, 2005). Successful implementation of an EMR is evidenced in part by end-user satisfaction, which is reflected by a product that is designed to meet the needs of the nurses who use it (McLane, 2005). Satisfaction is also determined by system efficiency, ease of learning, the system’s ability to identify data entry errors and assist staff to correct them.

Barriers to documentation

Barriers to electronic documentation as Moody, Slocumb, Berg, & Jackson (2004) found in their research, include problems with interruptions during documentation including change of shift and medical rounds, slowness of the electronic system and frequent downtimes. Computer issues including difficulty logging on, short battery life, frequent rebooting and other technical issues with either the computer or software, are all issues that staff have to deal with. Some of the possible solutions include ensuring computers remain plugged in, that passwords are able to be used in multiple programs and that IT assistance is available by phone, and on site as required. Other frustrations include system slowness which increased time away from patient care, the location and number of computers, increased documentation required in the program, experience and confidence in using a computer. Each of these impacts a nurse's satisfaction with an EMR and the willingness to use and recommend to other staff.

System slowness and staff lack of confidence lead some nurses to document on paper and then transfer the information into the computer (Moody et al.2004). Patients in isolation also require dual documentation and with the increase in drug resistant organisms staff use paper in the room, and must transfer the data into the computer when they have access to a computer. Dual charting, increases the risk of error especially if the staff are distracted prior to documentation being completed. As staff review data and then save it in an EMR, older staff find that they do not retain the details the same way they did when documenting on paper. As Lium, Lærum, Schulz, & Faxvaag, (2006) found patient care is a nurse's primary focus and documentation whether using a computer or paper needs to support patient care not interrupt it. One of the biggest complaints in the unit is that documentation takes so much more time on the

computer in part this is due to the style change from charting by exception to charting by inclusion. This is especially apparent to the pediatric nursing staff when they use paper for their pediatric patients and the computer for the adult in their care.

Conclusion

Nurses today are facing increasing patient acuity as those who remain in the hospital are increasingly medically complex (Nursing Workforce, 2001). This complexity requires nurses to have a greater depth of knowledge and understanding of pathophysiology and the interaction between treatments used on a single patient's multiple co-morbidities. The eICU® provides back up and support through the Intensivist and experienced ICU nurse who are available to provide education and support to those at the bedside. An added benefit for the patient is that the eICU® acts as an additional layer of security in a busy ICU where their conditions change suddenly (Kramlich, 2006). Having the extra pair of eyes in the background monitoring patient trends has made a difference by helping to increase survival rates and reduce length of stay in the unit.

Electronic medical records and the eCareManager™ system are here to stay, regulatory bodies, payers and the federal government all believe that the EMR is a priority for the American health care system. Administration at this tertiary care center worked hard planning the conversion from a paper-based to a computer documentation system. Nurses struggle to believe that there is a level of partnership between technology and the nursing role of 'caring' for the patient and their family (Newton, 1995); yet technology more specifically the EMR is

simply a tool for the nurse to use in order to document nursing's contribution to improved patient outcomes. Becoming familiar and comfortable with the EMR is the vital first step for nurses, overcoming fear and associated lack of confidence when using the computer is important for both nurses and their patients. Was the transition from paper to computer documentation one easy step? No it was a large leap of faith at the time of transition and many more small steps as we master the system, which I believe has paid off for both staff and patients in the unit.

References

- Abbott, P. (2003). Nursing informatics: A foundation for nursing professionalism. *AACN Clinical Issues*, 14(3), 267-70.
- Ammenwerth, E., Mansmann, U., Iller, C., & Eichstädter, R. (2003). Factors affecting and affected by user acceptance of computer-based nursing documentation: Results of a two-year study. *Journal of the American Medical Informatics Association*, 10(1), 69-84.
- Barr, B. (2002). Managing change during an information systems transition. *AORN* (Sonnenberg, 2007, p. 36), 75(June), 1085-1092.
- Bria, W. (2006b). Applied Medical Informatics for the Chest Physician; Information you can use!-part 3. *Chest*, 129(4), 1057-1060.
- Cho, I., & Park, H. (2006). Evaluation of the expressiveness of an ICNP-based nursing data dictionary in a computerized nursing record system. *Journal of the American Medical Informatics Association*, 13(4), 456-464.

