Survey of Satisfaction among Users of Electronic Patient Anesthesia Record in Neurological Institute Bangkok Thailand

Miss Sirinya Naratchariyangkoon

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

บทคัดย่อและแฟ้มข้อมูลฉบับเต็มของวิทยานิพนธ์ตั้งแต่ปีการศึกษา 2554 ที่ให้บริการในคลังปัญญาจุฬาฯ (CUIR)
เป็นแฟ้มข้อมูลของนิสิตเจ้าของวิทยานิพนธ์ ที่ส่งผ่านทางบัณฑิตวิทยาลัย
The abstract and full text of theses from the academic year 2011 in Chulalongkorn University Intellectual Repository (CUIR)
are the thesis authors' files submitted through the University Graduate School.

A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Public Health Program in Public Health
College of Public Health Sciences
Chulalongkorn University
Academic Year 2014
Copyright of Chulalongkorn University

การสำรวจความพึงพอใจของผู้ใช้แบบบันทึกอิเล็กทรอนิกส์การให้ยาระงับความรู้สึก ในสถาบันประสาทวิทยา กรุงเทพมหานคร ประเทศไทย

นางสาวสิริญญา นรัจฉริยางกูร

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาสาธารณสุขศาสตรมหาบัณฑิต
สาขาวิชาสาธารณสุขศาสตร์
วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2557
ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

Thesis Title	Survey of Satisfaction among Users of Electronic Patient Anesthesia Record in Neurological Institute Bangkok Thailand
By	Miss Sirinya Naratchariyangkoon
Field of Study	Public Health
Thesis Advisor	Associate Professor Prathurng Hongsranagon, Ph.D.

Accepted by the Faculty of College of Public Health Sciences, Chulalongkorn University in Partial Fulfillment of the Requirements for the Master's Degree

.....Dean of the College of Public Health Sciences
(Associate Professor Sathirakorn Pongpanich, Ph.D.)

THESIS COMMITTEE

.....Chairman
(Assistant Professor Kanchana Rungsihirunrat, Ph.D.)
.....Thesis Advisor
(Associate Professor Prathurng Hongsranagon, Ph.D.)
.....External Examiner
(Wongwat Liulak, M.D.)

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

สิริญญา นรัจฉริยางกูร : การสำรวจความพึงพอใจของผู้ใช้แบบบันทึกอิเล็กทรอนิกส์การให้ยาระงับความรู้สึกในสถาบันประสาทวิทยา กรุงเทพมหานคร ประเทศไทย (Survey of Satisfaction among Users of Electronic Patient Anesthesia Record in Neurological Institute Bangkok Thailand) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: รศ. ดร. ประเทือง หงสรานากร {, 49 หน้า.

แบบบันทึกการให้ยาระงับความรู้สึกทางวิสัญญีเป็นบันทึกที่สำคัญเพื่อใช้ในการบันทึกกระบวนการการให้ยาระงับความรู้สึกแก่ผู้ป่วยระหว่างผ่าตัด เป็นหลักฐานสำคัญทางกฎหมายใช้สื่อสารระหว่างบุคลากรทางการแพทย์ รายละเอียดต่างๆในใบบันทึกข้อมูลการให้ยาระงับความรู้สึกเป็นตัวบ่งถึงการดูแลผู้ป่วยอย่างต่อเนื่องตั้งแต่ระยะก่อนผ่าตัด ขณะผ่าตัด รวมไปถึงระยะหลังผ่าตัด ซึ่งที่ผ่านมาเป็นการบันทึกด้วยมือ อย่างไรก็ตาม ได้เริ่มมีการใช้แบบบันทึกอิเล็กทรอนิกส์การให้ยาระงับความรู้สึกเพิ่มมากขึ้นซึ่งได้รับการออกแบบและพัฒนาตั้งแต่ปี พ.ศ. 2513 โดยสถานพยาบาลได้ประยุกต์ใช้ระบบนี้เพื่อทำให้รายงานเกี่ยวกับผู้ป่วยมีเนื้อหาถูกต้องและสมบูรณ์ นอกจากนี้ กลุ่มงานวิสัญญีวิทยา สถาบันประสาทวิทยา ได้นำระบบแบบบันทึกอิเล็กทรอนิกส์การให้ยาระงับความรู้สึกมาใช้ด้วย วัตถุประสงค์ของการศึกษานี้เพื่อสำรวจระดับความพึงพอใจของผู้ใช้แบบบันทึกอิเล็กทรอนิกส์การให้ยาระงับความรู้สึกในสถาบันประสาทวิทยา การศึกษานี้เป็นการสำรวจแบบภาคตัดขวาง ประชากรที่สำรวจมีจำนวนทั้งสิ้น 182 คน โดยใช้แบบสอบถามในการเก็บข้อมูล และวิเคราะห์ความสัมพันธ์ทางสถิติด้วย ไค-สแควร์ (Chi-square Test) และ Mann –Whitney test ผลการศึกษาพบว่าในกลุ่มผู้เขียนแบบบันทึกส่วนใหญ่มีความ พึงพอใจในระบบดังกล่าวในระดับสูงถึงร้อยละ 50 และระดับปานกลางร้อยละ 45 ในส่วนของกลุ่มผู้อ่านแบบบันทึกจำนวนร้อยละ 84 มีความพึงพอใจในระดับปานกลาง คุณลักษณะทางประชากร-สังคมและความพึงพอใจของกลุ่มผู้อ่านแบบบันทึกอิเล็กทรอนิกส์การให้ยาระงับความรู้สึกมีความสัมพันธ์กับระดับความรู้ทางคอมพิวเตอร์ ($p=0.002$) และความคุ้นเคยกับเครื่องมืออิเล็กทรอนิกส์ ($p=0.001$) อย่าง มีนัยสำคัญทางสถิติ ท้ายที่สุด การศึกษานี้เป็นไปเพื่อประเมินเทคโนโลยีใหม่ที่นำมาใช้ในสถาบันประสาทวิทยา กรุงเทพมหานคร ข้อมูลนี้ จะเป็นพื้นฐานเพื่อการศึกษาเชิงลึกต่อไปเกี่ยวกับประสิทธิภาพ ประสิทธิผล และค่าใช้จ่ายเกี่ยวกับแบบบันทึกการให้ยาระงับความรู้สึกในอนาคต

สาขาวิชา สาธารณสุขศาสตร์ ลายมือชื่อนิสิต .....

ปีการศึกษา 2557 ลายมือชื่อ อ.ที่ปรึกษาหลัก .....

5678850053 : MAJOR PUBLIC HEALTH
KEYWORDS: ANESTHESIA / SATISFACTION / ELECTRONIC PATIENT ANESTHESIA RECORD

SIRINYA NARATCHARIYANGKOON: Survey of Satisfaction among Users of Electronic Patient Anesthesia Record in Neurological Institute Bangkok Thailand. ADVISOR: ASSOC. PROF. PRATHURNG HONGSRANAGON, Ph.D.{, 49 pp.

Anesthesia medical records are important in the recording process of anesthesia to patients during surgery; it provides legal evidence to protect communication between medical staffs. The anesthesia medical records patient details continuously before surgery, during surgery, and during postoperative period. All of these procedures had been manually managed. However, there has been an increase use of an electronic patient anesthesia record machine. This type of machine has been designed and developed since 1970. Each care institute has applied the machine to measure the accuracy and the completeness of the patient's record. Moreover, the Department of Anesthesiology Neurological Institute has implemented the use of electronic record of anesthesia. The aim of this study was to assess level of user's satisfaction to electronic patient anesthesia record in this hospital. This study is a cross-sectional survey and questionnaires were used to collect data for a population consisting 182 respondents. The statistical relationship was analyzed using Chi - Square Test and Mann -Whitney test. Results showed most of the respondents in recorders group had high level of satisfaction 50% and 45% felt moderate satisfaction and when focused on readers group found 84% of this group had moderate satisfaction of electronic patient anesthesia record. The association between socio-demographic characteristics and users satisfaction of electronic patient anesthesia record were associated significantly with level of computer knowledge and familiarity with electronic machine ($p = 0.002$ and 0.001 respectively) in reader respondents. Finally, this study was done to evaluate new technologies used in Neurological Institute, Bangkok. This information will be based on in-depth study to understand the efficiency, effectiveness and costs of the anesthesia in the future.

Field of Study: Public Health Student's Signature .....

Academic Year: 2014 Advisor's Signature .....

ACKNOWLEDGEMENTS

This thesis would not have been possible without the help and support of many people who directly and indirectly contributed their efforts to my study.

First of all, I would like to express my sincere gratitude and deep appreciation to my advisor for her untiring and invaluable efforts through her guidance and useful comments to help improve my thesis. My great appreciation is also extended to Ajarn Piyalamporn Havanond for suggestion about data analysis, Assoc. Prof. Kanchana Rungsithirunrat, Ph.D and Dr.Wongwat Liulak, MD for helpful suggestions and comments to improve my thesis.

I would like to thank the Dean and all my lecturers of the College of Public Health Sciences, Chulalongkorn University for their kind guidance. I also wish to thank all staffs of MPH office for their friendly attitude and kind support to all students.

I would like to specially thank all the Department of medical service, the Ministry of Public Health for generous scholarship support to expense of my graduate education. Besides, I wish to express my sincere thanks and gratitude to Dr. Audom Phuvarodom, Director of Neurological Institute, Dr.Phuping Akavipat, Director of anesthesia department, and Dr.Suchart Hartchaipiboomkul and Dr.Patchari Yimlamai for their useful comments to improve my study and questionnaire.

My thanks is also conveyed to all my classmates and friends in the College of Public Health Sciences for their support and assistance during the study course.

I also would like to thank all participants in the study from Neurological Institute that responded to the questionnaire.

Finally, I deeply appreciate my parents for their encouragement and support throughout the years of my studies.

CONTENTS

Page

THAI ABSTRACT iv
ENGLISH ABSTRACT v
ACKNOWLEDGEMENTS vi
CONTENTS vii
LIST OF TABLES ix
LIST OF FIGURES x
CHAPTER I INTRODUCTION 1
1.1 Background and Rationale 1
1.2 Research Question 4
1.3 Hypothesis 4
1.4 Research objectives 4
1.5 Conceptual Framework 5
1.6 Operational definition 6
CHAPTER II 7
REVIEW OF LITERATURE 7
2.1 Definition of anesthesia care 7
2.2 Patient anesthesia record 11
2.2.1 Handwritten patient anesthesia record 11
2.2.2.Electronic patient anesthesia record 14
2.3 Concept of satisfaction 17
2.4 Related research about users/customers' satisfaction 17
CHAPTER III 21
RESEARCH METHODOLOGY 21
3.1 Research Design 21
3.2 Study Area 21
3.3 Study Period 21
3.4 Study Population and Research Subjects 21
3.5 Pilot study 22

Page

3.6 Measurement Tools 22
3.7 Reliability 23
3.8 Validity Test 23
3.9 Data Collection 23
3.10 Data analysis 24
3.11 Ethical consideration 24
CHAPTER IV 25
RESEARCH RESULTS 25
4.1 Socio-demographic information 25
4.2 Information about satisfaction questionnaire 28
4.3 Satisfaction among users of electronic patient anesthesia record 32
4.4 Association between socio-demographic characteristics and satisfaction among users of electronic patient anesthesia record 33
CHAPTER V 36
DISSCUSSION 36
5.1 Socio-demographic information 36
5.2 Satisfaction among users of electronic patient anesthesia record 37
5.3 Association between socio-demographic characteristics and level of satisfaction among users of anesthesia information management system ... 40
5.4 Conclusions 40
5.5 Limitations 41
5.6 Recommendations 41
5.7 Further study 42
REFERENCES 43
VITA 49

LIST OF TABLES

Table 1Advantage and limitation of General anesthesia 8
Table 2Advantage and limitation of Regional anesthesia..... 9
Table 3 Socio-demographic Information of Recorder Participants 26
Table 4 Socio demographic characteristics of Reader respondents..... 27
Table 5 Information about satisfaction questionnaire in recorder group..... 29
Table 6 Information about satisfaction questionnaire in reader group 31
Table 7 Satisfaction of recorder respondents..... 32
Table 8 Satisfaction of reader respondents 32
Table 9 Association between socio-demographic characteristics and recorder respondent's satisfaction of electronic patient anesthesia record 33
Table 10 Association between socio-demographic characteristics and reader respondent's satisfaction of electronic patient anesthesia record 34

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

LIST OF FIGURES

Figure 1 Intra operative handwritten patient anesthesia record 12

Figure 2 Electronic patient anesthesia record workstation mounted on an anesthesia machine..... 14

Figure 3 Intra operative electronic patient anesthesia record 15

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

CHAPTER I
INTRODUCTION

1.1 Background and Rationale

"Anesthesia" word is derived from Greek language .The anesthesia is intended for patients who came for surgical or invasive procedures such as pain-free and unresponsive to stimuli caused by the surgery and procedures.

