Documentation of nursing practice: A closer look at care plans

in semi-electronic and conventional paper based-records

during a time of change

Lorraine Lalor

A dissertation submitted to Trinity College Dublin in partial fulfilment of the requirements for the degree of Master of Science in Health Informatics

2018

Declaration

I declare that the work described in

this dissertation is, except where

otherwise stated, entirely my own

work, and has not been submitted

as an exercise for a degree at this or

any other university

Signed: _____

Lorraine Lalor

16th July 2018

Permission to lend and/or copy

I agree that the Trinity College

Library may lend or copy this

Dissertation upon request

Signed: _____

Lorraine Lalor

16th July 2018

Acknowledgements

I must begin with special thanks to Prof Lucy Hederman and Ms Gaye Stephens for their support, motivation and immense knowledge.

I also wish to express my sincere thanks to my supervisor Mr Damon Berry, Dublin Institute of Technology. Damon kept me on course, helped me explore ideas and teased out what I thought I didn't know or couldn't do. The finished work is truly a collaboration of a wonderful leader who nudged me in the right direction and didn't allow me to falter but always there in the background as a fantastic support.

I must also extend gratitude to my work colleagues for their support and advice while conducting this piece of work. In particular, my Director of Nursing, Ms Geraldine Regan, her support, encouragement and enthusiasm for nurse led research projects is inspiring. Dr Ian Callinan in the audit department, Dr Alan Smith and all the staff in the Quality Department, Thank you.

Thanks to Dr Colin Fitzpatrick and Dr Christopher Fitzpatrick for academic guidance and support.

Table of Contents

List of Tables

List of figures

Abbreviations

ABA	An Bord Altranais
ANA	American Nurses Association
ADON	Assistant Director of Nursing
Cat-ch-Ing	Measurement instrument for nursing documentation
CDSS	Clinical Decision Support System
CNM	Clinical Nurse Manager
DoH	Department of Health
DoN	Director of Nursing
EHR	Electronic Health Record
HIQA	Health Information and Quality Authority
HSE	Health Service Executive
ISO	International Organisation for Standardisation
JBI	Joanna Briggs Institute
JCI	Joint Commission International
KPI	Key Performance Indicator
LAN	Local Area Network
LOINC	Logical Observation Identifiers Names and Codes
MHC	Mental Health Commission
NANDA-I	Formerly known as North American Nursing Diagnosis, 2018 referred to as NANDA-I
NCEC	National Clinical Effectiveness Committee
NIC	Nursing Interventions Classification
NMBI	Nursing and Midwifery Bord of Ireland
NMCAT	Nursing and Midwifery Content Audit Tool
NOC	Nursing Outcomes Classification
NSAI	National Standards Authority of Ireland

ONMSD	Office of the Nursing and Midwifery Services Director
PPM	Professional Practice Model (nursing)
PU	Pressure Ulcer
QC-M	Quality Care Metrics
SNL	Standardised Nursing Language
SNOMED-CT	Systematized Nomenclature of Medicine—Clinical Terms
TYC	Test Your Care website
UML	Unified Modeling Language
WAN	Wide Area Network
WHO	World Health Organisation

Glossary of Terms

A

Acute Services: Secondary Health care where a patient receives active short term treatment for an illness or injury, unscheduled or scheduled surgery.

Adverse event/outcome: An undesirable event experienced by a person while he/she are a patient and receiving treatment, medication or an intervention.

Adverse Drug event: Avoidable negative outcome to a patient following administration of a drug that leads to harm to a patient and could have been avoided.

Assessment Booklet: Section of the nursing record where a nurse records all necessary admission details for a patient. One section will include personal details such as name, date of birth, next of kin. Remaining sections will include past medical and surgical history, presenting complaint, nursing risk assessments, nursing diagnoses. The nursing care plan is in a separate booklet in semi-electronic records but in paper based records the nursing care plan is mainly in the same booklet unless specific care pathways or care bundles are initiated which will be in addition to free text nursing plan.

Assistant Director of Nursing (ADON): Senior Nurse Manager in charge of an area within a health care facility who is also responsible for managing the complete extent of nursing staff.

C

Care Bundles: A collection of interventions that may be applied to manage a particular condition.

Care Pathways: Also known as clinical pathways or integrated care pathways. Explained as a strategic plan for the mutual decision making and organisation of care for a well-defined cohort of patients for a specified period of time.

Care Plans: Provide direction for patient centred care.

Care Metrics: Process performance quality indicators framework for how nursing care can be measured.

Careful Nursing Philosophy: Professional practice model. Adapted from the philosophy of Aquinas, human beings are defined as persons.

I

International Classification for Nursing Practice (ICNP®): A product of the International Council of Nurses (ICN) and intended for use by nurses as a dictionary of term to describe and document nursing practice.

N

Nursing Process: Scientific practice application used by nurses to ensure the delivery of safe care.

P

Primary Care Services: Refers to health care provided in the community.

Q

Quality-Care -Metrics: QC-M – Measures of the quality of nursing and midwifery clinical care processes. They are aligned to evidence based standards and agreed through national consensus.

R

Roper Logan Tierney Model of Nursing: Theory of nursing care based on the activities of daily living. The model is currently being phased out and the one used for paper records in this study.

S

Secondary Care Services: Medical care provided by a specialist facility.

T

Tertiary Care Services: Health care from specialists in a large hospital after referral from primary or secondary care teams.

Chapter One [Preview]

Background

The topic of nursing documentation is hugely popular within nursing circles and continues to gain attention among the Health Informatics (HI) community as preparations for Electronic Health Records (EHR) progress at a significant pace, albeit, not in line with our international healthcare colleagues, but none the less plans are gaining a steady momentum. Changes in nursing practice are evident, and necessary, in order to improve quality of care and to delineate the presence of nursing practice in electronic records.

A large academic teaching hospital is currently implementing a new Professional Practice Model (PPM) incorporating a Standardised Nursing Language (SNL), to some extent as preparation for electronic records but also to improve standards of quality in documentation practices and patient care. SNL is used in semi-electronic format where all care plans are electronically stored. They are accessed for printing once appropriate nursing diagnoses are assumed. Interventions are then pre-printed which only require a date and signature similar to electronic records. Whereas paper based records, have some pre-printed booklets for sections of the care plan. The theory behind SNL and the new PPM is not applied, therefore the assessment, diagnoses and interventions are all free-text.

Any doubts held by health professionals about the importance of high quality documentation around practice can be removed by an attendance at the coroners court. Observation of the preparation beforehand where documentation was subjected to meticulous and methodical scrutiny by Medical-Legal professionals, and questioning of a Staff Nurse (SN), Clinical Nurse Manager (CNM) and Healthcare Assistant (HCA) on events that occurred years previously. It heavily relies upon the quality of their documentation rather than memory to recall and validate that quality care that has been delivered.

Seminal work on nursing documentation quite often focusses on paper based (Tange 1995) or electronic format (Jones et al. 2010b; O'Brien et al. 2015) and many compare the two, (Tubaishat et al. 2015; Wang et al. 2011). However, few studies look at the transition from

paper to electronic form and the effect SNL use has on quality of documentation and practice or possibly patient outcomes. One of the changes that has recently been made in the hospital that is included in this study, is the adaptation of SNL into semi-electronic care plans. The motivation behind this research therefore was twofold, one to address deficit around comparisons of two styles of documentation and two, to explore the use of (SNL) which is used internationally in EHR's but was adapted within a semi-electronic format as preparation for electronic records. See Appendix 1 for sample semi electronic care plan.

Introduction

Delivery of safe effective patient care relies considerably upon on access to accurate, timely information, the value of which depends on the quality of data recorded and stored for retrieval in patient records. For decades now eHealth Ireland has been working in the background to produce a national Electronic Health Record (EHR) and in May 2016 a business case was finalised and approved by the Health Service Executive (HSE), (HSE 2016). This programme represents a significant transformation in the use of technology and data to support safe and efficient care for future generations.

The use of Health Information Technology (HIT) provides solutions in addressing challenges for health care (Burston, Chaboyer & Gillespie 2014; Kelley, Brandon & Docherty 2011a) (Shortliffe & Cimino 2014) and with mixed results on fulfilment of this promise some studies believe HIT improves patient outcomes by improving nursing documentation systems (Müller-Staub et al. 2007a), (O'Connor & Hardiker 2017). The Health Service Executive (HSE) service plan for 2018 (HSE 2018) acknowledges fiscal challenges in deploying HIT systems but recognises the importance of developing information systems to facilitate communication, integrated and continuation of care across primary and secondary level facilities.

Nowadays there is an emphasis on delivering gold standard patient care to all and as we prepare for EHRs. This study will take a closer look at the progression the nursing profession has taken in preparation for EHRs and to enhance care delivery. A documentation audit was performed to examine new semi-electronic care plans using SNL and a new PPM versus paper based traditional nursing records which are currently being phased out. Nursing care metrics were chosen as the audit tool, the concept of which has been adapted from the business sector. It is described as a set of calculated measurements demonstrating adherence to expected professional standards. Metrics measure nursing care processes within nursing documentation; this framework was chosen as it presents a framework to accurately reveal quality of

performance and adherence to documentation guidelines (Foulkes 2011). Quality Care Metrics (QC-M) are considered a valid tool as it was developed in and currently used in the United Kingdom (Sunderland 2009). Ireland (HIQA 2013; ONMSD 2013) endorse the use of metrics as a measure towards to enhance safer care.

1.1 The Principals of good Nursing Record Management

Accountability is one of the compulsory foundations within professional nursing and midwifery practice, (NMBI 2015) state the professional and legal responsibilities to be adhered to by nurses and midwives on the standard of practice to which they provide. It also reminds practitioners that accurate record keeping of care delivered is included in this obligation. Practitioners are reminded that if something is not written down, it can be assumed that the action did not happen, furthermore, this is the opinion taken in a court of law and at a fitness to practice tribunal (Nursing and Midwifery Board of Ireland 2014). In addition hospital policies, national guidelines, (Data Protection Acts 1988 & 2003, GDPR 2018), and international Acts (EU 2016) also govern the recording of nursing/clinical practice.

Nurses and midwives are reminded that during the course of their work, documentation of nursing specific decisions and rationale for decisions and actions must be obvious. (Thoroddsen et al. 2013) describe the need for accurate, complete and reliable clinical information in relation to patient care, also communication of care. It also reminds us that documentation of nursing care acts as a reliable source to enable quality improvements, conduct research and support quality improvement policies which will contribute to improved standards in care. In addition (Prideaux 2011) describe documentation as an essential part of nursing practice having clinical and legal consequences. Moreover, (Kelley, Brandon & Docherty 2011b) demonstrate a link between good quality nursing records as a facilitator to improvement in patient care processes.

1.2 Key aspects of Nursing Records

1.2.1 Professional Practice Models (PPM's)

Florence Nightingale, one of the most recognised names in the history of nursing, has certainly laid the foundations for nursing practice, and provided a model, the tenets of which still exist today, including documentation of nursing care, assessing nursing care standards and introducing statistics to the profession with a view to evaluate and improve practice.

A (PPM) within nursing disciplines espouses the conceptual framework that contributes to nursing care structures which guide safe, evidence based, patient centred care. Furthermore PPM's support the visualisation and communication of nursing practice (Slatyer et al. 2016). (Stallings-Welden & Shirey 2015) acknowledge the challenge in the implementation of PPM and report the advantages for both nurses and patient outcomes. An example of this is: nurse interactions with colleagues, patients and relatives, decision making, autonomy, job satisfaction and positive experiences for patients. Moreover they state that the lack of a verified PPM could perhaps contribute to reduced standard in safety and quality of care.

In order to avoid ambiguity or confusion when referring to 'models' or 'practice models' it is necessary to point out differences the term *model* may infer to nursing and computer science experts. Unified Modeling Language (UML) differs to nursing models, in that PPM provides a framework that guides nurses work in contrast to UML. It is a software tool commonly used by software developers working on healthcare information systems (HIS) to augment visualisation, specification of objects for healthcare workers who will be end users of the system (Aggarwal 2002). UML is, therefore an expressive writing language facilitating communication between developers of elements within a HIS, presenting the objects in a specific format to support the development of a complete HIS, (Choi, Jansen & Coenen 2015). The reference to PPM and models throughout this dissertation refer to nursing practice models unless otherwise specified. A UML concept map and scenario diagram are used later in this chapter to explain nursing diagnoses and languages used to document all aspects of work carried out by nurses in their duty of delivering care.

(Slatyer et al. 2016) clarifies that a PPM represents nursing values and outlines the structures and processes that support nurses to practice in a professional, safe and effective manner. It often includes a caring theory within the model (Meehan 2012). (Jacobs 2013) states that PPM's differ from a conceptual model of care highlighting the patient-nurse relationship in combination with human values such as compassion, and professional relationship as delivering planned evidence based practice, (Parkman & Loveridge 1994) however believe that PPM's are grounded in well-established nursing concepts incorporating organisational with nursing core values. These are supported by hospital management to empower nurses as leaders in clinical and managerial practice whereby accountability, partnership and leadership are embedded concepts of the PPM supported by organisational governance (Kramer et al. 2009). An example of nurse practice failures without a PPM in place, outlined in the Mid-Staffordshire Report (Francis 2010), which recommended a review of nursing documentation, using it as a means to measure standards and quality of care delivered thereby identifying opportunities to improve standards. (Slatyer et al. 2016) agree describing how PPM's improve nursing practice and patient outcomes.

Some models may be more suitable for adaptation particular to local needs and preferences, Table 1 is a sample of PPM's used to support nursing practice and documentation.

TABLE 1 EXAMPLE OF PPM'S TO SUPPORT NURSING PRACTICE

PPM	Focus
Roper Logan & Tierney (Roper, Logan & Tierney 2000)	Model of care based on the basic activities of daily living
Dorothea E Orem's Self-care model (Orem 2003)	Therapeutic self-care, what patients or nurses need to do to.
Sr Callista Roy's Adaptation model (Phillips 2010)	Changes required by people, assisted by nurses in response to environmental stimuli
Betty Neuman's Systems model (Neuman & Fawcett 2011)	Environmental stressors on patient's wellness that threaten stability
Imogen King's conceptual System (Frey, Sieloff & Norris 2002)	Ability of people to meet basic needs (goal) to enable social interaction.

Careful Nursing Philosophy (Meehan 2003)	Developed independently from hospital governances and based on historical research interpretations of Irish nursing knowledge and practice dating back to early 19th Century.
VIPS model (Darmer et al. 2006) (Florin et al. 2012)(Björvell, Wredling & Thorell-Ekstrand 2002a)	Acronym for the Swedish model "well-being, Integrity, Basic Values" all of which underpin nursing care and guide documentation in paper or electronic forms.

1.2.2 Nursing Process

In 1987 the World Health Organization (WHO) embarked on a journey to progress the quality nursing documentation across Europe (Björvell, Wredling & Thorell-Ekstrand 2002a). The nursing process was defined as a systematic and scientifically logical method used by nurses to support the planning and delivery of quality patient care. The process is a series of organised steps designed as a guide not only to ensure optimum patient care, but every stage of the nursing process from admission, to discharge must be recorded by nurses in the patient record regardless of format. Figure 1: steps of the nursing process

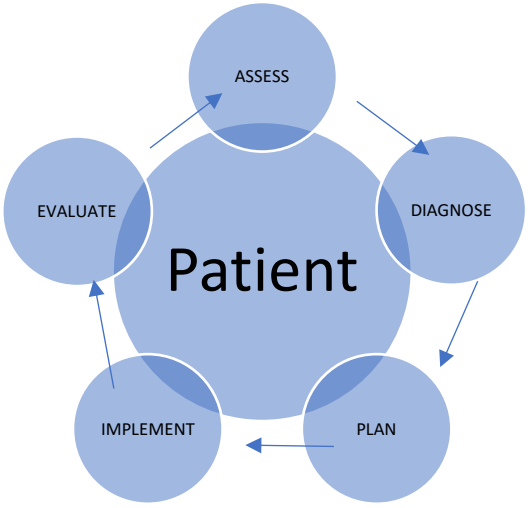


FIGURE 1 FRAMEWORK FOR THE NURSING PROCESS

The nursing care plan is documentation of the 'process', and includes nurses planned actions to address an identified nursing diagnoses and/or collaborative problems. It also includes the record of all actions or interventions, the PPM is the framework to guide patient centred care. Nursing departments within health care agencies decide upon which professional practice model to use for documentation. (Donabedian 1997) indicates that an accurate complete and process orientated record is central to quality care. A PPM provides the framework to assist nurses plan their nursing process which are essential steps taken to formulate a care plan.

1.2.3 Terminologies used in Nursing Records

Decades of international research has resulted in several nursing languages for documentation of nursing practice. The use of a Standardised Nursing Language (SNL) is described as a means of increasing descriptors of nursing practice, supporting daily care and improving patient safety (Saranto et al. 2014). The interface terminologies used in semi-electronic care plans chosen for audit for this dissertation is NANDA I, (NIC) (Bulechek et al, 2013) and (NOC) (Moorhead et al 2013), collectively known as NNN, the PPM is Careful Nursing ©. The PPM applied in the paper format is Roper Logan Tierney "activities of daily living" and the documentation format is framed within that model. This is due to professional and legal responsibilities for nurses with regard to documentation, and the outcome goals for each patient. The same audit tool was used to assess both forms and data quality criteria applied equally for each chart regardless of format.

Figure 2 presents standardised nursing terminologies currently recognised by the American Nurses Association (ANA) recognises eight interface terminologies, two minimum data sets and two reference terminologies: Fig 2

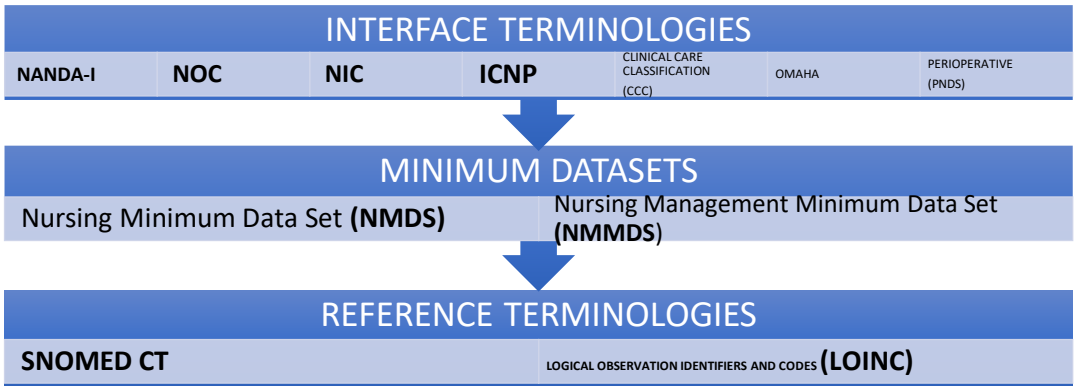


FIGURE 2 RECOGNISED STANDARD NURSING TERMINOLOGIES

Minimum data sets are a minimum; "essential set of data elements with standardized definitions and codes collected for a specific purpose, such as describing clinical nursing practice or nursing management contextual data that influence care" (Westra et al. 2008)

"Interface terminologies (point-of-care) include the actual terms/concepts used by nurses for describing and documenting the care of patients" explained by (Westra et al. 2008),(Herdman & Kamitsuru 2014b), (Bulecheck et al. 2013) and (Moorhead et al. 2013).

Internationally recognised reference terminologies, such as, SNOMED-CT and LOINC contain recognised codes for all aspects of health care delivered and corresponding codes for billing purposes. Reference terminologies support common semantics and enable all health care users to choose appropriate terms within their discipline but also allows the terms to be mapped in order that the data's true meaning can be shared across other disciplines. Several authors present opinions and justification for particular SNL (Cynthia Lundberg et al. 2008; Hardiker, Hoy & Casey 2000; Kim, Coenen & Hardiker 2012a) but all agree that a standardised terminology is essential to ensure validation and visibility of nursing practice.

SNL defines nursing practice and delineates nursing diagnoses and nursing care separate to medical diagnoses (Jones et al. 2010a; Rabelo-Silva et al. 2017), similarly (Clarke & Lang, 1992) focussed on actual nursing diagnoses rather than medical diagnoses and the recognition of a clear language to better establish nursing criteria and ensure patient safety. Figure 3 represents this in a class diagram.

