A QUALITATIVE ASSESSMENT OF CHANGES IN NURSES' WORKFLOW IN RESPONSE TO THE IMPLEMENTATION OF AN ELECTRONIC CHARTING INFORMATION SYSTEM

by

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Abstract

Introduction: In recent years, hospitals and healthcare facilities have been implementing clinical information systems (CIS) as a means to streamline processes and reduce costs. Evaluations of these implementations often focus on the technical aspects and tend to overlook the social and organizational issues, which can play an equally important role. By studying social and organizational issues of the end-users in their local environment, important issues can be discovered to help improve the systems overall acceptance and usability.

Methods: The purpose of this study was to assess workflow of nurses both before and after implementation of a CIS. This was a qualitative study using both observational and informal interviewing techniques to gather data. Five nurses were shadowed at three time periods, pre-implementation and at two and four months post-implementation. The data were analyzed in three ways. First, each nurse was presented as an individual case study, which provided an assessment of individual changes in workflow over time. Second, observations from all of the nurses were considered globally, providing insight into general themes and changes in workflow that applied to the nursing unit as a whole. And third, a comparison was made between the benefits of using the system as stated by the hospital facility, which funded the implementation, and the benefits as perceived by the nurses, who were the end users of the system.

Results: First, the individual case studies of each nurse elucidated how each person's attributes and preconceptions influenced how they adjusted their workflow to the new system and why. Second, the global assessment of all observations revealed general unanticipated effects of implementing the CIS. These issues fell into three categories: communication issues, technical issues, and true changes in workflow. Some of these issues have the potential to be resolved immediately, whereas others may take time and improvements in technology before they can be addressed. Finally, the nurses recognized half of the benefits of using the system as stated by the hospital facility. This result suggested that some items could have been removed or reworded from the original goals and benefits list to improve the concordance between the two.

Conclusion: The use of a longitudinal qualitative methodology provided insight into how the implementation of a CIS affected the workflow of nurses, elucidated how the nurses actually used the system in their local environment, and determined whether the initial goals as stated by the hospital facility were realized by the end-users. Overall, this study allowed the observer to identify both positive and negative effects of the systems implementation. These findings have the potential to improve both current and future CIS implementations.

Introduction

In recent years there has been significant pressure to implement integrated clinical information systems (CIS) into the healthcare industry. [1] Not only do these systems offer potential cost reductions for hospitals, but they also have the capability of improving the quality of patient care. The rising cost of healthcare, the increased complexity of care, and the concern over preventable errors are three of the driving forces causing healthcare institutions to turn to computerization as a remedy for such problems.[2, 3] Often, the goal of implementing these systems is to streamline the processes involved with patient information in hopes of addressing these very issues.

With this in mind, millions of dollars are being poured into the development of clinical information systems for the healthcare industry.[4] Undoubtedly, this trend will continue with increasing demands for newer and better systems to be developed. But, why do so many of these products fail to meet the needs of the hospitals which purchase them, and why do so many of them end up "staying on the shelf" after they are purchased? [5] These are questions that elude many and often go unanswered, costing hospital facilities millions of dollars in wasted time, training, and frustration. To answer these questions, some thought needs to be given to the development and evaluation of these CIS products.

Most hospitals do not become involved with commercial products until they are ready to be purchased off the shelf. From there, many institutions rely on the promises of vendors and their in-house information technology groups to make informed decisions about the best product in order to address their particular needs. Already at this point, there has

been an assumption both by those developing and by those purchasing the product that this new technology is transferable to many environments and will fulfill the requirements of many hospital facilities. However, even if a product offers an excellent solution for one hospital, it may turn out to be an utter failure for another. How can this be when the product itself is unchanged? In the following paragraph, some of the selection and evaluation criteria are considered to help answer this question.

Quantitative or Qualitative Approach?

Often, selection of a product is made based on volumes of statistical data presented by the vendors, which back up claims of speed and accuracy of a system.[4] Having access to this information has its merit. However, evaluation of a system from statistical data alone (better known as quantitative analysis) is not enough to ensure a successful implementation. There is yet another major area of evaluation that is often overlooked. Without it, the system's implementation may fail. Simply put, evaluations often do not consider how the system will actually be used in the local environment or how it will fit into the social and organizational context within which it is placed. Methods involved in capturing this type of data are most often categorized as qualitative analysis. In the following section a brief discussion surrounding the strengths and weaknesses of using quantitative and qualitative methods will be considered. In doing so, it will become clear why each method has the potential to answer different questions, why qualitative methods are less likely to be explored within the field of medicine/medical informatics and why qualitative analysis should be included in the toolbox of evaluation methods.

Within the scientific community there is an assumption, and as some describe it as formal bias, that research should conform to a hard science versus a soft science approach.[4] The term hard science encompasses quantitative research methods which, if conducted and presented accurately, can offer a great deal of validity to a study's results. Statistical significance can also be assessed. There are many methods to choose from within the quantitative realm with the randomized controlled trial (RCT) considered to be the Gold Standard. In a book on outcomes research, the RCT is described as follows: "Clinical research worships at the shrine of the RCT. The ability to assign subjects randomly to either experimental or control status confers an aura of science that is unsurpassed."[6, 7] From that description it is understandable that whenever possible, researchers and those in the field of medicine prefer to do an RCT for the greatest acceptance within the scientific community, ultimately proving or disproving their hypotheses. This may be the appropriate method, for example, when considering the efficacy of a drug. However, when the question changes from one of testing a hypothesis to one of discovering, developing and understanding a situation, researchers should consider the use of soft science or a qualitative research methodology to help answer these types of questions.[8]

As Kelly Devers describes, "Because of its philosophical roots…qualitative methods have often been viewed unfavorably regardless of the research conditions or the question."[9] Overcoming this stigma can be one of the most problematic hurdles when attempting a qualitative study. How does one establish the rigor and validity behind the results when the stereotype of this methodology is that it is a subjective soft science? The answer lies in the fact that there must be specific criteria for the design and analysis of a qualitative

study in order for it to significantly contribute to answering a research question or goal. In Table 1, there is a description of both quantitative and qualitative characteristics where some of the major distinctions between the two are well articulated. [8] This table suggests that the specific research question itself should actually dictate which approach should be used. Both methodologies have strengths and weaknesses and often using a combined approach can render a broad understanding of the issue of interest. As Friedman notes in his book on evaluation within the field of medical informatics, "For evaluation, we cannot give any particular method of study higher status than the problem under study."[10]

With this in mind, there is a broad continuum of "problems" or topics to consider in evaluation of a systems implementation. Of those that have been undertaken, many have focused on the computer technology itself. [5] But over time, with larger more pervasive systems being implemented, leading to an increasingly extensive number of people being impacted, evaluators are realizing the importance of studying the people and the organizational issues as well.[9-12] Although it is hard to determine the actual failure rate of systems implemented in healthcare organizations (for obvious reasons, healthcare facilities do not want to publicize failures), there is no doubt that the end-users have the power to make or break a system implementation.[1, 5] These are the people who use the system routinely and they have the power to determine whether the implementation is a "success" or a "failure."

Success and Failure

The terms success and failure, relative to systems implementations, are often used rather loosely and their definitions appear to be perspective-dependent. Therefore, for the purposes of this paper, these terms will be defined as follows:

- *Success*- a system that is implemented without major disruption to operations while fulfilling the expectations of the hospital and the needs of the end-users
- *Failure*- a system that is so disruptive and/or inadequate for the institution and/or the end-user's needs that is it pulled out of the hospital facility altogether

Of the failed systems implementations that are acknowledged, many of them failed due to dissatisfaction with the system by the end users who refused to use them.[13] In some circles, generally from the product developer's viewpoint, this concept is referred to as "end-user failure." However, this is also a perspective-dependent reference. In actuality, as Diana Forsythe reports in her analysis of system design and user acceptance, "the so called problem of user acceptance (is) the fact that systems embody perspectives that may not be meaningful to or appropriate for their intended users."[4] This concept plays an important role in the focus of this study, which elucidates the perspectives of the users in an evaluation of a CIS implementation.

Before discussing the specifics of the study itself, there are a few more reasons why this type of study approach is often overlooked by industry and these issues should be acknowledged as well. Apart from the academic debate about quantitative versus qualitative methods of evaluation, there are practical reasons why an investor, which in

this case is a hospital facility, rarely chooses to evaluate newly implemented systems in this way. Some of those reasons are: it can be time-consuming and difficult to quantify results, it is more likely that CEO's are looking for financial information such as return on investment versus information about the changes in workflow of their staff, and once a system is implemented, often hospitals are so busy and far behind with project implementations that they move on to the next one without much evaluation at all.

However, one goal of this study was to use observations of end-users while they were using a newly implemented system to provide feedback to further improve the implementation and efficiency of the system overall. The results can also help improve future systems implementations by elucidating potential problem areas, which hospitals can then better prepare for in the future.

Workflow

One way of capturing the end-user's perspective is to evaluate how and why systems work or do not work within the environment in which they are placed. Until recently, few studies have attempted to address the people and organizational issues that are inherently modified during the implementation process. [11] It is the purpose of this study to do so. One study approach that encompasses the goals of understanding these changes is again discussed by Friedman. He describes one of four qualitative approaches to evaluation as the Responsive/Illuminative Approach. This approach is largely derived from ethnography, which involves the investigator spending time and immersing himself in the host environment. By doing so, the investigator has the advantage of observing how

things are done on a day to day basis with the goal being to illuminate versus judge the impact of the new system in the host environment. This approach specifically "seeks to represent the viewpoints of those who are the users of the resource."[10] Some of the key issues that can lead to understanding this environment revolve around observing how the workflow of individual users changes over time, identifying what subtle unforeseeable issues arise, and discovering how the new system is actually used in the hospital setting once it is in place. These are the critical issues that this study is intended to reveal.

In order to assess workflow, which was the main focal point of the study, it was necessary to have a clear understanding of what workflow encompassed. The working definition of workflow that was used for the purpose of this study follows:

> *Any work process that must go through certain steps and be handled by more than one person on its way to completion... Inherent in workflow are concepts of teamwork, requests for approval, routing and tracking of documents, filling out forms and doing things either in series or in parallel. [14]*

Hospital vs. End-User Goals

One final question this study addressed was whether or not the hospital facility's goals for implementing the CIS were recognized by the end-users once the system was in place. Often it is difficult to determine whether or not the benefits of using a new system are realized, especially within the healthcare field. As Glandon and Buck describe, the benefits of information technology within the healthcare industry can be grouped into two categories: direct financial and quality.[15] They go on to say that determining whether or not the non-monetary benefits of implementing a system (i.e. the quality benefits) are

realized, can be difficult. "These benefits may be important but generally have indirect, time delayed, and uncertain effects on an institution." However, they suggest that end-user feedback can be used as an intermediate outcome to reveal whether or not some of the benefits of implementing the system are achieved.

For that reason, in order to assess whether the hospital facility's goals were realized, it was necessary to capture the projected goals of implementing the CIS exactly as they were stated by the hospital facility under evaluation. The goals are listed below as they were presented to the end-users prior to implementation of the CIS. It should be noted that the specifics regarding the CIS, the end-users, and the hospital facility itself are discussed in the methods section of this paper.

Goals and Benefits

- Do not have to search for chart to do documentation of assessments, intake and output (I/O's) and vitals
- Point of care (POC) charting improves timeliness and reduces redundancy
- Legible documentation
- Automatic I/O totaling and net amounts
- Remote access to physicians
- Electronic queries for chart audits
- One place to view/review: assessments, I/O, vitals, respiratory therapy, and rehabilitation services
- Laboratory, radiology and transcribed reports available to view

The perceived benefits of using the system, as stated by the end-users, can be used as the intermediate outcome and compared to the goals and benefits of the hospital. This comparison provides insight as to whether the quality measures of implementing the system are recognized.

Methods

Design

This was a qualitative study, which used both observational and informal interviewing data collection techniques. Specifically, the Responsive/Illuminative Approach was used (as was discussed earlier in the introduction).

Setting

Providence Health System is a Catholic health organization that extends care across four states: Alaska, Oregon, Washington and California (Southern). Within Oregon, there are seven hospital facilities and numerous primary care clinics. Currently, Providence Health System Oregon is listed as the fourth most integrated hospital system in the United States as reported by the SMG marketing group.[16] As part of this system, Providence has implemented CIS, Horizon Clinicals, in varying degrees throughout its Oregon facilities. The most recent implementation of Horizon Clinicals took place at the Providence Milwaukie Hospital facility, which was the facility chosen for this study, in November of 2001. The study took place on the Med/Surg floor, which was a 30-bed unit with one main nursing station and two satellite stations.

Software/System

Horizon Clinicals is a point of care documentation system developed by McKesson HBOC. Prior to July 2001, this software was known as Pathways Care Manager and has since been incorporated into the Horizon Clinicals umbrella of McKesson HBOC. The

software was developed to be used primarily by nurses to document and manage clinical information in the acute care setting.

Because it is a point of care documentation system, ten radio-frequency laptop computers were mounted on carts allowing nurses to take them into patient rooms on the Med/Surg unit. Access to Horizon Clinicals was also available at each of the nursing stations: three computers are at the main nursing station, two at a satellite nursing station, and one at a second satellite nursing station.

Subjects/Sampling

Five nurses from the Med/Surg floor were selected for this study. They were recommended by the charge nurse as "representative" of the nursing staff. Representative is defined here to mean that the nurses covered a broad spectrum of attributes including age, computer proficiency and nursing practice styles. With respect to computer proficiency and comfort level using a computer, all nurses were requested to fill out a self-reporting form two months prior to implementation of the CIS. This information was used to provide a general sense of nursing skills and exposure to computers, allowing the development of appropriate training information to be put together for the nurses prior to implementation. The form asked the nurses to rate themselves with respect to experience (no experience, some experience, and experienced) and comfort level (uncomfortable, comfortable, and very comfortable). The nurses selected to participate in this study all described themselves as having some experience. However, with respect to their comfort level, they ranged from uncomfortable to comfortable (two rated themselves as

uncomfortable and three rated themselves as comfortable). All of the nurses were women and they all worked the day shift on the Med/Surg floor.

Unfortunately, one of the nurses selected to be in the study moved to New Zealand between the pre-implementation observation and the two-month post-implementation observation. For that reason, the decision was made to shadow a sixth nurse in her place for both the two and four-month post implementation observation periods. Information about the number of nurses and the exact dates of the observations are presented in Table 2.

Data Collection

Each subject was shadowed three times throughout the study: pre-implementation and at two and four months post-implementation. During the pre-implementation observation period the nurses were shadowed from 2:00pm until the end of their shift, which was at 3:30pm or until they completed their work. The charge nurse and the nurse manager recommended this observation period as the most likely time when the nurses sat down to do their charting prior to implementation of the CIS. During the two-month post-implementation observation period, nurses were shadowed from 1:45pm until the end of their shift and at four-month post-implementation they were shadowed from 1:00pm until the end of their shift. The observation time was increased to incorporate many of the nurses' lunch breaks. This provided the observer/interviewer a chance to freely talk with the nurses about the system without the distractions of the nurses having to worry about their patients and their workload at the same time. The total amount of time spent

observing all of the nurses was roughly 35 hours and the exact length of time per observation per nurse is listed in Table 2.

Observations

There was one observer in this study (the author) and her role was to be as unobtrusive as possible (like a fly on the wall) noting where the nurse went and what the nurse did throughout the observation period. Time was noted when it was evident that a task was completed. However, strict timing of nursing tasks was not the focus of this study nor was it possible to record this information accurately with only one observer. All observational notes were written in a notebook carried by the observer and notes were compiled and then typed the evening of the observation, allowing for relatively immediate data capture. All of the typed field notes taken during each of the observation periods are available for review in Appendix A.

Informal Interviewing

Nurses were asked to explain their actions or explain why they were using certain tools if it was unclear to the observer. Nurses were also asked some general questions regarding how they felt about the system at each visit. The questions were structured in an open-ended format to avoid any potential leading by the interviewer. Finally, the nurses were also asked to list what they perceived to be the benefits of using the new CIS at the four-month post implementation observation period.

Data Analysis

Analysis of nursing workflow over time was done in two ways. First, each nurse was considered as an individual case study, which provided a unique understanding of how individual nurses differ in workflow. Second, observations were aggregated, allowing development of a more global picture of how the nurses' workflow changed over time as a result of the CIS implementation. From the observation notes, themes and trends were discovered and special attention was given to unanticipated changes in workflow that arose. From the informal interviews, the perceptions of the nurses were captured and then corroborated in many instances with the field notes taken by the observer. The perceptions and unforeseen issues that were identified were then verified by the nurses themselves via a member checking session. This technique was used as a means to verify that the correct conclusions were drawn from the data. The member checking session occurred six months post implementation with three of the five nurses available to participate in the session at that time.

The potential goals and benefits, as stated by the hospital system, were compared to the benefits as realized by the nurses in the following way: nurses were asked what they perceived to be the benefits of the new CIS, and their statements were compared to the original benefits stated by the hospital system prior to implementation. The statements were then matched based on corresponding themes.