Basic elements of anesthesia include

- Anesthesia refers to loss of sensation or loss of consciousness
- Analgesia refers to inability to sense pain
- Amnesia refers to loss of memory or inability to recall events

The role of anesthesia services is responsible for providing anesthesia to patients who are undergoing the surgery. Details of service include pre-operative, intra-operative and post-operative functions recording.

The steps of service starts from pre-operative visit for a review chart of the patient, an interview with the patient, a review of the appropriate examinations, a physical examination, and instruction-giving regarding the practice before and after the anesthesia. For the intra-operative function, the patient will be taken care of by the anesthesiologist and nurse anesthetists at all time during the operation.

The intra-operative function is an important period for anesthesia procedures. The anesthesiologist normally chooses appropriate techniques for each individual patient. General anesthesia techniques (GA) are appropriate for neurosurgery procedure.

The meaning of general anesthesia is the state of a patient receives medications for amnesia, analgesia, muscle paralysis, and sedation. Steps of general anesthesia consist of induction, endotracheal intubation, maintenance and endotracheal extubation.

Nurse anesthetists usually record the vital signs every 1-5 minutes, and notes down the information about the intake (for instance, intravenous fluids, blood component, and medication) and the output (for instance, blood loss, urine, drain) and any other events happening during the intra-operative function.

When the operation is over, the anesthesia team moves the patient to the post anesthetic care unit (PACU) for an observation of the vital sign, respiratory pattern, and the management of surgical pain. The duration in the post-anesthetic care unit is determined by the status of each individual patient.

After a 24-hour period, after the patients go through an anesthesia procedure, the anesthesia team pays a visit at the ward for an assessment to see if there are any problems by checking the awareness, pain level, dizziness, nausea, vomiting, and sore throat of each patient.

All of these procedures have been manually managed. However, there has been an increasing use of an electronic patient anesthesia record machine. This type of machine has been designed and developed since 1970. Each care institute has applied the machine to measure the accuracy and the completeness of the patient record. By this, it means that all information that an anesthesiologists and nurse anesthetists have recorded in the handwritten anesthetic record form, will now be switched to this record machine. The machine is aimed to be used as a reference point of the planning and the monitoring for quality standards of the treatment.

An electronic anesthetic record machine yields various kinds of benefits. For instance, it continues to help take care to the patient after the operation, particularly, at the ward. In case a nurse does not understand about the dose of narcotic drug given that is stated inaccurately or uncompleted in the paper-form record sheet, she may not be able to observe the patient's respiratory pattern which can develop into an apnea of the patient during the post-operative function. The nurse may then misunderstand

about the volume of the intake or the output at the stage of the intra-operative. As a result, the nurse cannot be aware of the patient's hypotension or patient's pulmonary edema. Apparently, the knowledge of those that have been involved in the process becomes very important. Noteworthy, is the fact that when an anesthesia record is invalid or when the record is not understood in term of its meaning of the record, it leads to a lack of effective treatment and causes an inappropriate continuity of care. In Thailand, when previous anesthesia record was handwritten, the problems occurred due to the unclearness, incompleteness and errors, any of which impedes the effectiveness and safety of care-giving.

Neurological Institute is a tertiary-care level hospital based in Bangkok. It is the center of excellence for neurological diseases ranging from stroke, epilepsy diseases, spinal diseases, brain tumor, and neuro-immunology diseases. Neurological Institute also provides medical care for the patients referred from other hospitals. In particular, the target of the anesthesia department is to yield the support for the neurosurgical procedure, neuro-intervention procedure, dental surgery in mentally retarded children, and eye surgery.

Electronic patient anesthesia record at the Neurological Institute is an automatic recording system that allows for automatic and reliable data collection, data storage, and patient's data presentation during the intra-operative and post- operative periods. Electronic patient anesthesia record are user-friendly due to its easiness to read, accuracy, effectiveness in terms of data recording, as well as potentially cost-effective for an anesthesia management. Also useful for research and development, and potentially is advantageous from the aspect of legal issues. However, as electronic patient anesthesia record needs to be connected with the Internet technology, some personnel who have less experienced with the computer system may be hesitant or worried to use it as they are unfamiliar with the layout and the replacement of the machine.

By far, Neurological Institute has been the first care institute in the country which implements the use of electronic patient anesthesia record in its full scale since September 2012 after one year of development and testing. As of now, Electronic patient anesthesia record has become a routine use in the operating theater to record patient's clinical information before anesthesia, anesthesia data during the intra-operative and the post-anesthetic care unit at the post-anesthesia functions.

After an implementation of electronic patient anesthesia record program by the Anesthesiology Department at the Neurological Institute, there has been no study to survey the satisfaction of the users toward electronic patient anesthesia record.

1.2 Research Question

1. What is the level of satisfaction among users of anesthesia information management system in Neurological Institute, Bangkok, Thailand?
2. What are the factors associated with the level of satisfaction among users of anesthesia information management system in Neurological Institute,Bangkok, Thailand?

1.3 Hypothesis

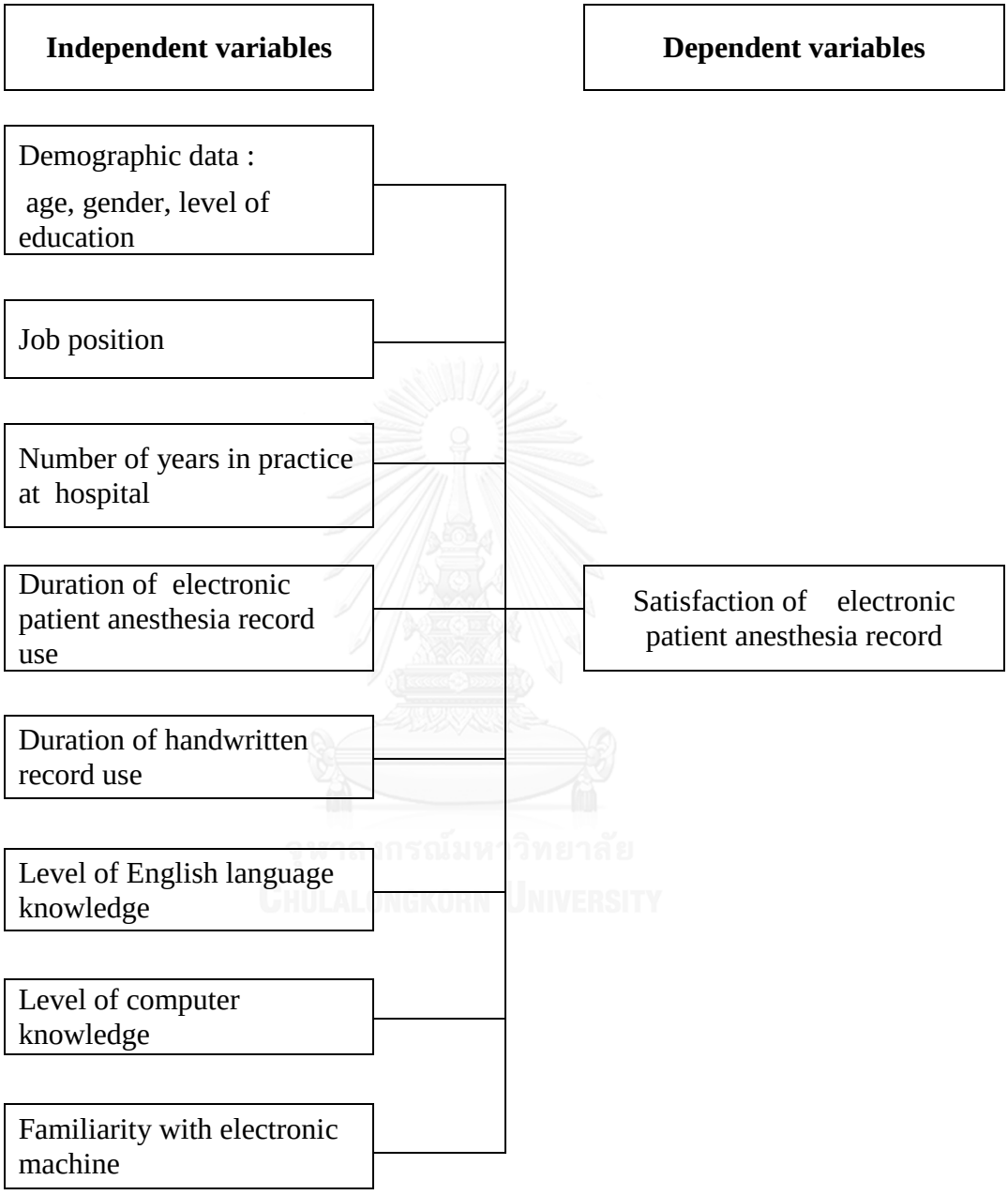
The socio-demographic characteristics associate with the level of satisfaction among users anesthesia information management system in Neurological Institute,Bangkok, Thailand

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

1.4 Research objectives

1. To assess the level of satisfaction among users of anesthesia information management system in Neurological Institute,Bangkok, Thailand
2. To examine the factors associated with the level of satisfaction among users of anesthesia information management system in Neurological Institute, Bangkok, Thailand

1.5 Conceptual Framework



จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

1.6 Operational definition

In this study, there are both independent and dependent variables:

Independent Variables

- Age refers to how old the interviewee is at the time of the interview.
- Gender refers to male and female.
- Level of educational refers to the highest year or education of the interviewee. It was divided into Bachelor's degree , Master's Degree and Doctoral Degree
- Job position refers to the role of person in Neurological Institute: as anesthesiologists / nurse anesthetist / registered nurse / neurosurgeons.
- Number of years in practice at this hospital refers to the period that one has worked in Neurological Institute.
- Duration of electronic patient anesthesia record use refers to the period of electronic anesthesia medical record use.
- Duration of handwritten record use refers to the period of handwritten anesthesia medical record use.
- Level of English language knowledge refers to level : high , moderate ,low
- Level of computer knowledge refers to level: high , moderate ,low
- Familiarity with electronic machine refers to level: high , moderate ,low

Dependent variable

- Satisfaction refers to the level of one's feeling of comfort with the electronic patient anesthesia record compared to the handwritten one.

