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Charting in a New World

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Charting in a New World

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Abstract

The purpose of this article is to present one project from conception to inception of how a simulated environment for undergraduate nursing students was developed applying contemporary documentation technologies. There will be discussion on the integration in one clinical course using simulation and an academic electronic health record. Numerous challenges were surmounted to bring this project to fruition. One challenge was the funding and procurement of these highly complex technologies, and most noteworthy was the facilitation of a team to help bring this dream to reality. An exploration of the path that was taken towards implementation will be shared using these technologies. The Electronic Health Record (EHR) is a longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting. Included in this information are patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data and radiology reports. The EHR automates and streamlines the clinician's workflow. Thus, this critical thinking application fosters quality care by standardizing input from any level of health care provider. The application of an EHR has the potential to not only standardize patient outcomes, but archive input, data and responses for all providers. This streamlining of thought processes decreases the potential for error from numerous aspects. It validates providers input by being a peer-reviewed type of document; it lessens the number of input events, and communicates the same information to numerous and varied providers. By using this technology in a simulated environment experienced nurses are able to assist fledgling nurses in their application of skills, knowledge, communication and critical thinking in a zero fault environment thus, providing a safer novice nurse who is not only highly marketable, but also valued for skills and expertise at the onset of employment.

Keywords: Academic electronic health record, charting, documentation, simulation, electronic health record (EHR), nursing

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Introduction

Charting has been around for eons. Medicine can date case history and documentation of Forman's and Napier's casebooks back to as early as before 1700 (Kassell, et al, 2011). Nursing, often influenced by medicine and certainly impacted by culture and technology was noted for years to be based on the nursing process and required documentation or charting of care that was rendered. There were many reasons for this documentation, such as providing objectives and outcomes of a patient's plan of care, for noting a patient's progress or lack thereof, as a tool to safeguard continuity of care, to provide reliable information for medical-legal examination, to provide validation of patient education, to provide evidence of chronological review of care and its outcomes, to provide a basis for evaluation of the efficacy of nursing interventions and/or treatments, to act as a repository for other healthcare workers who may tend to the patient, and lastly to provide reliable data which may be used for nursing research to contribute to the advancement of the science of nursing (WHO, 1977). To the current practitioner charting may seem as common as breathing, however it has undergone many transformations in recent times. Development of the clinical record in America was pioneered in the 19th century in major teaching hospitals. Yet, it was not until the 20th century that a functional medical record useful for direct patient care in hospitals and ambulatory settings was created and mainly standardized (Gillum, 2013). Compounded to this emerging chrysalis of a standardized charting template with common nomenclature was the digitalization of all health information for patients imposed by the Health Information Technology for Economic and Clinical Health Act, commonly known as the HI TECH Act. The paper/pencil charting as the nurse historically new it was now converted to electronic format and is often referred to as documentation now instead of charting. The subtle differences between the two while not noted within a dictionary are reflected from a cultural perspective. The electronic health record was crafted with input from healthcare providers, and by engineers, software scientists, human factor specialists and other information specialists. The merging of the two sciences, healthcare and information sciences was to blend two diabolically opposed perspectives to establish a standardized mechanism for recording and sharing of health information. It essentially eliminated the majority of free written text, which leaves the healthcare provider with minimal opportunity to free text one's assessment or idea onto the electronic health record. This leaves the healthcare provider now open to question from outside reviewers as to the individuality of the record. The over use of drop down menus, while offering a mechanism to standardize input of information has minimized the opportunity to allow the provider to note the uniqueness to the patient. This presents an opportunity to lawyers and others when questions arise on delivery of services to a patient. This was noted early on in the adoption of the electronic health record, but due to the pressure of the HI TECH Act and the threat of penalties there was little opportunity to re-

address this issue. At least no one came forward with a better solution at the time, nor have they since.