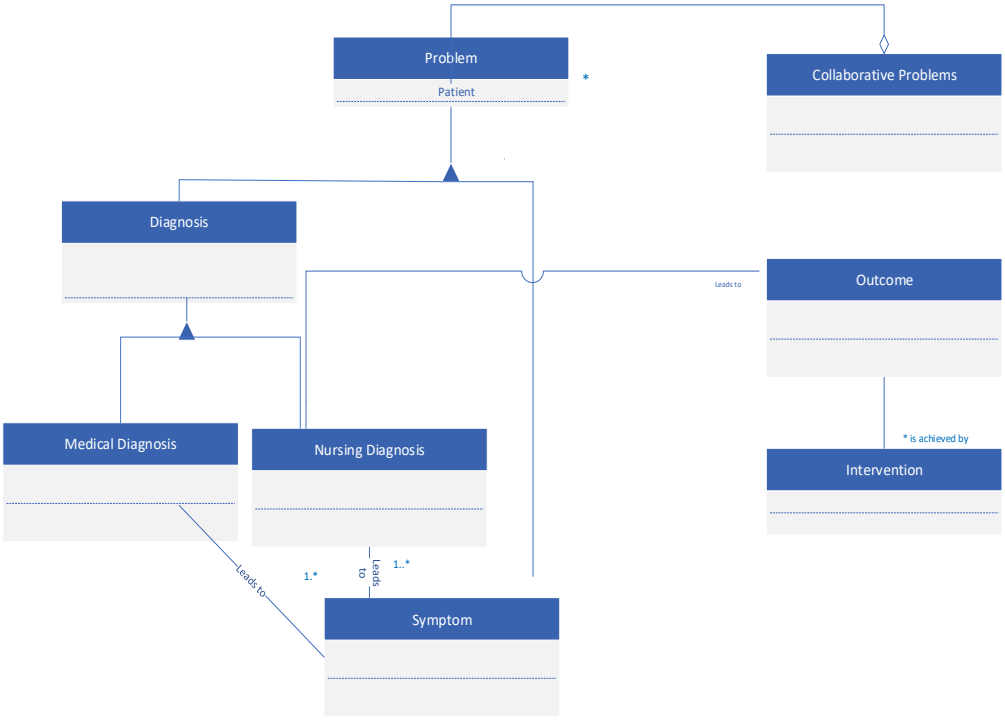


FIGURE 3 CLASS DIAGRAM NURSING LANGUAGE IN PRACTICE

Medical diagnosis refers to a condition or state whereas nursing diagnosis is the management of a response to the condition, for example:

Medical Diagnosis => "*Right sided Stroke*" "*Hypertension*" "*Atrial Fibrillation*"

Nursing Diagnoses => "*Impaired verbal communication*" "Impaired physical mobility" "*Ineffective coping*" "Self-care deficits" "Urinary incontinence functional".

Figure 4 illustrates this in a concept map as an instantiation of the class diagram [Figure 3] showing links to NANDA I codes and demonstrates a sample copy of SNL terminology system

that is used in this work. The diagram illustrates how the general concepts from NANDA I may be utilised for a specific clinical scenario, in this case the nursing management of a stroke.

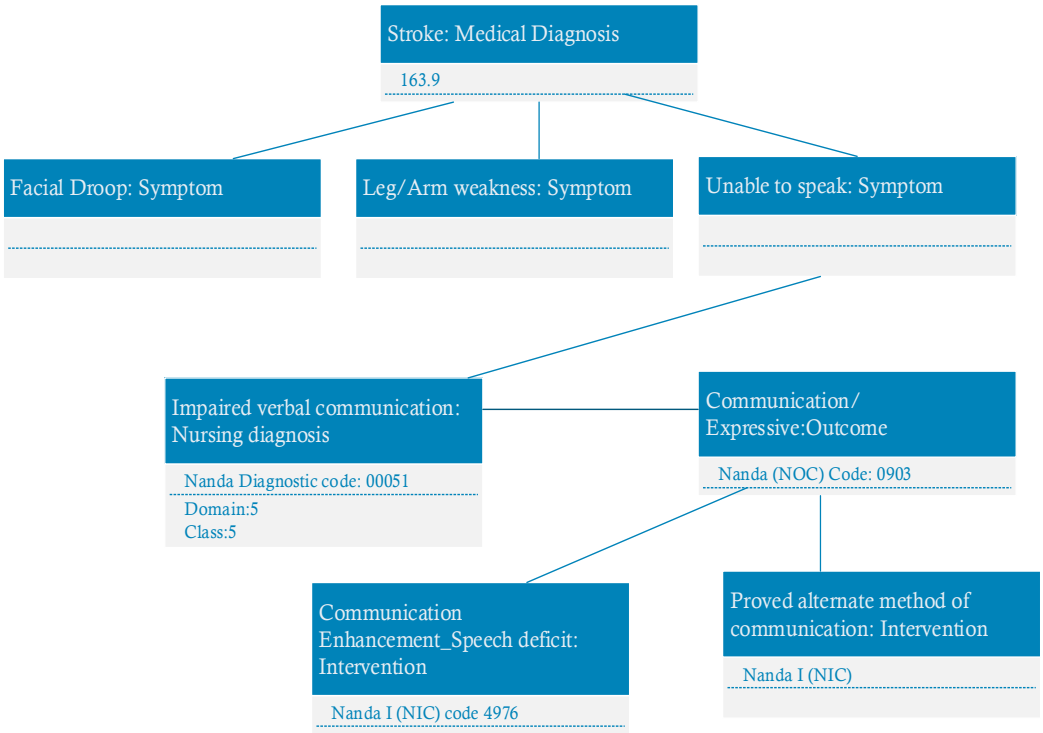


FIGURE 4 UML CONCEPT MAP USING NNN TO CAPTURE NURSING CARE OF STROKE PATIENT

QC-M are used to measure adherence to the nursing process. For the purpose of this dissertation elements of QC-M was applied in the documentation audit. NANDA I, NIC and NOC (NNN) is the chosen SNL in semi-electronic records. Reference terminology was not applicable because although NNN has been mapped internationally to Systemized Nomenclature of Medical Clinical Terms (SNOMED CT) it has not recently been updated. Care-plans are not yet fully electronic and as Ireland has recently purchased the (SNOMED-CT) licence it is anticipated to have NNN mapped in the near future and embedded onto a "standards based master data dictionary". This will ensure common semantics and interoperability of all medical clinical terms (Department of Health 2013 pg 34 section 7.1). NMDS provide elements to format the frame for SNL. Paper based records use PPM to formulate care plan. Admission details are captured on an

assessment booklet similar to the semi-electronic care plans. The plan of care is written free-text within the nursing booklet and not a separate identified care plan *per se.*

Standards, terminologies and data quality for nursing records are further discussed in *Chapter 2 sections 2.2.4 and 2.2.5.*

The audit process used for this dissertation is explained in Chapter 3 [Methods] & *Chapter* 4 [Results]. Appendix 2 (Appendix of research Proposal).

1.3 Measuring Quality of Care

Improving quality and demonstrating effectiveness throughout all domains of healthcare are central to the delivery of safe care. In addition changes in practice are necessary in order to improve standards. This involves assessing adherence to system and process performance resulting in improved professional development, (Batalden & Davidoff 2007). (Foulkes 2011; Sunderland 2009) agree and present the benefits, concepts and future plans for the role Quality Care Metrics (QC-M) plays in collecting, analysing and evaluating standards of practice through nursing documentation.

A solution for this problem was developed in the United Kingdom (UK) to monitor patient safety in a response to an increase in avoidable patient adverse events such as falls, pressure ulcers and medication incidents. It is a user friendly and transparent web based tool called “Test Your Care” (TYC). In 2012 the Nursing and Midwifery Practice Development Units (NMPDU) which are under the governance of Health Services Executive (HSE) Office of Nursing and Midwifery Serviced Director (ONMSD) supported the implementation of TYC and a group of nursing specific metrics authorised from the Heart of England NHS Foundation Trust, the national project is called Nursing and Midwifery Quality Care-Metrics (QC-M). The specific metrics were developed and established based on standards from the Nursing and Midwifery Board of Ireland (NMBI), Health Information Quality Authority (HIQA) and Mental Health Commission(MHC), (Health Service Executive 2018).

Application of the QCM process, the “TYC” website and data quality dimensions (Scannapieco, Missier & Batini 2005) were applied for the purpose of auditing nursing records. These are discussed further in chapter 2, section 2.3.2 and results section.

The intention is that QC-M is available in 'real-time' so ward clinical nurse managers (CNM) and senior nurse managers can review progress, however, some hospitals collect data on paper which is entered on to the TYC website by auditors later.

Chapter five presents suggestions for changes our hospital could easily implement in order to gain maximum benefits of using QC-M as a means to measure quality of patient care and an intention to maintain or improve standards practice and documentation.

1.4 Study Aims and Objectives

In an era of preparation towards Electronic Health Records (EHR), the aim of this study is to measure the quality, accuracy and timeliness of two nursing documentation styles, subjected to the same audit process.

A) *semi-electronic format*, using *NANDA I*, Nursing Interventions Classification *(NIC)* and Nursing Outcomes Classifications *(NOC)* collectively referred to as *(NNN),* incorporating the Careful Nursing Professional Practice model©

AND

B) *traditional paper based* nursing care plans using traditional Roper Logan Tierney nursing process,(Roper, Logan & Tierney 2000).

Data was audited based on the national architecture audit tool (HSE QC-M) used to measure quality. The content of documentation was also appraised for accuracy, completeness, timeliness and validity, as per data quality guidelines described by (Scannapieco, Missier & Batini 2005), and (Pipino, Lee & Wang 2002). Following statistical analysis of both methods, comparisons or similarities will be examined and suggestions for change in practice presented.

The objective is to ascertain if the application of SNL in semi-electronic care plans reflects negatively on the quality of nursing assessment documentation and subsequent plan of care and/or patient outcomes.

1.5 Research Question

A closer look will be taken at two different styles of nursing documentation, paper based and semi-electronic. As a new PPM is introduced incorporating SNL, simultaneously a documentation audit was carried out on the newly implemented and outgoing nursing records. A number of questions have arisen from this exercise.

Firstly: Documentation of the nursing assessment and care plan: Are there differences in compliance in the recording of nursing care in semi-electronic and paper based systems?

Secondly: Do paper records fulfil the professional and legal criteria necessary for 21st century nurses?

Thirdly: Can the application of SNL in nursing care-plans improve compliance of nurses legal and professional responsibilities towards documentation practice?

Finally, having examined the first three questions the overarching question is:

"In assessing the quality care process within nursing documentation, are there differences between paper and semi electronic records?"

1.6 Guide to layout of remaining sections of dissertation

During the course of the literature review, which took place prior to conducting the documentation audit, a wide range of themes emerged from papers written by nursing and HI scholars. Combining ideations from both sectors provided an insightful and slightly different focus to apply to the data that was to be collected. This slight change of course applied stringent data quality assessment criteria in addition to the national tool that is QC-M and measures nursing and midwifery care processes and patient experiences. The literature from both disciplines revealed varied opinions on many areas and these were articulated into themes to be addressed throughout the dissertation.

The remainder to the dissertation is laid out as follows;

Chapter two will present the literature review and themes deduced therein. The use of metrics to assess standards and quality in nursing documentation identifying areas that do not comply and may need quality improvement plans applied is presented.

There are very few papers on the topic of preparation for EHR where semi-electronic system is used – the idea behind semi-electronic is that nurses use a PPM and SNL that is used in EHR's. The use of SNL is a preparation towards adaptation of electronic documentation and involved formulating a specific nursing care plan, devised by the nurse applying nurse specific diagnosis using critical thinking skills to a patient centred approach. The SNL used is NANDA I but other forms of SNL are mentioned where systematic reviews addressed the topic. Various studies will be presented that support or disagree with my research questions.

Chapter three presents the design and methodology. Analysis, collection and storage of raw data is explained. Also presented is the standards to which the practice that practice is measured against, the audit tool used to collect data and a background of the conditions where the audits took place.

Chapter four reveals and interpret the results and a complete analysis of data in relation to the themes discussed in chapter 2 will be presented and compared not only against each other but also in relation to seminal works on the topic.

Chapter five is a general discussion on the principal findings in an attempt to answer my research questions and contains suggestions of changes that could be made to ensure data collected for clinical audit is available real-time for ward managers to enable time to improve compliance in nursing documentation and in turn ensure safer care.

Chapter six concludes the dissertation

Chapter Two [Literature Review]

2.0 Introduction

Literature on the topic SNL in nursing documentation refer to its value in relation to improving safety, supporting daily care, evidence of practice, professional responsibilities and facilitating communication between primary and secondary care service, (Saranto et al. 2014), (Matney et al. 2012), (Jefferies, Johnson & Griffiths 2010), (Rutherford 2008). In addition nursing notes act as a repository to enable continuous assessments of care delivered and outcomes of care with the intention of improving quality of care, (Nursing and Midwifery Board of Ireland (NMBI) 2015), (Mykkänen, Saranto & Miettinen 2012). Chapter two elucidates the findings and themes assumed following a narrative review; some elements of the meta-analysis were adapted to assist with inclusion criteria affording deeper analysis from planning to synthesis of suitable articles, (Greenhalgh et al. 2005). The search included literature on nursing documentation in paper based and electronic formats. Nursing documentation in EHR's use SNL to record nursing care as opposed to freehand text written into paper records. The semi-electronic format addressed throughout this dissertation uses the SNL Nanda I Nursing Interventions Classification (NIC) & Nursing Outcomes Classification (NOC) collectively known as NNN.

Research of literature on the topic was conducted to discover a non-biased view on different aspects of nursing documentation including:

- *Practice models and theories applied to both paper and electronic health records;*
- *Application of Standardised nursing languages and their effect on documentation, practice and outcomes of care. In addition, methods deployed to measure quality of documentation and quality of care were explored, namely clinical audit;*
- *Assessment of documentation to measure adherence to frameworks that define practice standards of practice and consequent quality of care, e.g. quality care metrics, Key Performance Indicators (KPI's);*

Literature review was conducted during a change in practice for nursing in preparation towards Electronic Health Records (EHR). The aim was to gain a broad view of influential work on the topic around nursing documentation in both paper based and electronic patient records but the main focus is on electronic or semi-electronic record keeping. This is the plan for the future of documentation, either a national EHR or organisational electronic personal records (EPR).

The hospital where the audit took place is implementing semi-electronic nursing care plans which uses a standardised nursing language (SNL) to record nursing practice, the same used in EHR documentation. The underlying purpose was to integrate findings and collate major themes from studies of paper based documentation using traditional styles of documentation and electronic nursing documentation using SNL's.

2.1 Search Strategy

The Problem/Problem, Intervention, Comparators, Outcomes (PICO) framework was applied to formulate my research questions. PICO affords a well-defined search strategy for literature searches in order that I retrieve and collate published work from authors citing a broad spectrum of both positive and negative appraisal of the material for this topic. (Figure 4).

P	Problem/Population →Format used for nursing documentation of nursing care in paper and electronic health records,
I	Intervention → Implementation of a new professional practice model incorporating a Standardised Nursing Language as is used in Electronic Health Records
C	Comparison → Paper based records using traditional practice model and handwritten devised care plans with semi-electronic care plans devised using Standardised Nursing Language NANDA I NIC & NOC (NNN). Evaluating quality of documentation and evidence of care -> clinical audit
O	Outcome → Are there differences between both styles of documentation in terms of quality?

FIGURE 5 PICO -> FRAMING THE RESEARCH QUESTION

The following key words and synonyms were identified using the PICO framework:

"*nursing*"; "*documentation*"; "*professional practice models*"; "*nursing processes*"; "*electronic health records*"; "*paper based records*"; "*standardised nursing language*"; "*clinical audit*" "*documentation audit*". Later "*standardized nursing language*" was added because alternative spelling using 'Z' instead of 'S' and "*nurs**" "*audit**" and/or "*documentation*" and/or "*measuring quality*" and/or "*clinical audit*" which widened the results parameters and revealed appropriate literature to ensure a wide spectrum of international opinions. Initially only

contemporary literature was retrieved. However after reading some of these articles it was noted that influential work dating back decades was frequently quoted in current literature so some of this was deemed valid for inclusion.

The following databases were used for the search: PubMed, CINAHL, Cochrane Library, Science Direct, ProQuest, Web of Science, Joanna Briggs Institute (JBI), Google Scholar, OVID and Scopus and included original articles, systematic and narrative reviews, government publications and health authority documents from Ireland, the UK, Scandinavia and Australia.

2.2 Themes Identified:

Themes that were identified throughout the literature review were sometimes the subject within the main body of papers, some were declared as significant issues deserving further research. All included the topic of nursing documentation both in paper and electronic format adapting the SNL that is used in the semi-electronic version of records audited. The themes are as follows:

- *Legal & Professional responsibilities of nurses*
- *Measuring Documentation to enhance Quality of care*
- *Importance of good and consequences of poor Documentation*
- *Standardised Terminologies & Quality of data for nursing records*
- *Suggestions for future study*

Sections of the QC-M tool emulate identified themes which presents an effective approach for examining both styles of documentation.

2.2.1 Legal & Professional Responsibilities

Nursing bodies, national laws and organisational policies govern the requirements of each nurse in relation to their obligation for completing patient records, namely the code of professional conduct (Nursing and Midwifery Board of Ireland (NMBI) 2015) and guidelines for completing clinical/nursing records (NMBI 2015) and (Health Services Executive 2011).

The (Nursing and Midwifery Board of Ireland (NMBI) 2015), affirm legal and professional conditions regarding the management and collation of nursing documentation: The Board believe that the quality of records maintained is a direct reflection of the quality of care

delivered to patients. All nursing documentation, paper based and electronic, regardless of setting, should adhere to the guidelines of their respective nursing body. They should conform to standards as set out by national and local policies and serve as an essential factor of nursing practice. An inaccurate rationale behind the development of a care plan and evidence of the actual care delivered due to poor documentation can lead to adverse events for patients.

The Health Information and Quality Authority (HIQA) is a self-regulating body with legal powers and responsibility for monitoring, improving and setting standards for patient safety in Ireland and the Health Act 2007 affords HIQA the powers to do so. An inspection by HIQA uses documentation to gather evidence of care delivered and will ascertain facts written in the nursing record, interviews with staff members and events observed during a visit to formulate a report measuring care delivered against an expected national standard.

Table 1 outlines the minimum essentials of good clinical record keeping as detailed in (NMBI 2015) "Recording Clinical Practice" as required (Health Services Executive 2011).

TABLE 2 PURPOSE AND RATIONALE FOR CLINICAL RECORDS

Purpose	**Rationale**
Documented evidence of nursing & midwifery care planned and delivered	Documentation should include: An accurate assessment of the person's physical, emotional and social well-being and should include opinions of significant others, namely family or next of kin (NOK). Evidence of Planned and delivered care including a rationale/reason if care was not given, should reflect nurses clinical reasoning. Patients response to treatment. Education given to patient and family. An evaluation of the positive and/or negative consequences of care provided. Entered in chronological order. Written as events occur. Any change in status should be recorded

	Must contain actual work of nurses and discussions with patients in a non-biased manner.
Facilitate communication	Details of care given should be shared between all members of the multi-disciplinary health care team. Record should be legible and only include approved abbreviations.
Documentary evidence of delivery and quality of care.	Evidence of Nursing & Midwifery rationale and decision making. Continuity of care between health care professionals and facilities with details of future plan of care. Data available for clinical audit & to evaluate practice. Data available for dealing with complaints Data available for teaching students. Data available for legal enquiries.
Should be patient centred	The patient should be referred to by name.

2.2.2 Measuring and Improving Quality by assessing Standards

Clinical care delivered by nurses is based on a logical model with scientific fundamentals, which in turn forms the basis of a 'care-plan'. The measurement of the extent to which nurses and midwives follow the process contributes greatly in maintaining high standards of evidence based safe quality care.

Quality improvement supports positive changes and measurement of nursing care documentation is pivotal in identifying areas that require improvement (The Mid Staffordshire Foundation Trust 2013). Similarly (Griffith et al. 2008; Maben & Griffiths 2012) identify the universal practice of measuring efficiency and quality via performance management. One such

method is “Nursing and Midwifery metrics” whereby quality indicators provide a framework to measure standards of nursing care within nursing records, (Foulkes 2011), by informing efficient and inefficient practices. (Giltenane, Frazer & Sheridan 2016; ONMSD 2013) agree and present Quality Care Metrics (QC-M) as an effective means to measuring standards of care in order to improve or validate nursing practice.