CHAPTER II

REVIEW OF LITERATURE

In order to fulfill the thesis topic on "A survey of satisfaction among users of electronic patient anesthesia record in Neurological Institute, Bangkok, Thailand," the researcher has reviewed the following concepts to help designing the survey questionnaire:

2.1 Definition of anesthesia care

The Anesthesia Care Team includes physician and non-physician staff members. All members have an obligation to accurately identify themselves and other team members to the patients and their families. Anesthesiologists should not permit the mis-representation of non-physician personnel acting as though they are resident physicians or practicing physicians. The nomenclature below is appropriate terminology for this purpose (Committee of Origin Anesthesia Care Team, 2013):

Anesthesiologist is a physician's role as the director of the Anesthesia Care Team. A physician is licensed to practice medicine as he/she has successfully completed a training program in anesthesiology;

Nurse anesthetist is a non-physician but a registered nurse who has satisfactorily completed an accredited nurse anesthesia training program and certifying examination.

Anesthesia is a science that requires knowledge and expertise. Anesthesiologists must understand the anatomy and physiology of the body, pharmacology of drugs in use for anesthesia, type of anesthesia**,** principles to operate anesthesia machine or monitor**,** pathophysiology of patient and disease to operate. They must also know about procedures for surveillance of potential complications from surgery, and must have skills to communicate with the Surgeon, anesthesia nurse and other provider for anesthesia care and surgical procedures to make sure the procedures goes smoothly and that the patients recovers safety after surgery.

The choice to which type of anesthesia is used depends on the patients' surgery or procedure that patient receives, including the expertise of anesthesiologists and surgeons in the creation of such surgical anesthesia.

1. General anesthesia, general anesthesia is to allow the patient to be unconscious, analgesia, amnesia and immobility or muscle relaxation for convenience of surgery with the infusion of the intravenous anesthesia alone or a mix of inhalation anesthesia for stability of a deep anesthesia.

2. Regional anesthesia is when Anesthesiologists inject analgesia drug into epidural space, spinal canal or brachial plexus for nerve block. Patient can remain awake during the surgical procedure but feels no pain at the surgery site. Mostly, an epidural or spinal block technique is used for surgeries below the waist (cesarean section, total hip replacement, and total knee replacement) and brachial plexus block is used for arm surgery.

3. Monitor anesthesia care is to monitor the patient given intravenous drug injection for sedating patients to cooperate during operation. Most choose this type for short time surgeries and investigation procedure (i.e. colonoscopy, computer scan, MRI)

4. Local or topical anesthesia is administered anesthetic drug to the position of surgery example give anesthetic spray around a wound in the neck before an endoscopy procedure.

Advantage and limitation of type of anesthesia

Table 1Advantage and limitation of General anesthesia

Advantages	Limitations
1.used for long surgeries	1.patient high dose of anesthesia drug may find side effects of the drug
2.control deep anesthesia	2.Elderly patient or patient that have pathological brain conditions, liver and kidney problems may have a delay in recovery awake
3.appropriate for patient that are unable to cooperate or make decisions	3. higher risk of nausea and vomiting

4.stable of hemodynamic	4.less pain tolerance after surgery
	5.may find complications :difficult ventilation, difficult intubation, dental damage ,etc

Table 2Advantage and limitation of Regional anesthesia

Advantage	Limitation
1.can assess conscious of patient all time to operation	1.spinal anesthesia induce hypotension after local drug injection suddenly
2.more pain tolerance after surgery	2.complication of local anesthesia : can cause allergy, infection, headaches, back pain
3.no disturbed respiratory system	3.maybe patient feel fearful or excited
4.more attachment between mother and neonate in cesarean section at delivery situation	4.local anesthesia have duration of effect maybe can't predict time to surgery ,can' t refill drug
	5.patient blood coagulation is contra indication
	6. morphine mix in local anesthesia for spinal injection have possibility causing itchy skin, nausea and vomiting, respiratory depression

Statement on the Anesthesia care team from the committee of American Society of Anesthesiologists approved by ASA House of Delegates on October 26, 1982, and last amended on October 16, 2013 definition role for the safe conduct of the Anesthesia Care Team to achieve optimum patient safety, the anesthesiologist who directs the Team is required to be responsible for the following (Committee of Origin, 2011):

1. Management of personnel: anesthesiologists should assure the assignment to the physician and/or non-physician personnel with appropriate skills for each patient and each procedure;

2. Pre-anesthetic evaluation of the patient: a pre-anesthetic evaluation allows for the development of an anesthetic plan that considers all conditions and diseases of the patient that may influence the safe outcome of the anesthetic. Although non-physicians may contribute to the pre-operative collection and documentation of the patient's data, the anesthesiologist is the sole responsible for the overall evaluation of each patient;

3. Prescribing the anesthetic plan: an anesthesiologist is responsible for prescribing an anesthesia plan aimed at the greatest safety and highest quality for each patient. The anesthesiologist discusses with the patient or the guardian, on the issues of anesthetic risks, benefits and alternatives, and informed consent receiving. When a part of the anesthetic care will be performed by another qualified anesthesia practitioners, the anesthesiologist should inform the patient that delegation of anesthetic duties is included in care provided by the Anesthesia Care Team.

4. Management of the anesthetic: a management of an anesthetic is dependent on many factors, including the unique medical conditions of individual patients and the procedures being performed. Anesthesiologists will determine which pre-operative tasks, if any, may be delegated. The anesthesiologist may delegate specific tasks to qualified non-anesthesiologist members of the Anesthesia Care Team providing that quality of care and patient safety are not compromised. The anesthesiologist will participate in critical parts of the anesthetic, and will remain immediately available for the management of emergencies regardless of the type of anesthetic provided;

5. Post-anesthesia care: routine post-anesthesia care is normally delegated to post-anesthesia nurses. The evaluation and treatment of post-anesthetic complications are the sole responsibility of the anesthesiologist; and

6. Anesthesia consultation: like other forms of medical consultation, this is the practice of medicine and should not be delegated to non-physicians.

2.2 Patient anesthesia record

The goal of the anesthesia record is to capture a patient's response to anesthesia and surgery by recording the procedures, physiologic changes, key events, and pharmacologic administration that occur throughout the perioperative period

2.2.1 Handwritten patient anesthesia record

The paper anesthesia record has not changed fundamentally since its earliest inception in the 1890s by Dr Harvey Williams Cushing and Dr Ernest Amory Codman. And development anesthesia document appropriate for other place. (Figure1.)

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

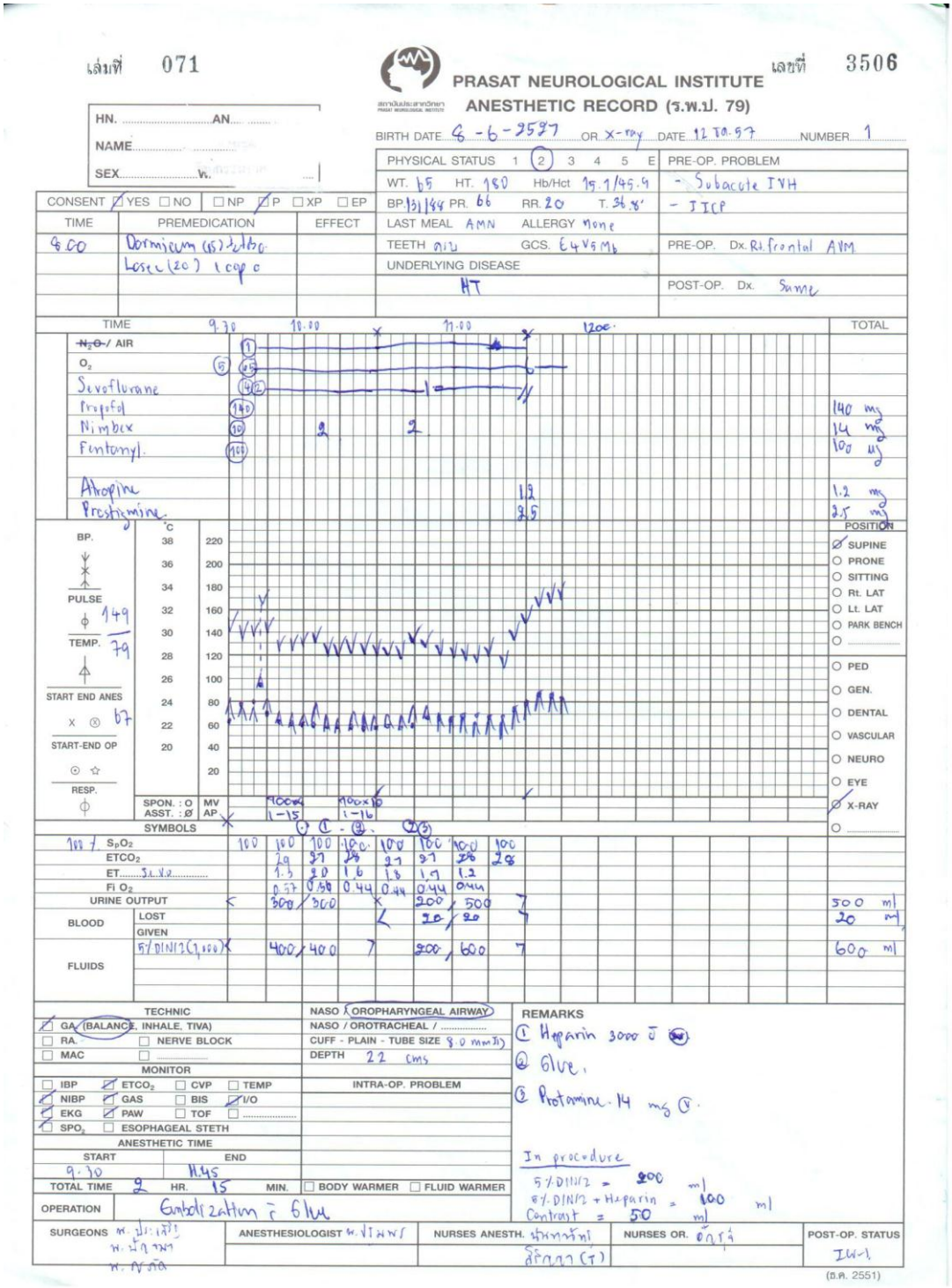


Figure 1 Intra operative handwritten patient anesthesia record

Anesthesia providers routinely monitor the following continuous and frequently obtained metrics and waveform data:

•Heart rate

• Pulse oximetry (non-invasive devices used to measure a patient's blood-oxygen saturation level and pulse rate)

• Blood pressure

• Electrocardiogram

• End-tidal carbon dioxide monitoring

• Respiratory rate

• Airway pressure

• Tidal volume

• Temperature

• Volatile anesthetic concentration

• Central venous pressure

• Pulmonary artery pressure

Although the paper-form anesthesia record has a good structure but it also has some limitations. From the study by the Department of Anesthesiology, Faculty of Medicine, Prince of Songkla University, by Wipharat Juthasantikul et al in 2012, it was indicated that from a handwritten anesthetic record, nurses at the ward had problems of readable handwriting. As a result, the record caused confusion about the antibiotic given. The study suggested for an integration of the electronic anesthesia record for more effectiveness in care-taking of the patient in the post-operative period.