The HI TECH Act was enacted under Title XIII of the American Recovery and Reinvestment Act of 2009 Pub. L 111-5. The HI TECH Act, signed into legislation by the then President George W. Bush required the United States Department of Health and Human Services to infuse almost \$30 billion dollars to promote and expand the adoption of health information technology (HIT). The HI TECH Act set meaningful use of interoperable electronic health record adoption into the health care system as a critical national goal and incentivized the electronic health record (EHR) adoption and its use (Blumenthal and Tavenner, 2010). Meaningful use is the use of certified electronic record technology to improve quality, safety, and efficiency in health care; engage patients and families in their care; improve care and coordination of care and foster privacy and security of patient information (U.S. Department of Health and Information Technology, 2013). It established significant goals for 2014, which were extended to 2015, and then imposed significant penalties to the non-adopters. Doctors and hospital institutions that did not comply with this mandate were penalized 1% of Medicare payments increasing to 3% over the next 3 years. As students from schools of nursing were often found to practice with doctors and institutions that were impacted by this legislation it was within the nurse educators prevue to figure out an expedient way to teach with meaningful use within the confines of one's course and program. It presented many educators with dilemmas on how best to teach documentation to the emerging practitioner.

In addition to the evolving ways of practice were the dictates from the accrediting bodies. The Institute of Medicine Reports of 1999 and 2011 noted "that nurses are being called upon to be competent in such areas as teamwork and collaboration, but also to master technological tools and information management systems while collaborating and coordinating care across teams of health professions. To respond to these increasing demands, the IOM committee called for nurses to achieve higher levels of education and suggested that they be educated in new ways that better prepare them to meet the needs of the population" (IOM, 2010). The IOM (2003) noted, "All health professionals should be educated to deliver patient-centered care as members from a multi-disciplinary team, emphasizing evidence-based practice, quality improvement approaches, and informatics." The American Association of Colleges of Nursing in the Essentials of Baccalaureate Education quoted from an article by McNeil et al. stating: "computer and information literacy are crucial to the future of nursing. Improvement of cost effectiveness and safety depend on evidence based practice, outcomes research, interprofessional care coordination, and electronic health records, all of which involve information management and technology" (2006: 17). The QSEN Institute, a grass roots initiative housed at the Frances Payne Bolton School of Nursing at Case Western Reserve University, predicated on Quality, Safety, Education in Nursing, has defined competencies for nursing and proposed targets challenging the preparation of future nurses for the knowledge, skills,

and attitudes to be developed in pre-licensure programs for each competency: patient-centered care, teamwork and collaboration, evidence-based practice, quality improvement, safety, and informatics (QSEN, 2015). Another grassroots initiative focused on education reform and interprofessional community development and has grown into the HIMMS (Healthcare Information and Management Systems) organization is the T.I.G.E.R. (Technology Informatics Guiding Education Reform) initiative. This TIGER initiative began in 2004 and advances the integration of health informatics by enabling the interprofessional clinical workforce to use informatics and technology to improve patient care.

Simulation, Technology and the Nursing Program

There were many driving factors encouraging faculty to engage students with technology and simulation. At this point in time, the nursing department did not have any simulation; it had only task training devices and was composed of only a skills lab with minimal to zero technology. This had to change. The faculty, champions of technology and simulation came together.

The project seriously started when the Department of Nursing and Allied Health procured federal grant monies from the Health Resources and Services Administration to support the use of simulation and informatics. This mechanism allowed the faculty to select an Academic Education Health Record Solution which was purchased from the vendor-Cerner. This was found to meet the needs of the department. It was multidisciplinary, could be used with other disciplines such as speech and language, dietetics, and even physical education. It provided for an interactive teaching approach for students to learn evidence-based clinical practices. It allowed for teaching strategies to be employed that fostered critical thinking skills in clinical simulation that mimicked real life clinical situations. Lastly, it provided a practice venue for students to practice in an electronic health record prior to their engagement in a clinical experience. This was important to the faculty as our affiliating agencies did not have true training domains, only off site areas where the student could log on and visualize real-time patients within the systems. Therefore, there was a true risk when learning was occurring and was not a safe learning domain for students. Additionally, four of the five clinical sites used this same vendor. However, this was only a minor consideration as any legacy vendor would contain the necessary requisite components for documenting in an electronic health record. Even so, there were still notable differences between clinical sites with the electronic health records as the agencies were owned and operated by different parent organizations and the vendor provided for customization. Still, students were able to grasp the basic concepts and easily shift between agencies as minor differences could be adapted to, although the students were noted to have some frustrations.