Evidence from research demonstrates that adverse events causing harm to patients are as a result of process and system failures (Institute of Medicine 2010) and organisational structures (Björvel, Wredling & Thorell-Ekstrand 2003a). (Linnen 2016) points to the large volume of data generated by nurses each day in recording practice of planned and delivered care and the subsequent slow turnaround of analysed data which leads to a delay in producing quality improvements. However, (HIQA 2013) recognises the importance of measuring quality of care through (QC-M) which is a necessary mechanism to determine areas that require improvement and (Foulkes 2011) explains how QC-M provide the necessary framework that should be applied. QC-M can reveal evidence of good safe nursing care which improves a patients’ experience and can highlight areas of the documentation process that need improvement which in turn can avoid unsafe sub-standard care. (Redman 1998) suggests the notion that generating alertness to a problem or potential problem is an important step towards creating a solution. This is the essence of clinical audit, namely identifying areas of underperformance with an action plan or creating a set of Key Performance Indicators (KPI’s) as the solution, although (Linnen 2016) argues that retrospective review of charts presents a static view of past events and that data extracted manually is not analysed in a timely manner by quality departments. This may cause a delay from the time data is interpreted into valuable information that will support changes in practice resulting in improved outcomes for patients. Furthermore, (Bowie, Bradley & Rushmer 2012) examine the validity and contribution of clinical audit following a qualitative study involving key stakeholders responses and question why clinical audit continues to be used as a quality improvement tool. They believe that evidence of the benefits of clinical audit and subsequent quality improvement initiatives in an attempt to improvement patient care are inadequate. This study expressed the viewpoint by clinicians who demonstrated difficulty in conducting clinical audit in addition to their usual workload. However clinical audit is more effective when considerations are given to staff by management if the outcome is to be of true value in offering solutions to problems (Callanan 2012; Excutive 2015; National Clinical Effectivemess Committee 2015).

Evaluation of documentation of care delivered contributes to identifying areas of care that may require improvement. It also demonstrates areas of good quality care. Furthermore, evaluation on the content of documentation measures to see if nurses are practising in accordance with approved or recommended processes. In turn, this ensures evidence based and safe care is delivered. It is also a requirement by the Health Information and Quality Authority who specified:

"Unless we actually measure the quality and safety of care, we cannot determine if improvements are being made" (HIQA 2013, pg 2)

The proposal 'Patient Safety First' was introduced in 2010 as suggested in the Report of the Commission on Patient Safety and Quality and Assurance – *Building a Culture of Patient Safety* (DoH 2008) to voice service user opinion of care received. The proposal suggested a National Framework for Clinical Effectiveness with the intention of offering structure and processes in the form of clinical guidelines. The use of clinical audit to ensure optimum patient care and outcomes were achieved by identifying areas that require improvement but also identify areas of good practice regarding the delivery of safe quality evidence based care. This information is captured directly from the patient records but in addition from the 'patient experience survey' (DoH 2018).

The National Service Plan (HSE 2018) outlines the importance of quality and patient safety in maintaining standards of care and minimising risk to patients. The Quality Assurance Framework incorporating clinical audit is a means suggested to support improving quality and safety by identifying areas that require improvement and areas demonstrating good quality practice. Areas that need improvement in order to achieve national standards are addressed by initiating 'action plans', regular measurement to ensure standards are maintained via KPI's, or supplemental staff training. Standards of care is what a person should expect should they require health care services. Furthermore, (Richter & Muhlestein 2017) report that a positive patient experience reflects positive financial outcomes for healthcare organisations. Moreover, (Tsai et al. 2015) demonstrated that effective use of quality metrics to monitor performance resulted in higher performance and provided targets which contribute to increased quality of care.

The National Clinical Effectiveness Committee (NCEC) and Health Information and Quality Authority (HIQA) carry out inspection audits in order to monitor services against measured national standards. NCEC provides the framework for developing clinical audits and guidelines. HIQA is an independent body funded by the HSE to monitor services nationally. Local clinical audits help to prepare organisations to meet national and indeed international standards such as required by the Joint Commission International (JCI). However, more importantly audits identify areas of good and bad practice guaranteeing the delivery of safe evidence based quality care.

Alternative Audit Tools in use for measuring quality in documentation

QC-M is designed for real time data collection to allow up to date review of compliance and prompt response if required (Royal College of Nursing 2011). It is the audit tool of choice because it is a nationally accepted and validated audit instrument with care processes and associated metrics that are relevant and fit in well with themes deduced following the literature review.

(Bjorvell, Thorell-Ekstrand & Wredling 2000) also trust documentation audit to measure nurse's clinical judgements by developing and validating the Cat-ch-Ing instrument which was used by (Darmer et al. 2006). They used the same tool to demonstrate improvement in nursing documentation following the introduction and application of the VIPS nursing model (The VIPS model is a Swedish acronym for *Well-being, Integrity, Prevention and Safety,* reflecting basic values in nursing care). An alternative but equally productive audit tool is the Nursing and Midwifery Content Audit Tool (NMCAT) presented by (JOHNSON, JEFFERIES & LANGDON 2010) as an effective means to measure the quality of content within nursing records.

(Donabedian 1988) maintains that quality of care can be divided into three classifications as Firstly) structure, Secondly) process and Thirdly) outcome and insists that it cannot be measured without being aware of the relationships between the three classifications, which means that social and physical factors can influence patients eventual outcome. Thus making it somewhat difficult to ascertain if the extent of an actual outcome is entirely due to care delivered. In addition, stating that is it is important to evaluate the process of care and recommends that measurement of quality should include the structure, process and outcome taxonomies, the QC-M, NMCAT and Cat-ch-Ing tools offer exactly this.

Table 2 outlines benefits of Quality Care-Metrics:

TABLE 3 BENEFITS OF QUALITY CARE-METRICS

BENEFITS OF QUALITY CARE-METRICS	
M	Measurement of Standard
E	Engagement of Staff
T	Timely Information
R	Results-open & Transparent
I	Improvement for Patients
C	Culture Change
S	Shared Learning

2.2.3 Importance of good and consequences of poor Documentation

Patient Safety and Quality of Care

Patient safety remains one of the most fundamental issues facing health care today. The delivery of safe, effective care places the patient and family at the core. It is the responsibility of all health care employees. Nurses provide care to patients every hour of every day and their contribution to influence patient outcomes are immense. This is, however, only if the care-plan, interventions and actions have been documented, (NMBI 2015). (Kim, Coenen & Hardiker 2012b) acknowledge nurses as the largest group of health care providers and therefore the nurses work is central to the delivery of effective care.

Nurses who are appropriately educated in the principals documentation and follow their organisations guidelines are shown to produce an accurate record of nursing practice. They consequently deliver safer patient care, (Frank-Stromborg, Christensen & Elmhurst-Do 2001). (D'Amour et al. 2014) reported 76.8% or one patient out of every seven hospitalised on a medical unit experiences at least one adverse event, which has negative impacts on lifestyle and imposes fiscal consequences on healthcare facilities. The literature accepts certain adverse events as being attributable to nursing care, including: Pressure sores; Falls; Medication Administration errors; Inappropriate use of restraints; Pneumonia; Urinary infections. These are regarded as nursing sensitive outcomes (Brown et al. 2010), or widely accepted as the nurses responsibility (Savitz, Jones & Bernard 2005). It reflects on how nursing practice relates directly to patient safety and (Okaisu et al. 2014) convey that poor standards of documentation are associated with a reduced standard, regardless of format in quality of care.

(Jefferies, Johnson & Nicholls 2011) contend that if readers cannot understand nursing documentation of planned, or delivered care, there is a risk that misinterpretations could lead to nurse related, avoidable, adverse events. (D'Amour et al. 2014) suggests a better understanding of the nurse's contribution in the problem of patients who suffer an adverse event will help to identify contributing factors and thereby identify necessary action. (Müller-Staub et al. 2007a) demonstrate how nursing processes support nursing documentation and in turn contribute to improved patient outcomes, similarly (Kent & Morrow 2014) report on

several initiatives undertaken in the United Kingdom demonstrating improvement in documentation of nursing and midwifery practice led to improve documentation of nursing practice. This in turn, not only demonstrated improved care but led to the process of improving documentation which has supported a national policy on implementing a better, safer, care strategy. In addition, (Institute of Medicine 2011) recognise the essential role nurses' contribute to quality and safety in patient care.

Some of the benefits for EHR implementation for patients include better quality care and improved safety, advanced methods of communication between interdisciplinary teams, (HSE 2016), (Middleton et al. 2013; Saranto et al. 2014). However (Kelley, Brandon & Docherty 2011b) doubt the contribution electronic documentation makes towards improvement in the quality of care patients receive during admission because of the lack in the use of comparison between paper based and electronic documentation. However, (Kim, Patricia C. Dykes, et al. 2011a) highlighted problems within the paper based health care records that require redefinition for an electronic system in order to fully support a complete and accurate documented account of nursing care. In addition (Lee 2015) hypothesises patient safety, reliability of care, efficiency and the patient experience as key indicators of performance from an organisational perspective define the status of the health care facility. (Lee 2015) presents the notion of measuring patient experiences and their own opinion of their outcome, in order to improve standards. "Patient Experience Survey" commenced in 2017 and repeated 2018 (DoH 2018) is an example of measuring from the patient perspective and nursing records offer a repository of data should patient experience survey reveal areas on concern that require investigation by.

Visibility of Nursing Practice

Record of nursing practice, in paper or electronic format, should not only provide evidence of care delivered (NMBI 2015) but also be in a format that provides clear information. This creates the foundation for quality of care planned and delivered (Akhu-Zaheya, Al-Maaitah & Bany Hani 2018). These outcomes can be achieved through the use of a standardised nursing language for recording practice (Strudwick & Hardiker 2016). Strong evidential criteria for using SNL within electronic nursing records has emerged; this refers to enhanced visibility of nursing practice (Herdman & Kamitsuru 2014b; Strudwick & Hardiker 2016). It is also a means to demonstrate proof that nursing care has been delivered. Interestingly (Rutherford 2008) and others failed to

see a difference between nursing documentation in electronic and the paper-based system (Wang, Yu & Hailey 2015).They noted , however, the nursing process had a role to play. (Tornvall,Eva; Jansson 2017) acknowledged the evidence for usefulness of SNL rather than effect on documentation quality but did find it to be essential for measuring, clarifying and understanding nursing care which demonstrates nurses' contribution in the health care record. They remarked that information is easily communicated between the multi-disciplinary team. Furthermore, (Urquhart et al. 2009) looked at nursing practice and if there was a correlation between outcomes for patients depending upon the type of record system used, including paper, electronic, nursing records kept by patients themselves, and records kept in clinics. It was concluded that changing an entire system may not alter how nurses deliver care nor improve outcomes for patients. Further work was then suggested with nurses as a main user, in the development of nursing records.

The importance of documentation in relation to professional and legal responsibilities has been mentioned. Reference to documentation of care nurses deliver not only makes nursing contribution visible but also acts as proof that care was given. It serves as a repository of data should it be required at a later date for an informal/legal enquiry or for research purposes. In addition the importance of the nursing process in conjunction with SNL ensures the quality of documentation is fit for purpose (Björvel, Wredling & Thorell-Ekstrand 2003; Kim, Patricia C Dykes, et al. 2011a; Vassar & Holzmann 2013; Westra et al. 2008) and is superior to paper based records where data is hard to retrieve and unstructured but may be that the nursing model needs to support nursing practice (Nykänen, Kaipio & Kuusisto 2012a). (Kim, et al. 2011) Remark that accurate structure is not present in paper records and is required in order to capture information of nursing practice. The authors also remark on the presence of redundant data and suggest that this is an area easily addressed by using electronic records.

The 'importance of good, and consequences of poor record keeping' have been emphasised in Ireland, by such reports as (Department of Health and Children 1999, 2001). The UK, (Francis 2010) delved into the area of record keeping. The report on the Inquiry into the care provided by Mid Staffordshire Foundation Trust highlighted below-standard nursing documentation as a contributing factor to the poor quality of care received by patients. Furthermore, recommendation 3 of the Leas Cross Report by (Professor O'Neill 2006) suggests electronic records should be used to assist and develop patient centred care plans, monitoring quality of care delivered as a repository for national statistics on morbidity and mortality. If electronic records are to become patient record repository of the future nurses need to ensure their

practice is visible and the information retrievable across all disciplines, SNL affords this within patient records (Jones et al. 2010b; Müller-Staub et al. 2006; Tastan et al. 2014a).

Organisational Benefits

Once nursing practice is incorporated into the electronic record organisations or hospital trusts can benefit financially with additional services or contributions to patient care supplied by nurses available for costing (Rutherford 2008). Additional data available for research purposes to improve standards of care (HIQA 2012; Saranto & Kinnunen 2009). Moreover (Fook 2003) states that clinical audit is the very essence of hospital governance and addresses problems by providing reliable systematic and unequivocal data to confirm or deny the quality of clinical services provided. In addition, extending the use of interface terminologies to consumers (patients & relatives) could improve access to primary care services and support the acute care sector (Monsen et al. 2006).

2.2.4 Standards for Nursing Records

Standardised Terminologies are necessary to ensure semantic interoperability between healthcare disciplines, in relation to nursing practice. Several terminologies have been established to ensure a common standard between, and within healthcare disciplines. These are necessary to support and capture the diversity of practice, including the nurses assessment, diagnosis, planned interventions and measurable outcomes of patient care (Kim, Hardiker & Coenen 2014). Furthermore, (Barthold 2001) remarks that without standardised terms or a standard language the some information could be misconstrued because of the variety of terms used within nursing practice. Providing a framework for documentation, in the form of process (Björvell, Wredling & Thorell-Ekstrand 2002b), a practice model (Björvel, Wredling & Thorell-Ekstrand 2003b; Darmer et al. 2006; Meehan 2003) and applying standardised terminologies (Strudwick & Hardiker 2016) allows for the reuse of data for communication (Barthold 2001; Rutherford 2008), evaluation (Jones et al. 2010a) and also contributes to improved quality and safe care (Menachemi & Collum 2011; Tastan et al. 2014). It is critical to determine quality and define standards to avoid ambiguity of information and facilitate the reuse of healthcare data.

Professional nursing bodies (NMBI 2015) and government standards (Health Services Executive 2011) regulate the minimum standards for recording of nursing practice in Ireland. Each country has to determine that national and international standards are met in relation to healthcare services including documentation *e.g.* the European Committee for Standardization (CEN), *e.g* International Organization for Standardization (ISO). The National Standards Authority of Ireland (NSAI) is the Irish standards body. (Timmermans & Berg 2003) differentiate standards into *Design*; *Performance*: *Terminology*; and *Procedure* for application in recording healthcare practice. Also, (Kim, Patricia C. Dykes, et al. 2011b) examined nursing documentation on paper form in preparation for computerised system and highlighted many problems such as non-standardised documentation fields, frequent and inconsistent use of free-text descriptions which fails to capture accurate data on a specific area of nursing care and requires more time to complete resulting in paper audit trails taking more time to complete.

Some ISO standards that apply to electronic patient records include:

- ISO 13606 1:2008(en) -> EHR Communication
- ISO/TS 4441:2013(en) -> Security and privacy requirements in Electronic Health Record use
- ISO/TS 13972:2015(en) -> Details Clinical models within healthcare
- ISO 27789:2013(en) -> Audit trails for Electronic Health Records

2.2.5 Terminologies & Data Quality for Nursing Documentation

HIQA believe that the application of quality information supports superior care. Accessing real time data ensures quality of information and impacts on the care that will be delivered. This is because good quality timely information contributes to decisions which include medical and nursing diagnoses. A subsequent care plan, will be formatted in relation to patient information given verbally by the patient and data in the patient record. Stored data contributes to decision making and should be available in a timely manner to those who rely on it for critical decision making, (HIQA 2012).

One of the many interpretations in defining data quality states:

> *"the totality of features and characteristics of a data set, that bear on its ability to satisfy the needs that result from the intended use of the data"* (Arts, De Keizer & Scheffer 2002).

Although data quality can be described as data that is 'fit for purpose' (Wang & Strong 1996), health care services should generate data that is adequately accurate, in a timely manner, reliable and consistent in order that competent decisions can be made for planning and delivering effective patient care, (Kerr, Norris & Stockdale 2007). (Keenan 1999) offers SNL as a unified language that describes care, that is understood by all nurses and conveys the concept that nurses should agree upon common terminologies to describe assessments, interventions and outcomes in relation to recording patient care. Similarly, (Bulechek & McCloskey 1995) describe the coding in Nursing Intervention Classification (NIC) as an aid to represent the very essence of nursing and (Herdman & Kamitsuru 2014a) show the Nursing Outcome Classification (NOC) as expected patient outcomes, developed to measure the effects of nursing ensuring patients at best return to their baseline on discharge from hospital.

(Batini & Scannapieco 2006) explain the consequences of poor data quality on efficiency and effectiveness on organisations and businesses. They present issues or dimensions related to data quality such as accuracy, completeness and consistency and point towards "Data Quality Act in the United States and the "European 2003/98" act brought into force. Collection, storage, use and sharing of personal data is protected by law under such acts as (Data Protection Act 1988), and more recently the Global Data Protection Regulations (GDPR) (EU 2016). These act include new guidelines enforced on 25th May 2018 imposing heavy fines for organisations in non-compliance.

Poor data quality increases healthcare costs (Menachemi & Collum 2011; Wang, Wang & McLeod 2018). It inhibits communication , obstructs obtaining measurements of performance and data for research purposes, (Cai & Zhu 2015; Linnen 2016; Pipino, Lee & Wang 2002; Vassar & Holzmann 2013).

(Gunningberg, Fogelberg-Dahm & Ehrenberg 2009; Paans et al. 2010; Park & Lee 2015) examined the lack of data entered, either written or entered electronically, as opposed to 'accuracy'. They reported these deficiencies which mean that patient records are not a valid source of information on patient care and perhaps do not reflect the rationale behind the decision for the care planned and delivered (Blair & Smith 2012). (Matney et al. 2012) define several recognised nursing terminologies or SNL's that contain nursing diagnoses. All of which have standard codes that allow data entry and retrieval in EHRs which improves communication, facilitates research and training. (Scherb & Weydt 2009) infer that nursing practice is more easily defined when they have a better understanding of the interventions required in order to ensure particular outcomes are achieved for their patients.

Data Quality Assessment Dimensions

Completeness, Accuracy and Consistency are dimensions measured when looking at the quality of data as (Cai & Zhu 2015), (Thoroddsen et al. 2013), (Batini et al. 2009), (Scannapieco, Missier & Batini 2005), (Zozus et al. 2014) explain these dimensions that were considered when collecting the QC-M audit.

The (Institute of Medicine (IOM) 1999) published a report on a national effort to make health care safer and it opened with the well-known phrase "To Err is Human to forgive divine". One important conclusion within the report referred to conditions, process and system failures as contributors suggesting that organisations should make it harder for healthcare staff to make mistakes. An example of this is to design health care systems where at every point of patient contact is made safer. This includes medication prescribing, medication administration and communication of patient data. Auditing of documentation is one way of making a system safer, highlighting areas of concern and affording the opportunity to improve areas that do not meet organisational or national standards. In an article on the consequences of poor data quality (Redman 1998) refers to this as 'creating an awareness of the problem' from a business perspective acknowledges the difficulty in measuring data quality. Moreover, in the health care setting medical record reviews present a valuable way to measure quality, improve standards and perhaps avoid errors as (Findley & Daum 1989) state "Wisdom comes from experience and experience from mistakes, but they don't have to be your mistakes".

2.2.6 Suggestions for Future study on topic of Nursing Documentation

(Saranto et al. 2014) believe that nurse's opinions towards using SNL are generally positive but suggest additional education and support from hospital and nursing management will ensure benefits from SNL, (Johnson, Jefferies & Langdon 2010) presented the Nursing and Midwifery Content Audit Tool (NMCAT) as a method to measure the quality of documentation and believed it to be an effective tool. They called for language support software and education programs regarding writing skills to improve illustration of nursing documentation. Following on from this the authors tested a program on writing skills incorporating workshops and one to

one coaching (Jefferies et al. 2012) emphasising the need for nurses to critically appraise their documentation. This ensures its eloquence as a communication of patient care to all members of the multidisciplinary team. The program also explains and supports nurses to document the patient's condition, care given and responses to the care using standardised terminologies readily understood by all relevant readers of the nursing record. Interestingly, (Okaisu et al. 2014) noted the importance of documentation in nursing practice and comment on obstacles in maintaining standards. Nevertheless the authors theorise that solutions to nursing problems are far more complicated than merely the education of staff. They believe that building a team (who already have the necessary skills) to participate in mandatory continuous professional development (CPD). Together with leadership and evidence based practice at the core will provide a more complete approach. There is, however training involved in CPD's.