From Mount Sinai journal of medicine Page 154-165, Bassam Kadry (2012) show about limitation of the paper anesthesia record

• Recall bias occurs because the anesthesiologist cannot simultaneously write down the vital signs and deliver care to the patient. This limits the record's accuracy and can result in a constant vital-sign data.

• Data can only be queried for outcomes research or quality-assurance purposes through manual chart review.

• Records are often illegible or difficult to read.

• Records may be lost or be otherwise inaccessible.

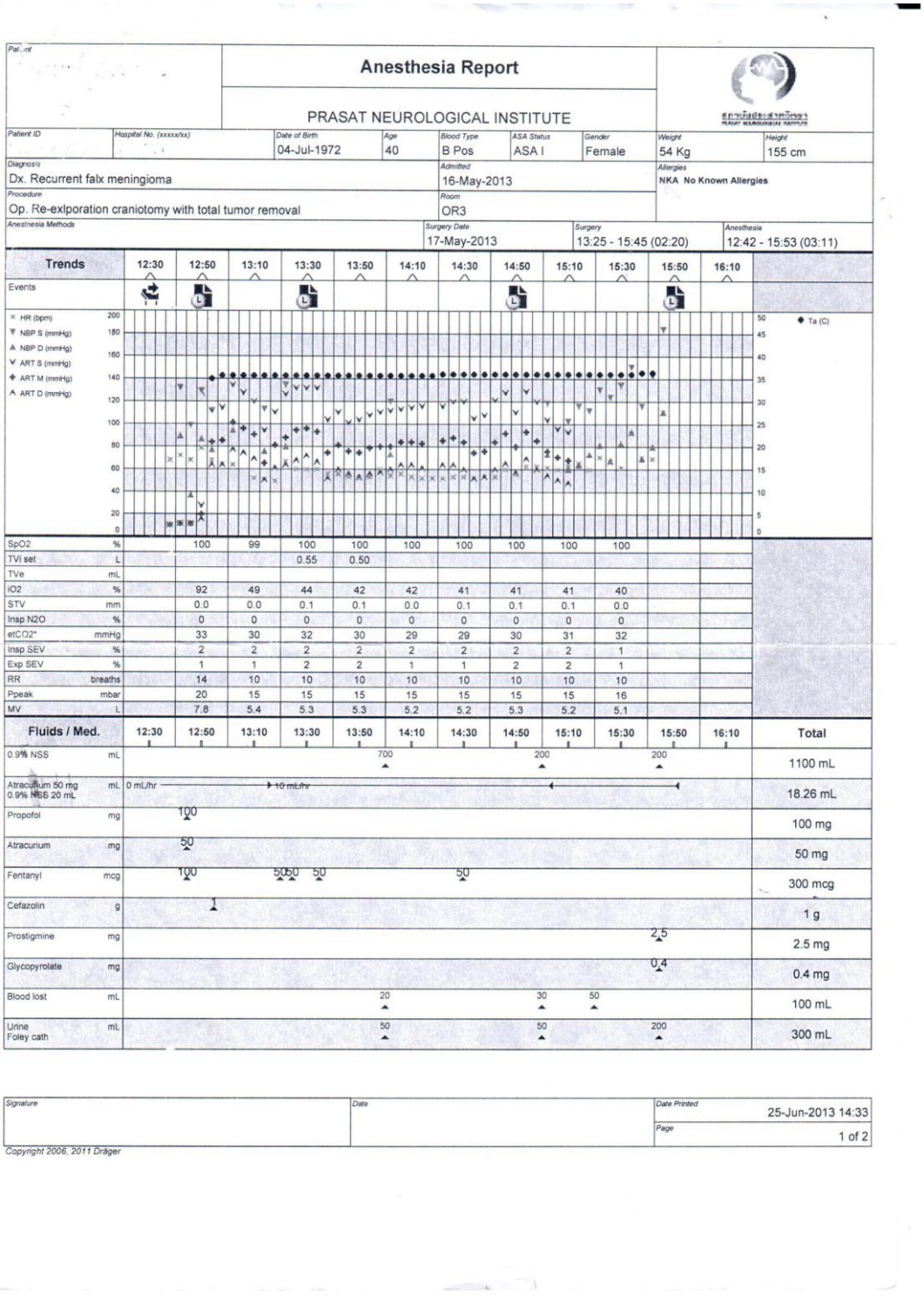
• Incomplete documentation can limit charge capture and billing opportunities.

• Less medical legal protection.

2.2.2.Electronic patient anesthesia record

The documentation of physiologic metrics by computers has been utilized since the 1970s. Electronic patient anesthesia record are specialized forms of electronic health record systems (Figure 2). The system allows for automatic and reliable data collection, data storage, and presentation of real-time patient data during the pre-operative, Intra operative and post-operative periods. Most electronic patient anesthesia record allow end users to access information for management, Quality assurance and research purposes. This system consists of a combination of hardware and software that interface with intraoperative monitoring. So primary role of electronic patient anesthesia record is to capture data during intraoperative phase, most system can corporate pre and postoperative phase. (Figure 3)

Figure 2 Electronic patient anesthesia record workstation mounted on an anesthesia machine



Anesthesia Report

PRASAT NEUROLOGICAL INSTITUTE

Patient ID	Hospital No. (xxxxx/xx)	Date of Birth	Age	Blood Type	ASA Status	Gender	Weight	Height
		04-Jul-1972	40	B Pos	ASA I	Female	54 Kg	155 cm

Diagnosis: Dx. Recurrent falx meningioma
Admitted: 16-May-2013
Allergies: NKA No Known Allergies
Procedure: Op. Re-exlporation craniotomy with total tumor removal
Room: OR3
Anesthesia Methods
Surgery Date: 17-May-2013
Surgery: 13:25 - 15:45 (02:20)
Anesthesia: 12:42 - 15:53 (03:11)

Trends — Events

HR (bpm), NBP S (mmHg), NBP D (mmHg), ART S (mmHg), ART M (mmHg), ART D (mmHg), Ta (C)

		12:30	12:50	13:10	13:30	13:50	14:10	14:30	14:50	15:10	15:30	15:50	16:10
SpO2	%		100	99	100	100	100	100	100	100	100		
TVi set	L				0.55	0.50							
TVe	mL												
IO2	%		92	49	44	42	42	41	41	41	40		
STV	mm		0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0		
Insp N2O	%		0	0	0	0	0	0	0	0	0		
etCO2*	mmHg		33	30	32	30	29	29	30	31	32		
Insp SEV	%		2	2	2	2	2	2	2	2	1		
Exp SEV	%		1	1	2	2	1	1	2	2	1		
RR	breaths		14	10	10	10	10	10	10	10	10		
Ppeak	mbar		20	15	15	15	15	15	15	15	16		
MV	L		7.8	5.4	5.3	5.3	5.2	5.2	5.3	5.2	5.1		

Fluids / Med.		12:30	12:50	13:10	13:30	13:50	14:10	14:30	14:50	15:10	15:30	15:50	16:10	Total
0.9% NSS	mL						700			200		200		1100 mL
Atracurium 50 mg 0.9% NSS 20 mL	mL	0 mL/hr				10 mL/hr								18.26 mL
Propofol	mg		100											100 mg
Atracurium	mg		50											50 mg
Fentanyl	mcg		100		50	50	50		50					300 mcg
Cefazolin	g		1											1 g
Prostigmine	mg											2.5		2.5 mg
Glycopyrolate	mg											0.4		0.4 mg
Blood lost	mL						20			30	50			100 mL
Urine Foley cath	mL						50			50		200		300 mL

Signature | Date | Date Printed: 25-Jun-2013 14:33 | Page: 1 of 2

Copyright 2006, 2011 Dräger

Figure 3 Intra operative electronic patient anesthesia record

From Anesthesiology news in September 2009, Jesse M. Ehrenfeld summarize area impacted by electronic patient anesthesia record

- Impact on patient :
  - more accurate record of patient responses to anesthesia
  - improve availability of history records
  - allow Anesthesiologist to focus on patient, rather than charting.
- Impact on the practice of anesthesia
  - improve quality assurance function due to more accurate and complete record
  - ability to quickly search for specific occurrences or area events across multiple case
  - provide a mean to track individual provider performance over time
  - assessment patient outcome through integration with other hospital database
  - available of accurate, high-resolution chart for education purpose
  - legal protection through provision of more accurate, unbiased information
- Impact on department management
  - facilitate accurate and timely billing
  - allow analysis of supply costs by patient/provider/type of surgery
  - can assist with concurrency and other regulatory compliance issues
  - satisfy joint commission requirements for comprehensive legible records

Although Electronic patient anesthesia record or electronic patient anesthesia record has many advantages but it also its limitations.

-limited mobility (electronic patient anesthesia record typically accessed on desktop computer: pre and postoperative assess usually at bedside)

-no electronic patient anesthesia record standards across vendors

-unrecognized system failure can lead to gap in data collection

-initial expense may not be recovered quickly in small practices

-requires significant time and effort for initial training and implementation

- potential introduction of monitoring and recording artifact into electronic record

2.3 Concept of satisfaction

In marketing term, positive and negative feedback from users/customers can influence the whole quality improvement agenda and provide an opportunity for an organization or a department to learn and develop their products/services pertaining to the needs and requirements of the users/customers, particularly in the target marketing way of conducting a business.

In general, satisfaction means the feeling of pleasure that one has when one has done or achieved what one has wanted. The feeling of satisfaction tends to decrease if the need or purpose has not been met with the response. Another meaning is that of a positive feeling to an assessed service, especially when one succeeds the purpose that one has set.

2.4 Related research about users/customers' satisfaction

In the study about the completion and the accuracy in charting an anesthetic records at Songklanagarind Hospital by Yunuswangsa Q et al (2008) aiming to audit the completeness and the accuracy in charting an anesthetic record in handwritten form. The result indicated that there was a 100% complete and accurate items regarding vital signs during anesthesia. The average of good anesthetic record was however only 94.5%. The incomplete anesthetic records were caused by illegibility, incorrect data filling, no data, or incomplete detail of each item, such as incorrect ASA classification, or problem list, etc. Handwritten records should be carefully filled-in to increase completion so that the data could be used as a legal evidence reference.

A study by the Department of Anesthesiology, Faculty of Medicine, Prince of Songkla University by Wipharat Juthasantikul et al (2012) studied about the perception of nurses regarding the benefits from anesthetic record for nursing care with post-operative patients. The result showed a high level score of nurse perceptions and score of benefits of anesthetic record for nursing care in post-operative period. The highest mean score about antibiotics was given during intra-operative stage (4.34) and the benefit score was 4.50. The mean score of benefit of the legibility of the handwritten record and the complete details of anesthetic record was the lowest (3.90). The nurses in the study suggested for a training course on how to read anesthetic record for

accuracy and quality care for patients in post-operative period. More importantly, they also suggested for a computerized anesthetic record information system.

In 2012, Hyun Seung jin et al focused on the satisfaction with electronic anesthetic record and compared it with the handwritten anesthesia record which was administered by the anesthesiologists, trainees, and nurses, at the Department of Anesthesiology and Pain Medicine, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, Korea. The result demonstrated that most of the anesthetic practitioners in the hospital promptly accepted and preferred electronic anesthetic record in operating over the handwritten ones.

Wrightson WA.et al (2010) compared between the electronic and the handwritten anesthetic records aiming for the completeness of information at the Department of Anesthesia, Starship Children's Hospital, Auckland, New Zealand. They found that there was no significant difference in the total score for the completeness between electronic (78%) and handwritten (83%) records ($p = 0.16$). There was no overall difference in the completeness of electronic versus handwritten records as well. However, several differences did exist highlighting both clinically important advantages and deficiencies in the electronic systems. Records from both systems sometimes lacked important information, the authors concluded.