The faculty had gone through an extensive search for the best fit for an electronic health record. Cost, accessibility, complexity, and clinical sites were reviewed extensively. Consideration was given to the implementation process and the challenges one would face. Long hard discussion ensued about how faculty could, would and could not adopt the various electronic health records that were under consideration. A graph was made to present the potential solutions and how they would or would not meet our needs. Discussion ensued on how it would impact within the various courses, at the various levels within the undergraduate program and even at the graduate level as there was a possibility that graduate and doctoral students may engage with teaching and research with the system. While we did not engage the entire student body there were select students that we did encourage input from for this serious selection. The main voices that were listened to by faculty were those of the early adopters of simulation, those most impacted from the grant and the Informatists. The Chair of our department was influential in a positive way in swaying those undecided. The department went with a clear majority rules for this decision. Pro's, cons, and alternatives were all considered. Interestingly enough, the ruling went with the one and only academic electronic health record (AEHR). All other systems at that time were only simulations and did not have the capacity for trended type data to be displayed and stored over time. This was one of the major indicators that swayed the faculty to adopt this system. While this system is a bit backend heavy, meaning that it takes the assistance of an Informatists, typically the vendor, to assist with the set-up, once the backend work is established, it is then set up well and can't be erased so the input from the student is simple enough and the faculty can track the progress of the student. For example, backend work may consist of establishing 10 electronic health records for a recently delivered mother along with her babies electronic health record so that all 10 students have access to the same visual but different records to record in. This is the type of work that either the vendor can assist with or an Informatists can assist with. In our case, we were fortunate to have an Informatists on faculty therefore, we were able to establish our own virtual medical center within our academic electronic health record solution.

The first two semesters of the freshman year the student is involved with acclimating to university life and learning to balance the hard sciences with the more liberal studies type courses. The freshman year the student is not involved with the nursing department. The sophomore year the student begins immersion into the professional role. Students at the sophomore level begin their exposure to simulation within our program of study. It is a traditional baccalaureate program of study, offering 6 semesters of clinical. The first semester the student is introduced to the electronic health record and provided access to the academic electronic health record. They participate in a series of simulation exercises that are mapped to nursing skills and tasks. The junior level students are either enrolled in maternity and pediatrics or Adult Health I, primarily a fundamentals type course. The students are enrolled in both clinical and theory for core nursing courses. Students are provided with clinical that

has a simulation component embedded in it. Typically 8 to 16 hours of simulation is provided for each clinical course. Maternity tends to use the simulation primarily pre-clinical and focuses on the electronic health record, while Adult Health I tends to focus on simulation practice that focuses on skills, tasks and medication administration that targets the electronic health record. The junior level faculty were able to engage the student in documentation exercises that had the student entering the history and physical, the interactive view-which contained such things as the patient's vital signs, the intake and outputs, foley insertion or removal, dressing removal, the results from glucose sticks, dietary tolerance, doctor visits, visitor visits, lab visits, or other visits off the unit. Students were also exposed to the computerized physician order entry (CPOE), and the medication administration process utilizing the bar code (Vana and Silva, 2014). Students were exposed to the various assessments, such as pain, gestation age, Finnegan scoring, Apgar scoring and the Glasgow coma scale. Finally, students were exposed to discharge planning and how to document all of the teaching that occurs during a patient's stay.

The students then advance from junior to senior level. The senior level students are enrolled in either Psych/Mental Health and Community/Public health or Adult Health II/Leadership. The senior level students tends to focus on medication administration using the Academic Electronic Health Record as well as delegation and supervision. At this point in time, as the electronic health record is about the patient we are not teaching students how to data input aggregate data into electronic systems for data mining or monitoring. The systems are not yet user friendly for this activity. At the Masters level students tend to apply advanced exercises in informatics concepts to their course of study. If we are fortunate, we may have doctoral students that are engaging in research that embrace simulation. To date no student has adopted a research agenda that has answered a research question related to the AEHR within our program.

