Medical Record and Statistical Analysis Office Internship Report

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Acknowledgement and Endorsement

This report has been written by me and has not received any previous academic credit at this or any other institution.

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Executive Summary

This report keeps track of the entire internship that takes place in the medical record and statistical analysis office of Nanjing Drum Tower Hospital (Nanjing Gulou Hospital), also known as The Affiliated Hospital of Nanjing University Medical School.
Tasks performed involves getting familiar with different systems used in reception desk/ copy and print service, reading room, medical record receiving office, medical record computerized room, medical record treasury, statistic analysis room; getting familiar with medical record and computerized process, understanding electronic medical record; dealing with a large number of medical records sorted by department and patients' check out date; working in medical record treasury and statistic analysis room.
A problem of current medical record receiving process is discussed, and scanning barcode solution is proposed based on health informatics aspect. In conclusion, objectives of this internship are basically met at the end of it, include using different systems, understanding data collecting and processing, experiencing the application of electronic health record and more. Future works need to focus on team working, multitasking, and bridging the gap between theory and practice.

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1. Introduction

The internship takes place in Nanjing Drum Tower Hospital (Nanjing Gulou Hospital), also known as The Affiliated Hospital of Nanjing University Medical School. It is one of the top hospitals in China, and the core department for this internship is the medical record and statistic department.
The subject of this internship report is to keep track of the entire internship. The report includes background, clear statement of the objectives of the project; relevance of the project (both in a medical and health informatics sense); and the outcome of the project. The following sections include description of the organization, description of performed works, discussion on relevance, discussion on problem solving, conclusion, and recommendation outline the entire internship experience based on conceptualize, analyze, synthesize and present of the overall internship experience.

The objectives of the project are

- Getting familiar with the existing information systems in the department.
- Engaging with clinicians and experiencing team working.
- Understanding data collecting and processing.
- Experiencing the application of electronic health record.
- For each undertaken task, always thinking about how to improve it using the understanding of health informatics.
- Building the ability of multitasking by working as different roles.
- Understanding how and where theory meets practice in order to bridge the gap between theory and practice.

2. Description of the organization

This section provides description of the organization and the core business of the specific department for internship.
The organization within which the internship took place is Nanjing Drum Tower Hospital (Nanjing Gulou Hospital), also known as The Affiliated Hospital of Nanjing University Medical School. It is a hospital consisted of healthcare, education, and research, and is one of the earliest western medical hospitals in China.
Dr. William Edward Macklin, M.D., Disciples (Canada) founded the hospital in 1892, with the assistance of Prof. Frank Eugene Meigs, the Church of Christ (USA), and the local Nanjing community. The hospital was named Drum Tower Hospital in honor of the heart of the Ming Dynasty's first capital city (Nanjing Drum Tower Hospital, 2007).
The hospital manages 2 clinical colleges, 32 clinical departments, 32 medical technical sectors, and 21 special research sections and laboratories. The hospital also provides advanced equipments for patient healthcare services, including PET, ECT, MRI, DSA, whole-body CT 1250mA X-ray, EEG Mapping, electronic gastroscope, color Doppler ultrasonic cardio-dynami apparatus, central monitoring devices, automatic biochemical analyzers, and multiple-function color Doppler diagnostic apparatus (Nanjing Drum Tower Hospital, 2007).
Nanjing Drum Tower Hospital is the clinical teaching base for Nanjing University Medical School as well as for other medical universities and nursing schools. The

hospital also serves as the appointed training base for the Public Health Bureau of Nanjing Municipality and the Provincial Public Health Bureau of Jiangsu Province, and serves as an advanced study base organized by the Chinese Ministry of Public Health and the Public Heath Bureau of Jiangsu Province as well (Nanjing Drum Tower Hospital, 2007).
The core department for this internship is the medical record and statistic department in the hospital. There are several sub-departments within it, including reception desk/ copy and print service, medical record receiving office, statistic analysis room, reading room, medical record computerized room, medical record treasury, and a library. Duties of the department include taking care of all the medical records; transferring paper works to electronic information, and stored them in the information system for future use, offering a medical record borrow service to staff, and keeping the medical records in the medical record treasury.

3. Description of the performed work

This section provides description of the internship work including job description, roles, responsibilities, achievements, and other job related details.
The core department for this internship is the medical record and statistic department in the hospital. There are several sub-departments within it, including reception desk/ copy and print service, medical record receiving office, statistic analysis room, reading room, medical record computerized room, medical record treasury, and a library. This internship involves all the sub-departments except the library. Each section takes two weeks time on average and there is a period for getting familiar with all the works, which takes about one week at the beginning of the internship. Responsibilities of this internship include all the related work that introduced below. Achievements from each section are different. In this department, co-workers meet weekly to summarize work and to announce adjustments, which is a really good way to communication.