Results/Data Analysis

Part 1 - Characteristics and observations of each nurse over time

Nurse A

Nurse A was an older nurse who had practiced at Providence Milwaukie for over thirty years. She relayed the fact that she was not comfortable with computers and did not feel that their use in patient care was appropriate. From the outset, she was the least proficient computer user of all the nurses in this study and was the slowest to "figure out the system." When she was observed at two months post-implementation, she slowly entered data with her index finger alone and she relayed a story to the observer about her inability to type. Vignette Number 1:

> *She grew up in the Midwest with her twin sister and her family simply did not have the means to send them both to school. Her sister was chosen to go to school, where she learned how to type whereas Nurse A had to stay at home to take care of things around the house.*

In conveying this story to the observer it was clear that the reason she had never learned to type still resonated with her and was an underlying issue of frustration for her. That being said, by the four-month post implementation observation period she had learned to work her way through the screens fairly quickly, trying hard to make the best of the situation.

In looking at Nurse A over time, the following are summary observations of her work patterns. She finished her work/shift at about the same time both with and without the computerized system in place (although her perception was that it took her longer with

the computer). Prior to implementation, she did most of her charting at the end of the day after 3:00pm, and by two months post implementation, this had not changed. However, by four months post-implementation, she had completed the majority of her patient assessments by 11:30am, leaving the I/O's, nutritional assessment for lunch, and progress notes to be charted later toward the end of the day. Although she was not necessarily doing point of care (POC) charting, she did appear to be doing some of it earlier in the day. Nurse A's impression of the system was that patient care was suffering with the CIS in place. At two months post-implementation, she said, "The computers take away from time that I would rather be spending with my patients." She relayed that same sentiment again during the six-month post-implementation member checking session.

Nurse B

Nurse B was a younger nurse who worked three days a week on the Med/Surg floor and one day a week in the ICU. She was a very proficient computer user and highly self-motivated, spending extra time on the computer to figure out shortcuts in the system. Prior to implementation, she was the only nurse who had already completed her main charting for the day early in the shift. For this reason, it was not surprising that she had also completed the majority of her charting prior to the time when she was shadowed with the CIS in place at both of the two and four-month post implementation observation periods. Her approach to charting with the computer was very systematic and she outlined it as follows:

- Received her patient assignment 7:00am
- Checked each patient's orders in the chart

- Checked on each of her patients
- Filled out the majority of the assessment for each of her patients by 8:00 am
- Completed the nutritional assessment for breakfast at 9:00am
- Did the final I/O totals and nutritional assessment for lunch at 2:00pm
- Filled in the other required fields of the assessment toward the end of the day

Interestingly, she was one of the only nurses observed who actually made a concerted effort to habitually do POC charting during the two-month post implementation observation period. Although she did not actually take a computer into her patients' rooms, she gathered the information such as I/O's at the bedside and then came directly out to a computer terminal where she inputted the information immediately. However, when she was observed again at four months post implementation, she admitted that it was simply too disruptive to try to do POC charting. Instead, she saved the information that she gathered in the afternoon on her "personal sheet", which was most often kept in her pocket and sat down to chart it all at about 3:00pm.

The best summary of Nurse B was captured when she was given a present at the end of the four month post implementation observation period as a thank-you. Vignette number 2:

> *She was given a present wrapped in iridescent paper, which was tied tightly with twine to hold it together. All of the other nurses had cut through the twine and the paper to open their presents, but nurse B liked the paper, so she worked hard to untie the twine. As she worked and worked to get the twine undone she said, "you know me, give me a challenge and I* ***will*** *get it."*

This vignette is fairly symbolic of the way in which she approached the computer system as well; when faced with a challenge, she was going to figure things out, make it work and get things done in a way that accommodated her goals in the most efficient manner.

Nurse C

Nurse C tended to be a sedentary nurse who worked at the same satellite nursing station (SNS) all of the time. She had spent fifteen years as the head nurse for a private care facility prior to coming to Providence Milwaukie, where she had since been nursing for four years. She noted that the aspects she liked best about working at Providence Milwaukie were the good friendships and support networks she had developed in her working environment. As a result, she exemplified an individual who worked closely with other nurses and was willing to ask questions or help others with questions if needed. This was pertinent in the sense that her closest friend was a strong advocate of the system, providing Nurse C a resource to turn to when questions about the system arose. Some of the other nurses were not as comfortable "bothering" people around them to ask their questions.

Another interesting finding in observing Nurse C was how she changed her workflow` at the two month post implementation observation period and then reverted back to her original way of doing things by the four month observation period. Prior to implementation of Horizon Clinicals, Nurse C did her charting and her shift reports at the same time. She started working on her charting at 1:30pm, allowing herself plenty of time to get her shift reports done prior to 3:00pm, which was the time when they needed

to be completed. The benefit of charting in this manner was that all of the information put on each patient's shift report also needed to go into the patient's chart. She could therefore process the same information at the same time. In order to chart this way, she had three out of four of her patients' paper charts stacked on the FAX machine at the satellite nursing station throughout this entire time, from 1:30 until 3:00pm. This was an ideal system for her to have the charts at her disposal during this entire time, but for others who also wanted to view/review the chart (such as the respiratory therapist, physical therapist, dietitian, or a physician), they needed to come looking for the chart.

By two months post-implementation her routine had changed. She had already completed three out of four of her patients' assessments by 1:00pm, which she noted was a miracle. By completing her charting earlier in the day (i.e. closer to POC) she no longer did her charting and her shift reports at the same time. However, at the four-month post-implementation observation period, she had reverted back to working on them at the same time, which she found to be much more efficient.

As a side note, when she was charting at the four-month observation period, she suggested that it would be good if the shift reports could be automatically generated from Horizon Clinicals (HC) since she was spending time entering the same information in two different places.

Nurse D

Nurse D had been practicing at Providence Milwaukie for eleven years. Her personality was non-confrontational and a bit passive. For this reason, it was not surprising that she approached the computer system more contemplatively. Instead of clicking on things to figure out what they did, she was more inclined to sit and look at the screen to see where the information should be placed most appropriately.

She was observed on some particularly hectic days when getting her charting done in a timely manner was difficult. At both the pre-implementation and the four month post-implementation observation periods, she needed to admit a new patient at 3:00pm and it took a least half an hour each time. With her patient load already heavy and the extra work of admitting new patients coming to her at the end of the day, it was not surprising that she was not able to finish her charting until 4:45pm on both of those days. However, at the two-month observation period, when things were not quite as busy, she had already completed three out of four of her patient assessments by 12 noon and she was totally finished charting by 4:00pm. This longitudinal assessment demonstrates that she too had attempted to do "closer to POC charting" at the two-month observation period. However, at the four-month observation period, she did not have the time to complete any of her patients' charting until the end of her shift at 3:30pm.

Another particularly striking issue that arose while observing Nurse D on such hectic days was the fact that she was constantly interrupted. Even so, she had a exceptional ability to multi-task and keep track of many things at once while still completing everything by the

end of the day. However, in such an environment with constant interruptions it was not surprising to find the issue of leaving the computer terminal logged-in inevitably occurred. This is not to suggest that she was the only person to leave the computer terminal logged-in, but it was apparent after observing her that when things were busy it was more likely to occur.

Nurse E

It was not possible to do a longitudinal assessment of Nurse E due to the fact that she moved away after the pre-implementation observation period.

Nurse F

Nurse F was randomly selected to be shadowed in place of the Nurse E. She had worked at St. Vincent's Hospital, which is also part of the Providence Health system in the Portland area, prior to working at Providence Milwaukie. This is significant to acknowledge, because St. Vincent's had attempted to implement HC ten years earlier. During this previous implementation, St. Vincent's had agreed to be a beta test site for HC and ultimately the product proved to be unsatisfactory for the nurses. They refused to use it and the system was removed from the hospital. It left such a negative impression on the nurses that to this day St. Vincent's is the last of the Portland area Providence facilities targeted for the implementation. After going through this failed implementation of HC, Nurse F already had some preconceived notions regarding HC. Although she admitted that the system was much improved as compared to the system ten years earlier,

she was reluctant to embrace the system and had one of the most pessimistic views about its role in the healthcare environment.

By the two-month observation period, she was very capable and proficient with the computer. However, it was apparent she had not taken the time to actually discover where to document everything appropriately, which she thought was a waste of time. Like Nurse A, her stance was that she preferred to spend the time with her patients versus "dragging the computer around." Unlike Nurse A, she did make an effort to do some POC charting by bringing the computer just outside a patient's door when she was doing their I/O's at the end of the day. This was also true at the four-month observation period, although she admitted she only really did POC charting when it was convenient and she had the time. Her routine during the last observation period was to finish her patients' assessments by 11:00am and do the rest when it was convenient at the end of the day from 2:30pm until the end of her shift, which ended at 3:50pm.

Part 2 - General Unanticipated effects of implementing the CIS

From the informal interviews and observations of the nurses, themes and trends were discovered that have broader contextual implications as compared to solely looking at the workflow issues of individual nurses. In this section, unanticipated effects are presented that affected the workflow of the nursing unit as a whole. These issues are not presented in any particular order. They were validated by the nurses themselves at six months post implementation using the member checking technique.

Processing of Information

The perception of the nurses was that patient information was being processed differently with the computer as compared to when the nurses were charting on paper. This issue appeared to have left the nurses with a disconnected feeling with respect to patient care. This sentiment was more true for some nurses than others, but they all agreed that the dynamic that HC had introduced into their environment had changed the intimacy of the nurse-patient relationship. One visible example of how the information was being processed differently was seen while observing Nurse C. Prior to implementation of the CIS, she would quietly work her way through her paper charting. However, when she logged on to the computer to do her charting with HC, she had started whispering to herself as she made her way through the screens. She found it funny that she whispered to herself but said it helped her in thinking about her patients. Although the other nurses did not display visible signs of processing information differently, nor could they put their fingers on exactly why they felt less connected, they all agreed that the computer system had introduced a less personal means of relaying patient information.

Another issue that arose in relation to processing the information differently was the fact that the nurses felt like it was more difficult to remember what they had and had not charted. Prior to the implementation of the computer system, the nurses had sat down to chart everything at the end of the day, allowing them to enter all of their patient information at one time. The benefit of charting this way was that they were doing it all at once and could be certain that the pertinent fields had been entered. Prior to implementation, most of the nurses kept their patient information that they gathered

throughout the day on a "personal sheet." Then, at the end of the day, they would cross the information off this sheet as they transferred the information into the paper chart. However, with the introduction of the CIS and the hospital's desire to have the nurses do Point of Care (POC) charting, the process had changed. The nurses were supposed to be entering patient data at POC, which was possible at some times, and not at others. For this reason, the process of entering information became staggered with part of the information making it into the computer at POC and the rest being entered at the end of the day. By entering the data into the computer at different times, it left the nurses feeling uncertain of what they had and had not been able to complete.

Point of Care (POC) Charting

This leads into the discussion about POC charting. In general, this was a difficult habit for the nurses to embrace. On the whole, it was observed that the nurses were doing a lot of their charting closer to POC (as was mentioned in the individual assessments). However, the overall feeling was that it was not practical for them to be "dragging" a computer in and out of each of their patients' rooms. This was validated by the fact that it was never observed that any of the nurses took a computer into a patients' room. The nurses reasoned that they traveled in and out of the rooms at such a fast pace, that it was too cumbersome for them to take a computer with them. They were also concerned with their patients' impressions that they should be tending to patient care and not "messing around with a computer." At the six month member-checking session, it was acknowledged that only one nurse out of all of the nurses on the Med/Surg floor had integrated POC charting into her daily routine. Overall, some of the nurses were doing it

when it was convenient and when they had the time, while the rest admitted they were not attempting to do it at all. The general feeling was that it was not worth the trouble. They felt it was more important to have a block of time dedicated to patient care versus continually logging in and out of the system, which they found disruptive.

Logging In and Out

Across the board, all of the nurses agreed that logging into the system was the biggest "hassle." Nurse B eagerly relayed her frustration with logging in at the two month observation period, and thought that the ideal system would be a voice recognition log-on to speed up the process. Many times throughout the observation periods the nurses failed to login correctly. Typically this occurred when it was very busy, in which case the nurses were visibly frustrated to be wasting time retyping their log-in and password when they had more important things to do.

As far as logging out, the biggest hurdle the nurses faced was that the environment in which they worked was filled with interruptions. From patients calling to them, to doctors paging the nurses for patient updates, interruptions were inevitable. As a result, it was not surprising to see that occasionally computer terminals were left logged-on when the nurses were called away. This issue is problematic in this era of patient confidentiality concerns, but it is also a difficult issue to rectify under these circumstances.

Interruptions

There was another issue with respect to being interrupted while charting on the computer. Each of the nurses liked to check over the information they had charted in HC prior to saving it to make sure the information entered was correct. However, this was not an option when interruptions occurred while they were only midway through entering their data. In this situation, they had two choices: either to save the information and modify any incorrect fields later, or to log-off without saving the information, in which case they would have wasted all of the time they spent entering it in the first place. Either way, the nurses would have to spend time either fixing or redoing their charting if they were interrupted midway through. This was in contrast to the simple solution they had when they were charting on paper, which was to close the chart and pick up where they left off once they returned without repercussions.

Modifying Information

With reference to modifying information, all of the nurses did quite well figuring out how to modify fields, with the exception of the I/O screen. This screen appeared to be the most difficult to understand why things did or did not work. One of the best examples of this occurred while observing Nurse D as she struggled to try to fix an output value that she had mistyped. She had meant to enter 600ml output but she had accidentally only entered 400ml. After realizing her mistake, she tried to modify the entry, but was not successful. Next, she tried asking some of the other nurses if they knew how to change the value, but no one else knew how to change it either. After about ten minutes, she decided to use to a workaround. She added an extra 200ml of output to the 400ml already

entered, which then equaled the correct total output of 600ml. As she did this she said, "I would have no idea how to fix this if I was 200ml over."

Support

This particular scenario points out another important issue. The nurses' perceptions were that there was a lack of accessible and timely support for them to turn to when they ran across problems or something they did not understand. There was a phone number to call if and when questions arose, but often the nurses felt they were too busy to call. They did not feel like they had the time to sit on the phone and explain the problem, nor did they feel that it was that important in the grand scheme of what they needed to accomplish for the day. Instead, they would either click on things until something worked, or resort to using a workaround as depicted above. As Nurse F noted, "nobody reads the nursing notes anyway so it is not worth bothering somebody and wasting the time to figure it out."

Disjointed Charting

Another issue that became apparent was the fact that the charting became more disjointed; half was still done in the paper chart and the rest was done on the computer with HC. Some of the nurses felt that since the hospital had pushed to have them do most of their charting on the computer, that **all** of it should be done on the computer. Others, like Nurse A, felt that although the charting was more disjointed, they were not ready to put everything in the computer, especially since the doctors were not "required" to use the system and important information might be missed.

The "half paper-half computer charting" also created confusion as to where to chart some items most notably the progress notes. It was not clear to the nurses whether they should continue to write the progress notes in the paper chart or if they should put them in the nursing notes section of HC. For that reason, some nurses were putting the information in both places while others, understandably, were putting it in one place or the other. Without a consensus, people did not know where to find the information reliably, which was a point of frustration for many.

Important Information Difficult to Find

Another point relating to finding critical information, revolved around the fact that within HC critical information could become difficult to find within a screen. This occurred because some screens required a lot of information to be filled in and there was no way to bring special attention to items that were of particular interest for a patient. It was true that abnormal lab values turned red in HC, but in some situations the nurses felt that other information was important to note as abnormal and drawing attention to that information was not easy. This had not been a problem with the paper based charting because the nurses could simply draw attention to important information by drawing a line under it or writing it in red. It should be noted that when this issue was discussed at the six-month member checking session, Nurse F actually tried to demonstrate that HC did have a feature called the "significance button." This button was supposed to allow the nurses to be able to highlight important information. However, after Nurse F tried to save an important message two times while selecting the significance button with no apparent affect, it was agreed that this feature was not working. Beyond the fact that it did not

work at that time, it was clear that not many of the nurses even knew that this feature was a potential option.

Pulling Information Forward

There was another feature within HC that noticeably changed the nurses' workflow and the way information was conveyed. This had to do with the capability of letting the nurses pull previous nursing assessments forward to use as part of a new assessment. There were a few issues that arose as a result of using this feature. First, nurses had to be careful to make sure that all of the information that was charted previously on a patient was still pertinent. If the entire assessment was not looked over meticulously, information that was no longer relevant could accidentally be carried forward. This was especially true if the chart was pulled forward with all of the accompanying annotations which were hidden by the "&" symbol. In order to view the information behind the "&" symbol, it was necessary to double click on it and then erase the information if it no longer applied. Unfortunately, many of these annotations were missed, leading to irrelevant or incorrectly charted information being pulled forward.

Second, by pulling the exact same information forward on a patient, day after day, the nurses felt that there was no apparent "ebb and flow" to the patient's overall assessment. They felt that the subtle changes in the patient's condition were not as likely to be captured leading to a less accurate picture of the patient's status. For these reasons, two of the nurses in the study did not want to use the pulling forward feature. They wanted to be certain that what they charted on their patients was done personally, accurately, and up

to date. The other three nurses felt that this feature worked well for them as long as they vigilantly checked all of the information to make sure it was correct.