(Ehrenberg & Ehnfors 1999) looked at the effects of education on documentation. This was carried out a control group not receiving education, who confidently presented significant improvements in content of the recording of nurse specific diagnoses, history taking, goals and discharge planning many of which are poorly reflected in many studies(Akhu-Zaheya, Al-Maaitah & Bany Hani 2018; Blair & Smith 2012; Lees 2010; Prideaux 2011). While (Lindo et al. 2016) revealed similar weaknesses in documentation practices. It suggested increased education as one such intervention towards improvement in documentation. In addition a suggestion was made for the need to focus particularly on discharge planning, nursing assessment and patient education. All which contribute to improved quality care and are poorly captured in nursing records.

(SNL) used to document nursing practice, is described as a means of increasing descriptors of nursing practice, supporting daily care and improving patient safety (Saranto et al. 2014).

(Rutherford 2008) claims that once the nursing language is standardised a term can be measured and coded. The codes can be used in the clinical or education setting. In principle SNL gives us standardised words for what we know, plan and do every day for patients. (Rabelo-Silva et al. 2017), agree describing SNL as a set of terms used to label clinical findings involved in nursing assessments. (Tastan et al. 2014b) examined SNL and described nursing terminologies as a body of standardised terms for documenting the practice and science of nursing. In addition (Rutherford 2008) stresses the importance and capability of SNL not only to enhance communication among nurses and from nurses. It can be extended to the health care team and will increase the visibility of nursing influence on patient care.

Real Time Collection of Data

(Linnen 2016) points out the need to highlight areas where positive and negative outcomes are equally measured, and this may be best done if data collection was collected in real time, thereby ensuring fast, meaningful and easy to use analysis of nursing actions during the course of care delivery which affords nurses power over their data to improve safety and care of our patients.

2.3 Summary of Chapter 2

The HSE outlined a strategic business case towards implementation of EHR (HSE 2016), outlining key developments thus far, for example national systems such as the New-Born Clinical Management Systems (NB-CMS), Medical Imaging Laboratory System (MedLIS), the Lighthouse Projects for epilepsy, haemophilia and bipolar disorder and ePharmacy. The contribution of nursing practice is often paper based and written on pieces of paper during a shift handover and don't reflect the extent of the nurses work. Documentation of nursing action needs to be validated, as nurses attend patients every hour of every day from admission to discharge. As we move towards electronic records nurses should adopt a unified language in order that nursing care contribution is embedded in the patient's health chart, and easily communicated across all members and levels of the healthcare sector, (Bruylands, M; Paans, W; Hediger, H; Muller-Staub 2013; Hardiker, Hoy & Casey 2000; Institute of Medicine 2011; Lundberg et al. 2008).

Many studies report on the use, benefits, use and adaptation of Standardised Nursing Language(s) (SNL) in nursing documentation (Akhu-Zaheya, Al-Maaitah & Bany Hani 2018; Cynthia Lundberg et al. 2008; Kelley, Brandon & Docherty 2011b; Tornvall,Eva; Jansson 2017; Törnvall & Wilhelmsson 2008; Urquhart et al. 2009), many emphasise the need for education (Jones et al. 2010a) and further training (Gunningberg, Fogelberg-Dahm & Ehrenberg 2009) to ensure successful implementation. However, few studies report on the actual implementation process and the use of semi-electronic care plans incorporating a professional practice model (PPM). The use of semi-electronic care plans uses SNL and is a method of introducing nurses to the concepts of the language to be used in an electronic health record. (Gunningberg, Fogelberg-Dahm & Ehrenberg 2009) proposed that documentation in the electronic system will improve when nurses become more acquainted with SNL, the use of SNL in semi-electronic records will be looked at against paper records using traditional models of care.

Chapter Three [Methods]

3.0 Introduction

The research question was formulated during a transition from an old to new documentation style and PPM. With a focus on patient safety, previously poor performance of nurses adherence to standards of documentation practices. The correlation between avoidable adverse events and poor standards of nurse record keeping both styles were audited, analysed and compared for differences. Finally, in relation to patient safety a total number of avoidable adverse events for each style were included in the discussion for comparative reasons.

This chapter presents how a documentation audit using a national concept adapted from the UK was applied i.e. QC-M on TYC website, to take an in depth look at both forms of records. The design plan and methodology explain how the questions were addressed.

3.1 Research Design and Methodology

This study was an audit on the documentation of the nursing assessment and resultant care-plan. It was a prospective non-experimental, point prevalence chart review and cross-sectional analysis of pre-anonymised and aggregated data of the nursing assessment documentation and adverse events over a 2 month period. Chart reviews were from a total of four wards, two of which use a semi-electronic format incorporating SNL. They are currently being implemented across the hospital, and two using a paper based format, which is being currently phased out and replaced by semi-electronic care plans. The four wards are medical wards, one of which is short stay. However charts were only chosen for patients who had been admitted for at least seventy two hours. Each ward had a total of 30 to 35 patients. There was an average of 1 nurse

to 9 patients with between 2 – 3 additional health care assistants for the ward. On one occasion there was a medical emergency on the ward so the audit was deferred until the following day to ensure equity as no other ward had emergencies on going during audit period.

The charts were selected using a random sampling technique of patient charts who had been on the ward for a minimum of seventy two hours. Exclusion criteria applied to patients acutely unwell. The template, questions, guidelines and audit criteria applied were the same for every chart. Raw data sets were entered into Excel, coded and prepared for insertion of analysis graphs. Graphic visualisation of results are easily identified when applying the Red Amber or Green (RAG) zones to indicate compliance or non-compliance.

3.1.1 Sample and sampling technique.

Random sampling of medical record charts from a total of four wards, focussing on documentation within the nursing assessment and subsequent plan of care reasoned.

Charts will be only audited from Medical Wards. All wards follow a specific nursing process which guides nurses towards an individual care plan, **two** ward locations use **semi-electronic SNL** and **two** wards use **paper based documentation.** Documentation on the nursing assessment, using the open access audit tool as per HSE guidelines on clinical audit, appendix 1.0 (Sections from the audit tool that relate to documentation of nursing assessment and patient risk are highlighted in yellow). Sections that will not be used have been removed or 'strikethrough' entered.

The number of charts chosen for audit will be 45% of the total number of patients on the ward at the time of audit. Initially it was decided to only audit charts for patients who were twenty four hours on the ward because the admission documentation must be completed within that time frame, as per the Nursing and Midwifery Board of Ireland (NMBI) guidelines, however, it was decided to only use charts from patients who were seventy two hours on the ward to ensure fairness to each area. The usual number of charts audited as per HSE guidelines is 25 % of the total number of patients currently on the ward, however, as this audit only includes a total of four wards it was decided to increase the number of charts audited to ensure a significant sample size obtained for comparative and interpretative purposes.

3.1.2 Audit Instrument

Content from the audit tool to be used is based on the web based tool entitled (TYC) which was developed in the UK and adapted by (NMPDU) QC-M as a measure to monitor patient safety and promote quality evidence based care, (Excutive 2015). Therefore variables used to collect data, [Table 4], are defined as a priori and ensure data collected is complete, accurate and validated as a measurement of data content and quality within the nursing record. The audit tool is an open access 'nursing metric audit tool'. Permission, encouragement and guidance to use the tool and a guide for clinical audit is given by the HSE Quality and Improvement division, HSE Quality Improvement division, (2015), (HSE 2017), and (eHealth Ireland 2015). In addition local permission has been requested and granted as part of the organisations ethics approval process. Director of services NMPDU has also given permission to use the tool. Not all metrics that are on the open access document (HSE 2017) will be used, and no additional metrics/questions will be added, Table 4 lists the questions used. Appendix 2 (last section) contains copy of original template used with care process and metrics.

In order to assess data quality standards, in answering all the questions in the audit tool, factors such as completeness, accuracy and timeliness were applied to ensure consistent valid and equitable data suitable for comparison and analysis.

The following questions were answered "YES", "NO" or "N/A" (not applicable) in respect of each section outlined of the nursing record.

TABLE 4 AUDIT TOOL INSTRUMENT QUESTIONS TO ASSESS QUALITY OF THE NURSING RECORD

QUALITY CARE PROCESS METRIC	QUALTY CARE PROCESS INDICATORS
NURSING CARE PLAN: PERSONAL DETAILS	○ The Individual's name and Healthcare Record Number are on each page ○ Presenting complaint/reason for admission/attendance and the date and time are recorded ○ Past medical/surgical history are recorded ○ The allergy status is clearly identifiable on relevant nursing documentation ○ Infection status/Alert is recorded
NURSING CARE PLAN	○ A Nursing Care Plan is evident and reflects the individuals' current condition ○ All risk assessments have been completed within the set timeframe as per local organisational policy

	○ Nursing interventions are individualised, dated, timed and signed
NURSING CARE PLAN: NMBI GUIDANCE	○ All entries dated and timed using 24-hour clock ○ All written records are legible and signed ○ All entries are in chronological order ○ All abbreviations/grading systems are from a national approved list/system ○ Alterations/corrections are as per NMBI guidance ○ All student entries are countersigned
PRESSURE ULCER RISK ASSESSMENT	○ A pressure ulcer risk assessment was conducted on admission/transfer to the unit/ward and was dated, timed and signed by the assessing staff member ○ There is evidence of re-assessment of pressure ulcer risk in accordance with organisational policy ○ If the individual is identified at risk, a Care Plan with pressure ulcer prevention measures is evident ○ If identified at risk, a daily inspection has been recorded on the care plan/skin inspection chart ○ If a pressure ulcer present, the grade is recorded on the relevant documentation
FALLS RISK ASSESSMENT	○ A falls risk assessment was conducted on admission/transfer to the ward/unit, which was dated and signed by the assessing staff member ○ If the individual is identified at risk; a Care Plan with identified interventions to minimise the risk of falls is evident ○ If the individual has fallen, post falls documentation has been completed
DISCHARGE PLANNING	○ There is documented evidence of Discharge Planning ○ There is evidence of family involvement with discharge plan ○ A predicted date of discharge is documented

3.2 Research Question

"In assessing the quality care process within nursing documentation, are there differences between paper and semi electronic records?"

Data was collected from the nursing section within patients record charts between April and May 2018. Data collected from the chart will be extracted using HSE QC-M, audit tool, or part thereof, see Appendix 2 last section for data set chosen for this dissertation. In order to ensure data collection adhered to protocol for the purpose of this dissertation the author received training to become an "AUDITOR" to ensure data was collected as per national standards and to avoid bias and errors.Data was analysed using descriptive statistical methods and content analysis. No patient shall be identifiable; all data will be collected and stored anonymously with no traceability as per national and organisational data protection laws.

3.4 Ethical considerations.

(DPC Ireland 2017) and eHealth Ireland 2016 describe the principals around safe collection and storage of data within an organisation, collection of data for this study is in line with current data protection Acts of 1988, 2003 and also the new regulation introduced under the General Data Protection Regulation (GDPR) May 2018.

All data collected will be coded and divided into two categories, wards where charts used paper based documentation and wards where SNL was used for documentation. Every patient's identity shall remain anonymous because no patient details were collected at any time. No patient Medical Record Number (MRN), name nor Date of Birth (DOB) was recorded at any point during data collection. Anonymised data extracted from charts will remain on an Microsoft excel, coded and saved on researchers computer.

3.4.1 Ethics Approval

Approval was sought and granted from:

- Hospital Research and Innovation Committee,
- Hospital Clinical Audit department
- Quality/Risk department
- Director of NMPDU (National Lead Quality Care-Metrics)
- Trinity College Dublin [agreed to terms as laid out by the hospital].

3.5 Summary of Chapter Three

Chapter three presented the study questions and the method used to address the questions, which was via clinical audit. Full support and a keen interest on the topic was received from the Research and Clinical audit departments. In addition, permission was sought from the Quality department to provide statistics for the number of adverse events during the period the audit was conducted. It was decided not to use this report as further study would be required to prove that the adverse events were attributable to the finding of this study. The audit tool is robust and validated, and although it is available on open access additional permission was sought from the national lead in QC-M with full support and an offer for any additional support throughout the study.

Chapter Four [Results]

4.1 Introduction

Clinical audit was chosen to assess the documentation of nursing practice in newly introduced records and records that were being phased out. The introduction of a new PPM incorporating SNL within nursing documentation was implemented to improve adherence to legal and professional guidelines in relation to documentation of nursing care. In turn this should reflect on the standards in quality and safety of patient care, and ensure recording nursing practice format is compatible with electronic records to gain the benefits EHRs bring to healthcare services, (Darmer et al. 2006; Kent & Morrow 2014; Mahler et al. 2007; McGuire C 2014). The QC-M tool is used to collect cyclical data to measure standards of documentation. It is entered onto the TYC website for analysis. The QC-M process uses a framework to measure the quality standards of nursing care by assessing adherence to national and professional requirements when it comes to documentation of patient care. Data collected for the purpose of this thesis was collected on excel. Compliance is measured using traffic light system and referred to as "RAG Tolerance" i.e.

- **Red** scores are between **0 – 79%** and considered **Non-Compliance**
- **Amber** scores are between **80 -89%** and considered **Partial-compliance**
- **Green** scores are between **90 -100%** and considered **Compliant**

Standard to which practice and subsequent data output for this study is measured against is the QC-M audit tool, (NMBI 2015) professional guidelines on documentation of practice for nurses, (Joint Commission International 2015) AOP.1.1; AOP.1.2 and data quality dimensions of quality, accuracy and timeliness (Scannapieco, Missier & Batini 2005).

During collection of data QC-M guidelines were applied. Dimensions from data quality assessment are expected in nursing documentation to meet standards. All records must be complete and written in a timely manner, except in the case of emergencies. Detail regarding accuracy and timeliness were considered in response to all metrics during assessment. If data in the nursing record for each metric item was not completed as per standard expected, then the answer was 'No' and the score zero. On the other hand, if the item was completed the answer was 'Yes' and the score was one. The initials N/A are indicated as not applicable, perhaps if there were not student entries, no risk for pressure ulcer or falls so no care plan expected. The N/A scores were removed, and a percentage of the total was taken as relevant included data.

4.1.1 Characteristics format for paper and semi-electronic documentation used to collect data

A total of 60 charts were collected from four medical wards. There were two formats of documentation, paper and semi electronic. All charts had identical format and requirement fields such as demographics, admission details, past medical and surgical history. Both admission forms have a total of 24 pages. The two types of admission forms required nursing diagnoses and subsequent care plan was written in free text in paper format and in semi-electronic format. Then the nurse prints appropriate care plans and files in nurse record folder. Data in every chart was audited as per NMBI QC-M guidelines and under data quality dimensions of quantity accuracy, completeness and timeliness. Sections were grouped into the following categories as per audit tool:

i) ***Nursing Care Plan*** *-> eight data elements addressed including demographics, history, presenting complaint, allergy and infection status, nursing diagnoses and planned interventions.*

ii) ***Nursing Care Plan NMBI Guidance*** *-> six data elements assessing minimum requirements expected.*

iii) ***Risk Assessment*** *-> Falls*

iv) ***Risk Assessment*** *-> Pressure Ulcer*

A summary of characteristics is displayed in Table 5

TABLE 5 CHARACTERISTICS OF CHARTS CHOSEN FOR AUDIT

	Medical Ward 1A	Medical Ward 1B	Sample Size required as per QC-M cyclical audit
Paper Based Sample size (n=30)	Total patient charts suitable = 28 Sample (n=15)	Total patient charts suitable = 25 Sample (n=15)	25% of patients on ward for a minimum of 72 hours (n=6) per ward total (n=12)
	Medical Ward 2A	Medical Ward 2B	
Semi-Electronic Sample size (n=30)	Total patient charts meeting criteria for audit = 25 Sample (n=15)	Total patient charts meeting criteria for audit = 27 Sample (n=15)	25% of patients on ward for a minimum of 72 hours (n=6) per ward total (n=12)

4.2 Comparison of paper and semi-electronic nursing records: Nursing Care Plan: Personal

The overall differences with compliance in completion of health care records between both formats in the nursing care plan ranged from 75% in paper to 95% in semi electronic format. This is a difference between being ranked **non-compliant,** Figure 5 and **compliant** Figure 6, in terms of national and professional expectations. However, the overall score for the organisations report is amber which is **partial compliance** at 85%, Figure 7. The target for each department and the organisation is to reach compliance which is a score of 90%.

Paper records (n=30) scored less than 79% in four metrics, semi-electronic scored above 90% in all metrics. Of the thirty paper charts audited only ten charts contained a nursing diagnosis and in comparison, of the thirty semi-electronic records twenty-seven charts correctly identified and labelled a nursing diagnoses and completed an appropriate NNN care plan. Semi-electronic and paper records compared equal in three categories, a two tailed un paired T test revealed p value of 0.05 giving a confidence level of 95% demonstrating significant difference overall that semi-electronic records were more compliant. The category "*Reflects current condition and Nursing diagnoses*" paper records scored only 33% compared to Semi-electronic records at 90%, a second category "Interventions dated & signed" again semi-electronic records scored 93% against only 43% in paper records. Paper records on the other hand contained a direct quote from the medical diagnosis clinical sheet and not an appropriate nursing language diagnosis with subsequent care plan. The plan of care was mostly free style written text and only contained a pre-printed plan of care if an appropriate 'care bundle' was added to the free text section.

TABLE 6 GUIDE TO TRAFFIC LIGHT [RAG] TOLERANCE

Traffic Light (RAG) Tolerance:
Compliance: 90% - 100%
Partial compliance: 80% - 89%
Non-Compliance: 0 -79%

Paper charts:

n=30

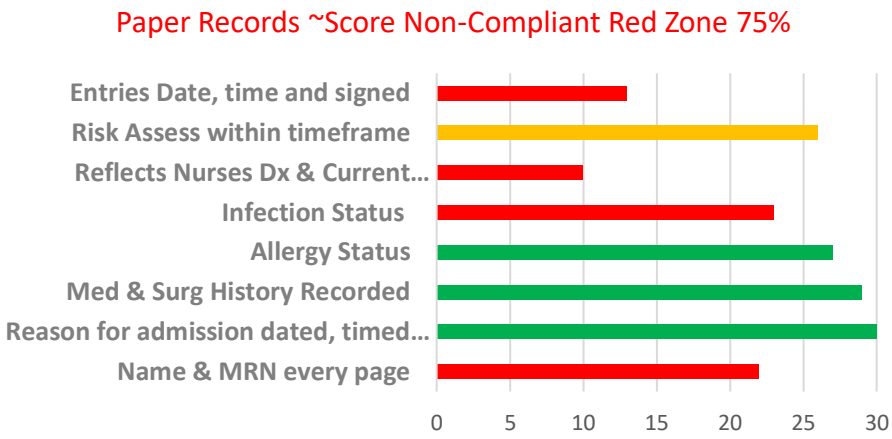


FIGURE 6 NURSING CARE PLAN: PERSONAL DETAILS ~ PAPER RECORDS

Semi electronic charts:

n=30

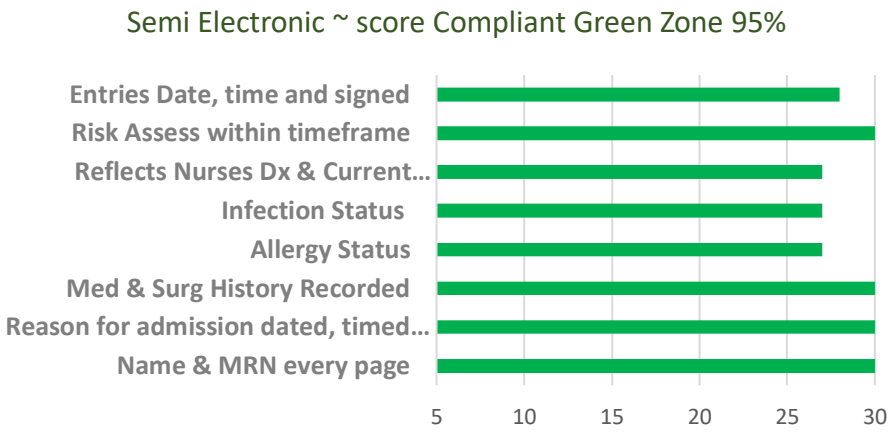


FIGURE 7 NURSING CARE PLAN: PERSONAL DETAILS ~ SEMI-ELECTRONIC RECORDS

Total Combined scores for paper and semi electronic:

n=60

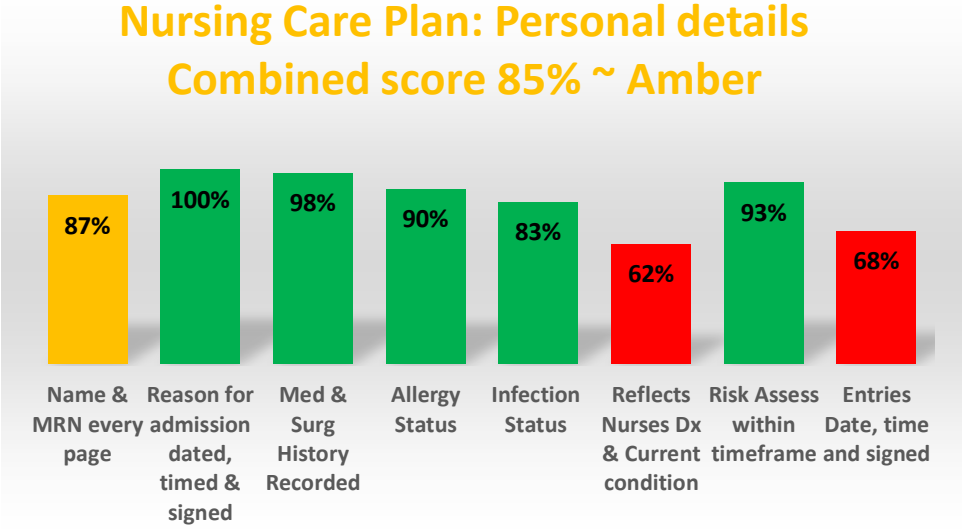


FIGURE 8 PERCENTAGE COMPLIANCE OF NURSING CARE PLAN: PERSONAL DETAILS ~ BOTH FORMATS

4.3 Comparison of paper and semi-electronic nursing records: Nursing Care Plan NMBI guidance

The Nursing care plan NMBI guidance: section was compared in both forms in terms of accuracy, completeness and timeliness, acceptable data quality dimensions, which I note are also relevant and apply as per QC-M standards. However, if each dimension were not met such at 'every entry dated, timed and signed", the score is zero and indicates non-compliance. In an EHR some fields are mandatory which ensures 100% compliance.