3.1 Reception desk/ copy and print services

During week 2 and week 3, the first section for the internship is the reception desk/ copy and print services. The section is the only direct connection between the whole department and patients. Responsibilities of this section are providing record searching, scanning, copying, and printing services for all the patients on their requests. Medical records in the last 10 years including hospitalization agreement, patient information (i.e. first page of records, check in/ out record, medical history), surgery records (i.e. anesthesia record), medical test results signed by doctor and nurses (i.e. track of body temperature), examination graphs (i.e. ECG), and doctors' advice can be found in the system or in the medical record treasure using the unique admission number. However, financial document cannot be processed in this department. Patients have no access to doctor's private records due to privacy issues. Most patients use these documents as evidences of insurance cases or further diseases. Different types of reports can be found via different methods based on the time of the patients' discharge. In reception desk/ copy and print services, a good service is provided to the patients and their family. Problem solving skill gets better during this experience, since many emergences need to be handled. Patience is very important for

this work, since there are so many medical records in the treasury, and it is hard to find the request ones.

3.2 Reading room

The second section during the internship is the reading room (week 4 and week 5). In addition to recording in notebooks, reading room has its own information system for medical records borrowing. The system uses a unique records number to keep track of borrowed records. Doctors and nurses can also read documents in the reading room. Unlike reception desk that opens to the outside, reading room only opens to inside of the hospital. Responsibility is to keep track of every medical record that is borrowed. In reading room, achievements include getting familiar with the information system for borrowing; finding and providing right medical records to physicians and nurses; and putting the returned medical records in the right place.

3.3 Medical record receiving office

The third section during the internship is the medical record receiving office (week 6 and week 7). This is the basic part of this department. It is the first step for medical records. Duties and responsibilities of receiving office include keeping track of all the new medical records come from different departments, recording them in the system and sorting them by department. In medical record receiving office, achievements include getting familiar with the information system for registering new medical records; sorting and organizing these medical records by check out date and department, and then sending them to medical record computerized room (Appendix A).

3.4 Medical record computerized room

The forth section during the internship is the medical record computerized room (week 8 and week 9). This is the core part in the department, all the sorted raw medical records are edited and computerized based on ICD standards. This process makes it easier for future search. All the clean records that have been put into the system are then stored in the medical record treasury. In medical record computerized room, paper works are processed electronically and stored in the information system safely. All the systems need specific username and password to log in. This protects the system and ensures privacy. Specific experts are in charge of medical records from different departments in order to improve efficiency and accuracy.

3.5 Medical record treasury

The fifth section during the internship is the medical record treasury that mentioned above (week 10 and week 11). It works as the warehouse for medical records (Appendix B). All the medical records are stored base on patients' check out date and departments. The shelves can be moved manually or automatically using the medical record treasury system. Responsibility is to keep all the documents in the right order, in case of missing. In medical record treasury, medical records in the last 10 years can be found.

3.6 Statistic analysis room

The last section during the internship is the statistic analysis room (week 12 and week 13). Data from the medical records are analyzed within statistic analysis room. All the detailed data and results are confidential. In statistic analysis room, statistic skills are applied. Many different research questions are studied in statistic analysis room. Achievements include assisting statistic analysis using software.

3.7 Event: JH (Johns Hopkins University) Project

The hospital maintains active international programming with numerous academic exchange and cooperative research programs with international colleagues and medical venues in the United States, Japan, Australia, Germany, Canada and Hong Kong. It provides the medical staff with advanced study opportunities throughout Asia and in Europe and the United States every year (Nanjing Drum Tower Hospital, 2007).
During week 7 of the internship, Johns Hopkins University visited the hospital for an education project. As an information background student, the opportunity of attending is achieved. This is an addition and valuable experience for the student since information platforms are used in clinician training. The education and training in Nanjing Drum Tower Hospital includes building information constructions.

4. Discussion on relevance

This section talks about the discussion of the relevance of the performed work with respect to health informatics aspects, links practical experience to academic learning experience. There are three main areas of health informatics, include Clinical Health Informatics, Research & Development Health Informatics, and Applied Health Informatics.
First of all, health information flow and use course provides the general understanding for the entire internship, such as Information systems, communication, searching, electronic medical record, coding, and so on. One of the most important requests for this internship is a fully understanding of every part in electronic medical records. The fundamental of clinical care for non-clinicians course provides suitable clinical knowledge for a student who has information system background, and allows non-clinicians to communicate with clinical experts. Further more, when dealing with all the different systems in the department during the internship, academic learning from health information systems & issues courses are applied.
The works in the medical record computerized room are related to health information standards. The course provides understanding about the reliability and accuracy of coding schema, interoperability, and standards development, which are closely related to the practical experience in the medical record computerized room. Performed works in here are based on academic learning, quizzes, assignments, and projects from the health informatics standard course.
In statistic analysis room, academic learning from data mining for health informatics, research methods course and statistics for health informatics course is applied. Knowledge from research method course makes it easier to deal with a research question. Then, using the knowledge from data mining and statistics courses, useful