One experience with the AEHR is presented here by the junior level faculty teaching in the maternity course which was used the second day of the clinical rotation. The exercise was built upon the course objectives and expectations consistent with professional standards. In this exercise, 10 identical patients to match the 10 clinical students in the course, were loaded into the AEHR, these are referred as "shells". Shells are the basic demographic and foundational medical information that accompany a patient to a unit for admission. In this instance, the shell was a replication of a patient EHR found on the maternity unit. The faculty member had prepared a handout, so each student would be working from the same findings for when we went to "document" on the patient, which we would examine in the simulation suite prior to the documentation exercise. The students had prepped for this day by completing a pre-assignment to view a DVD about documentation and reviewing in their textbooks about head-to-toe assessments, taking vital signs, and performing a physical assessment. At the start of the second day a pretest was administered to assess their knowledge as relates to documentation within

the healthcare system. The five questions on the pre and post-test were: (a) Define Meaningful Use. (b) What is the purpose of nursing documentation? (c) Identify one implication for making changes in the patient record. (d) Identify one dangerous documentation habit. (e) Describe at least one practice that can jeopardize your license.

The scenario was first executed by the faculty to the students. The technical skills expected to be performed included introduction to the patient, execution of double patient identifiers for both mother and infant, obtaining vital signs on patient and infant, performing a head-to-toe assessment on both mother and baby, in particular for the mother adhering to the BUBBLE-HE acronym. This stands for Breasts, Umbilicus, Bladder, Bowel, Lochia, Episiotomy, Homan's sign, Emotions (bonding and attachment), which is a short version of the unique assessment done on a newly delivered patient. In addition, morning medications if any were to be administered which most often included a stool softener, a prenatal vitamin, and due to the time of year-a flu shot for the mother. After the faculty role modeled expectations, then four students were selected to perform the simulation. One was assigned the role of primary nurse, another secondary nurse, a third student was assigned the role of significant other and the fourth student was assigned to be the voice of the physician in the control room for which a script or faculty was available should the need arise from either of the nurses in the simulation. The remaining students were brought into the control room, given an assignment to critically observe a designated member in the simulation scenario and then be prepared for the debriefing when we all assembled after the scenario was executed. Once the scenario was concluded the participants were all gathered into the debriefing room and the debriefing was held.

Immediately after the debriefing of the scenario, the lesson segued into a pre-brief about documentation. Discussion ensued about what should be documented in the EHR. The students were then asked to each sit to a computer which was located at the periphery of the room and to log onto the system with a temporary training identifier. The faculty member passed out the handout noting the assessment of the mother and infant. This allowed the students to be working from a similar foundation lightening their cognitive load as the class learned to navigate within the AEHR. The students were directed to document the mother's vital signs. This was accomplished with minimal oversight. The students were then instructed to document the mother's assessment findings and the medication administration for the influenza injection. The oral medications were not put into the AEHR as they were loaded into the system at time of delivery using a bar code administration system. The students were then instructed to document the infant's vital signs, and the head-to-toe assessment for the infant as well. While time was not allocated to documenting the gestational age assessment, the faculty did demonstrate where the gestational age assessment would go into the AEHR should we have had findings to enter from the infant. At the conclusion of the exercise, the faculty member did "authenticate" the student's results, essentially signing off on their notes in the AEHR so they would note the difference

between unauthenticated and authenticated notes. A post-test was then administered, the same questions were asked as noted from the pre-test. Remarkable improvement was noted from 20 questions missed (50 possible items) to zero items missed (Greenawalt, 2014). Since the exercise a significant improvement has been included on a daily basis which includes to not only authenticate the results for the student, but also to make a unique clinical note on each patient, in free text noting that the care given was consistent with the needs of the patient and was given under the supervision of faculty adhering to standards of care. It is important to note that this clinical note not be standardized, but be specialized and unique to each patient. This recommendation was offered at the HIMMS 2015 conference in Chicago by an attorney. The thoughtfulness and insightful comments from the instructor reflect that there is ongoing assessment as relates to the status of the patient. It is not enough to just authenticate the student comments, there must be evidence of critical review by the responsible nurse and that is the role of the faculty member (Klein, 2015).