In another study by Beilin Y et al (2009) on "A survey of anesthesiologists' and nurses' attitudes toward the implementation of an Anesthesia Information Management System on a labor and delivery floor" found that most people used anesthesia information management system in operating room but not on labor and delivery (L&D) floor. The purpose of this study was to then describe an implementation of anesthesia information management system on L&D floor and the attitudes of anesthesiologists and nurses toward the system. The result indicated that the anesthesiologists (76%) and nurses (73%) were satisfied with the L&D electronic patient anesthesia record and did not want to switch back to a handwritten record. In conclusion, anesthesia information management system should not be limited only to the operating room setting, but could as well successfully be used in labor and delivery section.

Another study tried to integrate the computerized anesthesia charting into a hospital information system. The study was conducted by Wang X et al (1995) to

evaluate the using time, to assess the impact of the system on the anesthesiologists' time use, to assess the completeness of the anesthesia record. Survey questionnaire was used to assess anesthesiologists' attitudes. The study showed a major reduction in time required for charting from 20.4% to 13.4% which was statistically significant ($p = 0.0001$). Other significant factors were a reduction in the time spent scanning the entire area which dropped from 10.5% to 5.6% ($p = 0.001$), patient preparation time increased from 10.1% to 13.1% ($p = 0.02$), the time spent arranging equipment increased from 6.4% to 8.1%, and the average time spent on non-anesthesia activities increased from 6.3% to 11.3%. The computerized anesthesia record was stated to be more legible and complete than the manual record. The overall assessment of the computerized charting by anesthesiologists was positive. The computerized anesthesia charting was preferred by the anesthesiologists, who, after one or two training sessions, used the system on their own quite comfortably.

A study at the intensive care unit was conducted to see the impact of an electronic information system on physician workflow and data collection. It was conducted by Apkon M et al (2001) to compare handwritten and electronic documentation to determine (1) time spent entering data or composing notes; (2) number of descriptors documenting patients' physical exams; (3) users' preferences for structured or unstructured data entry; and (4) frequency of documenting specific data elements related to nutritional support. The results showed that electronic and handwritten documentation consumed equal amounts of time. However, an advantage of electronic documents was that they were more detailed than handwritten while contained 50 % more descriptors overall where some data elements were not handwritten.

In the School of Nursing at the University of Alabama, Birmingham, AL, USA, an observational study was conducted on "The accuracy and the completeness of an anesthesia information management system: recommendations for documentation system changes." (2013). First, observational data was collected from the nurse anesthetists who delivered anesthesia care using a touch-screen tablet computer (for the utilizing of an access database customized observational data collection tool). Then, the survey questionnaire was administered to these nurse anesthetists to assess their perceived accuracy, completeness, and satisfaction with the electronic documentation

system. The major sources of data not being documented into the system were anesthesiologist presence (20%) and placement of intravenous lines (20%). The major sources of inaccuracies in documentation were gas flow rates (45%), medication administration times (30%), and documentation of neuromuscular function testing (20%). All sources of inaccuracies were related to the use of charting templates that were not altered to reflect the actual interventions performed.

In 2008 after an implementation in the Graduate School of Public Health, Younsei University, Seoul, Republic of Korea, a study was conducted to see the effect of an electronic medical record on the completeness of documentation in the anesthesia record. The purpose was to evaluate the completeness of anesthesia recording before and after the introduction of an electronic anesthesia record. The result indicated that the average completeness score of the electronic anesthesia records was 3.15% higher than that of the paper records. However, the type of the anesthesia records had no influence on the completeness in the data entry items.

Finally, a study on the factors influencing the quality of medical documentation when a paper-based medical record system was replaced with an electronic medical record system by Pourasghar F et al. (2008), the objectives of the study were to identify the factors which influence the quality of medical documentation when paper-based records were replaced with electronic ones. The results also indicated that the retrieval of information from the electronic medical records was easier and faster, especially in emergency situations. The electronic medical records system could be a good substitute for the paper-based medical records system. However, according to the study, some factors such as low physician's acceptance of the electronic medical record system, lack of administrative mechanisms (for instance, supervision, neglecting physicians and/or nurses in the development and implementation phases and also continuous training), availability of hardware as well as lack of specific software features, can all negatively affect the transition from a paper-based system to an electronic system.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Research Design

This study is a cross-sectional study to assess the satisfaction among users of electronic patient anesthesia record in Neurological institute, Bangkok, Thailand.

Research methodology

3.2 Study Area

The study area was at the Neurological Institute, Bangkok, Thailand.

3.3 Study Period

After an approval from ethical committee, the study started approximately end of March to early April, 2015.

3.4 Study Population and Research Subjects

The study population is all the users of electronic patient anesthesia record at Neurological Institute, Bangkok, Thailand. There are 200 personnel using it. They are recorders and readers of this electronic patient anesthesia record:

There are 20 people as recorders, which are anesthesiologists and anesthetist nurses who work at the Anesthesia Department at the Neurological Institute. They provide data into the electronic patient anesthesia records, and after finishing an anesthesia procedure, they print out the record form of the patient.

There are 180 people as readers, which cover neurosurgeons, neurosurgical residents, and registered nurses who use the information from an anesthetic record.

- **Inclusion criteria**
- Anesthesiologists , anesthetist nurses, neurosurgeons , neurosurgical residents, and registered nurses who work at Neurological Institute and use electronic patient anesthesia records on a regular basis

- Above personnel who are willing to reply the survey questionnaire.

Exclusion criteria

- Personnel who are inexperienced with electronic patient anesthesia record system.

3.5 Pilot study

The questionnaire is used as a pilot test for 30 respondents in Ramathibodi Hospital, Bangkok, Thailand tentatively during March 2015, which is after the researcher's thesis proposal examination but during the process of ethics request, in order to find out the reliability and the validity of the survey questionnaire.

3.6 Measurement Tools

Structured questionnaire in Thai were used to collect the data (see in the Appendix). It consists of 2 parts in close-ended questions.

Part 1 Socio-demographic characteristics of respondents:

There are 10 questions in this part. The questions are about the age, gender, education, job position, number of year in practice at Neurological Institute, duration of electronic patient anesthesia record use, duration of handwritten record use, level of knowledge English language, level of computer knowledge and familiarity with electronic machine

Part 2 Satisfaction level of electronic patient anesthesia record use

There are 23 questions in this part using Likert's scale. The statements include both positive and negative views. The rating scale is measured as follow:

For positive statements

Strongly agree	=	4 scores
Agree	=	3 scores
Neutral	=	2 scores
Disagree	=	1 score
Strong disagree	=	0 score

And reverse for negative statements

Strongly agree	=	0 scores
Agree	=	1 scores
Neutral	=	2 scores

Disagree	=	3 score
Strong disagree	=	4 score

The scores vary from 0 to 92 and all questions are summed up for total scores and then converted to 100 scores. The scores are grouped into 3 levels as follow:

High satisfaction	75-92 scores	(81-100%)
Medium satisfaction	56-74 scores	(60-80%)
Low satisfaction	0-55 scores	(less than 60%)

A survey questionnaire was developed based on literature reviews and previous studies about survey of user's acceptance of electronic patient anesthesia, a record study at Korea from Hyun Seung Jin el al in 2012 and L.Quinzio el al in 2003 study in Germany.

3.7 Reliability

To find out the reliability of the questionnaire, the questionnaire was tested among hospital staff at Ramathibodi Hospital, Bangkok, Thailand, with similar hospital function as compared to Neurological Institute.

The internal consistency of the rating scales will be performed by Cronbach's alpha coefficient for an analysis of the satisfaction in order to get at least more than 0.80 of alpha value.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

3.8 Validity Test

To achieve the validity of the questionnaires, three content experts were sought out.

3.9 Data Collection

The study's questionnaire will be used by the researcher to collect the data. The researcher will explain about the objective of the study, the components of the questionnaire, principle of confidentiality and ethical consideration is then given with questionnaire and envelop to the respondents at the ward before morning nursing routine and it is then sent back to the researcher after 3 day at the anesthesia department.

Researcher prepares a box for sending questionnaire in front of the department and after the data analysis process all the papers will be destroyed by a document shredder after 1 month.

3.10 Data analysis

After the data collection, data is coded, separated in 2 groups (reader and recorder) and an analysis is performed by using SPSS statistical software, version 17, licensed for Chulalongkorn University.

The descriptive statistics is used - the frequency, percentage, mean and standard deviation, including minimum and maximum values - to explain the distribution of socio-demographic characteristics, and the satisfaction level of the respondents.

For analytical statistics, Chi-square test and Man –Whitney test is used to explain the association between socio-demographic characteristics and the satisfaction level. The significant level in this study is set up at 0.05.

3.11 Ethical consideration

The study will seek an approval from the Ethics Review Committee for Research involving Human Research Subjects, Health Sciences group, Chulalongkorn University before full-scale data collection. Then approval from the Ethics committee for research of Neurological institute.

Before collecting the data through the questionnaire with the respondents, the researcher will give clear explanation to each potential respondent on the purposes and procedures of the study. Each of them will be informed that participation in the study is completely voluntary and they can dropout at any time which will not affect them by all means. The informed consents will then be obtained from them.

CHAPTER IV

RESEARCH RESULTS

This chapter provided the detailed description of the results obtained from the analysis of cross-sectional survey about satisfaction among users of electronic patient's anesthesia record in Neurological Institute, Bangkok, Thailand.

Users in this study refer to readers and recorders. Total number of readers was 180 respondents and the number of questionnaire returned to researchers was 162 sheets (90%). Recorders were 20 persons return rate which is 100%. The variables were described as simple percentages, means, and standard deviations as appropriateness depended on the nature of the variables.

It started with the demographic data followed by the responses for each section of the questionnaire. The level of satisfaction score were then presented followed by the results of Chi-square and Mann-Whitney Test to see whether there was any association between socio-demographic characteristics and satisfaction.

4.1 Socio-demographic information

According to the socio-demographic characteristics information of respondents in table 3 and 4 the total response for questionnaire participants were 20 participants in recorder group and 162 participants in reader group .

Table 3 Socio-demographic characteristics of recorder respondents

The recorders group showed mean of age 40 years (maximum 59, minimum 27).The majority of gender was female 95% and only 5 % of respondents were male. The results of education level showed that 80.0% of respondents had graduated Bachelor's degree. 80% of job positions in respondents were nurse anesthetists and 20% were Anesthesiologists. Mean of duration in practice at Neurological Institute showed 12.5 years (maximum 37, minimum 0.5), duration of use of anesthesia information management system showed mean 2.08 years (maximum 3, minimum 0.5) and mean of duration to use handwritten anesthesia record form showed 10.45 years (maximum 30, minimum 0.5)

About level of knowledge English language, level of computer knowledge and familiarity with electronic machine in recorder group found 80% had moderate level cognition.