Agency Nurses

There was one final issue that significantly changed the workflow of the nurses and increased the pressure on them with the CIS in place. This related to use of agency nurses. These are temporary nurses who cover staffing shortfalls in hospital facilities for a short period of time. The problem with the agency nurses relative to the CIS was that the agency nurses were required to use HC just like the staff nurses. Since agency nurses are only used to float through hospitals when there is shortage of staff nurses, they were not knowledgeable about the new CIS or the intricacies of entering patient data. Consequently, the staff nurses would need to help the agency nurses use the system. This was particularly frustrating for the staff nurse, because agency nurses were only used on days when there was a low staff to high patient ratio. They felt that there was already too much work for them to do without having to take time to help teach the agency nurses how to use the system and fix all of their mistakes.

Part 3- Anticipated effects of implementing the CIS

Overall, the nurses identified about half of the benefits of using the system that were initially stated by the hospital. It took time for the nurses to feel comfortable enough with the system to identify some of the benefits of using the new CIS but ultimately they had identified some of these benefits by the end of the study. The nurse's wording about their perceived benefits of using the system are shown below with the corresponding benefit as

stated by the hospital system bulleted underneath. Another representation of these results can be viewed in Table 3.

The issues that they acknowledged are:

1) Charting can be done anywhere where there is a computer terminal

- Do not have to search for chart to do documentation of assessments, I/O's and vitals

2) Do not have to call or FAX as many things to the doctors

- Remote access to physicians

3) The chart can be accessed from anywhere to look things up, including labs

- One place to view/review: assessments, I/O's, vitals, resp. therapy, rehab. services
- Laboratory, radiology and transcribed reports available to view

The benefits that the nurses did not acknowledge as benefits of using the CIS (in comparison to the original hospital goals and benefits list) are presented below:

- POC charting
- Legible documentation
- Automatic intake and output (I/O) totaling and net amounts
- Electronic queries for chart audits

Discussion

Part 1 - Characteristics and observations of each nurse over time

It was important to evaluate each nurse individually, because each had different strengths and weaknesses that helped explain how and why they approached the integration of the new CIS differently. It was also apparent in reviewing observations of each of the nurses over time that they exposed different issues which would not have been elucidated if they had been considered solely as a group. With various levels of computer proficiency and different workflow patterns in place prior to implementation, the nurses each revealed points of interest that are important in considering what influenced their individual changes in workflow.

Nurse A

For example, the first vignette about Nurse A not knowing how to type like her sister provided some insight as to why she was uncomfortable having to learn how to type at this point in her life. This issue may also have impacted her willingness to try to do POC charting in her patients' rooms. She strove to be a source of strength and support for her patients and her slowness and insecurity with respect to using the computer system was not the image she wanted to convey. This was an instance where a personal issue may have affected her willingness to try to learn the system and it should be recognized that these issues are not necessarily possible to foresee. However, one thing that might have helped identify this uncomfortable situation would have been to ask, in the initial questionnaire, if the nurses knew how to type, and if so, to rate their typing skills. Those nurses that needed a little help learning to type could have been tutored for a few sessions

allowing them to feel more comfortable prior to having to learn the intricacies of the new CIS as well.

In looking at this from a broader viewpoint, again this situation points out that everybody has personal issues that they carry with them and not all of these can discovered and remedied before a system is put in place. What is important to take away from this example is the idea of trying to address the "big" issues that might hold people back from using the system. By addressing an issue like this ahead of time, the hospital could improve user preparedness, acceptance, and satisfaction with a new system. For this reason, issues like knowing how to type would be important to consider for improvement of future implementations.

Nurse B

Nurse B was by far the most proactive user of the system, yet she had reservations about accepting the system as a good solution to charting on-line. As her vignette demonstrated, she was a very determined individual who was driven to make the system work for her. She tackled and mastered the computer system with ease and her story demonstrated how her workflow evolved, allowing her to practice nursing efficiently. In her case, she made a concerted effort to try POC charting and found that constantly running back and forth to input information into the computer simply did not work. She was proficient and capable enough to do it, but found that it interfered with the practical issues of being a nurse and using her time wisely. By observing and interviewing Nurse

B over time, it became clear why she initially adjusted her workflow pattern and then readjusted it to better accommodate the use of the system within her daily routine.

Nurse C

Nurse C helped bring to light the power and importance of a social network in the nursing environment. Her closest friend was undeniably one of the biggest advocates of the system. This helped encourage Nurse C to try to embrace the system as well. Her friend provided a great resource and sounding board for her when she had questions. This relationship also helped alleviate a lot of guesswork whereas many of the other nurses did not have this advantage. One suggestion from this observation would be to set up some kind of buddy system pairing the less proficient computer users with the more proficient computer users. The idea would be to provide the less proficient computer users with a resource to turn to, in real time, to help them as they encounter questions this will likely work better than calling a stranger. Another option might be to have someone available on-site to answer questions. Preferably, this individual would not be someone of authority but rather a friendly resource to contact providing insight as to how to use the system most effectively.

A second thing to note with respect to Nurse C was that she, like Nurse B, had tried to use the computer system as was specified. She tried to achieve POC charting but found that her routine of doing her shift reports and charting at the same time was more efficient. Nurses have a multitude of tasks that they need to complete throughout the day

and it was apparent that at least for her, doing POC charting disrupted her workflow and routine.

Nurse D

The issue that Nurse D illuminated was how her ability to do her charting was affected by her workload for the day. She demonstrated that having a difficult patient load with a lot of complications directly impacted whether or not some of the goals of implementing the system, like doing POC charting, were achievable. For practical purposes, POC charting was possible for her on calm days, but when things were truly busy with interruptions it was not feasible.

Nurse F

Nurse F provided great insight as to why a person who has gone through a failed system implementation is especially reluctant to try yet another one. Each time she was observed, she would compare the new system to the old system. Although she acknowledged that the new version of HC that was installed at Providence Milwaukie was better than the system that was installed at St. Vincent's ten year earlier, she definitely thought it still needed a lot of improvement.

Looking at these nurses individually helped elucidate how each person's attributes and preconceptions influenced how they adjusted their workflow to the new system and why.

Part 2 – General Unanticipated effects of implementing the CIS

In this section, a discussion of the unanticipated effects of implementing the CIS is given within the broader context of systems implementation. The results tend to fall into three categories: communication issues, technical issues, and what appear to be true changes in workflow. In the following paragraphs, the issues, their potential repercussions and possible solutions (when applicable) will be discussed.

Communication Issues

Many of the issues appear to be a result of a lack of communication and they could be addressed by further training, clarification and increased awareness. For example, further training would be helpful in addressing two of the issues. First, it would be helpful for many of the nurses to relearn how to modify and use the I/O screen effectively. Without more training, the nurses will most likely continue to resort to workarounds, leading to potentially inaccurate data capture. Although it can be difficult to coordinate times for training sessions with busy nursing schedules, in this case, the payoff might be worth the effort of setting up the extra sessions. Second, it would be a relief if the staff nurses did not to have to train the agency nurses how to use HC themselves. Ideally, someone else could take the time to give the agency nurses a short lesson on HC and continue to be available to answer their questions as they arise throughout the day. It is vitally important that hospital facilities keep their staff nurses as happy as possible and their workloads within reason. Otherwise, it is possible that the staff nurses might turn to agency work,

where they could find higher pay as a means to avoid an unpleasant working environment.

Better clarification should be used to make clear where to chart information and this issue should be addressed immediately. Part of the benefit of using a CIS is to allow timely retrieval of information. And, as is the case with the progress notes, without a consensus as to where to chart things, this benefit is lost. Therefore, a channel of communication to relay important changes and clarifications about the system to the end-users should be established. One suggestion might be to incorporate this information into the nurses' daily meetings when they receive their patient assignments. This would also provide an important feedback loop for the nurses, allowing them to follow up on their concerns and clear up any confusion they have about the system. Another option might be to post the new information about the system in the nurses' lounge and have them sign off on it when they had read through the information completely. Whatever the best channel of communication is for the hospital facility and the nurses, it is a good idea to continually update and clarify confusing issues as they arise.

Finally, by increasing awareness, issues such as forgetting to log-out might be addressed. All of the nurses know that they are supposed to log-out of the system to maintain patient confidentiality. However, interruptions occur and the nurses are bound to forget. One option to increase awareness and remind them to log-out might be to post reminders on the computer monitors. This technique was used when the system was implemented to remind the nurses to chart their information at the "correct time" and it appeared to have

worked. Therefore, it might be worthwhile to try this technique as a reminder for this issue as well.

Technical Issues

This section addresses workflow issues that arose as a result of technical issues. Some of these issues have the potential to be resolved easily whereas others might not be able to be corrected until advances in technology occur.

To start with, finding critical information within HC should be facilitated. This would involve making sure that the "significance button," that is already part of HC, is modified to work correctly. This would ensure that important information is visibly noticeable among all of the required fields of information, allowing clinicians to see and act upon it in a timely manner.

The issue relating to possible errors in charting due to nurses pulling charting forward should also be addressed. One way to assess this issue would be to perform chart audits to verify that patient specific information was correct from shift to shift when this feature was used. Hopefully, errors in charting are not taking place. However, if they are occurring because of this feature a couple of options might be considered. First, it might be worthwhile to only let the nurses pull the charting forward section by section. This might encourage the nurses to check over each section individually, providing them and extra chance to be more thorough when they check through the data. If this approach did

not appear to curb the problem of errors being pulled forward, then ultimately this feature could be turned off.

Finally, there are a few technical issues that are more difficult. For example, having to type in one's username and password in order to login to the system is unwieldy. One option the hospital facility might want to consider would be to change the login process from entering a username and password to only entering a password. Other technologies such as voice recognition or fingerprint identification might also be good solutions at a future point.

As far as technical advances go that could be made to HC in future versions, McKesson HBOC might consider creating a "temporary save mode." This mode could be used to accommodate the situation when the nurses are interrupted midway through their assessments. It would provide them with an option similar to what they had with the paper based charting of, "Here is where I left off. Now I can continue without wasting time modifying or redoing any charting."

The final issue that has been placed in the technical category has to do with the difficulty surrounding POC charting. This issue could be placed in any of the categories because it is hard to figure out why the nurses will or will not embrace this mode of entering patient data. However, one problem was that the nurses had to "drag" the computer in and out of patient rooms. One approach to address this issue would be to physically place or mount computer terminals in the patient rooms and assess whether POC charting improved.

True Changes in Workflow

The rest of the issues fall into the category of true workflow changes. It is likely that time will alleviate some of these issues, but others are more complicated and may need attention in the future. Either way, it is important to acknowledge that the nurses felt these issues had changed their workflow and it is worthwhile to be aware that these concerns exist.

An example of one of these issues is the fact that the nurses felt they were processing their patients' information differently. Some people may categorize this issue as just "one of those things" that the nurses need to adapt to, which may indeed be the case. However, it is a good idea to be aware of this issue to make sure important information is not being lost or changed as a result.

Another example of a true change in workflow is that the nurses were not as sure what they had and had not charted. This issue may also resolve itself over time as the nurses become more comfortable with the system and their new routines. However, if the nurses feel that this is a big problem and it continues to escalate, then steps will need to be taken to address this issue.

Part 3- Anticipated effects of implementing the CIS

The nurses recognized many of the same potential benefits of using the system as stated by the hospital. There were a couple of modifications that could have been made to the

original benefits and goals list, which might have improved the concordance between the two. One issue that was apparent in reviewing the goals and benefits as stated by the hospital system was that they should only have presented the goals that would be of interest to the nurses. The best example of an item that the hospital could have left off of the initial goals and benefits list was the "Electronic queries for chart audits." This may in fact be a great benefit for the hospital administrators, but from a nurse's perspective, being audited is not acknowledged as a benefit.

The other suggestion about the goals list would be to present issues that would make a difference from the nurses' perspective as a benefit. For example, "Remote access to physicians" might have been reworded to emphasize the benefit of this feature for the nurses. In this situation the benefit, as stated by the nurses, was that they did not have to send as many faxes or make as many phone calls to the doctors to explain/re-explain patient issues because the doctors could view the information remotely themselves.

Limitations

Two limitations need to be acknowledged as important with respect to this study. First, this study was conducted with only one observer, which introduced the potential for "observer bias" into the study. The concept of observer bias relates to the idea that distortions could have been made by the observer either consciously or unconsciously.[7] The way this issue was addressed was to have the observer write down any potential biases prior to each observation and be "reflexive." As Kelly Devers describes, "researchers must actively consider the effects of their personal characteristics and role in the research setting on the findings (i.e. they must be internally reflexive)."[9] By taking these characteristics into account and being mindful of the potential biases, the hope was that these issues would be avoided in the collection and analysis of the data.

Another potential limitation is that this study was conducted over only four months. This was the chosen period of time to give an initial understanding of changes in workflow. However, it is highly recommended that the hospital facility follow-up on these issues in the future. It is possible that some of these issues may resolve themselves over time, while others may need to be addressed when they are revisited.

Future Research

Future research could include the use of quantitative methods to further solidify areas where improvements in the system and the implementation can be made. For example, in order to assess what issues need to be addressed from the nurse's perspective, a survey could be given to all nurses using the HC. Issues raised in this study would provide a basis for the formulation of the survey questions. The results could then be statistically analyzed to determine which issues are of the greatest concern to the nurses, and which issues they would like addressed first.

From the hospital's perspective, a quantitative study would be ideal to determine how close to point of care the nurses are actually charting. Because this was one of hospital's main objectives in implementing the CIS, this may be the area where they would want to conduct future research. One approach to address this question would be to compare the "actual" time that the nurses chart information to the "back-dated" time when they collected the information. An example of how this works, relates to the fact that Horizon Clinicals allows nurses to enter patient data in the afternoon while "back-dating" it to look like it was entered in the morning (when it was collected). By analyzing the discrepancy in time (entered versus collected) the hospital would have a clearer understanding of how effectively the nurses are doing point of care charting.

Future research beyond this one site might include a cross-sectional survey of nurses using Horizon Clinicals. The focus of the study would be to determine if nurses continue to use more features of the system over time, and if so what features are used most often.

The target population, for whom the results would be generalizable, would be all nurses using Horizon Clinicals. The accessible population, which is the intended study sample population, would include all nurses in the states of Oregon, Washington, and Idaho who are using Horizon Clinicals. This information could be gathered from the vendor, which is McKesson HBOC. The nurses could be grouped into four categories based upon the length of time they had spent using the system. For example, individual nurses might be divided into groups who have used the system: less than six months, between six months and one year, between one year and two years, or more than two years. A Likert Scale could be used to measure how often the nurses used different features within Horizon Clinicals. For example one question might be, "How often do you use the 'pulling charting forward' feature?" The Likert scale responses might be, "never, rarely (<1 / month), sometimes (at least weekly), often (2-4 times / week), and daily." The use of a Likert scale would require the new instrument to be developed and tested to ensure internal consistency and validity behind results generated. The results could then be analyzed to determine what features each group uses most often. Comparisons could also be made across groups to determine if nurses continue to use more features of the software over time. These results could help the vendor understand how nurses use the system, what features nurses use most often and at what point in time. Having access to this information might help them develop and improve upon the current version of the software to better accommodate the nurses, which should be one of their most important goals.

Conclusions

This study successfully demonstrated that the use of a qualitative study design allowed the observer to elucidate unforeseeable workflow issues that arose once a system was in place. By analyzing the observational data on an individual level, this study provided insight as to how and why people vary as they try to incorporate new systems into their daily workflow. On a more global level, this study also identified issues that may need to be addressed in order to help improve the efficiency and practical functionality of the system for the nurses on the Med/Surg floor. Hopefully, the information revealed in this study will be useful to both the hospital facility and the end-users, improving the systems' current functionality and improving future systems implementations as they arise.