Both forms of documentation revealed areas of non-compliance most notably student entries were not counter signed by a staff nurse, this metric revealed very poor compliance. Figures 8, 9 & 10.

The use of accepted abbreviations was not at acceptable levels in either format. However, semi-electronic records demonstrated acceptable compliance at 87% overall for this section but paper records scored only 62% which brought the combined score to the unacceptable red zone of non-compliant.

Figures 12 and 13 shows that only 16% of paper records, which is five out of thirty charts, dated, timed and signed each entry using the twenty-four-hour clock. Semi-electronic records were 100% compliant. Notably though, every chart in both formats had all entries in chronological order.

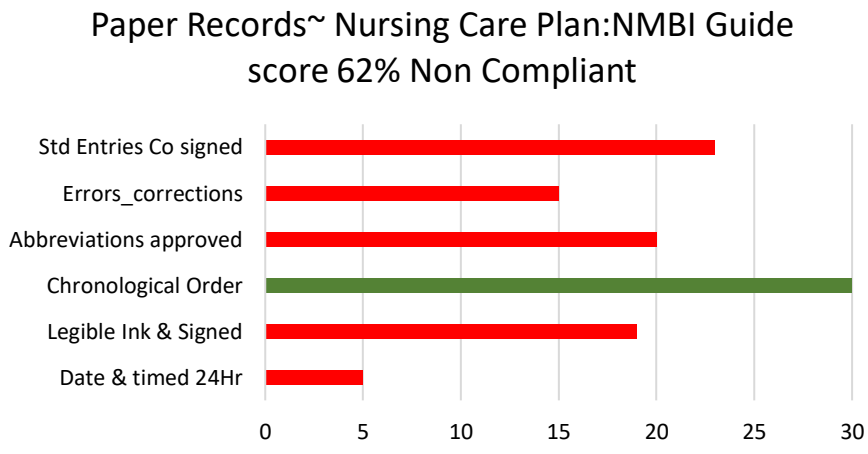
n=30	

FIGURE 9 PAPER RECORD NMBI GUIDE SCORE

n=30

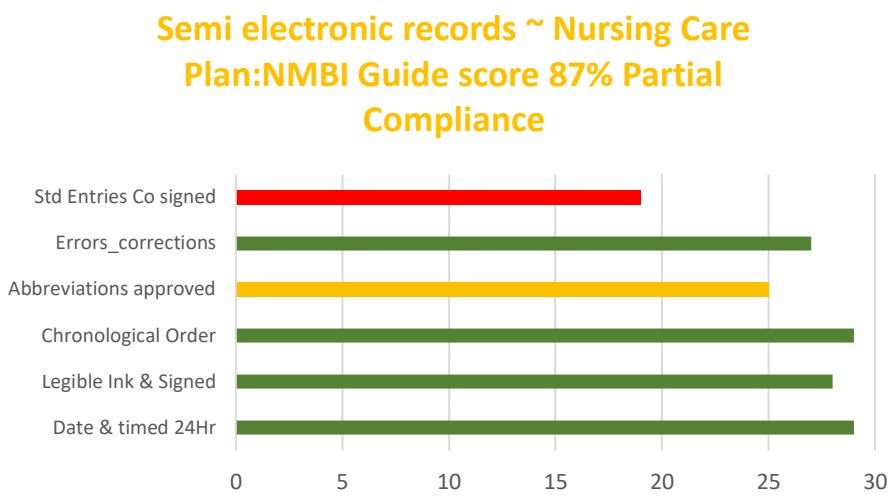


FIGURE 10 SEMI ELECTRONIC RECORD NMBI SCORE

n=60

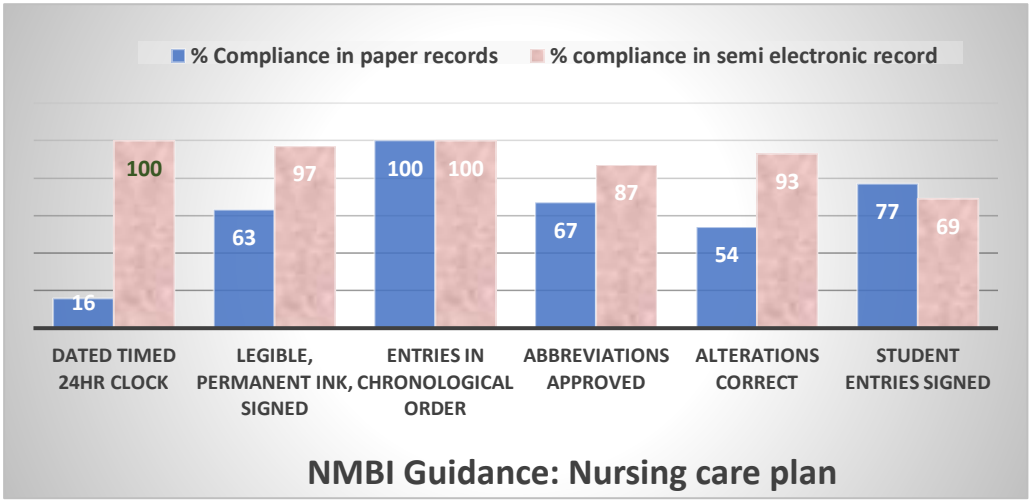


FIGURE 11 COMBINED RECORDS: PERCENTAGE NMBI GUIDANCE SCORE

n=60

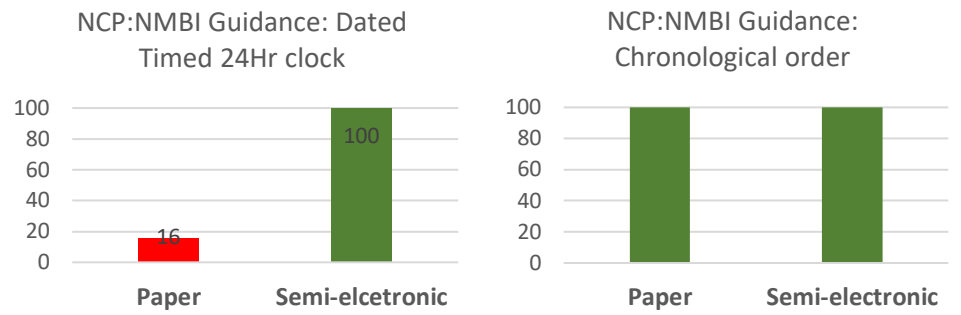


FIGURE 12 NMBI GUIDE ENTRIES IN CHRONOLOGICAL ORDER FIGURE 13 NMBI GUIDE ENTRIES DATED & SIGNED

4.4 Comparison of paper and semi-electronic nursing records: Risk Assessments

4.4.1 Pressure Ulcer

Both formats of documentation demonstrate non-compliance in Pressure Ulcer care and prevention. Although semi-electronic records are fully compliant and paper records scored 80% for assessing patients on admission for pressure ulcer risk only 68% and 69% respectively of patients who were at risk were commenced on an appropriate preventative care plan. This would avoid further tissue damage during their admission in hospital.

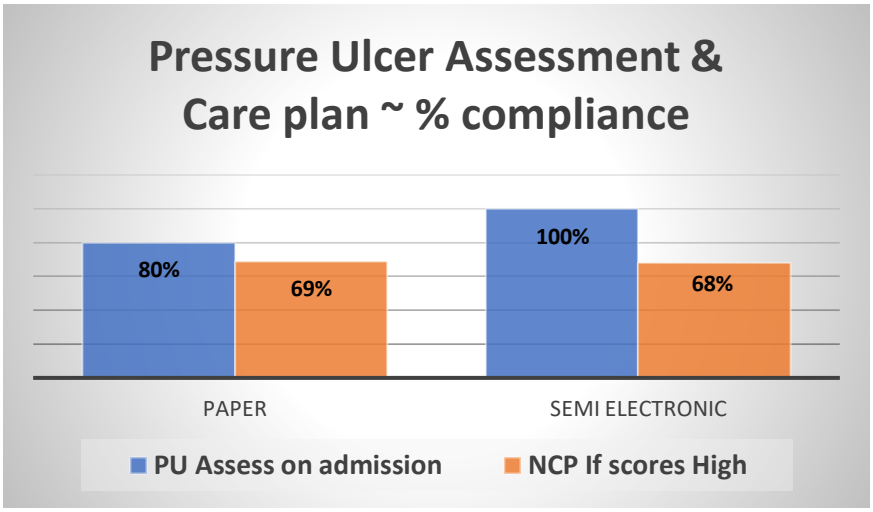
n=60	

FIGURE 14 PRESSURE ULCER ASSESSMENT & CARE PLAN: PAPER & SEMI ELECTRONIC RECORDS

4.4.2 Falls Risk

Figures 15 and 16 display the percentage results of compliance for completion of falls risk assessments. Paper format revealed poor compliance. Semi electronic documentation achieved scores between partial compliance of 83% in care plan prevention. If patients are at risk and full compliance at 90% for initial falls risk assessing, however, overall scores achieve an amber rating of partial compliance between 80% to 83%.

Identifying patients and risk and developing a subsequent falls prevention care plan demonstrated poor compliance within both formats. In paper records twelve patients were identified at risk for falls, however three patients were not commenced on care plan, scoring in red zone of non-compliant. In semi-electronic records nineteen were identified at risk and four patients were not commenced on care plan scoring in amber zone of partial compliance.

n=30

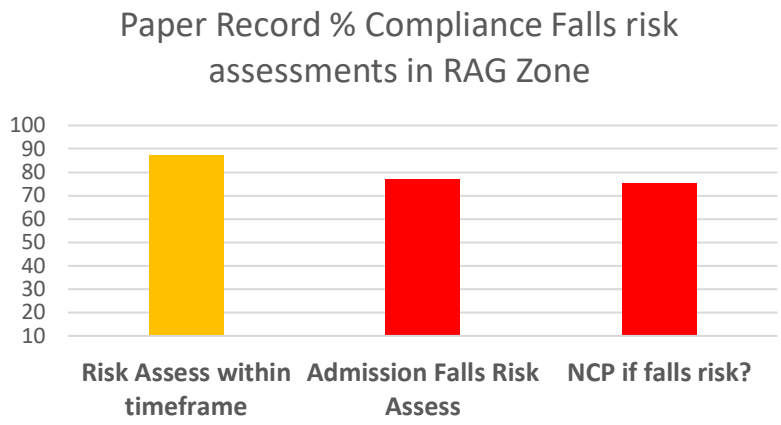
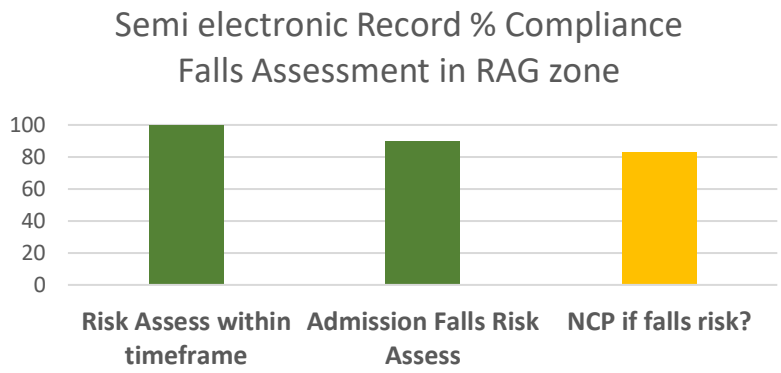


FIGURE 15 FALLS RISK ASSESSMENT COMPLIANCE: PAPER RECORDS



n=30

FIGURE 16 FALLS RISK ASSESSMENT COMPLIANCE: SEMI ELECTRONIC RECORDS

4.5 Comparison of paper and semi-electronic nursing records: Discharge Plan

Results for discharge plan reveal non-compliance, i.e. than 79% compliance, in both formats of documentation and are presented in figure 16. Semi electronic records demonstrate 83% compliance of communication with families or next of kin (NOK) in relation to discharge. However, this fails to formulate an appropriate discharge plan or predicted date of discharge, paper format scores between 0 – 50% in all area of the discharge planning process metric. Figure 17 shows comparative of compliance between the two formats where semi-electronic performance was better although not compliant.

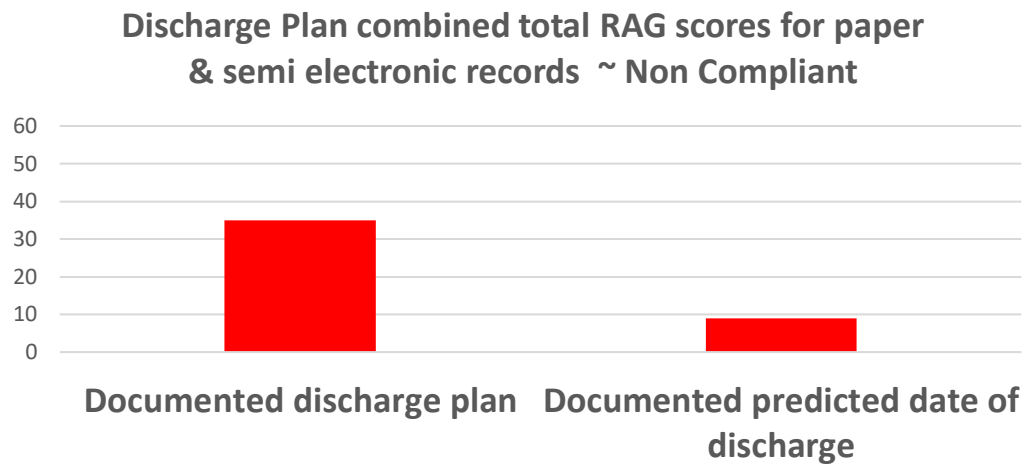


FIGURE 17 DISCHARGE PLANNING

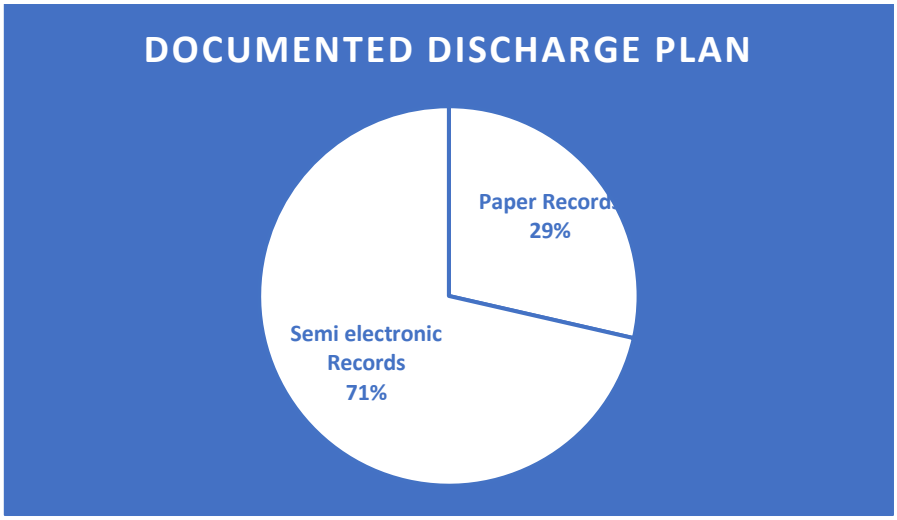


FIGURE 18 DOCUMENTED EVIDENCE OF DISCHARGE PLAN

4.6 Overall results paper versus semi-electronic care plan

Similarities of non-compliance or partial compliance with a RAG rating of 0 to 80% was evident in both documentation formats in the following sections:

- ◊ Discharge planning
- ◊ Initiation of fall prevention nursing care plan
- ◊ Co-signing of student entries
- ◊ Pressure Ulcer assess and care plan initiation
- ◊ Infection
- ◊ Allergy status

Compliance within the QC-M RAG rating order of compliance were in favour of semi-electronic records and were found sections:

- ◊ Nursing Plan: Personal details
- ◊ Nursing Care Plan; NMBI Guidance.

