Student's Surname

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Course

Date

Patient identification

Introduction

Advances in technology and medical sciences have led to the introduction of radiology, which involves using medical imaging to diagnose and treat diseases. Many imaging techniques are used in radiology and they involve X-ray radiography, computed tomography, nuclear medicine and magnetic resonance imaging are among the techniques that use radiology to diagnose and treat diseases (Mettler et al., 254-263). Despite all this advanced technology that used in the 21st century there is still a problem of misadministration, especially in radiology. Misadministration in hospitals means giving the patient the wrong form of treatment or giving the patient the wrong prescribed drugs. All this misadministration in the hospitals is a result of human error. In many hospitals, such confusion leads to almost 61% of the incidents that occur in many radiology related errors (Serig, 179-195). Many hospitals have now decided to use information technology to solve this issue and to come up with ways to reduce these errors.

One solution that many hospitals have decided to adopt is that the radiology patients could be electronically coded and matched. In many countries, several electronic identification systems are applied like the wristband identification system, mechanical barrier systems, and the blood loc system. All these systems are used with the aim of reducing human error in blood transfusion. The

same system can be applied in the radiology sector. The radiology patients should be given codes where they are electronically matched on the computer. The application of this technology can prevent misadministration in the radiology sector. The system can also monitor radiology safety by incident-reporting schemes, which are used to identify and analyze radiology errors. Even training doctors and nurses to eliminate errors in the radiology department does not eliminate these errors. In this paper, the main aim is to demonstrate the importance of patient identification, especially in radiology. The paper will also demonstrate how patient identification system goes hand in hand with patient safety and the results of identifying an incorrect patient in the radiology department. The paper will also look at the effects on the hospitals for having many identification errors, how do the patients perceive hospitals that are widely known for their false identification when it comes to treatments offered to them. The paper will also analyze the situation and identify who should take the blame for much false identification in the hospitals. The essay will also analyze the problem and come up with a solution for these issues and the measures that the hospitals can implement related to false patient identification.

Background information

Barcode technology applied in healthcare facilities involves the application of optical machine-readable and representation of information in a hospital or a healthcare facility (Sun et al., 327-332). The barcode technology was introduced in many hospitals in the 1970s and since then many hospitals have tried to use the technology with more upgrades being introduced in the hospitals. In the year 2000, many hospitals had numerous errors especially in patient identification and the increasing cost of obtaining quality healthcare facilities. Since then the use of barcode technology has helped many hospitals solve the patients' identification errors that usually come up whenever hospitals receive more patients. Many researchers have revealed the importance of the use of

barcode technology as an effective way to reduce human errors and ensure the medical safety of the patients (So, 124).

Barcodes are used to classify items in a way that will avoid confusion or errors in any way. For example, the barcodes can match the patients with the medicine that each patient requires and prevent situations where a patient is given the wrong medication. The barcodes go hand in hand with the barcode scanners. The barcode scanners are used to read the red and white lines on the wristbands of patients and quickly feed the information in the computer, which can identify the patient in the computer database. The red and white lines on the patients' wristband are the barcodes (Brian, 100). This means that the barcode scanners are used to read the barcodes and feed the information on the computer. The computers are installed with patients medical history where when the barcode scanners scan the barcodes it brings out the patient medical history. For example, after scanning a barcode given to a radiology patient the computer should reveal the patient's medical history. The medical history of the patient can involve the patient's diagnosis treatment and the drugs the patient should take. This kind of organization cannot lead to confusion as the patient is matched with the right prescription of their disease.

In the hospital set up, the wristbands given to the patients, containing the barcodes are scanned using head shines LED or laser light. The light that used to scan reflects back from the barcode into a light-detecting substance called a photoelectric cell. The white lines of the barcode reflect almost all the light while the black lines of the barcode do not reflect any light. When the scanner moves from the barcode, the photoelectric cell creates a pattern of on-off pulses that match up to the black and white lines on the barcode. For example, a barcode that is "white white black black white black" the photoelectric cell will be "on on off off on off." An electronic circuit that is connected to the computer scans these on-off impulses and converts the impulses into binary digits

of zeros and ones. The binary digits sent to the computer detect the code as 001101. After the computer detects this code it matches it in the hospital database of the patient registered into the database with the code avoiding confusion of patients and errors in the end (Ghrist, 61-75).