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Table 1. Quantitative versus qualitative research comparison (developed by the Royal Windsor Society for Nursing Research)

Quantitative	Qualitative
• Objective	• Subjective
• "Hard" science	• "Soft" science
• Literature review must be done early in study	• Literature review may be done as study progresses or afterward
• Tests theory	• Develops theory
• One reality: focus is concise and narrow	• Multiple realities: focus is complex and broad
• Reduction, control, precision	• Discovery, description, understanding, shared interpretation
• Measurable	• Interpretive
• Mechanistic: parts equal the whole	• Organismic: whole is greater than the parts
• Report statistical analysis. Basic element of analysis is numbers	• Report rich narrative, individual interpretation. Basic element of analysis is words/ideas
• Researcher is separate	• Researcher is part of process
• Subjects	• Participants
• Context free	• Context dependent
• Hypotheses	• Research questions
• Reasoning is logistic & deductive	• Reasoning is dialectic & inductive
• Establishes relationships, causation	• Describes meaning, discovery
• Uses instruments	• Uses communication and observation
• Strives for generalization	• Strives for uniqueness
• Designs: descriptive, correlational, quasi-experimental, experimental	• Designs: phenomenological, grounded theory, ethnographic, historical, philosophical, case study
• Sample size: 30 to 500	• Sample size is not a concern; seeks "information rich" sample
• "Counts the beans"	• Provides information as to "which beans are worth counting"

Source: http://www.kelcom.igs.net/~nhodgins/quant_qual.html

Table 2. Observation times and dates

Pre-implementation Nurse Code	Date 1	Start Time1	Finish Time1	Total Time 1
A	10/22/01	14:00	15:45	1:45
B	10/24/01	14:00	15:10	1:10
C	10/25/01	14:00	15:20	1:20
D	10/26/01	14:00	16:45	2:45
E	10/28/01	14:00	15:40	1:40
				8:40:00

2-mos Post-implementation Nurse Code	Date 2	Start Time 2	Finish Time2	Total Time 2
A	1/16/02	13:30	15:50	2:20
B	1/9/02	13:30	15:00	1:30
C	1/7/02	13:30	16:00	2:30
D	1/8/02	13:30	16:00	2:30
F	1/11/02	13:30	15:00	1:30
				10:20:00

4-mos Post-Implementation Nurse Code	Date 3	Start Time3	Finish Time3	Total Time 3
A	3/6/02	13:00	16:15	3:15
B	3/13/02	13:00	15:40	2:40
C	3/5/02	13:00	16:10	3:10
D	3/4/02	13:00	16:45	3:45
F	3/8/02	13:00	15:50	2:50
				15:40:00

Total Observation Time =	34:40:00

Table 3: Nurses versus hospital goals and benefits

	Nurses	Hospital
Do not have to search for chart to do documentation of assessments, I/O's and vitals	X	X
Remote access to physicians	X	X
One place to view/review: assessments, I/O's, vitals, respiratory therapy, rehabilitation services	X	X
Laboratory, radiology and transcribed reports available to view	X	X
POC charting		X
Legible Documentation		X
Automatic I/O totaling and net amounts		X
Electronic queries for chart audits		X

Appendix A

Nurse A
Pre-implementation

Code	A
Date	10/22/01
Start Time	2:00 pm
Finish Time	3:45 pm
Number of Pts.	4

R	Med/Surg Report
SNS	Satellite Nursing Station
MNS	Main Nursing Station
DS	Diet Sheet

Chronological Observations:
A is filling out her Med/Surg Reports sheets @ SNS. She is filling it out box by box moving down the page sequentially while referencing the pts MAR underneath for information. She notes that these sheets need to be done by about 2:00pm in order for the nurses that are coming on for the evening/night shift have the summary information about the patients and how they have been throughout the day. She takes the patients chart back to the rounder at the MNS where everybody can find/access the chart.
5 to 10minutes

Pt 1
She then goes in to see a patient and help the Physical Therapist move the patient. Helps clean up the patient and then walk him up and down the hall and then back to the patients room. She opens up the closet by the front of the room where the MAR is kept to document that she has put an alarm on the patient. This alarm lets the nurse know when the patient gets out of bed.
5-10 minutes

Pt 2
She checks on the next patient in their room. Then she checks their MAR to make sure all meds have been given. This is what she considers her last sweep to make sure all of the orders for the patient have been fulfilled on her shift.
1minute

Pt.3
Check on the next patient in their room. She checks their IV and then pulls the patients I/O sheet off of the bulletin board and puts it in her pocket.

Pt 4
Checks her last patient. His room is located down the hall and around the corner. All other patients were in a row next to each other.

Go back to the SNS to finish her last Med/Surg Report for pt 4. She uses a DS to keep most all of her notes for each patient. So she prints out an individual diet sheet for each patient and then fill sin the information that she wants to collect on them throughout the day and puts it on this sheet. She uses this sheet in order to fill out her Report on the this patient. She notes that she charted pt 2 at 1:30 b/c that pt was supposed to be going down to radiology for x-rays and she would not have access to the chart at the end of her shift. She also notes that 2 of her patients are also being seen by a Social Worker and so it can be difficult to locate the patients chart because they may have taken it as well. She drops off the Shift Reports at the MNS
It is now 2:40

She pulls a chart and puts it down on the counter. She goes in to check on pt 1 and notes that if there is an Orange sheet above a patients bed, as there is in this case, that this signifies that the patient is being treated by Respiratory Therapy as well. She picks up the chart she pulled and we go to the SNS where she puts it down and she goes off to check on pt.4. She pulls the I/O sheet off the BB and also checks his IV fluids bags to note last I/O numbers for her shift.

Goes to Pt 2 checks MAR and discusses when meds will be given next. Then goes back to the SNS. The Social Worker has taken one of her patients charts and so she can not do her charting for this patient at this time. She pulls out another patients diet sheet from under a chart that is lying on top of them - not her pt- looks over her notes and then calls the Radiology dept. b/c pt 2 has still not gone down for x-rays. This pt was supposed to have x-rays taken at 1:30 and it is now 3:00pm She goes back to pt 2 room and lets her know that she should be going soon.

She comes back to SNS and sits down to do her charting for the day.

Pt 1

She does the Progress notes section first and then enters I/O on the I/O sheet in the chart. She uses the temporary I/O sheet that has been in the patient room all day to transfer the information to the permanent I/O sheet in each pts chart. She takes this chart from the SNS back to the MNS and then pulls her next pts chart from the rounder.

Pt2

We stand at the counter at the MNS and do the rest of the charting

-She starts by graphing the Vitals which are done in red. (She charts with 2 pens in her hands. Red is for Vitals and black or blue is for everything else.

-Next she turns to the I/O sheet and needs to go to the pts room to get the temp I/O sheet off of the BB. She comes back to the MNS to chart the information.

-Fills out the Flowsheet- which is the nurses assessment of the patient

-Fills out the Progress Record and is finished with this patients charting

She puts this chart back on the rounder and pulls the next pts chart

3:20pm

Pt 3

-Fills out the Progress Record

-Charts the vitals (again in red)

-Charts i/o

-charts on the Interdisciplinary plan

-chart on the Flowsheet

and is finished charting this patients information. she puts this chart back on the rounder and pulls her last patients chart

3:40

Pt.4

Again she charts things in the same order as above

-Fills out the Progress Record

-Charts the vitals (again in red)

-Charts i/o

-charts on the Interdisciplinary plan

-chart on the Flowsheet

She is finished charting at 3:45 and is ready to head home.

Summary Observations:

A has been a nurse for 29.5 years with Providence Milwaukee and she worked as a nurse in Minneapolis prior to that. She is an older nurse and definitely has a routine of how she has been doing things for along time. She has relayed that fact that she is not comfortable with computers to me many times and states that she thinks she should be spending her time with her patients and not with computers. She is very patient focused.

She has her special way of taking notes as do all nurses. In her case she uses the diet sheets to write down all of her observations about each of her patients throughout the day. At the end of the day she tends to keep this sheet as well as the temp I/O sheet and the patients Vitals sheet on her clipboard so that if an issue about how or when she gave patient care arises she can reference these sheets within the next couple of days. After a few days she discards these sheets.

Impression:
She admitted that she does not think that using the computer will be easy for her. I would imagine that she will have a difficult time and that entering her patient information into the computer will by a very time consuming task for her. She stated that in her computer class it was very distracting b/c there was somebody there that kept skipping ahead in the lesson and it was very confusing to look over and see that the other persons screen was different that hers. She repeated many times that the computer was very confusing for her. She had sat down and tried to do any of the test cases that they were given to do as homework prior to go-live....which was not surprising. It is apparent that she is reluctant to try and start trying to understand how the computer is going to be used.

10/26/01
I talked with her again 5 days after I shadowed her and she still had not found the time to sit down and try to figure out how to use the computer....Once again it is not surprising that she has not tried to tackle it. I would expect the learning HC will be a difficult process for her.

Nurse A
2 months Post-implementation

Code	A
Date	1/16/02
Start Time	1:30pm
Finish Time	3:50
Number of Pts	3

Chronological Observations:
She has one patient that is heading off to get a CT scan. It was supposed to have been done the night before but somehow was missed and it needs to be done before she can go to surgery. Things are a little mixed up when I get there. Her other patient is heading home and she needs to get her ready for D/C i.e. remove her IV and get her meds ready.

1:55
She sits down at the SNSII to write up her Reports for each of the patients. She is not sure if the patient to be D/C will leave prior to the next shift coming on so she will write up the Report for that patient just in case. She tells about each patients situations and also tells me that she has already D/C another patient today and she will need to chart on them later. She situates herself at a make-shift desk and starts to write up the Reports. For the patient going to surgery (pt 1) she works off of scraps of paper that she keeps on her clipboard. She also keeps each of her patients information on the Diet sheet printed out for each patient.

2:10 She is still working on pt. 1. She has all of her paperwork out in front of her so that she can see many pieces of paper at once. She tells me that she mainly has this patients assessment done but still needs to do the I/O's. She logs into the computer to get this patients labs and writes them on the patients diet sheet. She also has information about this patient written on a bandage wrapper which she notes is kind of funny (but as we know it is practical) She puts the relevant information on the Report for this patient and then goes back to the computer.

2:20
She notes that she does not type well which is true. She hen pecks her way through the screens. She also tells me that her father did not have enough money to send both she and her twin sister to classes for typing and since so only her twin sister learned to type. She also notes that she has not spoken to her sister in many many years....She pulls up the patient flowsheet and looks at more labs and vitals information. While she is in the patients chart she decides to go ahead and chart some of the patients information. She does the patients I/O's which she has written on the patients diet sheet. She works slowly and carefully through the screens. She then checks the IV admin info...She enters the appropriate data and then puts a note in the annotation box.
2:25
She stops midway through to talk to the Physical Therapist about the patient she D/C earlier. Apparently she let the patient leave with the hospital walker and it was not supposed to have gone to the nursing home with the patient which the Physical Therapist says he will try to retrieve.

2:30
She is not sure whether or not to do Report for the patient that will be leaving shortly so she logs out of the computer and goes down the hall to talk with the patient and finds out when she will be heading home. After talking to the patient she decides to write up a Report.

2:35
She wants to check with Social Services to see if this patient will qualify for a special fund the nurses have set aside for patients who can not afford their medications. She goes to the SS office near the MNS to figure out the funding procedure but this SS officer is new and needs time to figure it out. She goes to the rounder and pulls the patients chart and takes it in to the SS officer. She comes back to the SNSII and starts to fill

out Report when the patient steps into the hall and yells down to her that her daughter is here and she is ready to go home. She goes down the hall and tells her to hang in there for a minute to see if she can get her medications covered in coordination with the help of the SS worker. She comes back to SNSII and continues to fill out the Report for this patient in case she is still here when the next shift comes on. She stills fills out her report sheet with both a red and a black pen which I have not noticed the other nurses still doing.

2:40 she takes both of her reports up to the MNS and puts them in the book.

2:45 she spends time prepping the room for the patient that is coming back from surgery. She social worker finds here in this patients room and tells her that her medications have been covered, she gives her the paperwork. She stops at the MNS to talk with the Dietitian about her patient that has gone to surgery and then goes to Pyxis to get the meds for the patient that is being D/C. She takes the meds to her and tells her to get ready to go home.

2:53
SNSII She logs on to the computer to do her charting for the patient that is in surgery. She open the assessment portion and fills out the nutritional information and puts a note in the annotation box after having spoken with the Dietitian.

She is not the fastest typist but she gets it done.
She saves the assessment and then realizes there was a better spot to enter the dietitian information so she correct herself and puts it in the right spot.

3:00 She tears down the patients chart that she d/C earlier today. She runs across a note that stated that the pt was on a blood thinner while in the hospital but was not sure if the patient was supposed to continue the medication once they were D/C. She spends time calling the patients doctors to clarify the note. As she is waiting to talk with the doctor she find another small note that states that the medication was supposed to be D/C once they left the hospital. However, this shows that it is unclear when the information is in the paper chart or if the orders have actually been entered in the computer. She finishes the chart out by filling out the Interdisciplinary Plan which takes about 5 minutes

3:07
She tells me a story and then goes to the MNS to put the empty chart back in the rounder. She also calls the pharmacy to check on the meds order to be filled for the patient being D/C. She tells the patient it will be about 15 more minutes. She get this patients chart from the rounder and goes back to the SNSII

3:15
She logs into the computer and starts to do her charting on the current D/C patient. She changes the time and then does the I/O information working off of the I/O worksheet which she has on her clipboard for this patient. She leaves the computer logged in to go down the hall and ask the patient if she has had a BM. She returns and inputs the information. Next she does the patients I/V admin. She is not sure where to find all of the information for this screen and decides to put a note in the annotation box.

3:20-3:40
She changes the time again to fill in the information for the morning assessment of this patient. She tells me that a lot of the checkboxes for this part are not where she would expect them. She does pretty well but has trouble double clicking fast enough to open some of the screens. She needs to work on clicking faster. She does some double-charting because she is not sure where to find the checkboxes so she puts her notes in the nursing notes but when she runs across the checkboxes she checks them as well. She is not using any notes she is just going by memory.

3:35-3:40
She is interrupted by the evening nurse who has some questions for her. She takes time to explain the patients situation and is interrupted about ¾ of the way through this patients assessment.

She turns back to completing her assessment and just needs to add in some more nursing notes and then she says she is pretty much done. She logs out and stops by her patient to say good-bye. It is now 3:50

Summary Observations:
She is not too keen on the idea of me following her but I persuade her that I will be quiet and not disrupt her work. The funny thing is that she talks to me a lot…She talked nonstop to me about different patients situations for at least a ½ and hour. I would have liked her to just do her work but it is hard to redirect someone if they want to tell you something.

She works very hard to make sure that her patients are well taken care of and that seems to be her priority. She worked very hard to get one of her patients the medications she needed and that she could not afford which was great to see. It took time to get all of the paperwork coordinated and she wanted to make sure that she tried her hardest to do all that she could for that patient.

Impression:
There is no doubt that she is the least advanced at working with and accepting the computerized system but she it doing it. She is definitely not doing POC charting but she is eventually getting the information in there. She still needs to spend some time and just look at the different screens to familiarize herself with where different options appear to alleviate any double charting that may be occurring.

She is a bit fearful of the system and is not enthusiastic to be using it. She noted a few days earlier when I say her that "The computer takes away from the time I could be spending with my patients and that isn't right."

Nurse A
4 months Post-implementation

Code	A
Date	3/6/02
Start Time	1:00pm
Finish Time	3:45pm/4:15pm
Number of Pts	4

Chronological Observations:
She started with all 4 of her patients today with one being D/C at 3:30. She starts by telling me that she is not having a good day…but I slid in beside her and she is okay with me shadowing her.
1:10
We go to Pyxis to get meds for one of her patients. She carries this patients MAR with her and checks off the medication on the MAR once she obtains it. We go back to the patients room where she gives the medication to the patient and locks the MAR in the closet on the room.
1:15-1:20
She goes to the SNSII where she makes notes in the patients paper chart in the Progress notes section. This is done on the IDCP sheet. Obviously the patients paper chart is already sitting down here in this area and once she is done making notes we take the chart up to the MNS.
1:20-1:25
We drop off the chart at the MNS in the rounder and she pulls another one of her patients charts from the rounder to check the meds orders. She checks the medications off with a red pen in the paper chart orders as well as on the MAR for each patient. This is her own system. She also fills out the progress notes for this patient in the IDCP.
Back at SNSII she fill out the D/C papers for Pt 3. She goes in to the patients room to see if Pt 3's ride is coming soon but her is either in the bathroom or out smoking so she decides to go get a wheelchair for him to be taken out of the hospital. She leaves all of her paperwork on her clipboard at SNSII on the counter.
1:30 She comes back with the wheelchair which she leaves outside the patients room and then goes in to check on Pt 4. She gets the I/O's for Pt. 4 which are on the I/O sheet. She comes back to the SNSII and thumbs thru her clipboard of paperwork to find Blank Report sheets.
1:35-1:40
She starts filling out and Epidural sheet. I have never seen anybody fill one of these out but this is one area of documentation that is not computerized.
1:40 She starts to fill out her first Report which she works on for about 3 minutes but she sees one of her patients doctors walk by. She grabs one of her orders from her clipboard and follows him down the hall to get clarification on an order. In this case she could read the order but since she has worked with him for so long she knows that he normally caps the IV vs pulling it in this situation. So she had capped it and wanted to make sure that what she had done was all right. He concurs that what she had done was fine which meant that she would need to change the order in the chart.
1:45 We go up to the MNS to write a new order for this patient. She pulls that chart from the rounder and writes the new order in the chart. She pulls up the yellow tab on the chart to alert the Unit Secretary that there is a new order that needs to be places in the computer system and places the chart in the rack vs the rounder.
Back at the SNSII she pulls out some bandages and tape and sets them on the counter, she then returns to filling out the report that she started earlier.
1:50 She is interrupted by a doctor to note that he has a new order for one of the patients cared for by her buddy nurse who is on lunch. Again she tries to work on the same report she mainly works from memory.
1:55-2:05
Again she is interrupted to go check on one of her buddy nurses patients. The doctor has come to her to show her the new order that he has written and placed in the chart which is to pull this patients IV. She decides to do this for her buddy. She spends the next ten minutes taking care of this other patient, getting them ice, pulling the IV etc.