For comparative purposes the percentage overall results for paper and semi-electronic formats are presented in: Table 7

Metric	% compliance paper records	% compliance semi-electronic records

TABLE 7 COMPLIANCE RESULTS FOR BOTH FORMS OF DOCUMENTATION

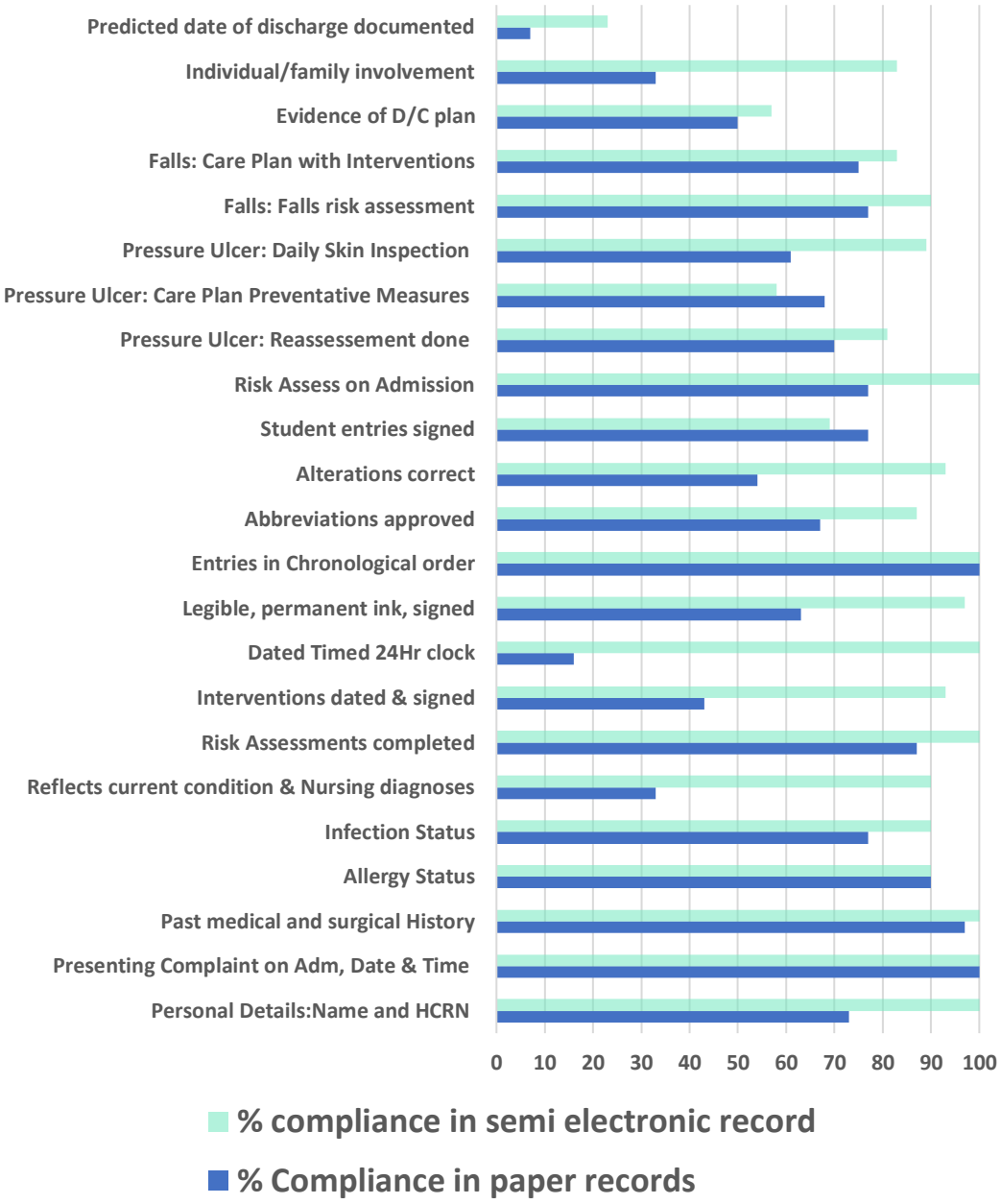


Table 8 displays the RAG order of compliance in both formats. Although there were similarities of non-compliance and compliance in both records, semi-electronic records demonstrated compliance more frequently when measured on it's own right but when combined with paper record scores the compliance rate fell from green to amber i.e. **compliant** to **partial compliance**.

TABLE 8 TOTAL INDIVIDUAL RESULTS INDICATING RAG ORDER OF COMPLIANCE

Medication Administration: Name and HCRN every page	83	100
Medication Administration: Allergy Status	97	100
Medication Administration: Omission codes	80	100
Nursing Care Plan: Personal Details: Name and HCRN	73	100
Nursing Care Plan: Presenting Complaint on Admission, Date & Time	100	100
Nursing Care Plan: Past History	97	100
Nursing Care Plan: Allergy Status	90	90
Nursing Care Plan: Infection Status	77	90
Nursing Care Plan: Reflects current condition & Nursing diagnoses	33	90
Nursing Care Plan: Risk Assessments completed	87	100
Nursing Care Plan: Interventions dated & signed	43	93
Nursing Care Plan: NMBI Guidance: Dated Timed 24Hr clock	16	100
Nursing Care Plan: NMBI Guidance: Legible, permanent ink, signed	63	97
Nursing Care Plan: NMBI Guidance: Chronological order	100	100
Nursing Care Plan: NMBI Guidance: Abbreviations approved	67	87
Nursing Care Plan: NMBI Guidance: Alterations correct	54	93
Nursing Care Plan: NMBI Guidance: Student entries signed	77	69
Pressure Ulcer: Risk Assess on Admission	77	100
Pressure Ulcer: Re-assessment done	70	81
Pressure Ulcer: Care Plan Preventative Measures	68	58
Pressure Ulcer: Daily Skin Inspection	61	89
Falls: Falls risk assessment	77	90
Falls: Care Plan with Interventions	75	83
Discharge Planning: Documented evidence of D/C plan	58	83
Discharge Planning: Predicted date of discharge documented	7	23

4.7 Limitations

The literature review and data collection for the audit was completed by one author. However, future study is required in the area of preparing for EHR and the use of semi-electronic care plans as an introduction to nursing diagnoses and standardised languages. It is

most definitely warranted. This study provides a good foundation for others to build and explore this topic further.

4.8 Discussion

The purpose of this study was to examine and compare two formats of nursing documentation. One format, paper based used a traditional style nursing process and model RLT and recording of practice was mostly free text including nursing diagnosis. Semi electronic documentation adapts elements of process and terminology used in electronic records incorporating NANDA I, NIC and NOC. In addition, the semi electronic records adapted a new professional practice model and all staff received training on SNL (NNN) and the new professional practice model which focusses on patient centred care (Careful Nursing). Assessments and admission booklets for both formats were similar. The audit criteria or metrics measured were identical for both formats and measured favourably against the standards expected legally and professionally for nurses in relation to documentation of their work.

Research questions will be addressed based on the results of the documentation audit, keeping in mind themes discussed in the literature review (chapter two) all of which are appropriate to ensure standards of compliance are achieved in the nursing records. This in turn should reflect good nursing care (Kent & Morrow 2014).

The first question proposed was:

Documentation of the nursing assessment and care plan: Are there differences in compliance in the recording of nursing care in semi-electronic and paper based systems?

On examining the nursing assessment and care planning section the intention was to highlight areas of compliance to reassure good quality care processes are in place, also to note areas of non-compliance which will determine areas of practice that may be of concern and may require intervention to address deficits in compliance. Most studies focussed on electronic or paper based and few compared the two. This study was carried out during a period of change in nursing practice guidelines as preparation for electronic records and to improve standards of patient care. The use of SNL within semi-electronic care plans provides the ability to have valid data available for use to measure patient outcomes (Saranto & U. M. Kinnunen 2009). Applying nursing process and care model as a framework utilises the assessment element of nursing skills

to evaluate patients who may be at risk and to diagnose. Measuring symptoms in response to interventions and documenting an expected outcome is part of nursing care process, the aim is to treat the symptom and monitor for improvement in symptoms which in turn indicates improvement in condition (Bulechek, Gloria M; Butcher, Howard K; Dochterman 2013; Häyrinen, Lammintakanen & Saranto 2010; Herdman & Kamitsuru 2014a; Moorhead, Sue; Johnson, Marion; Maas, Meridean L; Swanson 2013).

Unfortunately, non-compliance in completing documentation of work done is common in nursing (Broderick & Coffey 2013; D'Amour et al. 2014; De Marinis et al. 2010). Furthermore, nurses documentation of care delivered to patients is often an unfinished essay style account of work done and doesn't represent the advance nursing process that was involved in the planning and delivery of care, (Muller-Staub, M, de Graaf-Waar, H, Paans 2016).

In this study, semi electronic records used SNL to diagnose, plan, intervene and assess the care. Benefits of SNL have been demonstrated as improvement in standards of documentation which echoes in the quality of care delivered (Jones et al. 2010b; Müller-Staub et al. 2007b). Education and experience contribute to the affect and effect of SNL in nursing care (Prideaux 2011).

Similarly, Müller-Staub et al (2006) revealed an improvement in the quality of documented nursing diagnoses, interventions and outcomes when standardised languages are applied to practice. Results from this study showed similar findings in that nursing diagnoses were definitely evident in semi electronic records using SNL versus paper records, where diagnoses were simply copied from the medical notes.

In the assessment of pressure area care and falls prevention the paper nor semi electronic formats developed an appropriate prevention care plan for either metric. However, (Gallagher et al. 2008) found that seventy seven percent of pressures ulcers were hospital acquired, remarking that length of stay and immobility as contributory factors and not risk assessment documentation. This presents the question and perhaps an indication for further study to evaluate if any of the patients who didn't have a preventative care plan suffered a fall or developed a pressure ulcer.

Secondly: Do paper records fulfil the professional and legal criteria necessary for 21st century nurses?

Nurses are reminded that a patient record is a legal document and may be required in the event of a prosecution of an offence such as an assault or, at the request of the Coroner depending upon the circumstances of death and emphasise that the nursing notes should be factual, accurate and complete (NMBI 2015). Consequences of poor record keeping can place the patient and nurse at physical and legal risk. Increasing workload and institution policies have are reasons cited by nurses for non-compliance or poor standards of documentation. There are no excuses acceptable in regard to patient safety and certainly when legalities are concerned (Blair & Smith 2012). Documentation audit in relation to legal and professional requirements include all metrics.

Overall results in this study did show that semi electronic records scored above 90% and are placed in the compliant zone. This is the target and result hoped for by all healthcare facilities. However, when their scores were tallied with paper records, again, the overall score slipped into the partial compliant score zone of amber (79% - 89%) on the QC-M TYC system.

It appears that the structure of paper records do not fulfil the criteria required for documentation in electronic records, (Kim, Patricia C. Dykes, et al. 2011b) revealed similar findings. In this study semi electronic were completed to acceptable standards, however the education and training on SNL could influence the completion of fields such as nursing diagnosis as nurses using paper records did not receive training on NNN. In semi electronic care plans, the format supports dating and timing of each entry and once again this area demonstrated good practice against the paper format where each entry was not dated, signed and timed due the free text entry system. Remarkably though, paper format scored 100% compliance (n=30) for the chronological order metric.

The existing format presents a risk, that if there is a line left free at the end of one page and the last entry of a shift is written on the following page, the nurse on the next shift could write an entry out of sync. On this occasion it did not happen in any of the records.

Thirdly: Can the application of SNL in nursing care plans improve compliance of nurses' legal and professional responsibilities towards documentation practice?

Presentation of nursing documentation is part of the legal and professional requirements expected (Tornvall, Wahren & Wilhelmsson 2007). Recording of practice should include the

nurses' judgement of the patients' condition. It should clearly state the plan of care and list interventions but more importantly demonstrate interventions the nurse has taken to address particular issues for the patient (Jefferies, Johnson & Griffiths 2010). Important legal requirements assume the documentation should legible and clearly state the patient's condition (NMBI 2015). QC-M measures care processes to reflect compliance in all areas of professional and legal standards expected from nurses when recording an account of their practice.

(Thoroddsen, Ehnfors & Ehrenberg 2010) mentioned that the use of SNL in electronic documentation has the potential to distinguish nurses as a speciality however (Nykänen, Kaipio & Kuusisto 2012b) raises concern regarding electronic documentation, SNL and PPM with regard to multidisciplinary information exchange, rather exchange of nursing data to fellow healthcare professionals and suggest the use of templates that would be easy to apply but mentions that nursing practice must be supported by an effective nursing model.

SNL was used in semi electronic care plans for this study. According to results, semi electronic care plans demonstrated compliance, except in areas of discharge planning, pressure ulcer care, falls prevention and the requirement that student nurses' signatures are co-signed by a staff-nurse. Diagnoses and interventions were clearly stated and achieved a score of full compliance on the QC-M rating compared with paper records, who were in non-compliant zone and reduced the overall score to See table 8.

Overarching question: "In assessing the quality care process within nursing documentation, are there differences between paper and semi electronic records?"

Both formats demonstrated acceptable levels of quality in admission data fields, but implementing appropriate interventions in areas such as pressure area care, discharge planning and falls prevention did not meet expected standards. Similar findings were reported in a study by (Paans et al. 2010).

(Wang, Hailey & Yu 2011) found no difference in paper based system versus electronic and found that electronic records contained fewer nursing diagnoses than paper records. This study fount quite the opposite with only, (10 vs 27 out of 30) paper records containing an appropriate

NNN diagnosis. Overall the semi electronic records achieved higher score in QC-M rating ($P < 0.01$).

Completeness and accuracy were considered during the audit and strictly adhered to, if the data wasn't entered as it should be the score was zero.

Education and visibility of nursing practice

Education and training in reaching appropriate NANDA I diagnoses' which in turn leads to the nursing care plan is given as part of the implementation process and ensures nurses are informed, and aware, how to apply SNL within the nursing process and would therefore understand the need to apply nursing diagnoses rather than transcribe medical diagnoses from the clinical notes. Nurses who have completed the paper records would not yet have received this training. Qualified nurses should be aware that patient symptoms are a response to a condition and it is the symptoms the nurse treats per se not the medical diagnosis. The interventions a nurse takes to ensure a patient returns to baseline should be measured. An absence of symptoms indicate that both the nursing and medical outcomes have been achieved. It is imperative that nurses action is visible, which is possible via the use of nursing languages, however nurses need education, training and updates on the topic to ensure it is logically applied in practice and documentation and to ensure that nursing activity is appropriately recorded as (De Marinis et al. 2010) observed only 40% of nurses work was documented in the patients nursing record.

Incomplete entry of work carried out or an omission of work that should be done are evident in the results from this study and similar to previous studies carried out by (Gunningberg, Fogelberg-Dahm & Ehrenberg 2009; Paans et al. 2010; Thoroddsen et al. 2013).

All aspects of the nursing record must be captured to ensure compliance and safe effective care. Areas of non-compliance revealed in this study could be considered when designing an electronic system. All incomplete functions could be locked out until critical issues addressed, for example, nursing assessment identified patients at risk for falls and pressure ulcers but did not initiate a preventative care plan, an electronic system would prevent access to the next section of the care plan until all appropriate fields are completed.

Also identified from this study are the necessary co-signing of student entries. This field in an electronic record could require two signatures to ensure safe practice for patient, student and staff nurse.

Date, time and signature entries were also highlighted as incomplete. Electronic records easily rectify this deficit.

4.9 Summary of Chapter 4

Care processes and associated metrics were used to compare and evaluate both formats of documentation. Both record formats revealed areas of poor and good performance in relation to RAG tolerance. However, overall, semi-electronic records achieved a 90% compliance, but paper records achieved 65% which is non-compliant. The variation in the nursing care plan metric for evidence of nursing diagnosis and appropriate care plan revealed nurses using semi-electronic care plans applied the NNN theory appropriately perhaps because they have received education on SNL and application of the NANDA I, NIC and NOC to practice as part of the implementation process, of note all diagnoses were appropriate NANDA I terminology with relevant appropriate NIC and NOC applied.

Areas of poor performance evident in both formats revealed non-compliance with the co-signing of student entries, signature of a qualified nurse is required for all student entries and is the professional and legal requirement of the nurse and student nurse. Risk assessment on admission completed on both paper and semi electronic, however development of a subsequent falls prevention care plan was not completed.

Accuracy and timeliness applies when assessing each metric, when applied to the paper record only 16 % of the entries all contained a date, time and signature, the format of semi-electronic requires completion of this field and scored 100%. Nonetheless, when entries were assessed for accuracy in relation to chronological order both formats scored 100%, There was, however, a margin of error presented in the paper records; if an entry was not made on the last line of the page the subsequent entry may not be entered chronologically.

Chapter Five [Suggestions for future practice]

5.1 Education

Development of online learning units and compulsory short duration workshops for ward areas who are consistently underperforming or not achieving acceptable targets on a monthly basis.

5.2 Cyclical audit

Collection of data

Perhaps analysis from audits would give a more accurate picture if data were collected from the charts in a sporadic fashion, throughout the entire month and not collected at the same time. This would allow ward managers to monitor progress and address deficits before the end of the month rather than receive a report at the end of the month and address issues the following audit period.

Currently the hospital collects data from the charts in paper format and enter onto the TYC website on return to the office because of poor internet connection. If this issue is addressed, Local Area Network (LAN) and wide area networks (WAN) and internet speed are addressed by the hospital Information and Communication Technology (ICT) department real time data could be collected, which is the idea behind the TYC website.

5.3 eHealth Solutions

5.3.1 Interactive Metrics Dashboard

Figure 19 demonstrates an interactive dashboard designed for display on screens in nurses' stations. The addition of slicer to the pivot tables will help filter the data and update fields real-time to display current status.

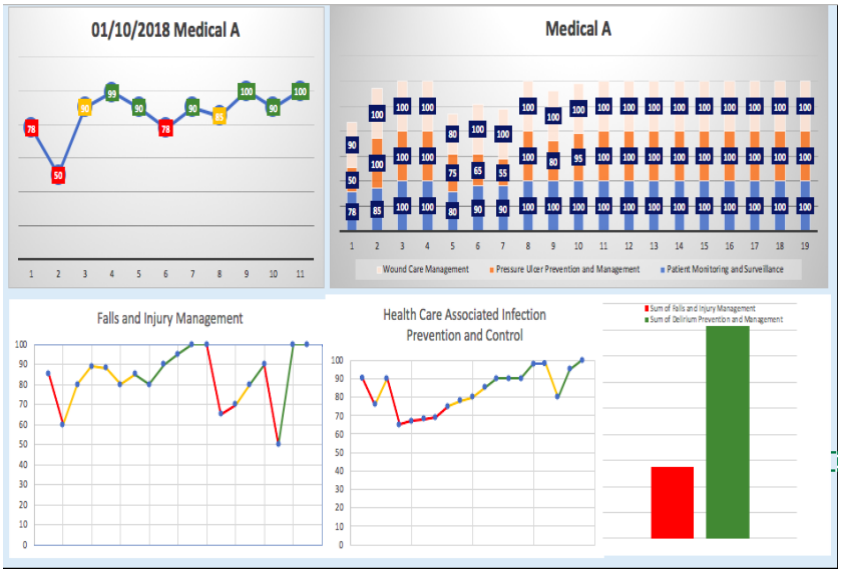


FIGURE 19 SAMPLE CHARTS FOR INTERACTIVE METRICS DASHBOARD

5.3.2 Electronic Record and Clinical Decision Support system (CDSS)

A recent visit to Galway Clinic to review an electronic health care record system in practice demonstrated possible solutions to issues identified in this study.

All areas of non-compliance revealed in this study in both paper and semi-electronic records could be considered as mandatory fields within an electronic record to ensure full compliance is achieved in quality care metrics. Achieving full compliance is a target, but the overall goal is that patients receive quality care. Perhaps when designing an electronic system, areas where both systems demonstrated poor compliance could be captured as mandatory fields. For example, incomplete data fields of a risk score, allergy status, infection status or high 'at risk' score, mandatory fields would ensure this is addressed by locking out the next function until critical issues are addressed.

Clinical Decision Support Systems (CDSS)

Information regarding patient infectious disease history is valuable and easily captured in electronic records. The alert functionality within CDSS provides an invaluable safety feature for all patients particularly if isolation is required and avoids potential cross contamination.

CDSS system has the capability to provide an alert when necessary interventions are not addressed.

Chapter Six [Conclusion]

This study took place during a time of change. A change in documentation of a new nursing process. Documentation underpins a strategic plan that could affirm the visibility of nursing practice within electronic records. The delivery of safe care ensures positive outcomes for patients and their families. Efficient documentation captures care delivery and ensures a repository of reusable data to support continuity of care, measure, validate or disprove facts regarding the care. Documentation formats within nursing practice should support nursing work and reduce the risk of human errors or omissions in the patient record.

Areas of non-compliance were evident on both formats of documentation and must be addressed in a timely manner as this is an indication of the quality of care delivered. Discharge planning needs to be addressed if a focus on early discharge to primary care can support acute services is addressed. Appropriate prevention care-planning is necessary to ensure the delivery of safe effective care. Student nurses are the future generation staff nurses and need to learn early in their career the importance of legal and professional accountability in documentation of their work. Suggestion of real time data collection and an interactive metrics dashboard displayed in ward areas present an opportunity for Clinical Nurse Managers to acknowledge areas of good compliance and observe areas underperforming. This will afford time to improve prior to receiving the month end report and reduce the risk of a patient suffering an adverse event. Lessons learned from this study prompts the question in relation to preparation and benefits of EHRs. Metrics highlighted as non-compliant could be considered when designing electronic records. Mandatory field functionality applied to these metric indicators would ensure 100% compliance.

REFERENCES/BIBLIOGRAPHY

Aggarwal, V. 2002, 'The application of the unified modeling language in object-oriented analysis of healthcare information systems', *Journal of Medical Systems*.

Akhu-Zaheya, L., Al-Maaitah, R. & Bany Hani, S. 2018, 'Quality of nursing documentation: Paper-based health records versus electronic-based health records', *Journal of Clinical Nursing*, vol. 27, no. 3–4, pp. e578–89, viewed 24 February 2018, <http://www.ncbi.nlm.nih.gov/pubmed/28981172>.

Arts, D., De Keizer, N. & Scheffer, G.-J. 2002, 'Defining and improving data quality in medical registries: a literature review, case study, and generic framework.', *Journal of the American Medical Informatics Association : JAMIA*, vol. 9, pp. 600–11.