Table 3 Socio-demographic Information of Recorder Participants

Characteristics		**Number**	**Percentage (%)**
1. Age (years) Mean 40 SD 10.3 Max 59, Min 27			
2. Gender	Male	1	5
	Female	19	95
3. Level of education	Bachelor's Degree	16	80
	Master's Degree	3	15
	Doctoral Degree	1	5
4.Job position	Anesthesiologists	4	20
	Nurse anesthetist	16	80
5. Duration in practice at this hospital (years) Mean 12.5 SD 9.7 Max 37, Min 0.5			
6. Duration of electronic patient anesthesia record use (years) Mean 2.08 SD 0.7 Max 3.0, Min 0.5			
7. Duration of handwritten record use (years) Mean 10.45 SD 9.7 Max 30, Min 0.5			
8. Level of English language knowledge	High	3	15
	Moderate	16	80
	Low	1	5

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

9. Level of computer knowledge	High	3	15
	Moderate	16	80
	Low	1	5
10.Familiarity with electronic machine	High	3	15
	Moderate	16	80
	Low	1	5

Table 4 Socio-demographic characteristics of Reader respondents

Characteristics of the respondents are presented in Table 3 the mean return rate for this survey was 90 %. The readers group showed mean of age 35.97 years (maximum 59, minimum 21).The majority of the gender were female 73.5% and 26.5 % of respondents were male. The results of education level showed that 80.9 % of respondents had graduated Bachelor's degree. 82.1% of job position in respondents were registered nurses, 11% were Neurosurgery residents and 6.8% were Neurosurgeons. Mean of duration in practice at Neurological Institute showed 11.2 years (maximum 37, minimum 0.3), duration of use of anesthesia information management system showed mean 1.9 years (maximum 3, minimum 0.25) and mean duration of the use of handwritten anesthesia record form showed 7.4 years (maximum 30, minimum 0.0)

The majority of the readers level of English language knowledge, level of computer knowledge and familiarity with electronic machine in this group was found to be moderate level cognition 74.7%,68.5%.,70.4%.

Table 4 Socio demographic characteristics of Reader respondents

Characteristics		**Number**	**Percentage (%)**
1. Age (years) Mean 35.97 SD 9.57 Max 59, Min 21			
2. Gender	male	43	26.5
	female	119	73.5

3. Level of education	Bachelor's Degree	131	80.9
	Master's Degree	31	19.1
4.Job position	Nurse	133	82.1
	Neurosurgeon	11	6.8
	Resident	18	11.1
5. Duration in practice at this hospital (years) Mean11.24 SD 9.44 Max 37.0, Min 0.33			
6. Duration of electronic patient anesthesia record use (years) Mean 1.93 SD .82 Max 3.0, Min 0.25			
7. Duration of handwritten record use (years) Mean 7.40 SD 7.67 Max 30, Min 0.0			
8. Level of English language knowledge	High	34	21
	Moderate	121	74.7
	Low	7	4.3
9. Level of computer knowledge	High	46	28.4
	Moderate	111	68.5
	Low	5	3.1
10.Familiarity with electronic machine	High	46	28.4
	Moderate	114	70.4
	Low	2	1.2

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

4.2 Information about satisfaction questionnaire

This table showed information satisfaction question in recorders group. Most participants showed general satisfaction towards the use of electronic patient

anesthesia record in the operating room. Most respondents strongly agree of the automated convenient in lengthy cases which were more than 3 hours. (65%) and found to agree that anesthetic records were easy to read (65%), results in accurate documentation of procedures and events (65%), easy to review the record during and after the case (65%). However, respondents disagreed results are as follows, time-saving record-keeping system (15%), system easy to maintain (15%), respondents strongly disagreed only with one question which is convenient in short cases 1-3 hours (5%).

Table 5 Information about satisfaction questionnaire in recorder group

Question	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	%	%	%	%	%
1.information in anesthetic record easy to read	35	65	0	0	0
2. Time-saving record-keeping system	25	50	10	15	0
3. Results in accurate recording of vital signs	55	40	5	0	0
4. Results in accurate documentation of procedures and events	30	65	5	0	0
5. Allows more time to concentrate on patient care	45	40	15	0	0
6. Convenient in short cases (1-3 hr.)	25	30	30	10	5
7. Convenient in lengthy cases (>3hr.)	65	30	5	0	0
8. Convenient in simple cases(Laminectomy, Tracheostomy)	35	50	10	5	0
9. Convenient in complicated cases(Brain tumor, Aneurysm)	45	50	5	0	0

10. Beneficial in complicate or emergency cases	25	55	15	5	0
11. Convenience for record-keeping in emergency (eg. CPR) situations	15	50	25	10	0
12. Easy to review the record during and after the case	30	65	5	0	0
13. Convenient for data collection and research use	40	35	25	0	0
14.Over all satisfied with the electronic patient anesthesia record	35	55	10	0	0
15. Safe for patient	40	55	5	0	0
16. Safe for personal	45	50	5	0	0
17. Advantageous for legal protection	40	45	10	5	0
18. Prefer electronic patient anesthesia record over handwritten anesthetic record	45	35	20	0	0
19.Value investing in the future	45	45	10	0	0
20.Easy to maintenance	40	35	10	15	0
21. Understand the interpretation of the AIMS more than handwriting record.	25	45	25	5	0
22. Understand of the electronic patient anesthesia record more than handwriting record.	30	35	25	10	0
23. Electronic patient anesthesia record appropriate to Global technology	45	55	0	0	0

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

This table showed information satisfaction question in reader group

According to reader respondents they strongly agree that it is convenient for data collection and research use (20.4%) and agreed that it is easy to review the record during and after the case (79%) and over all satisfied with the electronic patient anesthesia record (79%), but only (0.6%) of respondents disagreed that information in anesthetic record was easy to read using electronic patient anesthesia record

Over all respondents satisfied with the electronic patient anesthesia record, understand the interpretation of the electronic patient anesthesia record more than handwriting records.

Table 6 Information about satisfaction questionnaire in reader group

Question	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	%	%	%	%	%
1.information in anesthetic record easy to read	13.0	75.3	11.1	0.6	0.0
2. Time-saving record-keeping system	7.4	72.8	19.8	0.0	0.0
3. Results in accurate recording of vital signs	13.6	77.8	8.6	0.0	0.0
4. Results in accurate documentation of procedures and events	11.7	76.5	11.7	0.0	0.0
5. Allows more time to concentrate on patient care	5.6	64.2	30.2	0.0	0.0
6. Convenient in short cases (1-3 hr.)	6.8	74.1	6.8	0.0	0.0
7. Convenient in lengthy cases (>3hr.)	6.2	75.9	17.9	0.0	0.0
8. Convenient in simple cases (Laminectomy, Tracheostomy)	6.2	75.3	18.5	0.0	0.0
9. Convenient in complicated cases (Brain tumor, Aneurysm)	7.4	70.4	22.2	0.0	0.0
10. Beneficial in complicate or emergency cases	6.2	73.5	20.4	0.0	0.0
11. Convenience for record-keeping in emergency (eg. CPR) situations	6.2	77.8	16.0	0.0	0.0
12. Easy to review the record during and after the case	12.3	79.0	8.6	0.0	0.0
13. Convenient for data collection and research use	20.4	72.8	6.8	0.0	0.0
14.Over all satisfied with the electronic patient anesthesia record	9.9	79.0	10.5	0.6	0.0
15. Safe for patient	8.0	74.1	17.9	0.0	0.0
16. Safe for personal	7.4	77.8	14.8	0.0	0.0
17. Advantageous for legal protection	14.2	69.1	16.7	0.0	0.0
18. Prefer electronic patient anesthesia record over handwritten anesthetic record	13.0	75.3	11.7	0.0	0.0

19.Value investing in the future	10.5	74.7	14.8	0.0	0.0
20.Easy to maintain	8.6	75.9	15.4	0.0	0.0
21.Understand the interpretation of the AIMS more than handwriting record .	8.6	74.7	16.0	0.6	0.0
22. Understand electronic patient anesthesia record more than handwriting record.	8.6	76.5	14.2	0.6	0.0
23. Electronic patient anesthesia record appropriate to Global technology	19.1	77.2	3.7	0.0	0.0

4.3 Satisfaction among users of electronic patient anesthesia record

Table 7 Satisfaction of recorder respondents

The result of the study showed 50% of recorder group were high satisfied of the electronic patient anesthesia record and moderate satisfaction in this program found 45 % and only 5% felt low satisfaction.

Satisfaction	**Number**	**Percentage (%)**
Low	1	5
Moderate	9	45
High	10	50
Total	**20**	**100**

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Table 8 Satisfaction of reader respondents

The result of the study showed 84 % of reader group were in moderate satisfaction with the electronic patient anesthesia record and high satisfaction in this program found 13 % and only 3.1% felt low satisfaction.

Satisfaction	**Number**	**Percentage (%)**
Low	5	3.1
Moderate	136	84
High	21	13
Total	**162**	**100**

4.4 Association between socio-demographic characteristics and satisfaction among users of electronic patient anesthesia record

Table 9 shows the association between socio-demographic characteristics and recorder satisfaction of electronic patient anesthesia record, there was no significant association between all of socio-demographic characteristics and satisfaction among users of electronic patient anesthesia record

Table 9 Association between socio-demographic characteristics and recorder respondent's satisfaction of electronic patient anesthesia record

Characteristics	**Satisfaction N (%)**		**p-value**
	High	**Moderate and Low**	
1. Age (years)	Mean 37.5 max 55 min 27	Mean 42.5 max 59 min 29	0.226
2. Gender			0.305
Male	1 (10)	0	
Female	9(90)	10(100)	
3. Level of education			0.513
Bachelor's Degree	8(80)	8(80)	
Master's Degree	1(10)	2(20)	
Doctoral Degree	1(10)	0	
4.Job position			1.00
Anesthesiologists	2(20)	2(20)	
Nurse anesthetist	8(80)	8(80)	
5. Duration in practice at this hospital (years)	Mean 10.15 max 23 min 0.5	Mean 14.94 max 37 min 2	0.495
6. Duration of AIMS use (years)	Mean 1.95 max 3 min 0.5	Mean 2.21 max 2.5 min 0.75	0.641

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

7. Duration of handwritten record use (years)	Mean 7.5 max 30 min 1	Mean 13.4 max 30 min 0.5	0.211
8. Level of knowledge English language			0.531
High	2(20)	1(10)	
Moderate & Low	8(80)	9(90)	
9. Level of computer knowledge			0.531
High	2(20)	1(10)	
Moderate & Low	8(80)	9(90)	
10.Familiarity with electronic machine			0.06
High	3(30)	0	
Moderate & Low	7(70)	10(100)	

Table 10 Association between socio-demographic characteristics and reader respondent's satisfaction of electronic patient anesthesia record

Characteristics	**Satisfaction N (%)**		**p-value**
	High	**Moderate and low**	
1. Age (years)	Mean 37.57 max 56 min 25	Mean 35.73 max 59 min 21	0.38
2. Gender			0.07
male	9 (42.9)	34 (24.1)	
female	12(57.1)	107(75.9)	
3. Level of education			0.239
Bachelor's Degree	15(71.4)	116(82.3)	
Master's Degree	6(28.6)	25(17.7)	

4.Job position			0.065
Nurse	14(66.7)	119(84.4)	
Neurosurgeons	2(9.5)	9(6.4)	
Resident trainee	5(23.8)	13(9.2)	
5. Duration in practice at this hospital (years)	Mean 10.89 max 31 min 0.75	Mean 11.29 max 37 min 0.33	0.725
6. Duration of AIMS use (years)	Mean 2.03 max 3 min 0.25	Mean 1.92 max 4 min 0.25	0.433
7. Duration of handwritten record use (years)	Mean 6.86 max 20 min 0	Mean 7.48 max 30 min 0	0.889
8. Level of English language knowledge			0.36
High	6(28.6)	28(19.9)	
Moderate & Low	15(71.4)	113(80.1)	
9. Level of computer knowledge			**0.002***
High	12(57.1)	34(24.3)	
Moderate & Low	9(42.9)	106(75.7)	
10.Familiarity with electronic machine			**0.001***
High	13(61.9)	8(38.1)	
Moderate & Low	33(23.4)	108(76.6)	

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

CHAPTER V

DISSCUSSION

The study was aimed to access the level of satisfaction among users of anesthesia information management system at Neurological Institute, Bangkok, Thailand, and determine an association among level of satisfaction and demographic data.