The barcodes identification goes hand in hand with patient safety. The main reason for this is that barcode identification helps to match up a patient with the disease. The barcode identification even reveals if a person is a patient in that hospital. Patient safety is a major priority in all hospitals and barcodes will ensure the safety of a patient by ensuring that the patient receives the right medical treatment protecting the patient from false treatment that may even lead to the death of the patient. For example, a patient who goes to a hospital to get a radiopharmaceutical injection may be exposed to risks if the doctor confuses the injection by giving the wrong injection to the patient or by giving the right injection but to the wrong patient. These injections can lead to the patients' exposure to the wrong radiopharmaceutical injection, which can lead to severe effects like the death of the patient.

A hospital that has a history of misadministration may lack patients to attend to with the patients afraid that the hospital may give them the wrong diagnosis and treatment of their diseases. Hospitals with this kind of misadministration may be closed by many healthcare organizations to avoid the risk of exposing more patients to situations that may endanger the patients. In any hospital set up, the nurses are the ones who deal with the administration of the patients in the hospitals. The nurses are the ones who prepare the medical history and previous medical reports of the patients and they give these reports to the doctor. The doctor's work is to work with what the nurses provide to him. The problem of misadministration always comes down to the nurses because the nurses arrange the medical history of the patients to give it to the doctor and it is the nurses who look for the medical history of the patients in the hospital's database.

The barcode technology has many applications in the hospital set up. The barcodes are used for drug identification and match the drug to the patient that should take the drug. When the patients' barcode is scanned on their wristband the information in the computer should show the medication that the patient should take related according to the patients' diagnosis and treatment. medication management is also very important in a hospital set up. Medication management involves the five rights, which include right patient, right medication, right dose, right time and right route of administration. The barcodes will ensure that the nurses document the administration of drugs by scanning the barcodes to the right patient. The barcodes play a vital role in the hospitals from drug identification, medication management and specimen collection, which are all related to ensuring the patients' safety in the hospitals.

Analysis of the problem: Misadministration in Radiology

During radiology, therapy incidences that are caused by human errors can lead to the patients getting the wrong dose of radiation that required as part of the patient's therapy. The patients who get the wrong dose of radiation exposure over a period can lead to cancer. Misadministration simply means giving the radiopharmaceutical injection to the wrong patient or giving the wrong radiopharmaceutical to the right patient. This confusion can lead to complete extravascular injections, which causes an increased exposure at the injection site even when the exposure is small (Ostrom et al., 227-234). The long-term effect for this is the patients suffer from cancer.

There are several causes of misadministration in radiology. The first cause is communication problems. The language barrier is the most common problem in all sectors of the society. On most occasions, the issues that cause language barrier is that the people in the hospital do not understand each other or there is insufficient communication in the hospital. Insufficient communication is

because of improper labeling of vials and syringes. The nurses may label the radiopharmaceutical syringe with the wrong treatment and the doctor ends up giving the patient the wrong medication. Insufficient communication also arises in the event the doctor all the nurse is not clear on the right diagnosis of the patient. This may arise if the doctor uses initials in the injection prescription, which may lead to the nurse assuming that the doctor meant a certain prescription when he actually meant another prescription. Communication problems also arise where the nurse is not articulate enough and the nurse ends up giving the doctor the wrong description of the patient's disease.

Busy environment and distractions is another cause of misadministration in radiology. A busy environment can cause a mix-up of injections and prescription notes. Hospitals receive many patients in a day and, which may cause confusion in the hospitals. The nurses' work is to provide the medical history of the patient to the doctor so that the doctor can analyze the situation and provide his own medical analysis. The doctor may use the wrong medical history for the wrong patient because of a mix-up caused by a busy environment. The nurses can also get confused while looking for the medical histories of the many patients that have come to the hospital on a particular day, which also causes confusion leading to the doctor treating the wrong patient for the wrong disease (Charlton and Robert, 585-591).

Lack of training in emergencies is another cause of misadministration in radiology. During emergencies, that first person that receives the patient is the nurse before the doctor is called in to attend to the patient. In nursing school, the nurses are not taught practically on how to handle emergencies but they just read the procedure in their books and try to apply it in the real nursing world. During an emergency, there is a lot of activity that takes place from the moment the patient is brought in for medication. In that, the moment the nurses can confuse the proper medication of the patient and the doctor ends up giving the patient the wrong diagnosis and the wrong treatment.