Barthold, M. 2001, 'Standardizing electronic nursing documentation', *Nursing Management*.

Batalden, P.B. & Davidoff, F. 2007, 'What is 'quality improvement' and how can it transform healthcare?', *Quality and Safety in Health Care*, vol. 16, no. 1, pp. 2–3.

Batini, C., Cappiello, C., Francalanci, C. & Maurino, A. 2009, 'Methodologies for data quality assessment and improvement', *ACM Comput. Surv.*, vol. 41, no. 3, pp. 1–52.

Batini, C. & Scannapieco, M. 2006, *Data Quality*, *Springer*.

Björvel, C., Wredling, R. & Thorell-Ekstrand, I. 2003a, 'Improving documentation using a nursing model', *Journal of Advanced Nursing*, vol. 43, no. 4, pp. 402–410.

Björvel, C., Wredling, R. & Thorell-Ekstrand, I. 2003b, 'Improving documentation using a nursing model', *Journal of Advanced Nursing, vol. 43, no.4, pp. 402-410*.

Bjorvell, C., Thorell-Ekstrand, I. & Wredling, R. 2000, 'Development of an audit instrument for nursing care plans in the patient record', *Quality in Health Care*, vol. 9, no. 1, pp. 6–13, viewed 8 April 2018, <http://qualitysafety.bmj.com/lookup/doi/10.1136/qhc.9.1.6>.

Björvell, C., Wredling, R. & Thorell-Ekstrand, I. 2002a, 'Long-term increase in quality of nursing documentation: Effects of a comprehensive intervention', *Scandinavian Journal of Caring Sciences*, vol. 16, no. 1, pp. 34–42.

Björvell, C., Wredling, R. & Thorell-Ekstrand, I. 2002b, 'Long-term increase in quality of nursing documentation: Effects of a comprehensive intervention', *Scandinavian Journal of Caring Sciences,vol*. 16, no. 1, pp.39-42.

Blair, W. & Smith, B. 2012, 'Nursing documentation: Frameworks and barriers', *Contemporary Nurse Europe*, vol. 41, no. 2, pp. 160–8, viewed 9 June 2018, <https://www-tandfonline-com.elib.tcd.ie/doi/pdf/10.5172/conu.2012.41.2.160>.

Bowie, P., Bradley, N.A. & Rushmer, R. 2012, 'Clinical audit and quality improvement - Time for a rethink?', *Journal of Evaluation in Clinical Practice*, vol. 18, no. 1, pp. 42–8.

Broderick, M.C. & Coffey, A. 2013, 'Person-centred care in nursing documentation', *International Journal of Older People Nursing, vol. 8, no.4, pp. 309-318*.

Brown, D.S., Donaldson, N., Burnes Bolton, L. & Aydin, C.E. 2010, 'Nursing-sensitive benchmarks for hospitals to gauge high-reliability performance.', *Journal for healthcare quality : official publication of the National Association for Healthcare Quality*, vol. 32, no. 6, pp. 9–17.

Bruylands, M; Paans, W; Hediger, H; Muller-Staub, M. 2013, 'Effects on the quality of nursing care process through an educational program and the use of electronic nursing documentation.', *International Journal of Nusing Knowledge*, vol. 24, no. 3, pp. 163–70.

Bulecheck, G; Butcher, H; Dochterman, J; Wagner, C. 2013, *Nursing Interventions calssification (NIC)*, 6th

edn, Elsevier, St Louis, MO.

Bulechek, Gloria M; Butcher, Howard K; Dochterman, Joanne M; Wagner, C.M. 2013, *Nursing Intereventions Classification (NIC)*, Sixth., Elsevier, St Louis, MO.

Bulechek, G.M. & McCloskey, J.C. 1995, 'Nursing interventions classification (NIC).', *Medinfo. MEDINFO*, vol. 8 Pt 2, p. 1368.

Burston, S., Chaboyer, W. & Gillespie, B. 2014, 'Nurse-sensitive indicators suitable to reflect nursing care quality: A review and discussion of issues', *Journal of Clinical Nursing*, pp. 1785–95.

Cai, L. & Zhu, Y. 2015, 'The Challenges of Data Quality and Data Quality Assessment in the Big Data Era', *Data Science Journal*, vol. 14, no. 0, p. 2, viewed 8 April 2018, <http://datascience.codata.org/article/10.5334/dsj-2015-002/>.

Callanan, I. 2012, *Title A Practical Guide to Clinical Audit The National Clinical Audit Advisory Group 2011-2012 Name Title Organisation Role*, viewed 14 April 2018, <www.hse.ie>.

Callis, N. 2016, Falls prevention: Identification of predictive fall risk factors, *Applied Nursing Research*, vol.29, pp.53-58.

Choi, J., Jansen, K. & Coenen, A. 2015, 'Modeling a Nursing Guideline with Standard Terminology and Unified Modeling Language for a Nursing Decision Support System: A Case Study.', *AMIA ... Annual Symposium proceedings. AMIA Symposium*, vol. 2015, pp. 426–33, viewed 20 June 2018, <http://www.ncbi.nlm.nih.gov/pubmed/26958174>.

Cynthia Lundberg, B.B., Warren, J.J., Brokel, J., Bulechek, G.M. & Dochterman, M. 2008, 'Selecting a Standardized Terminology for the Electronic Health Record that Reveals the Impact of Nursing on Patient Care Association of PeriOperative Registered Nurses', *Online Journal of Nursing Informatics*, vol. 12, no. 2, pp. 1–20, viewed 12 May 2018, <http:ojni.org/12_2/lundberg.pdf>.

D'Amour, D., Dubois, C.-A., Tchouaket, É., Clarke, S. & Blais, R. 2014, 'The occurrence of adverse events potentially attributable to nursing care in medical units: Cross sectional record review', *International Journal of Nursing Studies*, vol. 51, no. 6, pp. 882–91.

Darmer, M.R., Ankersen, L., Nielsen, B.G., Landberger, G., Lippert, E. & Egerod, I. 2006, 'Nursing documentation audit - The effect of a VIPS implementation programme in Denmark', *Journal of Clinical Nursing*, vol. 15, no. 5, pp. 525–34.

Data Protection Act 1988, *Data Protection Act, (1988) & (2003)*, Office of the Attorney General, viewed 4 May 2018, <http://www.irishstatutebook.ie/eli/1988/act/25/enacted/en/html>.

Department of Health 2013, *eHealth Strategy for Ireland. Government Report.*

Department of Health and Children 1999, *Children First - National Guidelines for the Protection and Welfare of Children*, Dublin.

Department of Health and Children 2001, *Report of the Inspector of Mental Hospitals For the year ending 31st December 2000*, Dublin.

DoH 2008, *Building a Culture of Patient Safety Report of the Commission on Patient Safety and Quality Assurance*, July., The Stationery Office, Dublin, viewed 2 June 2018, <https://health.gov.ie/wp-content/uploads/2014/03/en_patientsafety.pdf>.

DoH, H. 2018, *Results of the National Patient Experience Survey - National Patient Experience Survey*, Dublin, viewed 27 May 2018, <https://www.patientexperience.ie/survey-results/>.

Donabedian, A. 1988, 'The Quality of Care: How Can It Be Assessed?', *JAMA: The Journal of the American Medical Association,vol. 260, no.12, pp. 1742-1748*.

Donabedian, A. 1997, 'The quality of care. How can it be assessed? 1988.', *Archives of pathology &*

laboratory medicine, vol. 121, no. 11, pp. 1145–50, viewed 5 May 2018, <http://www.ncbi.nlm.nih.gov/pubmed/9372740>.

eHealth Ireland 2015, *Nursing & Midwifery Quality Care-Metrics (QC-M) - eHealth Ireland*, viewed 12 May 2018, <http://www.ehealthireland.ie/Case-Studies-/Nursing-Midwifery-Quality-Care-Metrics>.

Ehrenberg, A. & Ehnfors, M. 1999, 'Patient records in nursing homes: Effects of training on content and comprehensiveness', *Scandinavian Journal of Caring Sciences,vol. 13, no.2, pp.72-82*.

EU 2016, 'Home Page of EU GDPR', *EU GDPR Terminal*.

Excutive, H.S. 2015, *Guiding Framework for the Implementation of Nursing and Midwifery Quality Care Metrics*, Ireland.

Findley, T.W. & Daum, M.C. 1989, 'Research in physical medicine and rehabilitation. III. The chart review or how to use clinical data for exploratory retrospective studies.', *American journal of physical medicine & rehabilitation / Association of Academic Physiatrists*.

Florin, J., Ehrenberg, A., Ehnfors, M. & Björvell, C. 2012, 'ARTICLE IN PRESS A comparison between the VIPS model and the ICF for expressing nursing content in the health care record', *International Journal of Medical Informatics*, viewed 18 June 2018, <http://dx.doi.org/10.1016/j.ijmedinf.2012.05.016>.

Fook, L. 2003, 'Principles of Best Practice in Clinical Audit; National Institute of Clinical Excellence', *Age and Ageing*, vol. 32, no. 4, pp. 467-b-468.

Foulkes, M. 2011, 'Nursing metrics: measuring quality in patient care.', *Nursing Standard*, vol. 25, no. 42, pp. 40–45.

Francis, R. 2010, 'Press Statement', *The Mid Staffordshire NHS Foundation Trust Public Inquiry*, pp. 1–9.

Frank-Stromborg, M., Christensen, A. & Elmhurst-Do, D. 2001, 'Nurse documentation: not done or worse, done the wrong way--Part II.', *Oncology nursing forum*, vol. 28, no. 5, pp. 841–846.

Frey, M.A., Sieloff, C.L. & Norris, D.M. 2002, 'King's Conceptual System and Theory of Goal Attainment: Past, Present, and Future', *Nursing Science Quarterly*, vol. 15, no. 2, pp. 107–112.

Gallagher, P., Barry, P., Hartigan, I., McCluskey, P., O'Connor, K. & O'Connor, M. 2008, 'Prevalence of pressure ulcers in three university teaching hospitals in Ireland', *Journal of Tissue Viability*, vol. 17, no. 4, pp. 103–109.

Giltenane, M., Frazer, K. & Sheridan, A. 2016, 'Evaluating the impact of a quality care-metric on public health nursing practice: protocol for a mixed methods study', *Journal of Advanced Nursing*, vol. 72, no. 8, pp. 1935–1947, viewed 19 June 2018, <http://doi.wiley.com/10.1111/jan.12964>.

Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P., Kyriakidou, O. & Peacock, R. 2005, 'Storylines of research in diffusion of innovation: a meta-narrative approach to systematic review', *Social Science & Medicine*, vol. 61, no. 2, pp. 417–430.

Griffith, P., Jones, S., Maben, J. & Murrels, T. 2008, *State of the Art Metrics for Nursing: A Rapid Appraisal.*, London.

Gunningberg, L., Fogelberg-Dahm, M. & Ehrenberg, A. 2009, 'Improved quality and comprehensiveness in nursing documentation of pressure ulcers after implementing an electronic health record in hospital care', *Journal of Clinical Nursing*, vol. 18, no. 11, pp. 1557–1564.

Hardiker, N.R., Hoy, D. & Casey, A. 2000, 'Standards for nursing terminology.', *Journal of the American Medical Informatics Association : JAMIA*, pp. 523–528.

Häyrinen, K., Lammintakanen, J. & Saranto, K. 2010, 'Evaluation of electronic nursing documentation-Nursing process model and standardized terminologies as keys to visible and transparent nursing',

International Journal of Medical Informatics, vol. 79, no. 8, pp. 554–564.

Health Service Executive 2018, *Nursing and Midwifery Quality Care-Metrics: Acute Care Research Report.*, Dublin, viewed 24 June 2018, <https://www.hse.ie/eng/about/who/onmsd/safecare/qcm/acute-services.pdf>.

Health Services Executive 2011, *HSE Standards & Recommended Practices for Healthcare Records Management.*, Dublin.

Herdman, T.H. (Ed) & Kamitsuru, S. (Ed) 2014a, 'NANDA International nursing diagnoses: definitions and classification 2012-2014', *Nursing diagnoses 2015-2017 : definitions and classification*, pp. 31–561.

Herdman, T.H. (Ed) & Kamitsuru, S. (Ed) 2014b, 'NANDA International nursing diagnoses: definitions and classification 2015-2017', *Nursing diagnoses 2015-2017 : definitions and classification*, pp. 31–561.

HIQA 2012, *Guidance on information governance for health and social care services in Ireland*, Dublin, viewed 6 May 2018, <https://www.hiqa.ie/system/files/Guidance-on-information-governance.pdf>.

HIQA 2013, *Guidance on Developing Key Performance Indicators and Minimum Data Sets to Monitor Healthcare Quality*, *Health Information and quality Authority*, Dublin.

HSE 2016, *National Electronic Health Record (NEHR) Strategic Business Case*, no. May, pp. 1–124, viewed 21 April 2018, <http://www.ehealthireland.ie/Strategic-Programmes/Electronic-Health-Record-EHR-/Progress/National-Business-Case.pdf>.

HSE 2017, *Measurement for Quality - Ireland's Health Service*, viewed 5 May 2018, <https://www.hse.ie/eng/about/who/qid/measurementquality/>.

HSE 2018, 'National Service Plan 2018', *National Service Plan*, viewed 20 May 2018, <https://www.hse.ie/eng/services/publications/serviceplans/national-service-plan-2018.pdf>.

HSE Quality Improvement division n.d., *Routine Audit Tools Acute Hospital Services - Ireland's Health Service*, viewed 15 April 2018, <https://www.hse.ie/eng/about/who/qid/other-quality-improvement-programmes/auditsupport/rauditttoolsacute.html>.

Institute of Medicine 2010, *The Healthcare Imperative: Lowering Costs and Improving Outcomes*, *The Healthcare Imperative: Lowering Costs and Improving Outcomes: Workshop Series Summary*.

Institute of Medicine 2011, *The future of nursing leading change, advancing health*, *The Future of Nursing: Leading Change, Advancing Health*.

Institute of Medicine (IOM) 1999, *To Err Is Human: Building a Safer Health System*, *New York*.

Jacobs, B.B. 2013, 'An Innovative Professional Practice Model', *Advances in Nursing Science*, vol. 36, no. 4, pp. 271–288.

Jefferies, D., Johnson, M. & Griffiths, R. 2010, 'A meta-study of the essentials of quality nursing documentation', *International Journal of Nursing Practice*, vol. 16, no. 2, pp. 112–24.

Jefferies, D., Johnson, M. & Nicholls, D. 2011, 'Nursing documentation: How meaning is obscured by fragmentary language', *Nursing Outlook*, vol. 59, no. 6.

Jefferies, D., Johnson, M., Nicholls, D. & Lad, S. 2012, 'A ward-based writing coach program to improve the quality of nursing documentation', *Nurse Education Today,vol. 32, no.6, pp.647-651*.

Johnson, M., Jefferies, D. & Langdon, R. 2010, 'The Nursing and Midwifery Content Audit Tool (NMCAT): A short nursing documentation audit tool', *Journal of Nursing Management*, vol. 18, no. 7, pp. 832–845.

Joint Commission International 2015, 'Joint Commission International Accreditation Standards for Hospitals Including Standards for Academic Medical Centre Hospitals', *Joint Commission International Accreditation Standards for Hospitals*, viewed 4 July 2018, <https://www.jointcommissioninternational.org/assets/3/7/JCI_Standards_Only_6th_Ed_Hospital.pdf>.

Jones, D., Lunney, M., Keenan, G. & Moorhead, S. 2010a, 'Standardized nursing languages: essential for the nursing workforce.', *Annual Review of Nursing Research*, vol. 28, pp. 253–94.

Jones, D., Lunney, M., Keenan, G. & Moorhead, S. 2010b, 'Standardized Nursing Languages
 Essential for the Nursing Workforce', *Annual Review of Nursing Research*, vol. 28, no. 1, pp. 253–294.

Keenan, G. 1999, 'Use of standardized nursing language will make nursing visible.', *Michigan Nurse*, vol. 2, no. 72, pp. 12–13.

Kelley, T.F., Brandon, D.H. & Docherty, S.L. 2011a, 'Electronic Nursing Documentation as a Strategy to Improve Quality of Patient Care', *Journal of Nursing Scholarship*, vol. 43, no. 2, pp. 154–162.

Kelley, T.F., Brandon, D.H. & Docherty, S.L. 2011b, 'Electronic Nursing Documentation as a Strategy to Improve Quality of Patient Care', *Journal of Nursing Scholarship*, vol. 43, no. 2, pp. 154–62, viewed 13 May 2018, <http://doi.wiley.com/10.1111/j.1547-5069.2011.01397.x>.

Kent, P. & Morrow, K. 2014, 'Better documentation improves patient care', *Nursing Standard*, vol. 29, no. 14, pp. 44–51.

Kerr, K., Norris, T. & Stockdale, R. 2007, 'Data quality information and decision making: A healthcare case study', *ACIS 2007 Proceedings - 18th Australasian Conference on Information Systems*, pp. 1017–1026.

Kim, H., Dykes, P.C., Thomas, D., Winfield, L.A. & Rocha, R.A. 2011a, 'A closer look at nursing documentation on paper forms: Preparation for computerizing a nursing documentation system', *Computers in Biology and Medicine*, vol. 41, no. 4, pp. 182–189.

Kim, H., Dykes, P.C., Thomas, D., Winfield, L.A. & Rocha, R.A. 2011b, 'A closer look at nursing documentation on paper forms: Preparation for computerizing a nursing documentation system', *Computers in Biology and Medicine*, vol. 41, no. 4, pp. 182–189.

Kim, T.Y., Coenen, A. & Hardiker, N. 2012a, 'Semantic mappings and locality of nursing diagnostic concepts in UMLS', *Journal of Biomedical Informatics*, vol. 45, no. 1, pp. 93–100, viewed 29 October 2017, <http://www.sciencedirect.com.elib.tcd.ie/science/article/pii/S1532046411001626?_rdoc=1&_fmt=high&_origin=gateway&_docanchor=&md5=b8429449ccfc9c30159a5f9aeaa92ffb&ccp=y>.

Kim, T.Y., Coenen, A. & Hardiker, N. 2012b, 'Semantic mappings and locality of nursing diagnostic concepts in UMLS', *Journal of Biomedical Informatics*, vol. 45, no. 1, pp. 93–100.

Kim, T.Y., Hardiker, N. & Coenen, A. 2014, 'Inter-terminology mapping of nursing problems', *Journal of Biomedical Informatics,vol.49. pp.213-220*.

Kramer, M., Schmalenberg, C., Maguire, P., Brewer, B.B., Burke, R., Chmielewski, L., Cox, K., Kishner, J., Krugman, M., Meeks-Sjostrom, D. & Waldo, M. 2009, 'Walk the talk: Promoting control of nursing practice and a patient-centered culture', *Critical Care Nurse,vol.29, no.3, pp.77-93*.

Lee, T.H. 2015, 'Performance metrics as drivers of quality: Getting to second gear', *Circulation*.

Lees, L. 2010, 'Improving the quality of nursing documentation on an acute medicine unit.', *Nursing times*, vol. 106, no. 37, pp. 22–26.

Lindo, J., Stennett, R., Stephenson-Wilson, K., Barrett, K.A., Bunnaman, D., Anderson-Johnson, P., Waugh-Brown, V. & Wint, Y. 2016, 'An Audit of Nursing Documentation at Three Public Hospitals in

Jamaica', *Journal of Nursing Scholarship*, vol. 48, no. 5, pp. 499–507, viewed 8 April 2018, <http://doi.wiley.com/10.1111/jnu.12234>.

Linnen, D. 2016, 'The promise of big data', *Nursing*, vol. 46, no. 5, pp. 28–34.

Lundberg, C.B., Warren, J.J., Brokel, J., Bulechek, G.M., Butcher, H.K., Dochterman, J.M., Johnson, M., Martin, K.S., Spisla, C., Swanson, E. & Giarrizzo-wilson, S. 2008, 'Selecting a Standardized Terminology for the Electronic Health Record that Reveals the Impact of Nursing on Patient Care', *Online Journal of Nursing Informatics*, vol. 12, no. 2, pp. 1–20.

Maben, J. & Griffiths, P. 2012, *High Quality Care Metrics for Nursing*, *National Nursing Research Unit, King's College London*, London, viewed 19 June 2018, <http://eprints.soton.ac.uk/346019/1/High-Quality-Care-Metrics-for-Nursing----Nov-2012.pdf>.