2:05 Back to treating her own patients . Pt 2 needs to have his meds for his back administered at 2:00. She checks his MAR and prepares and gives him his meds.
2:07-2:10 She checks on one of her other patients to get their I/O's and takes their food tray up to the MNS.
2:10-2:15 She comes back to finish up the same Report. She pulls up the patient on HC to get their labs which she notes on her report. Finally she is done with this report.
2:20-2:25 She starts working on Report 2. She works mainly off of the dietary sheet to fill it out. She almost finishes it but it interrupted when her D/C patients ride comes to pick him up.
2:25-2:35 She gets him all ready to go and wheels him out of the hospital herself because they are short on CNA's and she thinks it is just as easy to do it herself vs. waiting for someone to take him out.
2:35 She picks up where she left off with Report 2 and finishes it in about 1 minute.
2:37-2:45 Report 3 Again she uses the diet sheet to fill out the Report. She pulls out the copies of the orders and refers to them as she goes. She also pulls up the pt on HC to look up their labs. She is done with Report 3.**She leaves the computer logged in**
She takes the Reports up to the MNS and puts them in the white binder on the counter and then returns to her patients care.
2:45-2:55 she makes one of her patients beds. She goes to the D/C patients room to get and extra sheet and while she is there she checks the meds closet to make sure that there are not any left over meds. She also grabs this patients MAR and tosses it on her clipboard as she walks by to go back to making the bed.
2:55-3:00 She gets drinks for her Hysterectomy patient
3:00-3:10 **She starts charting**. She has all of her I/O sheets for all of her patients in one hand and she stands at one of the RF terminals as she charts. She starts with the Nutritional Assessment for her first patient. She keeps this information on the I/O sheet for this patient. She continues to fill out some other pieces of the assessment that she had not charted on earlier. But the biggest surprise was that she had done most of her charting earlier in the day at about 11:30. She inputs the I/O information and she is done.
Pt. 2 She had also charted most everything on the D/C patient earlier in the day so she did not have to chart on him now.
3:10-3:20 Pt. 3. 1)She starts with the Nutritional assessment/ Lunch. And the IV site information. 2) IV admin. which she references her I/O flowsheet. 3) I/O's she pokes around trying to remove some items from the I/O screen that no longer apply. She was a little confused how to actually do this clicking around, but she gets it done. She never understands this portion of the documentation why things work or dont work is a mystery.
3:20-3:27 Pt 4 1) She starts with I/O's and uses the I/O flowsheet as a reference of information. 2) Assessment and IV Admin/ADLS. At this point she tries to open ADLS but cant get it to open. She clicks and clicks and clicks all over this section but it wont open. Honestly I dont know why it wouldn't open either. So she exits out of the assessment, re-enters the assessment and selects ADLS another way ie selecting the charting from the menu bar on top and then pointing to the ADLS section once the drop down menu came up. This seemed to work but once again she was not sure why it worked this way and not the other way. While she entering the data a patient is calling from her from their room. She goes to take care of him **and leaves the computer logged in.**
3:27 She wants to change one of her patients IV's b/c there is only 100LTC and she doesn't like to make the evening shift nurses change the IV as soon as they get on their shift so she changes it for them.
3:30-3:35 she gets and IV bag and talks to the night shift nurse about the transfer of patients to this nurse. Then she comes back to the patients room and hangs the new bag.
3:35-3:40 She has to chart on the new IV in HC
3:40 She grabs the patients paper chart from the MNS rounder and charts some more things in the Progress notes
3:45- She pulls her D/C patients chart from the rounder and tears the chart down.
3:50-4:15At this point she is basically done with her charting but she needs to add one more thing to the Epidural sheet that she started earlier. She is working a bit slower now b/c the night shift nurses are on and she can take her time. Unfortunately she makes a mistake on this rather complicated Epidural form and so she spends then next 20 minutes redoing the entire form.

Summary Observations:
She notes the following things:

- It can be difficult to remember to go back in and chart on lunch and pain after doing her main charting earlier in the day
- The I/O interface is the most difficult screen to work with and the most difficult to understand why things are working or not working
- She says she has questions about why things work sometimes but generally everybody is too busy to ask and so she does workarounds to get things done
- She thinks that orders are being missed more often b/c the nurses do not need to be looking at the paper chart as much and right now with the split system of partially paper-based/partially computer based there is not as much continuity in this process.
- It is not clear what should still be charted in the Progress Notes of the paper based chart. This is the same issue that was brought up by D earlier in the week. D and many of the other nurses would prefer to have it all in the computer whereas Nurse A is still much more likely to write things in the paper chart
- She is getting used to the computer system but she says she feels there is something missing in the nursing care now…like there is a gap or a disconnected feeling that she has with her patients that wasn't there prior to the implementation of this system.
- She tells me the story of one doctor who came up to her and asked her how she was doing with the computer system. She explained that the doctors were taught HC in the hall and for those who might have needed some extra help it was not a good situation b/c it would have been embarrassing for them to be taught in the hall for so long. This particular doctor asked her if she would be willing to help him out in understanding where he could find the information he was looking for.

Impression:
She has done a great job at adapting to the new system She is much much faster at entering data into the computer as compared to last time. She is the first one I have see that has actually already done most of her charting by the time I get there. She still hen pecks her way through typing but she gets the job done.

This was a somewhat busy day but nothing like what C & D had earlier in the week.

Nurse B
Pre-implementation

Code	B
Date	10/24/01
Start Time	2:00pm
Finish Time	3:10
Number of Pts	2

Chronological Observations:
2:00 She is doing her charting at the main nurses station
Pt.1
-She is entering I/O information which she is copying from a personal sheet that she uses
-Next she does the Vitals Graphics again she uses 2 pens at the same time
-Finally she does the Flowsheet
She is done by 2:05

She spends the next the next 40 minutes working on the computer to run through one of the practice cases that they were given in order to learn how to use HC. She already done this case the previous day but all of her work had disappeared and could not be retrieved so she sat down to do it again. All of her other work was completed and both of her patients were sleeping at this time so it was an ideal time to spend on the computer.

2:45 She checks on Pt 1
Goes into patients room and gives her an injection.
Opens up the closet at the front of the room to note the meds injected on the meds sheet.
Patient requests mouthwash so we go all over looking for mouthwash and after 10 minutes are told that the hospital has stopped ordering mouthwash
2:55 Checks on Pt 2
This patient is in isolation down the hall so she puts on protective gear and goes into his room
Gathers information about I/O
changes the patients IV fluids
gives and injection
Takes the I/O sheet and the Vitals sheet form the room
we go to the MNS to do the charting on this patient

3:00 Sit down at the MNS and do charting for Pt 2.
-Enters the I/O information referencing the Temp I/O sheet from the pts room
-Fills out the Flowsheet
-Enters the Vitals
She is done with this chart by 3:10. It is apparent that she had most everything done earlier

She goes down to check on pt 1 again and finds the patient sleeping. She is set to go home on time at 3:30

Summary Observations:
She is a young nurse with a lot of energy. In her case this day was light b/c 2 of her patients had been discharged earlier that day so her work at the end of the day was very light.

Impression:
After watching her work on the computer it is apparent that she is computer savvy and will probably not have much trouble entering her pts information into the computer. She seemed to have a positive attitude about the computer and was definitely making and effort to learn about it before they go live

Nurse B
2 months Post-implementation

Code	B
Date	1/9/02
Start Time	1:30pm
Finish Time	3:00
Number of Pts	2

Chronological Observations:
She has 2 patients left by the time I get there. She has discharged 2 patients and admitted one and one she had the previous day. By the time I get there she is mostly done with her "Report" she says that she tries to get them done by 12:00. This is a lot earlier than the other nurses I have talked to. She is also done with both of her patients assessments by 2:00. She says that she always fills in the required fields of the a patients assessment by 8:00am and then just fills in other notes throughout the day.
2:00-2:10
She gets up to help a patient back to bed after they have finished their meal.
2:10
She goes into both patients rooms to get their I/O information. She likes to have the I/O worksheet in on the BB in the patients room. If the CNA charts any I/O information on the patient she like them to write it on the worksheet and then cross it off so she knows that it has been charted. After she collects the I/O info from each patient she comes directly out to the SNSII and sits down to chart the info. NO she does not take the computer in the room , but it is pretty close to POC charting. She also does each patients afternoon nutrition assessment while she is in each patients chart.
2:20
She is interrupted while charting b/c her patient is disoriented and wants to go home. He is attempting to stand up, which he is not supposed to be doing. She races into his room to get him back to bed and calm him down. She also ends up leaving the computer terminal logged on and in that patients chart.

She is basically done and is asking other nurses if they need any help.

2:45 she goes to the MNS to tear down her D/C patients charts for the day. She fills out and Interdisciplinary Plan for one of the D/C patients (this is a paper form) and pulls all of the papers together to be sent to Medical Records. She is finished with everything she can think of

3:20
She has to hang a new IV bag for a patient which requires her to log all of the IV admin info into that patients chart. This takes logging into the assessment at one time to note that the IV bag has ended. Than you have to log in one minute later to note that she has hung the next bag. There is no way to chart this transaction all at once. She is formally done for the day at 3:25

Summary Observations:
This was an exceptionally light day for her but she is also and incredibly fast and organized person. She has no problem with the computer and is probably the most proficient nurse I have seen to use the system. She is willing to sit down and think about how she can make her work easier and faster with the computer. Even so she is not necessarily an advocate.

Nurse B
4 months Post-implementation

Code	B
Date	3/13/02
Start Time	1:10
Finish Time	3:40
Number of Pts.	4

Chronological Observations:
When I arrive she is finishing up her Reports. She has three to do but 2 of her patients are being D/C so she is not doing report for them. She finishes all of her reports by 1:30. We talk for a little while
1:35 opens up HC to do some charting
1:35-1:37 Pt1 nursing notes
1:37-1:40 Pt 2 charts ADLS
1:40 She looks up Pt 3 and Pt 4 to see if the CNA has charted baths for these patients. They already had done so.
1:40-1:45 She goes in to care for Pt 1
1:45-155 She goes to MNS where she finds a new order for Pt 2. She has the D/C record, and MAR at the counter. She calls this patients Dr. to find out what the D/C patients orders are, she writes them down in this patients paper chart and asks the Unit Secretary to fax the orders to the "Healing Place" where this patient is going for their rehab therapy.
2:00-2:20
She goes to the D/C patients room to give the final medications and to relay the D/C orders for rehab therapy to the patient. She is in this room for quite some time b/c the patient does not speak English very well and they do not want to take the antibiotic medication.
2:20-2:30 she takes care of pt 3. While looking over the MAR she talks with the patients wife about the patients care and medications.
2:30-2:35 She needs to go get a wheelchair for Pt 4
She check in on Pt 1 to see if they have made the appointment for rehab therapy as the Dr. had ordered
She takes care of her patients basically until 3:00. During this time she has collected all of her patients I/O sheets and has put them in her pocket.
3:00 She sits down at the SNSI to do each patients I/O's. She logs into HC but glances down and see that she has not turned in her Reports. She **leaves the computer logged in** and takes her reports up to MNS. She takes her reports up to the MNS and turns in the antibiotic that her patient refused to take.
3:03- She comes back to SNS and starts charting for Pt 1:

- lunch ~ 30 seconds
- I/O's ~30 seconds
- IV site here she finds that the person who charted before her must have made a mistake, this person did not have a IV at 7am when she started - she can figure out who it was but she can not do anything to change the information b/c it is not her charting. A nurse can only make modifications to their own charting.

3:10-3:15 D/C pt 2 This patient was D/C at 2:15 but she charts Lunch, I/O's and Nursing notes for this patient now, an hour after the patient has left the hospital.
3:15-3:20 Pt 3 She does Lunch, and I/O's
3:20-3:25 Pt 4 She does IV Admin, I/O's and then the nutritional assessment i.e. lunch
After she is done entering the I/O information she throws away the I/O sheets.
3:30-3:40
She pulls all of her paper charts and fills out the care plans for each of her pts at the MNS. She also tears down the 2 charts of the D/C patients at the MNS and is done by 3:40

Summary Observations:
The order in which she does things when she comes on is:

- she gets her patient assignment,

- she checks each patients orders in the chart,
- she checks on each of her patients
- then she does the patients assessments by 8:00 am
- the only things left are the patients I/O's, Nutritional assessment, and any other issues throughout the day

She thinks that orders have been missed for a while. But she does admit that she does not look at the paper chart at the end of the day. What she tries to do is be aware of when one of her patients Dr.'s is around and then she will make sure to check the patients chart to see if they have entered a new order for her to see.

She says that the worst part of the computer system is having to log in and log out.

A Dr. walks through the hallway with all of his patients paper charts on a rack. He leaves the cart outside of each patients room and pulls the paper chart for the appropriate patient as he enters each room. I had not seen this technique but it is apparent that he relies heavily on each patients paper chart.

Nurse A is doing her charting at 1:35. She does not pull any of the previous nurses charting forward. She says she tried it but some of the screen would lock up and she could not change the information so it was just easier for her to start from scratch and know that she was charting what she wanted correctly.

- She also notes that the vitals are no longer posted in the patients rooms, she thinks it would still be helpful if the vitals were still posted on the white-boards for ease of care…ie it is much easier to glance up at the white-board while you are in the room vs. logging into the computer to check on things.
- She also makes an actual copy of the piece of paper that the physicians write orders on vs. using the carbon copy of the orders…she notes that they are all that much more clear to read from the primary order vs trying to read the carbon copy
- She **leaves the computer logged in** when she goes to turn in her Reports

Impression:

When opening up her present that I gave her the twine holding it together were pretty tight. Most of the other nurses had cut the twine but nurse B sat there working and working to get the twine undone. She liked the iridescent paper that it was wrapped in and so she worked to preserve it. As she worked she said, "you know me, give me a challenge and I will get it."' This is pretty much symbolic of the way in which she approached the computer…she was going to figure it out and not let it be an obstacle for her. This was seen in how she was working to figure it out in the first session that I was with her and this mentality persisted straight on through my observation periods with her.

She works 3 days/wk on the med/surg floor and 1 day/wk in the ICU. She notes that in the ICU they are supposed to chart on each patient once/hour and logging in and out is the worst part of this new system. Initially she said that she tried to do more of her charting at POC but has found that it "doesn't really matter" and it is easier to do her afternoon charting all at once. For example she used to do the lunch assessment earlier in the afternoon and then do the I/O's last but she says it is so much easier to just sit down and do it all at once that it isn't worth it to sit down and enter things in the computer at 2 different times. She like to have block of time to work with her patients vs being interrupted to enter things in the computer at 2 different times.

Nurse C
Pre-implementation

Code	C
Date	10/25/01
Start Time	2:00pm
Finish Time	3:20pm
Number of Pts	4

Chronological Observations:
I find C at the SNS doing some charting for a patient. She notes that she has done most of this patients assessment earlier but has just now sat down to actually chart the information.

Pt 1
She starts charting I/O information and then moves on to the Flowsheet. When she is charting she like to pull the Flowsheet out of the chart so that she can unfold it and work on it outside the confines of the binder. She like to fill out her Med/Surg Report for the day at the same time that she is doing her charting. Currently she has 2 out of 4 patients Reports done and is working on the third pts. So she has the Report sheet out the Flowsheet out as well as the temp I/O and Vitals sheets out in front of her. She is using all of these sheet simultaneously to aggregate the information and transfer it from one sheet to another.

The Physical Therapist walks by with a patient and gives her an update on one of her patients vitals which she then needs to stop charting and find the appropriate pts vitals sheet and write it down before she forgets.

She has three of her patients charts piled on top of the FAX machine next to her. At this point another nurse needs to use the FAX machine so the charts are moved to the desk behind her.

Pt 1 charting cont.
She moves her chair over to the computer and uses the STAR system to look up lab information on her pt off of the computer
-She transfers this information to the Med/Surg Report on this patient and notes that she only writes down any abnormal lab values for each of her patients on the Report

Pt2
Still sitting at the SNS
-She starts charting with the Vitals
-Next she does the Flowsheet
again she takes this out of the actual chart and spreads it out on the desk. She works her way methodically down the boxes of the assessment
-While she is doing this she is also entering the pertinent information on the Report
-She finishes and puts the papers in a pile on the side

Pt 3
She starts filling out the Report and then also starts charting at the same time
Again she pulls up this patients labs from the computer which she puts on the Report but does not transfer lab values to the pts chart.
She needs to get information about the patient from the patients room so she goes to the room and comes back with the temp I/O sheet and the Vitals sheet that are kept on the BB
She comes back to the SNS and charts this information

Now she starts going through the pile of paperwork that she has put in the corner. She find the Standards of Care sheet for each patient and puts it with each corresponding pts Report. After piling them together she reads through each SOC bullet and makes sure that she has noted that she has checked those items on the pts Report. In this pile of paperwork she find a Flowsheet from one of the charts and she now needs to find that chart so that it can be put away. Now that she has checked the SOC with the Report she now separates

the 2 forms into 2 piles b/c that is the way they are passed along to the next shift of nurses. She picks up each pile and takes them to the MNS where she files them in the Folder for the next shift.

2:30 Now she goes in to check on Pt 1
She pulls the I/O sheet off of the BB, records the I/O numbers from the machine at the bedside and clears the machine.
We go to the MNS and enter this data on the corresponding pts Report
We go get a new IV bag and go back to the pts room where she replaces the IV fluids bag
It is now 2:40 and she takes the time to explain to the patient what the numbers of his vital signs mean

As we leave the room she consults with the Dietitian in the hall about the pts eating

2:50 We check on pt 2
She writes I/O information on the temp I/O sheet which she has pulled out of her pocket.

We check on pt 3
pt requests anti-nausea meds which the nurse goes down the hall to get and returns.
She draws up the meds at the SNS- find the right meds sheet out of the pile of papers that she has stacked in the corner and goes into the pts room to give the injection
She notes the medication given and puts the meds sheet in the cabinet by the door in the patients room

Now that she has visited all of her patients one last time she can enter her final I/O information in each of their charts. She then draws a line through their temp I/O sheet to remind her that the information is entered and then she throws the temp I/O sheet away.