Another issue that results in misadministration in radiology is because the responsibilities of some people in the hospitals are not clearly defined by the hospital. Many hospitals have nurses, registrars at the booking office who also keep records. What leads to confusion when patients go into the office is not clearly knowing who should do what and what roles should each person play to help the patient. Some hospitals do not clearly state who should book the patient in the hospital is it the nurse or the registrar. This causes confusion when admitting the patient because the patient may be booked twice using two different medications by the registrar and the nurse separately. This causes confusion when the doctor wants to attend to the patient because the doctor is not sure of the right medical history to use in the radiography therapy.

Misadministration in radiology is caused by lack of quality assurance in the hospitals, especially during emergencies. Quality assurance services involve the hospital conducting audits to reveal the deficiencies in the hospital and the procedures that the hospital should follow regarding an emergency. Annual audits are very important in the hospital because they ensure that every staff in the hospitals clearly understands the role that they should play during a hospital emergency. These audits will reveal the main cause of misadministration in hospitals and ensure the administration of the hospital looks for solutions to curb these problems. The lack of quality assurance in many hospitals is what causes many people fail to understand their roles during an emergency.

Analysis of the solution: Barcode Scanners to scan patients' wristbands in radiology

Due to the increased patient safety, facing modern hospitals it is not easy for the healthcare industry to manage data from the hospital records. Every day these hospitals deal with inventory management, matching patients to their various patient records and patient validation. The

hospitals that do not use barcodes to do all this work, it allows human error from the nurses and it is time-consuming. However, the introduction of barcodes in hospitals will solve all these problems and prevent misadministration in many hospitals. Barcodes are cost effective and they provide accurate data especially regarding the patients' medical records and treatment. The barcodes also ensure accurate data entry into the hospitals' database and increase efficiency in data management techniques (Sutcliffe, 145-157).

Inventory control involves the organization, storage and distribution of information according to the customers' specifications or history. Inventory control is very important in the hospitals, and in this case in the radiology department. Inventory control involves accurately organizing the medical records of patients in the radiology department and ensuring that the names of each patient match with their own medical history and treatment (Serig, 679-681). Hospitals that manage their inventory manually are prone to human errors and it is time-consuming. The use of barcodes is helpful in ensuring that these medical inventories are accurately managed and organized. When the radiology patients visit a healthcare facility with barcodes, they are given wristbands with a barcode that is scanned to record the patients' first visit to the hospital. After treatment, the nurse will record the medical history and the diagnosis of the patient and this information will be saved in the hospital's main database. When the patient comes for radiography therapy, the following day after registration of the patient at the entrance of the hospital the patient is provided with a new wristband with a new barcode that matches their current medical history from the previous day. When the patient goes to see the doctor and the doctor requires the patient's medical history and reports instead of the manual inventory, where the nurses bring the patient's medical report in a file the doctor can just scan the patient's barcode. After scanning the patient's barcode, the doctor

will see the patient's previous medical history and records. This method is easier, fast and accurate and it ensures that there are no errors when handling the entire patient's medical history.

Barcodes are also important in patient validation. Patient validation involves validating the barcodes, which show that the patient receiving the radiography therapy is the right patient and the treatment given to the patient is accurate and appropriate. Doctors can scan the patient's barcodes and ensure that the patient receives the right medication. Patient validation also ensures patient safety in the hospitals. Patient safety results when the doctors use the right medication for the right patient and prevent a mix-up in medication between two different patients. The barcodes are also important when the nurses want to confirm the medication that the doctor ordered. All the nurse has to do is scan the patient's barcode, look into the hospital's database, and check the right medication that the doctor ordered for the patient.

Conclusion

Barcodes are very important in many healthcare facilities because the prevent confusion in the hospitals and ensure that the right medication is given to the right patient. Barcodes not only help in patient validation it also provides patient safety in the hospitals and ensures good organization in the hospital's inventory. It is important for hospitals to ensure that they use the barcode system to provide customer safety in the hospitals and prevent confusion that arises when the hospitals receive many patients.

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