The discussion is based on the finding collected from 182 respondents divided into readers and recorders group.

5.1 Socio-demographic information

From this study, in recorders group it was found that the majority of respondents were in the mean age of 40 years (max 59,min 27) and readers group found mean age of respondents were 35.97 years (max 59,min 21). More than half of the respondents were female in both group (95%,73.5%) that coincided with the report on total number of all staff in Neurological Institute ,the number shows female more than male in all departments (Neurological Institute access on April 15, 2015) This result is aligned with Wirharat Juthasantikul et al in 2012 that explained the nurse perception score of anesthetic record in Prince of Songkla University were mostly in female 95.% and the age range in this study showed most of respondents were 20-40 years (82%)

The majority of respondents both groups had graduated Bachelor's degree (80%, 80.9%) and higher Bachelor's degree (20.0%, 19.1%) respectively. When focused on the study population in nurse group, majority in this group graduated Bachelor's degree same with many previous studies (Lumyai Sabangban 2006).

Regarding the job position in Neurological Institute mainly respondents of both groups had nurses (80%, 82.1%) respectively. This report shows total number of all staff in Neurological Institute which shows the number of nurses were more than other positions in all hospital (Neurological Institute access on April 15, 2015)

The duration in this study are consisted of three parts. The first showed duration in practice at Neurological Institute, the mean years of both recorders and readers group

were found to be similar (12.5, 11.24). The second study duration of anesthesia information management system used in this hospital found similarities in both groups approximate to mean of years (2.08, 1.93) and a different in both group found mean duration of handwritten anesthesia record use (10.45,7.40)

First of all, Electronic patient anesthesia record was implemented to use in Anesthesia department since September 2012 for 1 year to develop and test. As of now, this program routine is used in the operating theater to record patient's clinical information before anesthesia, anesthesia data during the intra-operative and the post-anesthetic care unit at the post-anesthesia functions. So duration of anesthesia information management system used in this hospital by both groups have similar usage time.

Concerning the level of English language knowledge, computer knowledge and familiarity with electronic machine most of the respondents both recorders and readers group had moderate level of knowledge (80%, 74.7%), (80%,68.5%) and (80%,70.4%) respectively.

5.2 Satisfaction among users of electronic patient anesthesia record

The results of satisfaction level contrasted with recorders and readers group. In recorders group half of the respondents felt a high level of satisfaction with electronic patient anesthesia record (50%) moderate and low satisfaction were (45%, 5%) and majority of the anesthetic practitioners in Neurological institute felt positive satisfaction in this system.

But in readers group showed 84% of respondents felt moderate level of satisfaction to electronic patient anesthesia record, and those that felt high and low satisfaction in this system had 13%, 3.1% respectively.

The result of level of satisfaction with electronic patient anesthesia record was similar to Hyun Seung jin et al. (2012) that evaluated that the attitudes of the Anesthesiologists, trainees and nurse anesthetists towards electronic patient anesthesia record and compared findings with manual documentation in the operating room, found after 1 year routine of computer system use, results revealed very positive attitudes toward electronic patient anesthesia record in all personnel's. One more result in this study found trainees and nurses groups seemed to have higher preference for the

electronic anesthesia record, compared to the attending anesthesiologists, and this difference was statistically significant (P = 0.002 and P = 0.029, respectively).

A study by the Department of Anesthesiology, Thammasat University Hospital by Rungjai Ronnatee and Npaporn Chunam studied for the improvement of anesthetic record aimed to develop new form of anesthesia record and compared the satisfaction among old anesthesia records and new anesthesia records in anesthesiologists and nurse anesthetists at Thammasat University Hospital. The result found a high level of satisfaction to new form of anesthesia record with statistically significance at 0.05 level (Rungjai Ronnatee and Npaporn Chunam, 2013).

Another study at the faculty of medicine Vajira hospital reviewed about the problems of the development of anesthesia records and found many problems of hand writing medical records and recommended the use of electronic patient anesthesia record. The same result was seen in the study perception score of anesthetic record in Prince of Songkla University.

When each item of the questionnaire is taken a look at by the recorders group, it was found that the respondents strongly agreed with the automated anesthesia information management system convenient in lengthy cases for more than 3 hours (65%), and found agree anesthetic record easy to read (65%), results in accurate documentation of procedures and events (65%), easy to review the record during and after the case (65%). On the other hand, (15%) disagreed about time-saving record-keeping system and system easy to maintain (15%), only (5%) of respondents strongly disagreed with only one question which is convenient in short cases 1-3 hour. The same study by Hyun Seung jin et al.(2012) used by anesthetic trainees (2^{nd} - 4^{th} year residents) ,Anesthesiologists, nurse anesthetist, the result showed automated recording of vital signs patient monitoring was convenient (92.6%, 97.%, and 97.8%), time-efficient (100%, 72.4%, and 100%),more time to care for patients (96.2%, 96.4%, and 100%), and data accurate (88.9%, 85.7%, and 80.8%). However, when focus on the type of surgery found lower satisfaction of Anesthesia information management system was presented for short cases which lasted < 30 min (37%, 46.5%, 53.2%) and simple surgery which required less anesthetic concern regardless of the operation time (51.8%, 53.6%, 65.9%), compared to lengthy surgery which lasted > 30 min (100%, 82.1%, 89.4%) and complicated surgery with require invasive monitoring and intervention

(81.5%, 64.3%, 73.2%). Similarly, lower preferences were shown in operation for emergencies or major trauma only 63% of trainees and 60.7% of attending anesthesiologists said electronic patient anesthesia record was convenient and 22% of trainees and 17.9% of attending anesthesiologists felt uncomfortable with electronic patient anesthesia record under CPR conditions. Most of the participants thought that electronic patient anesthesia record was convenient for reviewing medical recordings, and most of the anesthesiologists indicated that the system was useful when utilizing research data.

However, readers respondents group were found to strongly agree with the convenient for data collection and research use (20.4%), agreed that it was easy to review the record during and after the case (79%) and over all satisfied with electronic patient anesthesia record (79%). On the other hand, only 0.6% disagreed with using electronic patient anesthesia record because respondents felt information in anesthetic record easy to read, understand the interpretation of the electronic patient anesthesia record more than handwriting record and understand electronic patient anesthesia record more than handwriting record.

Another result of this study found that respondents needed time to adapt the electronic medical records between 1 to 4 weeks.

According to satisfaction of registered nurses in wards with anesthesia service at Srinagarind Hospital, Khon Kaen University,Thailand (2006). The overall found high level of satisfaction (3.03 ± 0.36) by following a) administration 2.72 + 0.50; b) service 3.30 + 0.46; c) knowledge 2.90 + 0.45; and d) personnel 3.22 + 0.46. The open-ended questions indicated that nurse expected better communication and relationship amongst all of the members of the anesthetic team. They felt that the distribution of knowledge about anesthesiology was inadequate and wanted training program and dissemination of anesthesia knowledge, because after implementation of electronic patient anesthesia record system in Neurological institute, the anesthesia department did not announce to readers group. Therefore, the study results from readers group resulted in moderate level of satisfaction which can be can predicted that they want training on reading electronic patient anesthesia record before use this system.

5.3 Association between socio-demographic characteristics and level of satisfaction among users of anesthesia information management system

The results of this study revealed in readers group that the level of computer knowledge (p = 0.002), and familiarity with electronic machine (p = 0.001) were associated significantly with the level of satisfaction with anesthesia information management system. This means respondents with differrent level of computer knowledge and familiarity with electronic machine had different level of satisfaction .

Besides in recorders group there was no significant association between socio-demographic characteristics and level of satisfaction of anesthesia information management system.

Khanthong Satsanakul study about attitude of registered nurse to the Nursing care record in operating room at Vajira Hospital,Bangkok using descriptive research findings registered nurses had positive attitude to data and recording format in nursing care record (95.5) and 86.3% recommended to use this form and finally found work experience, nurse working in different departments were not significant to attitude of format nursing record (p=0.798,0.334) (Sasanakul, 2009).

5.4 Conclusions

This cross-sectional study attempted to assess the satisfaction among users of electronic patient anesthesia record in Neurological institute, Bangkok, Thailand.

Data was collected during April 2015 at Neurological institute. Statistics that was used in this study were number, percentage, mean, standard deviation, Chi-square test and Mann-Whitney Test. The sample consisted of 182 respondents, separated into readers and recorders group. The return rate for this survey was 91%.The results showed that approximately 75.3% of respondents were female and mean of ages were 36.41 years old(max59,min21). 80.8% of respondents had highest education of Bachelor's Degree. 73.1% were nurses. Mean duration in practice at Neurological Institute showed 11.38 years (maximum 37, minimum 0.33), duration of use of anesthesia information management system showed mean 1.95 years (maximum 3, minimum 0.25) and mean of duration to use an handwritten anesthesia record form showed 7.73 years (maximum 30, minimum 0.0)

The majority of the reader found level of English language knowledge, level of computer knowledge and familiarity with electronic machine in this group found moderate level cognition 75.3%,69.8%.,71.4% respectively.

Most of respondents had high level of satisfaction 50% and 45% felt moderate satisfaction in recorder group and when focused in readers group found 84% of this group moderate satisfaction of electronic patient anesthesia record. The association between socio-demographic characteristics and users satisfaction of electronic patient anesthesia record were associated significantly with level of computer knowledge and familiarity with electronic machine (p=0.002 and 0.001 respectively) in reader respondents. However, in recorder group it was found no significant association between socio-demographic characteristics and satisfaction of electronic patient anesthesia record.

5.5 Limitations

This study is conducted only at the Neurological Institute, Bangkok, Thailand, due to time constraint. Therefore, it cannot be a representative of all users of the anesthetic medical record in Thailand.

5.6 Recommendations

Based on the findings of this study, the following recommendations should be considered.

1. According to the results this study it gives us a baseline data about the users' satisfaction of the electronic medical record used at Neurological institute. This data could be used to understand and evaluate other findings.
2. In recorders respondent these small group could be studied using an in depth interview to get more appropriate and accurate results.
3. In readers respondent it is suggested to do a follow up on level of satisfaction every 5 years

5.7 Further study

1. Neurological institute can bring the study results to further investigate the phase 2 of the project to find out in-depth the factors that correspond to the satisfaction and dissatisfaction of the users.
2. Neurological institute can finalize the phase 3 of the project on the effectiveness of the use of electronic patient anesthesia record at Neurological institute.
3. The conclusion may be useful for other care institutions on the tertiary level with similar nature as the Neurological institute for electronic patient anesthesia record implementation when all factors are carefully taken into consideration

REFERENCES

Apkon M, S. P. (2001). Impact of an electronic information system on physician workflow and data collection in the intensive care unit. *Intensive Care Med, 27*((1)), 122-130.

Bassam Kadry, W. W. F., Alex Macario and Jesse M. Ehrenfeld.Anesthesia. (2012). Information Management Systems: Past, Present, and Future of Anesthesia Records. *Mount Sinai journal of medicine, 79*(154–165).