She gets interrupted by another nurse asking her if she can go look at an epidural pump. She goes to the pts room and checks the pump and returns to the SNS

Back at the SNS she starts to clean up her pile of papers. It can be noted that the three charts she has been working on of and off have been sitting at the SNS the entire time. Her 4th pt comes to the SNS and gives her a little piece of paper with personal information on it that needs to go in his chart. She puts this piece of paper on her clipboard. Now that she is completely done charting the first three pts she takes all three charts up to the MNS and puts them in the rounder.

Now she picks up the 4th pts charts and returns to the SNS. She punches a hole in the piece of paper that the patient gave her and puts it in the chart. She goes thru the last bit of her papers and comes across this pts MAR which she needs to return to his room and put in the closet by the front door. She returns to the SNS and cleans up the last of her papers and is completely finished by 3:20

Summary Observations:
She likes to work at the SNS and is a pretty sedentary individual. She piles her papers up and sifts through them a lot. Shy has a system that does not look very organized and yet she gets everything done and seems to find everything just fine.

She keeps her papers together with on a clipboard. This clipboard is generally found somewhere at the SNS and she just piles her other pieces of paper on top in a pile and will sort through them when she needs to find something. and uses 1 sheet of paper to keep all of her patients information that she has collected during the day. So on this day she has one sheet of paper with 4 names across the top and the assessment categories down the side. It is interesting b/c this sheet is very confusing with a lot of background noise of boxes and lines but it doesn't seem to bother her. I had a hard time reading anything on this page but to her it was crystal clear. She also has a technique of writing the information she collects on the patient in the morning in black and then she uses red ink for the information she collects later in the day

She also throws away the temporary sheets of information about each of patients at the end of each day as opposed to keeping them for any reason. She notes that this is maintains pt confidentiality and the

information should be in the chart if it is really important so there should be no reason for her to hang on to it

Impression:
She is the only nurse that I had observed that used the computer to retrieve any patient information. In her case she looks up each of her patients lab values using the STAR system. In this sense it was encouraging to see her accessing the computer. On the other hand she is not necessarily the most organized person and she seems to like looking through all of her papers to make sure she has all of the patients information entered. It may be tough for her to figure out a new routine for a while but I think she will figure out a new system of entering the data and maybe it will help her become more organized.

Nurse C
2 months Post-implementation

Code	C
Date	1/7/02
Start Time	1:30pm
Finish Time	4:00pm
Number of Pts.	4

Chronological Observations:
When I arrive C is on her lunch break from 1:30 - until 1:50. So we take that time to discuss how things have been going which I describe below. As she goes back out on the floor she gets call as she passes the MNS. She has requested a Nicotine patch for a homeless patient because this patient is in isolation and cant go out and smoke. The doctor is calling to approve the order which she writes on a sticky note. She then goes to the front desk to get an Order Sheet, she stamps the sheet with the patients id card information. She then looks on the chart rounder for this patients chart and then sits down at the MNS to fill the order and put it in the chart. Once this is completed she puts the chart back in the rounder.
2:00
We go to the SNS (which is where she generally works) to work on a patient of hers that is going to be D/C at 3:30. There is some confusion about this patient because he still has a catheter in and there are no wound care instructions. She calls the patients primary doctor who is out of the office so she asks to have him call if and when he gets in.
2:05
She decides to work on "Report" for each of her patients in the meantime. She uses her own personal sheet to gather information about the each of her patients throughout the day, and uses this to transfer the information to each patients "Report" sheet. It takes her about 5 minutes per patient to do report ie 2:05 - 2:10 for pt 1, 2:10-2:15 for pt 2

2:15-2:30
At this point the social worker that is charge of D/C arrangements for the third patient comes by to get some clarification about the D/C orders. It appears from one of the patients doctors that they want the patient to go home but the patients other doctor has not given the formal order. At this point, she call the other doctor to try and get the D/C order and wound care orders. She finally gets the orders and writes them down on her personal data sheet. Since she has this patients chart with her she can now fill in the Interdisciplinary Sheet with the D/C information.

2:30
She takes the chart to the MNS and goes to the social worker where the Interdisciplinary Form is copied and the patient should be set for D/C. She then goes to this patients room to explain the order to the patient. She also needs to provide care to the patient which takes about 15minutes

2:45
She now wants to finish up her afternoon I/O's. She goes into each patients room to collect the information. The data is left on the I/O worksheet in the patients room on the BB. She goes into each of her 4 patients rooms to get the info. and it takes her about 10 minutes total to complete this. She then sits down at the computer to input the information.

2:55
Pt 1- Logs in, selects patient and goes to the I/O screen, fills in the information and moves on to the assessment. She has already completed the patients assessment earlier in the day and now works on filling in the Nutrition information and IV information. She saves this information with a time stamp of 11:30 am, for when the readings were done, and then goes back in to do something else in the assessment. She puts a nursing note about the patient in the nursing notes sections saves this for the current time and then moves on to the next patient.

Pt 2 - She selects patient 2 and starts by entering the I/O information. After doing so she realizes that she mixed things up and needs to modify the input values. She tries to figure out how to modify or undo her mistake. Her method of figuring it out is to click on everything on the screen until she can get what she needs to fix to change. The computer dings every time you click in the wrong spot so she just sits there clicking and dinging around until she finds the right screen. There is no particular rhyme or reason to how she gets this done but eventually she figures it out. She references the I/O worksheet and enters the values. When she tries to save the information the computer wont let her because it says there are duplicate values, she tries changing the time and then it will allow her to save the information.

3:00 Pt 3 she enters this patients I/O and Nutrition assessment quickly. She still has to do one more chart but need to go hang an IV and check in with her patients one last time before her shift is over.

3:05 She comes back to the SNS and tells me that the D/C patients transfer has come early and so she will be gone a while helping to get this patient out the door. Originally this patient was supposed to be transferred after her shift was over but since they came early she is responsible.

I note that she leaves to care for her patients with the computer terminal logged in under her name.

3:30 C is back to do the charting for the last patient which is the D/C patient. She looks in the patient roster and although the patient has probably not left the bldg the patient is already listed with the D/C patients. So she must pull from that list to find the patient. When she looks up the patients name there are three entries with no way to tell which one is the most recent. She selects one of the entries and finds that it is an earlier visit by the patient. Therefore she has to go back in to select another listing. One thing to note is that she uses the arrow to move through the alphabet of people, and since this patients name starts with an S it takes quite a while to find the S's out of all of the D/C patients in the database. After five minutes of searching she is ready to do the patients assessment

3:35
As she goes through doing the assessment she whispers out loud to herself as she works through each section. She saves most of the assessment for one time. This major entry time has taken 10 minutes.
3:45 She goes back into the assessment to add more information about the patient at another time. Finally, she goes into the assessment one last time to write up final nursing notes in the assessment which she saves at the current time. The last step to complete the assessment is to pulls up the Flow-sheet screen to make sure that all of the information has been logged in and saved as she wants it. It is now 3:55.

After that she needs to go the MNS to pull the D/C patients chart and "tear it down." This is the same process as they did prior to Horizon Clinicals where they take all of the accumulated information out the patients chart and send it off the permanent patients medical record which is stored somewhere else. It is now 4:00 and she is finished for the day.

Summary Observations:
She notes that some things have changed. I/O information must now be done before 3:00 so she tries to get the information in the computer between 2:00-2:30. Prior to HC I/O's were done at 3:00. Once I/O's are done her goal is to do Report which still needs to be in the book at 3:00.

When I arrive she notes that she has completed ¾ of her patients assessments prior to lunch which is a big change. She also states that the Doctors are the people that are really struggling with the system. She says that she is asked at least once a week to help a doctor out to find where notes on the patient are and how to find them. This is problem b/c notes can placed in a few spots to it is not consistent nurse to nurse.

Another problem that she notes is that agency nurses are expected to use HC to chart and since they dont know the system it can be taxing for the other nurses to show them everything. She said that one day they had 4 agency nurses which put everybody into overtime and they are not supposed to do that. She says that it just puts extra stress on the other nurses.

She notes that she and the other nurses just have note quite made the leap to do I/O's at POC. Especially when she comes right to the SNS to enter them right after collecting the data. It seems understandable that they do not want to drag a computer in and out of their patients room. Actually, she did not take the computer into any of her patients rooms while I was there. The CNA's take the computers in the patients rooms and enter the vitals POC but not the nurses.

Impression:

She is a very competent nurse with a very upbeat attitude. She is not necessarily a wiz when is comes to computers but she tries very hard to make sure that things are done right. She is not overly curious about computers enough to figure out short cuts but she gets the information in there. She is also the only nurse I have seen that still uses the vitals sheets if she takes the patients vitals. In most cases the CNA enters the vitals into the computer but C likes them to also post them in the room on the BB so that she can see them when she walks in the patients room.

Nurse C
4 months Post-implementation

Code	C
Date	3/5/02
Start Time	1:15pm
Finish Time	4:10
Number of Pts	4

Chronological Observations:
When I get here Nurse C says she has not charted anything. She actually has done some of the work but the majority of the charting is left until later. She has three of the same patients from yesterday and one new admit. She is hot and almost sweaty from running around so much. But basically as soon as I get there she takes her lunch.
1:15-1:50 Lunch
1:50-1:55 When comes out of the break room she goes right over to the MNS to look in her box for new orders that have been placed. These are mainly for the new admit patient. We walk back to SNSI where she grabs the Clinical Admission Data Sheet and takes it into the admit patients room. Today she is just too busy to sit down and fill it out for the patient…she wants the patient to fill out as much as possible and then she will help fill in the rest.
2:00-2:05She comes back to SNSI from the admit pts room and glances up to see another one of her patients sitting in a wheelchair in her room. This patient is supposed to be on bed rest but has been left in a wheelchair after going down for a bone scan to see if she has a fractured pelvis. She puts in a call to the Dr. to confirm the bed rest order. She also goes into Pt 3's room to check on the pt and get the I/O form and comes back to start her charting.
2:05-2:17 **She starts charting** on Pt. 4
She needs to do a full assessment for the patient. She works off of her own personal sheet as she does her charting. A nurse aid calls to her from a patients room to say that "She had 150" C knows exactly what this pertains to and puts this information on that pts I/O form which is in front of her on her clipboard. She save the information that she has charted so far- changes the time and goes back in to put in her nursing notes for this patient. Then she does I/O's, then the Nutritional Assessment, and is done.
2:17-2:25 Pt 2 As she looks as the assessment for this patient she finds that she has done some of the charting for this patient earlier in the day. She adds in the rest of the assessment information onto this previously entered data.
2:25-2:30 She does the I/O's - she adds the I/O's on the I/O form. Then she does the Nutritional Assessment. And then reviews the overall flowsheet for this patient
2:30-2:33 She takes out the MAR for the admit and starts to write in the orders for this patient. She spends time trying to figure out what the Dr. has written on one of the orders. She puts all of the orders on the sheet except that one that she cant read.
She switches gears and finishes up her Report for her patients. She has already finished one of them and needs to complete the 2 more
2:35-2:40 She uses her personal sheet and information from the previous Report sheet to fill it out. As she is doing this she notes that it would be nice if the pertinent information from the computer could be transferred to Report so that she did not have to re-write a lot of the same information all over again
2:40-2:45 Again she uses her PS and information from the previous report to fill out the current Report for this patient.
She still has to complete the I/O's for one of her patients so she goes into their room to collect the I/O form.
2:50-2:53- She logs back in to HC and does the Nutrition Section of the assessment and the I/O's
2:50-3:10 She takes all of the Reports up to the MNS and then goes in to finish up admitting the new patients. This takes quite some time which is normal for a new admit. Now she has to sit down and do the charting for this new patient. Apparently, this patient is in the hospital quite a bit so she and the other nurses know the patient pretty well and she is a very complicated obese individual with a lot of problems.
3:10-3:45 She sits down and logs in to HC to chart on the admit. She is interrupted by Respiratory Therapy to talk about a patient. She works her way through the assessment but there is a lot to chart. She is interrupted at 3:35 to talk about the transfer of patients to the night shift nurses and to give the new nurse

her keys and beeper. She enters I/O info and then looks up the Vitals on HC to put on the Admissions Data Sheet which will be put in the patients paper chart.

During this time she has asked one of the nurses aids to get another nurses aid and to put the bed rest patient to bed. The 2 nurses aids go into the patients room and ask her if she wants to be put into bed- the patient says no- so they tell her that is just fine. C is not pleased that they did not put her to be since that is the Dr.s order and it is not good for her to be sitting with a broken pelvis. She tells the nurses aid that the pt must be put to bed and the nurses aid tells her that the pt does not have a broken pelvis because the "test thingy" that she went down for came back negative. The important point is that the nurses aid is telling nurse C the outcome of a test- Nurse C does not believe that the aid knows what she is talking about and is obviously not pleased that the aid will not do as she asked – she says to me " I am only the nurse, what do I know" So she decides to look up the results of the test on the computer…lo and behold the test has not been read yet so there is no way that the aid could have known what she is talking about. Nurse C talks to the evening nurse and relays the fact that this patient needs to be transferred to bed which is done at 3:40.

Now she goes through and throws out the I/O sheet for the day and goes through the orders to make sure that they all have been filled or noted. She finds that one order for the admit patient that she cant read so she asks three other nurses if they can figure out what it says….nobody can piece it together.
3:50-4:00 She fills out information on the admit patients IDCP, throws some more papers away and then takes everything up to the MNS. She pulls the admit pts chart and puts the ADS and the IDCP into the paper chart. As she is putting the papers in the chart she finds there was an order change for this patient. She tells the night shift nurse to grab this patients MAR and she will change the order on this sheet.
4:00-4:10 She also has to tear down the paper chart for the patient that had been D/C earlier in the day. She does this while she waits for the night shift nurse to bring her the MAR- she changes the order- wraps up the D/C patients paperwork and gives it to the US. She is now officially done.

Summary Observations:
C is an efficient nurse and has a good attitude about the computer. She does has become much more familiar with where things are in the computer and how to look things up. She also has a close friend who is probably one of the biggest advocates of trying to make the computers work. At lunch we talked about the computers a bit the this is what her friend had to say:

- She is more likely to do Care Plans because the computer reminds her that they need to be done- there is discussion in the lunch room about this and many of the nurse wish that is was possible to chart the Care Plan on the computer as well.
- They don't have to hunt for the chart
- They do Pain and Risk assessment more often because it is required on the computer which they think is a good thing
- She says that she doesn't think she puts as much "silly stuff" in the chart
- She also thinks that she charts faster
- None of the nurses take the computers into the patient rooms - it is too impersonal and they are in and out of the rooms so fast that it doesn't make sense for them to drag it in and out of there.
- C-notes that it is easier to do the Risk Assessment and the Braden Scale Assessment on the computer than it was to do it with the paper chart.

Impression:
She has a great attitude and works well with the computer. She has improved quite a bit since the last time I met with her and seems to know how to get things in and out of the computer very well. She felt like today was a bad day and that things had taken her quite a while to get squared away but really I didn't think it was that bad to finish at 4:10 seeing as how she had an admit so late in the day.

She has been working at Providence Milwaukie for 4 years. Prior to that she spent 15 years as the Head nurse for a Care facility in a small town. She said this was a big change. She really like working here because she has good friends/support ne2rk and the working environment is enjoyable.

Nurse D
Pre-implementation

Code	D
Date	10/26/01
Start Time	2:00pm
Finish Time	4:45pm
Number of Pts	5

Chronological Observations:
She is trying to get a head start on her charting for the day , at the MNS, since she is supposed to get and admit and also discharge a patient. She is writing up a couple of verbal meds orders from a patients doctor and placing this sheet in the pts chart. She is interrupted to go and get a bed pan for one of her patients and then returns to the MNS.

Pt.1
She is paged to go help one of her patients and goes to the patients room. There she spends about 15 minutes with the patient trying to get and IV started as well as helping with pts personal issues. She needs to give the patient an injection so she goes and gets the cart and draws the needle in the hall. She is paged right before she re-enters the pats room to go and look at her admit pts blood. She delays this until she has given the injection. While in the room she tries one more time to get the pts IV going but the pt is very dehydrated and again she has difficulty. She goes to the MNS to ask the charge nurse to see if she can get the IV started.
2:40pm

She goes back to the patients room and unlocks the front cabinet where the meds sheet is stored and checks to make sure that all meds have been given and also makes updated notations about the meds she just gave the patient. At this point she is beeped again and after asking the charge nurse and the secretary at the MNS neither one knows what she has been beeped for…

**She has about ten things going at once and is very busy.

Pt 2 the discharge
Now she starts to get her discharge patient ready to go. In the patients room she takes the IV out of the pts arm and works to stop the bleeding (pt is on cumadin so this takes a little while). The Vitals and I/O sheet are already down in the patients room. The patient is ready to go and does not want to wait for the CNA to walk him out so nurse D walks him out of the hospital.
2:50pm

When she gets back she goes to the whiteboard by the MNS and crosses off this patients name so that he is no longer logged as a patient on the floor.

Pt 3 - the admit
She goes down the hall to this patients room and check in on her. The patient is still getting in to her gown so the nurse will come back in a few minutes to get her height and weight. She places the admit papers at the SNS. She takes a minute to go through her pockets and makes sure that she has all of the information she needs and then she heads back into pt.3's room to get the admission process going. When we enter the room the charge nurse is in the room starting the pt's IV.