eICU® Solution. (n. d.). Telemedicine today saves lives and ICU costs thru remote patient monitoring - integrated healthcare solution. Retrieved June 9, 2008, from http://www.visicu.com/index_noflash.asp

Frank-Stromborg, M., Christensen, A., & Elmhurst, D. (2001). Nurse documentation: not done or worse, done the wrong way - Part I. *Oncology Nursing Forum*, 28(4), 697-702.

Nursing workforce. (2001). In J. Heinrich (Ed.), *Emerging nursing shortages due to multiple factors* (GAO-01-944, pp. 1-19). Washington, DC: General Accounting Office. Retrieved June 9, 2008, from <http://www.gao.gov/archive/2001/d01944.pdf>

Hu, J., Herrick, C., & Hodgin, K. (2004). Managing the multigenerational nursing team. *The Health Care Manager*, 23(4), 334-340.

Korst, L., Eusebio-Angeja, A., Chamorro, T., Aydin, C., & Gregory, K. (2003). Nursing documentation time during implementation of an electronic medical record. *The Journal of Nursing Administration*, 33(1), 24-30.

Kramlich, D. (2006). Technology comes to the rescue for Maine ICUs. *Advance for Nurses*, 6(26), 12-15.

Kupperschmidt, B. (1998). Understanding Generation X employees. *Journal of Nursing Administration*, 28(12), 36-43.

Lium, J., Lærum, H., Schulz, T., & Faxvaag, A. (2006). From the front line, report from a near paperless hospital: Mixed reception among health care professionals. *Journal of American Medical Informatics Association*, 13(6), 668-675.

McLane, S. (2005). Designing an EMR planning process based on staff attitudes toward and opinions about computers in healthcare. *Computers, Informatics, Nursing*, 23(2), 85-92.

- Markey, D. (2001). The Synergy Model in Practice Applying the Synergy-Model: Clinical Strategies. *Critical Care Nurse*, 21(3), 72-6.
- Moody, L., Slocumb, E., Berg, B., & Jackson, D. (2004). Electronic health records documentation in nursing. *Computers, Informatics, Nursing*, 22(6), 337-344.
- Newton, C. (1995). A study of nurses' attitudes and quality of documents in computer care planning. *Nursing Standard*, 9(38), 35-39.
- Nowlin, A. (2004). Get ready for the virtual ICU. *RN Magazine*, 67(8), 52-7. Retrieved June 9, 2008, from <http://rn.modernmedicine.com/rnweb/article/articleDetail.jsp?id=114162>
- Sonnenberg, W. (2007). EMR ROI: A Pennsylvania family practice's investment in an EMR pays off three-fold. *Health Management Technology*, 28(5), 36-7.
- The Joint Commission 2008 national patient safety goals hospital program*. (2008). Retrieved May 3, 2008, from http://www.jointcommission.org/PatientSafety/NationalPatientSafetyGoals/08_hap_npsgs.html
- Turpin, P. (2005). Transitioning from paper to computerized documentation. *Gastroenterology Nursing*, 28(1), 61-2.
- Weinstein, R., & McNeill, A. (2001). Powering the Arizona telemedicine program. *Health Management Technology*, 22(6), 46-7. Retrieved June 9, 2008 from <http://archive.healthmgttech.com/archives/h0601powering.htm>

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I originally graduated from a diploma program in Auckland, New Zealand before leaving to work in both Canada and the United States. While working as a travel nurse in the US I completed my Bachelors degree in nursing long distance from a NZ university. I continued to travel before settling in Portland, ME taking a job in the mixed adult and pediatric intensive care unit. I work as a staff nurse, Level III at Maine Medical Center and am working on an online Masters of Nursing Education program through Saint Josephs College in Standish, Maine.