information can be gathered from raw data. Statistical techniques are used to find some operational information from the data, while data mining methods provide the opportunity to derive in an exploratory way. Both statistical methods like frequency, hypothesis test and data mining methodologies like data preprocess, classification, clustering are used. Although during this internship, the software used for analyzing is different from the ones used in the courses, similar rules are applied.

5. Discussion on a problem and proposed solution

This section describes a critical analysis of a problem that experienced while working within the organization and a health informatics solution to the problem.

5.1. Problem description

At the medical record receiving office, all the record numbers of new coming medical records are written on notebooks organized by department. They are typed into the information system one by one manually then. This process in necessary for future searching and checking, but it takes a really long time to operate and mistakes occur very often (i.e. wrong number, missing…). Wrong patient's medical record number will cause misidentification of the patient. According to Natarajan, Wottawa, & Dutson, patient misidentification in hospitals can cause serious errors in medication dispersal, blood transfusions, and so many procedures, which will lead to patient injury or even death (Natarajan, Wottawa, & Dutson, 2009). During the internship, it is notable that many of the new coming medical records have barcode on the front page (Appendix C). However, scanning method is not used here.

5.2. Proposed solution

In the health information systems & issues course, it is learned that scanning barcode is a common and very efficient way to record information. The electronic barcode system can be effective in reducing human error related to other procedures (Chan, Chu, Young, Chow, Pang, ... & Leung, 2004). In 1989, Brown, J. D. has developed a Hospital Error-Limiting Program (HELP) directed primarily at reduction of hospital errors. The invention includes a patient wrist identification band with preprinted barcode (Brown, 1989).
These literatures can prove the reliability of barcode scanning method. Since each medical record can have a unique barcode, scanning method would be a better way to put record numbers into the system. Evaluation is required before using scanning method in case of mistakes. If the evaluation of results is satisfied, scanning barcode method can be used to save time and increase efficiency.

6. Conclusion

The conclusion provides discussion on how the objectives stated in the introduction are met.
First of all, during the internship, the student had chance to use all the different systems in each section, so the objective of getting familiar with the existing information systems in the department is achieved. Engaging with clinicians and experiencing team working are met as well since all the performed works are done with co-workers include clinicians and experts. During the internship, the student got chance to understand all the parts in medical records and how to make them computerized into system based on standards, so the objects understanding data collecting and processing; experiencing the application of electronic health record are both met. This internship involves all the sub-sections in the department, this lead to the accomplishment of the object building the ability of multitasking by working as different roles. During the internship, for each undertaken task, how to improve it using the understanding of health informatics is always taken into consideration. After the entire internship, a better understanding of how and where theory meets practice in order to bridge the gap between theory and practice is achieved. As mentioned in the above discussion about relevance, performed works during the internship are closely related to academic learning experiences in health informatics.

7. Recommendations

This part proposes plans of action for the future.
Lessons learned during this internship experience are valuable information for future practice, which include:

- Teamwork is an important point in all the organizations. Focusing on teamwork should always be taken into consideration in the future.

- It is important to always think about how to improve a task using the understanding of health informatics in the future.

- Multitasking can be hard, because working as different roles may cause mistakes. In future works, practice on multitasking should always be considered.

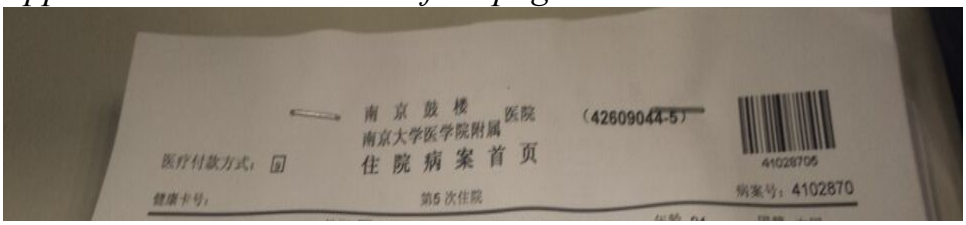
- Bridging the gap between theory and practice in critical. As a result, more attention should be paid on it in the future.

8. Appendix

Appendix A Medical record sorted by department

Appendix B Medical record treasury

Appendix C Barcode on the first page



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