It is clear at this point that the charge nurse did not understand which of her patients she was having a difficult time getting the IV started for. Nurse D explains that she actually needed her other pt's IV started and not this one.
2:55pm

At this point the nurse starts to do the admission paperwork.

1) She starts with filling out the Valuables checklist which specifies what valuables the patient has when they enter the hospital.

2) Next she fills out the Clinical Admissions Data
   This is a long list of questions (30) and it generally takes quite a while to fill out.
3) The CNA comes in to do the patients vitals
4) She goes through what the procedure will be like for the patient and the expected time line for the surgery

3:20pm

She goes back to the MNS to check the chart for instructions about pt 3's IV. While here a Social worker gives her paperwork on one of her patients. She takes them and puts them on the pile of her papers which have been sitting in the corner at the MNS. She goes and gets the proper IV fluids for the patient and then goes back to the patients room to hook it up. She also checks the patients C-section incision to make sure it has healed well enough for today's surgery (this patient delivered a baby only 3 weeks earlier) She goes to the closet by the door of the patients room to write down I/O information.
3:25pm

She now goes to the SNS to call OB for a breast pump for pt 3 since she will need to pump at soon as she is out of surgery. OB does not have any breast pumps. At this point she is informed that another one of her patients will be D/C and she will need to do the paperwork for her as well. At this point the evening nurses are coming on the floor and so she goes through a verbal run down of her patients with these nurses as they come on duty.

Basically there are 2 problems to be passed along.

1) Pt 2's IV could not be started by herself of the charge nurse and so the evening shift will have to try and get it started
2) Pt 3 just had a baby and will need to find a breast pump for her since she is breast feeding and has to go in for surgery.

Pt 4
3:40pm She is standing at the MNS filling out the Home Transfer Sheet. She uses her notes she has written on the patients SOC to fill out the Transfer Sheet. She reaches in her pocket and pulls out that patients I/O information and fills out the appropriate information on the Transfer sheet. She goes over to the rounder to look for this patients chart but does not find it in the rounder. She finds it on the cart behind the secretary. She sits down and goes through the chart to fill out the missing information for the Transfer Sheet.
3:50pm

Pt 2.
The evening nurse for pt. 2 comes by and asks about the progress on finding a breast pump. Calls distribution to see about a finding a breast pump—they dont answer.

Pt 4.
She goes down the hall to check on her this patient. She needs to get information from her about where her personal possessions are: clothes/dentures ect. She goes back to the MNS to fill out the last information for the Transfer. The Social Worker for this patient gives her the nursing home number so that she can call in a verbal assessment of the patient and let them know she is coming to their facility. She is put on hold for about 5minutes during which she works of filling out information for the patients MAR. Once she gets a hold of the facility they tell her that they have no record of this patient and that she is not their patient. Nurse D must now find the D/C planner/ Social worker for this patient and ask her where the patient is supposed to go. The D/C planner tells her she is very tired and apologizes for giving her the wrong information. She also gives Nurse D the new number which she writes down on her hand. She sits down at the MNS again and calls then number....it is a bogus number and so she looks up the facilities numbers herself. She now dial the facility and gives them the assessment information

4:05pm
She is now handed the chart for the admit pt and is asked to have the patient sign the "Permission" to have the surgery performed. Ideally the evening nurse would have taken over this patient but she is still filling out

the patients paperwork so she is asked to do this as well. She goes to the patients room and gets her to sign it and returns to the MNS. It is 4:15 and she is now ready to do her charting.

Pt 1- the admit

1) she fills out the Interdisciplinary Plan
2) Flowsheet

A nurse sitting next to Nurse D that is taking this patient to Surgery comments that " The procedure (that this patient is having done) is so simple that it will probably take less time than doing all this paperwork."

She finishes the chart and sets it aside. She has three more charts to do.

Pt 2- the transfer

She uses/references the PCP for this patient to transfer the information into this patients chart

1) she fills out the I/O sheet in the chart
2) she fills out the assessment for this patient working her way methodically down the boxes

- she is interrupted by the evening shift nurse who has taken over one of her patients. The evening shift nurse asks her where this patient is b/c she is missing. It turns out the patient was in the bathroom

3) Fills out the Interdisciplinary Plan

4:40pm she finishes and throws out the PCP

Pt 3

1) I/O charting sheet
2) Transfusion Record Sheet

she has already filled out the other paperwork earlier and now she is done with this patient

Pt 4

1) verifies information on the MAR and transfers appropriate information to the patients chart
2) needs to fill out an Interdisciplinary form for this patient. Gets a forma and stamps it with the patients Prov ID card which is kept at the front desk in a rounder. She fill out the form and finally at 4:45 she is finished.

Summary Observations:

She uses each patients Standards of Care (SOC) sheet to write notes on the patient. There is space on the right to write things down and this way she has all of her notes for each patient with their SOC information.

She also keeps information on the Patient Care Plan (PCP) sheet

Impression:

Clearly this was a very chaotic shift and very time consuming. She is an efficient worker and still it took her quite a while to get everything done. I don't think she will have too much trouble or a bad attitude about the new system. She is younger and seems to be willing to go the extra mile to get things done. She is persistent and has a good attitude about things which is a great attribute. A very kind individual.

Nurse D
2 months Post-implementation

Code	D
Date	1/8/02
Start Time	1:30pm
Finish Time	4:00
Number of Pts.	4

Chronological Observations:
When I arrive she has just spent the last 20minutes collecting admission data from a new patient. This is collected in the "Admission Sheet" and will be kept in the paper chart. I meet up with her at the SNS which is where she is nursing today. This new admit is asking for swabs and chapstick which she goes to get near the MNS. She gets those items and goes to pull the patients chart from the rounder at the MNS to go over the patients orders and meds. She goes back to the patients room to give the patient her items and then realizes that she need to get her IV started. She goes to Pyxis to get the IV bag and tubing which is near the MNS and returns to the patients room to hook things up. The CNA actually enters the patients initial vitals in the computer. She does this in the hallways outside the patients room. 2:05
Nurse D goes back to the SNS and calls about another patient to see if the blood that was ordered that morning is ready. In fact the order is just being filled which is surprising to her.
2:10
She sits down at the SNS and works to finish up "Report" for the admit. She transfers the data that she has gathered from the Clinical Admissions Data Sheet to the "Report" form
2:20
She finished all of her "Reports" by 2:20 and takes them up to the MNS and puts them in the book on the counter. She also has the new admits papers in her hand so she pulls this patients chart from the rounder and files the paperwork in the chart. As she is standing there the secretary transfers a call to her from one of her patients relatives to check up on their status.
2:25 She wants to start gathering the patients I/O information
We go back to the SNS and she goes in to this patients room to give them a message and also collect their I/O information. She writes the I/O info down on the I/O Worksheet and tosses it in her clipboard as she leaves their room. She returns to the same room to give the patient a glass of H2O which they promptly spill all over which she then takes time to clean up.

She goes in to her other 2 patients rooms to get the I/o information and tosses the Worksheets on her clipboard at the SNS as she passes through. While she is in each patients room she also checks the meds sheets to make sure that all of the appropriate meds have been given. One of her patients MAR seems incorrect and so she decides to go to yesterdays MAR to see if she can figure out what is missing. It just so happens that she was taking care of the same patient the previous day so she remembers that they are missing Digoxin in their MAR today. After looking at the patients chart at the MNS she determines that indeed the patient is missing a medication. She goes back to the SNS to look up the orders from the STAR system. For some reason the med order was not pulled forward from the previous day which she fixes in the computer. She then writes the order on the MAR in the patients room and then goes to Pyxis to get the medication. She goes back to the patients room and gives them the medication.

3:00She sits down at the SNS to do her charting.
Pt 1- She enters their I/O info and then moves on to filling in the nutrition portion of the patients assessment. Once she is done with the I/O worksheet she tosses it in the trash.
3:05
Pt2-She does the I/O for this patient and puts a note in this section about the patients oral intake. Then she moves on to the Assessment. She starts by putting in a nursing note in the assessment and saves it at one time. Then she goes back in to do the Nutrition part of the assessment and saves it at a different time.

3:10
Pt 3- She finishes up the last of her nutritional assessment and this patients I/O.

3:15-3:30
Last pt. This is the patient that she needs to do the full assessment for. She slowly works her way down each of the headings in the assessment. She is using no notes as she goes through. She pauses on one screen to ask the difference between 2 of the choices in the assessment... i.e. the difference between 2 checkbox choices. She accidentally hit save while midway through her assessment and was worried that some of the information that she had entered might not be right and she hadn't wanted to save it but it was all okay. She carefully looks over everything that is saved and then calls it good.

As she at the SNS for some reason she wants to go back in and check on one of the patients I/O information. She had a feeling that something wasn't entered right., sure enough she had only entered 400mg for oral intake and it was supposed to be 600mg. She confirms this by pulling up the patients chart and also pulling the I/O sheet out of the trash. She tries to modify the information but it wont allow her to change it. She asks another nurse to help her out but the other nurse says that once the next shift comes on she does not know how to modify old entries. As a workaround instead of fixing the incorrect entry she just adds 200mg more to the patients I/O oral intake one minute prior to the other entry. As she notes, " I would have no idea how to fix this if I was 200mg over." After all of this fussing around it is about 4:00 before she is done.

Summary Observations:
She makes her individual patient notes on PCP sheet which is the patient care profile which is printed out for each patient.

By the time I arrive (1:30) she has already completed her Reports for her patients and the 4th one she has just admitted so she will finish that up shortly

She has completed the main part of three of her patients assessments by 12:00. The only full assessment that she needed to do was for the admitted patient that she received midway through her shift.

Impression:
She is a well organized nurse. It was not a particularly busy day but with 4 patients it is never a light load, anything can happen in the last ½ hour. She is a bit unsure about some aspects of the computer. She is not one to madly keep clicking on things until something works rather she sits and looks at each screen to see if there is something that she missed or to see if there is something that might work to get the "task" done. She is willing to ask others but is a little shy so I am sure she doesn't do it too often…she is more of an observer than an aggressive learner.

Nurse D
4 months Post-implementation

Code	D
Date	3/4/02
Start Time	1:00pm
Finish Time	4:45pm
Number of Pts	4 pts

Chronological Observations:
When I arrive she it printing out a copy of one her patients MAR. She verifies the MAR against the copies of the actual orders for that patient. She takes this MAR to the patients room and coordinates with her " buddy" to keep and eye/ear out for her patients while she takes her break for lunch.
1:10-1:45 Lunch
1:45 She goes into the meds room and gets meds and IV fluids for the patient she had worked with prior to lunch. She drops them off outside this patients room since he is down having an X-Ray taken.
1:50-2:00 She gives IV meds to pt 2. She spends time taking care of the patient. She uses the MAR to write on and check things off once given. She goes down to Pyxis to get the meds and then returns to the patients room to give them. She puts the MAR back in the closet and locks it up
2:00-2:05 - She checks the MAR for pt 3. She then gets the medication/needles etc. and give pt 3 the injection. She checks with the CNA to get the I/O information for this patient. The CNA had put the information in the computer but nurse D would like it noted on the I/O form as well.
Next she needs to find the patients chart to find out what this patient was wearing when she came. This patient is being transferred to a nursing home and she needs to make sure that she has all of her belongings when she leaves.
2:10 She works at the MNS to fill out the Nursing Home Transfer Sheet(NHTS). She logs on to HC to look up I/O information and puts it on the NHTS. She finishes writing this up and turns it in to the US.
She check on pt 1 and notes something on the SOC sheet which she uses as her PS
2:15 She stops to talk to another nurse about the disorientation of one of her patients. This is the difficult patient. She goes into his room to give him his meds. She is not sure what medication he is on so she checks the MAR.
2:20 She then wants to check the flowmax for a HTN drug so she looks in a drug reference book. She then calls to verify information. She is put on hold but finally she is given the information which she writes on her hand. She grabs a shift Report sheet to fill out as she walks back to this patients room. She puts the MAR back in the closet. She gets the patients I/O information and writes it on a paper towel. She washes her hands and puts the paper towel on her clipboard at the MNS.
2:30- 2:35 The EMT's are here to transfer her patients to the nursing home. She grabs her clipboard and runs through D/C information with them.
2:35-2:50 She goes back into the difficult patients room to attach the antibiotic to the IV bag. She is in his room for a very long time. She is visibly flustered b/c she needs to restart the IV. She notes she is very behind and every time she goes in this patients room there is something wrong and the patients brother has been difficult to deal with all day. She asks another nurse if she is caught up and if so could she go in and restart the IV….this nurse is behind as well but she goes into the ICU and gets one of their nurses to come in and help.
She sits down to do her Reports which are not yet done
2:50-2:53 Report 1- She works off of her PS and also goes to the rounder to look up some information about the patient in the patients paper chart.
2:53-2:55 Report 2 - She uses the previous report and her PS to fill out the information
2:55-3:00 Report 3- this is the admit patient so she uses the ADS to fill out report and does the rest from memory. She makes copies of her Reports before she hands them in and then takes them into the evening shift nurses who are already reviewing their patients.
During this time the ICU nurse has come over to try to get the IV in the difficult patient. The patient is so huge that it is very difficult to find a vein they consider putting the IV in his toe. She checks in on the patient to see how things are going and then decides to go start her charting while she has a chance.

3:05- All of the computer terminals are taken at the MNS so she sits down at a RF terminal in the hall and tries to do her charting. This is a ridiculous way to try and chart a full assessment b/c there is no place to put all of your paperwork. She puts her papers on her lap and tries to make it work. She logs in but the loggin fails. She is a bit on edge but she retypes it in and thankfully it works. She starts doing her first assessment/charting. She is working her way through the assessment when the ICU nurse walks by and says that he got the IV started. She **leaves the computer logged** in b/c she needs to go give this patient his antibiotic that was supposed to be given at 2:00. It is 3:15 when she comes back out with the patients food tray

3:15 She sits back down to continue her charting. She puts quite a bit of information in the annotation box vs. using the check-boxes. She is trying to chart while keeping her clipboard on her lab which keeps sliding off.

3:20-3:25 she is interrupted by the difficult pts. brother. He is concerned about the disorientation of his brother and his medications but she notes that she has talked to this guy repeatedly about this issue and it is driving her crazy. She politely talks to him again about the situation and then finally is able to return to her charting.

3:25 She returns to her charting. She moves the mouse over all of the checkbox options and does not find anything suitable for what she wants to chart so she puts it in the annotations again. This suggests she may not be familiar with all of the checkbox options quite yet or she is so busy that she cant think straight. She is interrupted again by the US who has one of her patients Dr.'s on the phone who wants to know about restraints on one of her patients. She is a bit irritated b/c the Dr. was just here and could have looked. Another nurse takes the call and answers the Dr.'s questions. Nurse D keeps working on her assessment. She is interrupted again by the evening shift nurse to turn over her keys and beeper. She continues charting, she looks things over in yellow and then saves it turning the screen blue. She moves on to doing her I/O's. She saves the information and then **leaves the computer logged in** as she verbally passes along pt information to the evening nurse.

3:35 She goes in to flush the difficult patients IV and finds that he has taken it out! Luckily he didn't pull the whole thing out of his arm and she is able to reattach it. She is definitely very tired of trying to deal with this patient today.

She comes back to the MNS and switches to a PC at the desk to finish up the rest of her charting.

3:37 Pt 2 Full Assessment of the admit pt - she logs in to HC and enters the vitals which have been recorded on the ADS. She moves on to the I/O's. Next she needs to find the patients paper chart. She looks all over for it in the MNS and finds it lying on one of the counters. She files the ADS it is 3:45

She sits down to continue with the actual assessment.

3:45 Next Pt 1 Assessment - She pulls forward a previous assessment on this patient and then takes things off/clears things that are no longer pertinent. She is interrupted by the evening nurse to talk about the difficult patient.

> 3:50-4:05 She continues with the assessment. She then tries to explain some of the problems with the difficult patient and the family members who have also been difficult to deal with in the nursing notes section of HC but the field is limits her. Obviously this is frustrating b/c she has no way to relay this information on.

*4:05-4:10 Pt 3 She enters Nutritional Assessment information, save, IV admin information, save, the I/O information save.

4:10-4:20 D/C Patient 4 - She selects the patient from the D/C patient screen, then pulls forward yesterdays assessment and makes the changes as necessary. 4:20-4:25Next she does the patients I/O's. Finally she goes back into the assessment and does the nutritional lunch portion.

*4:25-4:40 - Pt 3 She needs to go back and finish Pt 3's full assessment. She pulls forward a previous assessment, changes it and saves it. New time, she enters the pain, new time she enters the O2 delivery, new time she puts in the nutritional assessment information. Next she does I/O, then IV admin. Finally she is done.

Summary Observations:

This was an incredibly hectic day with many frustrating issues. She notes that the workload has been far too overwhelming for a while. Providence has been under-staffing and has pulled her off her days off many many times. All of the nurses today had 4 patients which leaves very little slack. While she is finishing up her charting she looks over her shoulder and notices that the regular night shift nurses all have 3 patients

and all of the agency nurses have 4 patients. Obviously she thinks that there is some inequity in how the staffing and distribution of patients is being made. The more patients you have the more difficult the job is especially when the patients are as demanding as the one she had today. She vows that she will refuse to take care of this patient again tomorrow.