This exercise was noted to be a worthy teaching learning experience that prepared the student to be effective and efficient for the first operational day of clinical. The simulation allowed students to decrease their anxiety, decrease their cognitive load, enhance deliberate practice, and embrace new learning experiences that presented themselves while they were on the unit. It was also noted by the staff, anecdotally that students appeared to be more engaged and not too embroiled with paperwork, textbooks, and generally floundering. They appeared to have a comfort level that freed them up to interact more collegially with staff and patients alike. This set the stage for a productive clinical rotation that continued throughout the course. As the students advanced in their program of studies they continued to engage with simulation and the AEHR.

Work with other disciplines has also revealed that the use of the Academic Electronic Health Record Solution is invaluable in educating students in nutrition as we work through simulation to practice executing nutritional consults on our teenage pregnant patients. Still in the exploration stage is the engagement of the psychology students with nursing and criminology as we incorporate into their lessons for such experiences as training in consults on geriatric patients for assessment of elder abuse, or child abuse by first responders. Additionally in the early phases of how to engage the computer science faculty, eagerly asking how they can assist to "build behind the scenes" and our educational technology faculty asking how they can teach their students to assist with mining big data, and storing these data fields. The Health Administration faculty are exploring how they can use simulation and the AEHR to assist in teaching their students supervisory skills, and teaching how data is collected and used for monitoring outcomes and measuring progress. In addition, on our campus-interdisciplinary education is just emerging and simulation and the academic electronic health record are both tools that can foster collaboration, networking and partnering.

Faculty within the department of nursing reached out to other departments, specifically the theater department to partner. This was a natural collaboration as many simulations embrace standardized patients. As noted in the Standards (Meakim, et al, 2013) of Best Practice: Simulation Standard I: Terminology, it is noted that Robinson-Smith et al. (2009) identify that "a standardized patient is a person trained to consistently portray a patient or other individual in a scripted scenario for the purposes of instruction, practice or evaluation" (p. S9). This collaboration provided an occasion for grant writing, scenario writing, and an opportunity for both behavioral health and community health to come together for learning engagement for students. A result of this collaboration was the creation of Theater 481 course, called The Performance of Caring. It used acting skills to engender healing relationships, provided a creative, empathetic and practical approach to preparing future healthcare professions with enhanced skills in the art of establishing and building patient relationships while using an approach common to the training for performing artists. As all nurses know, nursing is the combination of science and art. This course brings out the artistic side that may be foundational to relationships and quality communication, pillars of safe nursing care.

Discussion

Reflection on the program from various faculty and staff nurses revealed that exposure to simulation and the AEHR early on has benefitted students in clinical by decreasing cognitive load to the student allowing for more freedom and interaction between students to staff and patients alike. This decreased cognitive load bears further investigation as nursing is about relationships and quality communication which can lead to safer, more effective delivery of care. While we know that there is a negative emotional impact for physicians who have made a patient error, anecdotally, it also appears this may be the case for nursing students as well (Waterman et al. 2007). It appears that there may be a possible correlation worthy of exploration for the nursing student who comes prepared for clinical from a hands on experience with the technology that is in the clinical arena that may be related to a decreased anxiety upon arrival to a clinical unit. This may have implications for schools of nursing and how students should be prepared for practice from a practical standpoint.

It remains, even with the shift in form from pencil/paper to electronic format that documentation is a necessary component of healthcare. However, the reasons and priorities may be shifting. The value of documentation remains unquestioned, however, electronic health records have not yet established best practices nor do we know how best to teach with this emerging technology. As educators we do know that documentation integrity is at risk when the wrong information is documented on the wrong patient health record. Errors of this magnitude can impact patient safety, privacy and security. One can also see that critical thinking in the healthcare provider is questionable when templates, dropdown menus and copy and paste measures are employed. Cloned

documentation creates significant problems that may lead to unnecessary redundancy and may at times yield inaccurate information compromising patient safety.

As innovations emerge it is clear that the educator must take fundamental measures to make sure that basic compliance is adhered to for both the sake of the patient, the student, the organization and for the faculty member themselves. It is important for educators to be familiar with the HI TECH Act and to be aware of what is transpiring in the clinical arena if we are to prepare our students to be workforce ready. We shoulder a responsibility to prepare the student for what they will encounter. When the encounter is as dynamic as it currently is within the technology framework of the HI TECH Act it is the responsibility of educators and clinicians alike to stay informed and knowledgeable of best practices.

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