Beilin Y, W. D., Torrillo T, Mungall D, Guinn N, Henriquez J, et al. (2009). A survey of anesthesiologists' and nurses' attitudes toward the implementation of an Anesthesia Information Management System on a labor and delivery floor. *International Journal of Obstetric Anesthesia, 18*, 22-27.

Committee of Origin. (2011). *Surgical Anesthesia. Guidelines for patient care in anesthesiology*.

Committee of Origin Anesthesia Care Team. (2013). Statement on the anesthesia care team. Retrieved 5 january, 2014, from https://www.asahq.org/For-Members/Standards-Guidelines-and-Statements.aspx

Daungwiboon, C. (2008). The development of anesthesia records of Nurse Anesthetists, College of Medicine And Vajira Hospital in Bangkok. Retrieved 21 January, 2013, from http://office.bangkok.go.th/csc/attachments/article/189/2093.pdf

Eric L.Bloommfield, N. G. F. (2008). The anesthesia information management system for electronic documentation: what are we waiting for? *J Anesth 22*, 404–411.

Hyun Seung Jin, M. H. K., Suk Young Lee, Hui Yeon Jeong, Soo Joo Choi, and Hye Won Lee. (2012). A survey of user acceptance of electronic patient anesthesia records. *Korean J Anesthesiol, 62*((4)), 350-357.

James R. Douglas, J., Melody J Ritter,. (2011). Implementation of an Anesthesia Information Management System (AIMS. *The Ochsner Journal, 11*, 102–114.

Jang J, Y. S., Kim CB, Moon Y, Kim S, . (2013). The effects of an electronic medical record on the completeness of documentation in the anesthesia record. *Int J Med Inform, 82*((8)), 702-707.

Lumyai Sabangban , W. C.-I., Krisana Sumret, Wiriya Thinsheelong , Pikool Malasai,. (2006). Satisfaction Among RNs With Anesthetic Services at Srinagarind Hospital. *Srinagarin Medical journal, 21*(1).

M.Ehrenfeld, J. (2009). Anesthesia information management systems. *Anesthesiology news*, 1-8.

Naphat Thanaphuttinath, N. K., Yawadee Gatesamphan,. (2011). The results of the clinical record form for the recording quality and satisfaction of nurses in ward. *hcu. journal, 14*(1), 1-21.

Office of the Department of Medical Nursing. (2009). *Standard hospital care (Edit Version2)*. Bangkok: Publisher Organization War Veterans.

Pourasghar F, M., KochSS, ForsU,. (2008). Factors influencing the quality of medical documentation when a paper-based medical records system is replaced with an electronic medical records system. *an Iranian case study.Int J Technol Assess Health Care, 24*((4)), 445-451.

Rungjai Ronnatee and Npaporn Chunam. (2013). Improvement Anesthetic record Thammasat University Hospital. from http://www.hospital.tu.ac.th/PlanTUHosWeb/data/Project%20Research/research_2556/5630031.pdf

Sasanakul, K. (2009). The nursing opinion survey about medical recording format at Surgical Patients Medical College at Vajira Hospital Bangkok. Retrieved 21 January 2013, from http://office.bangkok.go.th/csc/attachments/article/189/2181.pdf

Thepakorn Sathitkarnmanee , W. J., Sirirat Tribuddharat , Kotchakorn Palachewa , Supattra Sripor (2011). Patient Satisfaction with Anesthesia at Srinagarind Hospital *Thai Journal of Anesthesiology, 37*(2), 20-27.

Wilbanks BA, M. J., Berner ES,. (2013). An observational study of the accuracy and completeness of an anesthesia information management system: recommendation for documentation system changes. *Comput Inform Nurs, 31*((8)), 359-367.

Wipharat Juthasantikul, A. C., Emon Wattanayomnaporn, Thavat Chanchayanon Ward Nurses. (2012). Perception of Details and the Benefits of Anesthetic Records after Training. *Songkla Med J, 30*(21).

Wrightson WA. (2010). A comparison of electronic and handwritten anaesthetic records for completeness of information. *Anaesth Intensive Care, 38*((6)), 1052-1058.

Yunuswangsa Q, N. S., Wasinwong W,. (2008). Completion and accuracy in charting of anesthetic records in Songklanagarind Hospital. *J Med Assoc Thai, 91*((7)), 1002-1010.

APPENDIX

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Appendix A

Questionnaire (Thai version)

ลำดับที่.....

ด้วยข้าพเจ้า นางสิริญญา นรัจฉริยางกูร นิสิตระดับปริญญามหาบัณฑิต วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย ประสงค์จะดำเนินการวิจัยเรื่อง การสำรวจความพึงพอใจของผู้ใช้แบบบันทึกการให้ยาระงับความรู้สึกอิเล็กทรอนิกส์ในสถาบันประสาทวิทยา กรุงเทพมหานคร ประเทศไทย

ในฐานะที่ท่านเป็นหนึ่งในผู้ที่ใช้แบบบันทึกการระงับความรู้สึกอิเล็กทรอนิกส์ดังกล่าว ข้าพเจ้าจึงใคร่ขอความร่วมมือจากท่านให้เข้าร่วมการศึกษา ครั้งนี้ โดยการตอบแบบสอบถามอาจใช้เวลา 20-30 นาที เป็นการตอบเพียงครั้งเดียว

ผลการศึกษาจะเป็นการเรียนรู้ทางวิชาการและเป็นประโยชน์ของโรงพยาบาลด้วยในการเรียนรู้เกี่ยวกับเทคโนโลยีใหม่นี้

การตอบแบบสอบถามของท่านในการวิจัยนี้จะเป็นความลับ และเป็นไปด้วยความสมัครใจ

แบบสอบถามมีทั้งหมด 5 หน้า แบ่งออกเป็น 2 ส่วน ดังนี้

ส่วนที่ 1 ข้อมูลทั่วไปลักษณะทางประชากร จำนวน 10 ข้อ

ส่วนที่ 2 ความคิดเห็นต่อแบบบันทึกการระงับความรู้สึกอิเล็กทรอนิกส์ จำนวน 23 ข้อ

ขอขอบคุณทุกท่านที่เสียสละเวลาและให้ความร่วมมือในการตอบแบบสอบถามฉบับนี้

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

<u>ส่วนที่ 1</u> ข้อมูลส่วนบุคคลทั่วไป

คำชี้แจง โปรดทำเครื่องหมาย ✓ ลงใน ❒ หรือเติมข้อความลงในช่องว่างตรงตามความเป็นจริง

1. เพศ

❒ ชาย ❒ หญิง

2. อายุ……ปี

3. ระดับการศึกษาสูงสุด

☐ ปริญญาตรี ☐ ปริญญาโท ☐ ปริญญาเอก

4. ตำแหน่ง

☐วิสัญญีแพทย์ ☐ วิสัญญีพยาบาล ☐พยาบาลวิชาชีพ

☐ ศัลยแพทย์ ☐ แพทย์ประจำบ้าน

5. ระยะเวลาทำงานที่สถาบันประสาทวิทยา/โรงพยาบาล .....ปี

6. ระยะเวลาของการใช้แบบบันทึกการให้ยาระงับความรู้สึกแบบอิเลคโทรนิกส์ ……

7.ระยะเวลาในการใช้บันทึกการให้ยาระงับความรู้สึกที่เขียนด้วยลายมือ.....

8. ความรู้ภาษาอังกฤษ

☐มากที่สุด ☐มาก ☐ปานกลาง ☐น้อย ☐น้อยที่สุด

9. ความรู้ด้านคอมพิวเตอร์

☐มากที่สุด ☐มาก ☐ปานกลาง ☐น้อย ☐น้อยที่สุด

10.ความคุ้นเคยกับเครื่องมืออิเลคโทรนิกส์

☐มากที่สุด ☐มาก ☐ปานกลาง ☐น้อย ☐น้อยที่สุด

<u>ส่วนที่ 2</u> ความพึงพอใจต่อแบบบันทึกการระงับความรู้สึกอิเล็กทรอนิกส์

คำชี้แจง โปรดทำเครื่องหมาย ✓ ลงในช่องที่ตรงกับความรู้สึก / ความคิดเห็นของท่านมากที่สุด

ความคิดเห็นต่อแบบบันทึกการให้ยาระงับความรู้สึกอิเล็กทรอนิกส์	**ไม่เห็นด้วยอย่างยิ่ง**	**ไม่เห็นด้วย**	**ไม่แน่ใจ**	**เห็นด้วย**	**เห็นด้วยอย่างยิ่ง**
1. ข้อมูลอ่านง่าย					
2. ใช้เวลาน้อยในการบันทึก					
3. สัญญาณชีพมีความถูกต้อง แม่นยำ					
4. รายละเอียดเกี่ยวกับกระบวนการและเหตุการณ์ต่างๆมีความถูกต้อง					
5 ทำให้มีเวลาเหลือมากขึ้นในการดูแลผู้ป่วย					
6. ความสะดวกในการผ่าตัดที่ใช้ระยะเวลาสั้นๆ (1-3 ชั่วโมง)					
7. ความสะดวกในการผ่าตัดที่ใช้ระยะเวลานาน * (มากกว่า 3 ชั่วโมง)					
8. ความสะดวกในการผ่าตัดที่เรียบง่าย/ไม่ซับซ้อน เช่น Laminectomy, Tracheostomy					
9. ความสะดวกในการผ่าตัดที่ซับซ้อน/ยุ่งยาก* เช่น Brain tumor , Aneurysm					

10. มีประโยชน์ในกรณีการผ่าตัดฉุกเฉิน					
11. สะดวกในการเก็บรายงานเมื่อเกิดเหตุฉุกเฉิน เช่น ในสถานการณ์ของการช่วยฟื้นคืนชีพ*					
12. ง่ายต่อการทบทวนรายงานระหว่างและหลังจากการผ่าตัด					
13. สะดวกต่อการเก็บข้อมูลและการใช้ในงานวิจัย					
14. ระบบเป็นที่น่าพึงพอใจ					
15. ระบบปลอดภัยต่อผู้ป่วย					
16. ระบบปลอดภัยต่อเจ้าหน้าที่					
17. เป็นประโยชน์ในการป้องกันการฟ้องร้องทางกฎหมาย					
18. ดีกว่าบันทึกการให้ยาระงับความรู้สึกที่เขียนด้วยลายมือ					
19. มีความคุ้มค่าต่อการลงทุนเพื่อนำไปใช้ในอนาคต					
20.แบบบันทึกง่ายต่อการดูแลรักษา					
21.ความเข้าใจการแปลผลจากบันทึกมากกว่าบันทึกการให้ยาระงับความรู้สึกที่เขียนด้วยลายมือ					
22.ความเข้าใจในการบันทึกมากกว่าบันทึกการให้ยาระงับความรู้สึกที่เขียนด้วยลายมือ					
23.ระบบมีความเหมาะสมกับสถานการณ์โลกเทคโนโลยี					

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

VITA

Name : Mrs. Sirinya Naratchariyangkoon

Date of Birth : 20 August 1981

Place of Birth : Bangkok, Thailand

Educational Achievement

- Bachelor degree of Nursing (2002), Naresuan University
- Certificate training program in Nurse Anesthetist (2008),Faculty of Medicine Siriraj Hospital

Work Experience

- Nurse Anesthetist at Anesthesia department, Neurological institute, Bangkok, Thailand.
- Instructor Cardiopulmonary resuscitation program (CPR)
- Instructor palliative patient care course
- Instructor neuro anesthesia course

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University