Impression:
This was a very busy day and one of her patients was extremely difficult to deal with. She says she spent about half of her day trying to deal with him and it was a very difficult day. I did not anticipate that she would have things done on time today.

She does pretty well with the computer. She is not the most proficient with it because she is still unsure about how and where to find some things. For example she was not sure how to access the scroll bar along the bottom of one of the screens when she pulled it up i.e. I showed her how to maximize the screen so that she could use it. She also leaves the computer logged on a bit but when you are as busy as she was being pulled away for patient care it was apparent that this would be an issue. Also, some of the computers have screen savers on them that are on different timers so that when she would leave a computer terminal the screen saver would be on masking the fact that she was still logged in. Other computers do not have the screen savers on them and it is my opinion that they all should be uniform.

Nurse E
Pre-implementation

Code	E
Date	10/28/01
Start Time	2:00pm
Finish Time	3:40pm
Number of Pts	3

Chronological Observations:
As I start my observation period Nurse E has just admitted a schizophrenic patient. She has been having trouble getting an IV started on this patient due to the patient struggling and being dehydrated. We go into the ICU unit to ask another nurse to help get an IV started but someone needs to watch the monitors in ICU so we go back to the MNS on the Med/Surg unit and talk with the charge nurse who says she will try to start the IV. We go back to ICU to tell the other nurse that she is not needed. WE go back to MNS and get the charge nurse and then go to the patients room.

The patient is in for pneumonia and is very dehydrated which makes getting the IV started very difficult. After trying in 2 places she gets the IV going by the patients thumb. Since it is in an area that can flex the IV needs to be stabilized. The charge nurse suggest that nurse E go get a tongue depressor and tape it to the patients wrist. Nurse E does not know where the tongue depressors are but we go to the supply room and after rummaging around find a tongue depressor. We go back to the patients room and tape it to her wrist. It can be noted that all the while the patient has been unresponsive to any of us in the room. And the patient is technically restrained due to the fact that all 4 rails are up on her bed. This is to keep her in bed if she starts thrashing around again. Because of this special paper work will need to be filled out.
2:20pm

Nurse E needs to get an IV started on patient 2 but when we go to his room we find that he has gone for a walk. She decides to go back to the SNS to start getting her Reports ready for her 3 patients. She has 2 of the three Reports basically done but adds some updated information to them which she has recorded on her own personal sheets that she uses, this sheet is described below. She does not have all of the information she needs. She goes to the recently admitted patients room and gets the Vitals off of the Whiteboard (generally they are on separate sheets but since she was recently admitted they were jotted down on the whiteboard because the sheets were not available). She write this information on her personal sheet and goes back to the SNS to record it in the patient's Report. She then goes to patient 2's Vitals sheet off of the BB in his room and returns to the nurses station. After she records these values on the corresponding Reports she takes them up to the MNS where she places them in the Reports Folder which is located on the counter.

Now she needs to get a Restraints form for the psychotic patient. They are located in the bottom drawer by the Med/Surg Secretary. She stamps the Restraints form with the patients medical card which is kept in a little rounder on the desk of the Secretaries desk. She then puts all of her papers on her clipboard and goes back to the SNS to fill out the Restraints form.

She fills out the form at the counter of the SNS and then walks to the patients room and posts it on the BB where it will remain while she is restrained. She then makes sure that the IV is dripping correctly makes sure it is dripping at the right rate.

We go back to the SNS to fill out the admission paperwork for this patient. This should normally take a long time (roughly 30minutes) since it asks about 50 questions. She is not quite sure how to do this since the patient is unresponsive and she goes up to the MNS to get more information about the patient from the patients chart. We look through the rounder and can not find the chart. She looks at what charts other people are using and finds that somebody else is using her chart to pull up a PCP for the nurse.

She decides to go and try to get the IV started for her other patient while the chart is being used by somebody else. At this point it just so happens that this patient is beeping her. When we go in his room he

says that he would like his anti-nausea medication. She goes to the front closet to check what anti-nausea medication he is taking which is listed on his MAR. He verbalizes that he would like some things to drink etc. She takes his tray away and puts it in the Utility Room. We then go next door to another supply room and use Pyxis to get some morphine for him. Pyxis is of course the automated drug dispensing machine. We wait while another nurses finishes b/c she has entered the wrong number of units left and need to correct her mistake. Nurse E then gets the morphine and goes next door to get some 7-up and some beef broth. While she is walking back to the patients room (with her hands full she is paged) she sets everything down on a cart outside his door and goes to the MNS to ask why she was paged. The secretary transfers a call to her at the MNS and she sits down to discuss one of her patients with him.
After the call she collects the morphine and drinks for the patient and goes back into his room to deliver care. After she gives him his meds she notes this on the MAR in the closet. She also notes glucose on his Personal Blood Sugar sheet which is yellow and posted on his BB . This is a crucial sheet for this patients care.
2:55pm

We go next door to her next patient and she helps him with a hose that is taped to his nose. We go to the supply room to get some bandages to re-tape the hose and then return to his room. Back at the patients room she talks to him about how he is doing and tries to cheer him up a little b/c he is quite blue. He hasn't unwrapped the flowers that were given to him which she does for him. The patient would like some more ice chips which she gets from across the hall and brings back to him. She pulls his MAR out of the front closet and takes it to the SNS to start doing her charting. At this point she realizes that her clipboard with all of her notes about her patients is down the hall on the IV cart in front of her other patients door. She goes down the hall to get her clipboard places it at the SNS

Now she wants to start collecting the pieces of paper from each of her patients rooms to allow her to do their charting. She goes to patient 1's room to get the temp. I/O sheet off of the BB in his room. She puts it in her pocket and them goes to the MNS to get her patients charts from the rounder. At this point the charge nurse tells her that she needs to fill out the top portion of the restraints form for the psychotic patient a little differently. She sits down at the MNS fills out the form and has the charge nurse check it over to make sure it is done correctly.
3:05pm

We go back to the SNS with 2 of her patients charts and start to do her charting. She like to pull out all of the patients medical orders sheets and verify that they have been filled for each of her patients which she compares against the MAR and the patients charts to make sure that the orders have been filled. After she verifies them she throws away the meds order sheets. (These sheets are thin pink/white/blue/ with the patients medical card stamped on top) She piles all of the MAR's in the corner and before she actually starts charting she goes to get something to drink.
3:15pm

Sits down at SNS and starts charting. She has charted most of pt.1's information earlier.

-She starts with tallying I/O's which she does on the temp I/O sheet. She enters the information on the charts I/O sheet and throws the sheet away.

-Next she verifies the patients meds orders and then throws them away.

She is paged and calls the front desk where the secretary transfers a call to her. It is an ex-wife of one of her patients that is insistent about getting information about the status of the patient. She repeatedly tries to explain pt confidentiality and if this woman wants information about the pts health she will need to contact the pt directly. The woman is very insistent and finally she transfers the call to the patients room. The CNA delivers pt 2's vitals to her while she is on the phone. At this point she realizes that she has charted the wrong I/O values in the wrong chart. She goes back to the chart she just filled out and crosses the entries out and initials it.
3:25pm
She starts over again with pt 1. She goes to his room to get the most recent information on his I/O's and enters this information and enters the correct information in his chart.

She pulls the I/O sheet that she threw away out of the trash and now enters those values in pt 2's chart. Now she is done charting these 2 patients charts. She takes them up to the MNS and pulls her last pt's chart (i.e. the psychotic pt)

We go back to the SNS and sit down to finish the last chart. At this point the evening shift nurses have come on the floor so she verbally goes over the psychotic pts status with her. She asks how she should proceed to fill out the rest of this pt's admission paperwork when the pt is not responsive and 2 nurses point out a box that she can check which states that the pt is mentally incapable of answering the questions. This nurse has never cared for someone that she couldn't fill out the admission paper work for.
She fill things out in the following order:

1) Admission papers
2) Interdisciplinary Plan
3) I/O sheet
4) Flowsheet - which she fills out working her way methodically down the boxes

By 3:40 she is all done with her charting and she takes the chart up to the MNS and is ready to go home

Summary Observations:

The personal sheet she uses to collect her patients information on throughout the day is as follows:

All of her patients information is collected on one sheet
The sheet is therefor divided into five horizontal slots
Within each horizontal block she has labeled the pieces of information that she generally collects on each patient

Impression:

She is a very energetic nurse and she will probably have some difficulty with the system which is to be expected but I think she will pick it up and get into a routine. She is young and will probably be able to adapt to a new method of entering data fairly well.

Nurse F
2 months Post-implementation

Code	F
Date	1/11/02
Start Time	1:30pm
Finish Time	3:00
Number of Pts	4

Chronological Observations:
She uses 1 personal sheet to keep track of all of her patients information. She puts this in her pocket to keep with her at all times and does not carry around a clipboard.
1:50 she is charting a full assessment of a patient. She saves is so the screen turns blue and then checks it over to see what is missing. At this point she notes that it is too bad that this system does not have an alert to let the nurses know which of the required fields still need to be charted on . She also notes that she just learned how to modify a mistake earlier in the morning from one of the super-users. She mentions this because as she was working on an assessment earlier in the morning she interrupted and left the computer logged in- so someone came by and saved her assessment and logged her off. Not all of the information was correct in the assessment so she had to learn how to modify many of the fields where default values had been entered.
1:55
She starts charting on Pt 2 but is called away b/c of an emergency- she leaves the computer logged on. She comes back and finishes up her this patients assessment. And crosses off this patients info on her personal sheet.
2:00
She remembers that she need to chart on Pt.2's vitals from 9:50 am. Obviously this is not POC documentation. She adjusts the time on the computer and enters the data.
2:05
She works thru Pt 3 full assessment. She estimates some things as she goes and saves the info. Next she does the IV admin. She has to go in and change the time on the computer and then input the IV information. She reviews the assessment and realizes that she needs to chart something else
2:20
She explains that she put a catheter in a patient when it wasn't necessary and needs to explain this in the chart. Again she must adjust the time and enters the explanation
2:25-Report1
She gets the sheets to do Report for her patients. 2 of her patients were D/C 1 is going to surgery and 1 is a post-op patient meaning that she only has to do 2 reports. She looks up the post-op pts meds on the STAR system and prints out the MAR for this patient. She explains that the nurses generally print off the MAR for their patients from the STAR system. She uses this information as well as the information she keeps on her personal sheet to write up this patients Report.
2:30 Report 2
Again she uses her Personal Sheet to fill in the info for this patient. She fills in the information and then turns both sheets in i.e. she puts them in the folder at the MNS. It is now 2:32
Next she goes to Pyxis to get the post-op patients meds. She also tries to find some pt education material which is kept in drawers. She cant find any information and so she goes to the computer in the Pyxis room to look on the Internet….unfortunately there in not any information that is useful there either.
2:30 She notes that she is basically done with entering pt data for the day except for the last I/O's
2:35
She collects all of the meds and the MAR and goes into the patients room to deliver them . She takes care of the patient and leaves the MAR in the closet of the patients room.
2:55She goes tot he MNS and needs to do I/O's for the day. She brings a computer to the patients room and leaves it just outside the door. She goes into the patients room to get the I/O's sheet and finds that the patient has gone to the bathroom and flushed so how is she going to do I/O's right. She logs into the computer and puts a note in the system to account for the inaccuracy of the data.
She is done with I/O's by 3:00pm

Summary Observations:
She is not fond of the computer but she does pretty well. She notes that the doctors never read the nursing notes before and she assumes that it is no different now. This may explain why she is more carefree about being exactly correct with some of the information she puts in the computer.
She also said that if she was to start all over she is not sure that she would want to become a nurse. All of this computer stuff might not make this worthwhile to deal with.

She has not modified her personal sheet at all - it is the same sheet that she used prior to HC implementation.
She also worked at Providence St.V's when HC first went in 10 years ago and was pulled. She said that the system was a disaster over there and so she was not all that excited to see the system coming to Providence Milwaukie. However, she talked about the systems almost like they were 2 separate products. She said that this system was nothing like the earlier version and was much better. This brings up the issue of a user going through a failed implementation with Beta test site implementation that was yanked.

Negative points:
When I asked her about the negative elements of the system she noted that from the patients perspectives she has felt like the patients don't want to see the nurses struggling with the computer vs. patient care. She says that this was especially true in the first few weeks post implementation.
She is not fond of the feature where she writes a note and all that shows up unless you click on it is an &.

Positive:
Charts are available everywhere allowing her to see what is going on with her patient at all times
Doesn't have to fax things to the docs because they can look them up
She has just started to look up labs and other information about the patient which she finds useful

Impression:
She has not spent a lot of time to get to know the intricacies of the system. She is still discovering new fields and new ways of entering the data. Although she is not a computer advocate her computer skills are fine and she gets things done. She has an attitude that rolls with the punches, she is not going to get all bent out of shape about the system she will do what it takes to get along with it.

Nurse F
4 months Post-implementation

Code	F
Date	3/8/02
Start Time	1:30pm
Finish Time	3:50
Number of Pts	4

Chronological Observations:
When I arrive today things Nurse F says that she is basically done with her charting for the day. She has just admitted a patient that is basically there to die so she will not have much charting to do for her and the other three she did earlier around 11:00. We spend some time talking about some of the issues of the day. She talks about the difference between Providence Milwaukie and St. V's…see below.
1:40 She goes to one of her patients rooms to get him back to bed. She comes back to the SNSI to call the doctor with some questions about this patient. The doctor has not called her back all day. The CNA is walking one of her patients up the hall. The patients O2 is only at 81 which is too low so Nurse F needs to increase the flow of O2 so that it is between 85 and 92.
2:00 She is goes to the MNS to get an IV bag for the dying patient. And then returns to another patients room to walk with her.
2:10 She comes to SNSI to return a page but it was nothing.
2:15-2:30 MNS She decides to read the doctors assessment for the dying patient in order to put together some sort of charting assessment for this patient. This is in the paper chart, she sits down as the MNS and logs into HC. She enters the vitals and does the General assessment. While she is selecting options for the breathing pattern she asks the other nurses at the MNS what sonorous means…it is one of the checkbox options.
2:35 She is looking around for a pump for one of her patients. There are none available on the Med/Surg floor so she goes to the ICU. They are somewhat reluctant to give her one but finally they find one. As she is walking through the hall the CNA tells her that one of her patients has a fever of 101.9.
2:45 She checks in on the dying patient and the family. As she comes out of that room the Husband of her other patient asks for a warm blanket for his wife which she goes to get out of the supply room. She takes this patient a blanket and gets her I/O form.
2:50-2:55Another lady stops her in the hall to ask for chapstick for her sister who is a patient. This is not Nurse F's patient but she goes to get the chapstick for her anyway. Next she drags the Vitals monitor in to Pt 3's room b/c the CNA noted that her BP was low. Nurse F checks the BP and is concerned that it is low. She collects the I/O sheet.
3:00 She goes into Pt 4's room to collect the I/O sheet.
She is concerned about Pt 3 so she calls the Dr. who gives her the order to start and IV. She looks in HC to see what the flowsheet shows with respect to this patients I/O's and why the IV was taken out last night.. She **leaves the computer logged in** at the MNS.
3:20 F starts to write the order in the patients paper chart when it occurs to her that she should go and ask the patient one more time if she had urinated today. She leaves the chart on the counter with the order halfway written and goes to the patients room to clarify things. This time the patient thinks that she has actually urinated which makes her I/O's make a lot more sense.
3:25 She comes back to get the IV bag and goes back to hang it in the pts room.
3:30 She comes back to MNS to finish writing up the order. She also writes a note on the communication sheet in the front of the chart.
3:35 She is asked by the night shift nurse for a Report on the dying patient. Nurse F thought she did one but cant find it. She verbally relays the information to the night nurse about the patient's status. She also looks through the patients paper chart to clarify any orders. She fills out the ADS for this patient and puts it in the patients chart.
3:4-3:50 She goes to SNSI to input I/O's for her patients. Pt 1 I/O's 1 minute, Pt2 I/O's, and Nutritional assessment 2 minutes, Pt 3 I/O and IV Admin. She is called away because someone who is not her patient is adamantly wanting to get out of bed when they are not supposed to and the family member is very upset.

She leaves the computer logged on. She comes back looks things over quickly and " "calls it good for the day."

Summary Observations:
Cons

- This system depersonalizes the nursing.
- By "Pulling Forward" documentation she says that the charting lacks any ebb and flow to it for example when she first started nursing she said you would chart about every 2 hours on the patient and now you do it once during the day and it is not as apparent how the patient fluctuated during the day.
- By Pulling Forward - nursing annotations are left in there accidentally- this leads to inaccurate charting.
- Another nurse feels that since some of the doctors do not look things up on the computer there is a communication gap in the patient care. Some docs look things up and other dont want to or dont know how.

Impression:
This day was much less stressful than the other days this week. Things were much calmer and felt much quieter than other days. She is definitely not as meticulous and some of the other nurses. You might say that she has a pessimistic attitude or negative attitude today but she is a pleasant person to be around. She is rather frank and practical about the busy work of nursing. Her feeling is that she would rather spend the time on the floor with her patients vs. sitting in front of the computer documenting "useless information." As she was looking at the screen of information that she had inputted for the dying patient she said "see I can fill up this whole screen with a whole lot of useless information and we can call that charting."