Mahler, C., Ammenwerth, E., Wagner, A., Tautz, A., Happek, T., Hoppe, B. & Eichstädter, R. 2007, 'Effects of a computer-based nursing documentation system on the quality of nursing documentation', *Journal of Medical Systems*, vol. 31, no. 4, pp. 274–82.

De Marinis, M.G., Piredda, M., Pascarella, M.C., Vincenzi, B., Spiga, F., Tartaglini, D., Alvaro, R. & Matarese, M. 2010, ''If it is not recorded, it has not been done!'? Consistency between nursing records and observed nursing care in an Italian hospital', *Journal of Clinical Nursing*, vol. 19, no. 11–12, pp. 1544–1552.

Matney, S.A., Warren, J.J., Evans, J.L., Kim, T.Y., Coenen, A. & Auld, V.A. 2012, 'Development of the nursing problem list subset of SNOMED CT®', *Journal of Biomedical Informatics*, vol. 45, no. 4, pp. 683–8, viewed 17 November 2017, <http://www.sciencedirect.com/science/article/pii/S1532046411002176>.

McCrae, N. 2011, 'Whither Nursing Models? The value of nursing theory in the context of evidence-based practice and multidisciplinary health care', *Journal of Advanced Nursing*, vol. 68, no. 1, pp. 222–9, viewed 7 May 2018, <https://pdfs.semanticscholar.org/8a53/4da7e9a595747f0dfe6108eb3a87441aac7e.pdf>.

McGuire C, R.D. 2014, 'Developing leadership roles in nursing and midwifery.', *Nursing Standard*, vol. 29, no. 9, pp. 43–49.

Meehan, T.C. 2003, 'Careful nursing: A model for contemporary nursing practice', *Journal of Advanced Nursing*, vol. 44, no. 1, pp. 99–107.

Meehan, T.C. 2012, 'The Careful Nursing philosophy and professional practice model', *Journal of Clinical Nursing*, vol.10. no 8, pp.990-1001.

Menachemi, N. & Collum, T.H. 2011, 'Benefits and drawbacks of electronic health record systems.', *Risk management and healthcare policy*, vol. 4, pp. 47–55, viewed 28 April 2018, <http://www.ncbi.nlm.nih.gov/pubmed/22312227>.

Middleton, B., Bloomrosen, M., Dente, M.A., Hashmat, B., Koppel, R., Overhage, J.M., Payne, T.H., Rosenbloom, S.T., Weaver, C. & Zhang, J. 2013, 'Enhancing patient safety and quality of care by improving the usability of electronic health record systems: Recommendations from AMIA', *Journal of the American Medical Informatics Association*, vol. 20, no. E1, pp. 2–8, viewed 12 May 2018, <http://www.ncbi.nlm.nih.gov/pubmed/23355463>.

Monsen, K.A., Fitzsimmons, L.L., Lescenski, B.A., Lytton, A.B., Schwichtenberg, L.D. & Martin, K.S. 2006, 'A public health nursing informatics data-and-practice quality project', *Comput Inform Nurs*, vol. 24, no. 3, pp. 152–8.

Moorhead, Sue; Johnson, Marion; Maas, Meridean L; Swanson, E. 2013, *Nursing Outcomes Classification (N0C)*, Fifth., Elsevier, St Louis, MO.

Muller-Staub, M, de Graaf-Waar, H, Paans, W. 2016, 'An Internationally Consented Standard for Nursing Process-Clinical Decision Support Systems in Electronic Health Records', *CIN: Computers,*

Informatics, Nursing., vol. 34, no. 11, pp. 493–502.

Müller-Staub, M., Lavin, M.A., Needham, I. & van Achterberg, T. 2006, 'Nursing diagnoses, interventions and outcomes Application and impact on nursing practice: systematic review', *Journal of Advanced Nursing*, vol. 56, no. 5, pp. 514–531.

Müller-Staub, M., Needham, I., Odenbreit, M., Lavin, M.A. & van Achterberg, T. 2007a, 'Improved quality of nursing documentation: results of a nursing diagnoses, interventions, and outcomes implementation study.', *International journal of nursing terminologies and classifications : the official journal of NANDA International*.

Müller-Staub, M., Needham, I., Odenbreit, M., Lavin, M.A. & van Achterberg, T. 2007b, 'Improved quality of nursing documentation: results of a nursing diagnoses, interventions, and outcomes implementation study.', *International journal of nursing terminologies and classifications : the official journal of NANDA International*, pp. 5–17.

Mykkänen, M., Saranto, K. & Miettinen, M. 2012, 'Nursing audit as a method for developing nursing care and ensuring patient safety.', *Nursing informatics ... : proceedings of the ... International Congress on Nursing Informatics*, vol. 2012, no. 18, p. 301.

National Clinical Effectivemess Committee 2015, *NCEC Prioritisation and Quality Assurance Processes for National Clinical Audit Prioritisation and Quality Assurance for National Clinical Audit*, no. September, pp. 0–20, viewed 2 June 2018, <https://health.gov.ie/wp-content/uploads/2015/12/Prioritisation-and-Quality-Assurance-for-National-Clinical-Audit.pdf>.

Neuman, B. & Fawcett, J. 2011, 'The Neuman Systems Model', *Pearsons*.

NMBI 2015, *Recording Clinical Practice, Professional guidance*, viewed 22 April 2018, <https://www.nmbi.ie/nmbi/media/NMBI/Publications/recording-clinical-practice-professional-guidance.pdf?ext=.pdf>.

Nursing and Midwifery Board of Ireland 2014, 'Code of Professional Conduct and Ethics for Registered Nurses and Registered Midwives', *Nursing and Midwifery Board of Ireland*, Dublin, viewed 19 June 2018, <www.nmbi.ie>.

Nursing and Midwifery Board of Ireland (NMBI) 2015, 'NMBI Code of Professional Conduct and Ethics - Standards and Guidance', *NMBI Publication*, viewed 10 December 2017, <https://www.nmbi.ie/Standards-Guidance/Code>.

Nykänen, P., Kaipio, J. & Kuusisto, A. 2012a, 'Evaluation of the national nursing model and four nursing documentation systems in Finland - Lessons learned and directions for the future', *International Journal of Medical Informatics*, vol. 81, no. 8, pp. 507–520.

Nykänen, P., Kaipio, J. & Kuusisto, A. 2012b, 'Evaluation of the national nursing model and four nursing documentation systems in Finland - Lessons learned and directions for the future', *International Journal of Medical Informatics*, vol. 81, no. 8, pp. 507–520.

O'Connor, S. & Hardiker, N. 2017, 'Derek Hoy: A legacy for Nursing Informatics in Scotland', *International Journal of Medical Informatics*, vol. 104, pp. 126–127.

Okaisu, E., Kalikwani, F., Wanyana, G. & Coetzee, M. 2014, 'Improving the quality of nursing documentation: An action research study', *Pediatric Critical Care Medicine*, vol. 15, p. 213.

ONMSD 2013, 'Developing and implementing nursing and midwifery metrics in HSE Dublin North East.', *Office of Nursing and Midwifery Services*, vol. 4, no. 1, p. 9.

Orem, D. 2003, 'Self Care Theory in Nursing : Selected Papers of Dorothea Orem', *Springer Publishing Company*.

O'Brien, A., Weaver, C., Settergren, T. (Tess), Hook, M.L. & Ivory, C.H. 2015, 'EHR Documentation', *Nursing Administration Quarterly*, vol. 39, no. 4, pp. 333–339.

Paans, W., Sermeus, W., Nieweg, R.M.B. & Van Der Schans, C.P. 2010, 'Prevalence of accurate nursing documentation in patient records', *Journal of Advanced Nursing*, vol. 66, no. 11, pp. 2481–2489.

Park, H. & Lee, E. 2015, 'Incorporating Standardized Nursing Languages Into an Electronic Nursing Documentation System in Korea: A Pilot Study', *International Journal of Nursing Knowledge*, vol. 26, no. 1, pp. 35–42.

Parkman, C. a & Loveridge, C. 1994, 'From nursing service to professional practice.', *Nursing management*,vol. 25, no.3, pp. 63-68.

Phillips, K.. 2010, 'Roy Adaptation Model: Sister Callista Roy', *Nursing theorists and their work, pp. 365*.

Pipino, L.L., Lee, Y.W. & Wang, R.Y. 2002, 'Data quality assessment', *Communications of the ACM*, vol. 45, no. 4, p. 211.

Prideaux, A. 2011, 'Issues in nursing documentation and record-keeping practice', *British Journal of Nursing*, vol. 20, no. 22, pp. 1450–1454.

Professor O'Neill 2006, *Leas Cross Report*, Dublin, viewed 14 June 2018, <http://www.hse.ie/eng/services/publications/olderpeople/Leas-Cross-Report-pdf>.

Rabelo-Silva, E.R., Dantas Cavalcanti, A.C., Ramos Goulart Caldas, M.C., Lucena, A. de F., Almeida, M. de A., Linch, G.F. da C., da Silva, M.B. & Müller-Staub, M. 2017, 'Advanced Nursing Process quality: Comparing the International Classification for Nursing Practice (ICNP) with the NANDA-International (NANDA-I) and Nursing Interventions Classification (NIC)', *Journal of Clinical Nursing*, vol. 26, no. 3–4, pp. 379–387.

Redman, T.C. 1998, 'The Impact of poor data quality on the typical enterprise.', *COMMUNICATIONS OF THE ACM February*, vol. 41, no. 2, pp. 79–82.

Richter, J.P. & Muhlestein, D.B. 2017, 'Patient experience and hospital profitability: Is there a link?', *Health Care Management Review,vol 42, no. 3, pp.247-257*.

Roper, N., Logan, W.W. & Tierney, A.J. 2000, *The Roper-Logan-Tierney model of nursing : based on activities of living*, Churchill Livingstone, London.

Royal College of Nursing 2011, 'Nursing dashboards-Measuring Quality', *Report*, viewed 22 June 2018, <https://www.rcn.org.uk/-/media/royal-college-of-nursing/.../2012/.../pub-004198.pdf>.

Rutherford, M. a. 2008, 'Standardized nursing language: What does it mean for nursing practice?', *Online Journal of Issues in Nursing*, vol. 13, no. 1, pp. 1–7.

Saranto, K. & Kinnunen, U.-M. 2009, 'Evaluating nursing documentation - research designs and methods: systematic review', *Journal of Advanced Nursing*, vol. 65, no. 3, pp. 464–76, viewed 8 April 2018, <http://doi.wiley.com/10.1111/j.1365-2648.2008.04914.x>.

Saranto, K., Kinnunen, U.-M., Kivekäs, E., Lappalainen, A.-M., Liljamo, P., Rajalahti, E. & Hyppönen, H. 2014, 'Impacts of structuring nursing records: a systematic review', *Scandinavian Journal of Caring Sciences*, vol. 28, no. 4, pp. 629–47, viewed 5 May 2018, <http://doi.wiley.com/10.1111/scs.12094>.

Saranto, K. & Kinnunen, U.M. 2009, 'Evaluating nursing documentation - Research designs and methods: Systematic review', *Journal of Advanced Nursing*, vol. 65, no. 3, pp. 464–76.

Savitz, L., Jones, C. & Bernard, S. 2005, 'Quality indicators sensitive to nurse staffing in acute care settings', *Advances in Patient Safety: From Research to Implementation*, vol. 4, pp. 375–386.

Scannapieco, M., Missier, P. & Batini, C. 2005, 'Data Quality at a Glance', *Datenbank-Spektrum*, vol. 14, no. January, pp. 6–14.

Scherb, C. a & Weydt, A.P. 2009, 'Work complexity assessment, nursing interventions classification, and

nursing outcomes classification: making connections.', *Creative nursing*, vol. 15, no. 1, pp. 16–22.

Shortliffe, E.H. & Cimino, J.J. 2014, *Biomedical Informatics Computer Applications in Health Care and Biomedicine*, *Biomedical Informatics. Computer Applications in Health Care and Biomedicine.*

Slatyer, S., Coventry, L.L., Twigg, D. & Davis, S. 2016, 'Professional practice models for nursing: A review of the literature and synthesis of key components', *Journal of Nursing Management*, vol. 24, no. 2, pp. 139–150.

Stallings-Welden, L.M. & Shirey, M.R. 2015, 'Predictability of a professional practice model to affect nurse and patient outcomes', *Nursing Administration Quarterly*, vol. 39, no. 3, pp. 199–210.

Strudwick, G. & Hardiker, N.R. 2016, 'Understanding the use of standardized nursing terminology and classification systems in published research: A case study using the International Classification for Nursing Practice®', *International Journal of Medical Informatics*, vol. 94, pp. 215–221, viewed 17 December 2017, <https://www.sciencedirect.com/science/article/pii/S1386505616301411?via%3Dihub>.

Sunderland, M. 2009, 'Metrics enable the profession to take control of nursing quality', *Nursing Times*, vol. 105, no. 46, p. 11.

Tange, H.J. 1995, 'The paper-based patient record: Is it really so bad?', *Computer Methods and Programs in Biomedicine*, vol. 48, no. 1–2, pp. 127–31, viewed 14 June 2018, <https://www.sciencedirect.com/science/article/pii/016926079501672G>.

Tastan, S., Linch, G.C.F., Keenan, G.M., Stifter, J., McKinney, D., Fahey, L., Lopez, K.D., Yao, Y. & Wilkie, D.J. 2014a, 'Evidence for the existing American Nurses Association-recognized standardized nursing terminologies: A systematic review', *International Journal of Nursing Studies*, vol. 51, no. 8, pp. 1160–1170.

Tastan, S., Linch, G.C.F., Keenan, G.M., Stifter, J., McKinney, D., Fahey, L., Lopez, K.D., Yao, Y. & Wilkie, D.J. 2014b, 'Evidence for the existing American Nurses Association-recognized standardized nursing terminologies: A systematic review', *International Journal of Nursing Studies*, vol. 51, no. 8, pp. 1160–1170.

TheMidStaffordshireFoundationTrust 2013, *Report of the Mid Staffordshire NHS foundation Trust Public inquiry, Volume 1: Analysis of Evidence and Lessons Learned (part 1)*, The Stationery Office, London.

Thoroddsen, A., Ehnfors, M. & Ehrenberg, A. 2010, 'Nursing specialty knowledge as expressed by standardized nursing languages', *International Journal of Nursing Terminologies and Classifications*, vol. 21, no. 2, pp. 69–79.

Thoroddsen, A., Sigurjónsdóttir, G., Ehnfors, M. & Ehrenberg, A. 2013, 'Accuracy, completeness and comprehensiveness of information on pressure ulcers recorded in the patient record', *Scandinavian Journal of Caring Sciences*, vol. 27, no. 1, pp. 84–91.

Timmermans, S. & Berg, M. 2003, *The Gold Standard: The Challenge Of Evidence-Based Medicine*, *Southern Medical Journal*, Temple University Press, Philadelphia.

Tornvall,Eva; Jansson, I. 2017, 'Preliminary Evidence for the Usefulness of Standardized Nursing Terminologies in Different fields of Application: A Literature Review', *International Journal of Nusing Knowledge*, vol. 28, no. 2, pp. 109–127.

Tornvall, E., Wahren, L.K. & Wilhelmsson, S. 2007, 'Impact of primary care management on nursing documentation.', *Journal of Nursing Management*, vol. 15, pp. 634–642.

Törnvall, E. & Wilhelmsson, S. 2008, 'Nursing documentation for communicating and evaluating care', *Journal of Clinical Nursing*, vol. 17, no. 16, pp. 2116–2124.

Tsai, T.C., Jha, A.K., Gawande, A.A., Huckman, R.S., Bloom, N. & Sadun, R. 2015, 'Hospital board and management practices are strongly related to hospital performance on clinical quality metrics',

Health Affairs.

Tubaishat, A., Tawalbeh, L.I., AlAzzam, M., AlBashtawy, M. & Batiha, A.-M. 2015, 'Electronic versus paper records: documentation of pressure ulcer data', *British Journal of Nursing*, vol. 24, no. Sup6, pp. S30–537.

Urquhart, C., Currell, R., Grant, M.J. & Hardiker, N.R. 2009, 'Nursing record systems: Effects on nursing practice and healthcare outcomes', *Cochrane Database of Systematic Reviews*, no. 1, pp. 1–67, viewed 5 May 2018, <http://doi.wiley.com/10.1002/14651858.CD002099.pub2>.

Vassar, M. & Holzmann, M. 2013, 'The retrospective chart review: important methodological considerations', *Journal of Educational Evaluation for Health Professions*, vol. 10, p. 12, viewed 6 June 2018, <http://www.jeehp.org/DOIx.php?id=10.3352/jeehp.2013.10.12>.

Wang, N., Hailey, D. & Yu, P. 2011, 'Quality of nursing documentation and approaches to its evaluation: A mixed-method systematic review', *Journal of Advanced Nursing*, pp. 1858–1875.

Wang, N., Yu, P. & Hailey, D. 2015, *The quality of paper-based versus electronic nursing care plan in Australian aged care homes: A documentation audit study*, vol. 84, no.8,,pp.561-569.

Wang, N., Yu, P., Hailey, D. & Oxlade, D. 2011, 'Developing measurements of quality of electronic versus paper-based nursing documentation in Australian aged care homes', *Electonic Journal of Healh Informatics*

Wang,R.Y & Strong, D.M. 1996, 'Beyond Accuracy: What Data Quality Means to Data Consumers', Journal of Management Information Systems, vol. 12, no. 4, pp.5-33.

Wang, T., Wang, Y. & McLeod, A. 2018, 'Do health information technology investments impact hospital financial performance and productivity?, *International Journal of Accounting Information Systems*, vol. 28, pp.1 -13

Westra, B.l., Dealaney, C.w., Konicek, D. & Keenan, G. 2008, 'Nursing standards to support the electronic health record', *Nursing Outlook*, vol. 56, no.5.

Zozus, M.N., Hammond, W.E., Green, B.B., Kahn, M.G., Richesson, R.L., Rusincovitch, S.A., Simon, G.E. & Smerek, M.M. 2014, *Assessing Data Quality*, viewed 7 May 2018, <https://www.nihcollaboratory.org/Products/Assessing-data-quality_V1 0.pdf>.

Appendices:

Appendix 1: Semi electronic care-plan

PATIENT NAME:	MRN:							
NURSING DIAGNOSIS: IMPAIRED SWALLOW & RISK OF ASPIRATION	**NURSING OUTCOME: SWALLOWING STATUS**							
	Severely	Substantially	Moderately	Mildly	Not			
			Compromised					
What's the optimum outcome rating (1-5)? …….. *How often is the outcome score to be measured? ……..* *Tick relevant OUTCOME INDICATORS from SVUH approved list:* Maintains food in mouth ☐ Clears oral secretions ☐ Chewing ability ☐ Ability to clear oral cavity ☐ Timely swallow reflux ☐ Maintains neutral head & trunk position ☐ Food acceptance ☐ Swallow screen findings ☐	1	2	3	4	5			
	Circle the patient's baseline reading on D1							
	Date:							
	dd nd	**D1**	**D2**	**D3**	**D4**	**D5**	**D6**	**D7**
All procedures and expected outcomes are being discussed with the patient and family / carer as appropriate								
SLT has reviewed the patient and clear instructions provided, and the risk factors clearly identified regarding feeding and swallow.								
The MUST Screening score has been calculated, the patient has been seen by the dietician, and all instructions have been implemented								
Where oral diet is indicated, consistency is clearly documented by SLT, and examination of the mouth cavity has been carried out for any pocketing of food /medication after eating to avoid aspiration								
Where applicable patient has been encouraged and assisted to use dentures at meal times.								
Oral hygiene has been carried out regularly as indicated.								
There is no evidence of any aspiration								
Nursing Outcome Score is (Insert score where applicable)								
NURSING DIAGNOSIS:IMPAIRED VERBAL COMMUNICATION	**NURSING OUTCOME: COMMUNICATION**							
What's the optimum outcome rating (1-5)? …….. *How often is the outcome score to be measured? ……..* *Tick relevant OUTCOME INDICATORS from SVUH approved list:* Use of written language ☐ Use of spoken language ☐ Use of pictures & drawings ☐ Use of sign language ☐ Use of non-verbal language ☐ Acknowledgement of messages received ☐ Accurate interpretation of messages received ☐ Directs message to correct recipient ☐ Exchanges messages accurately with others ☐	Severely	Substantially	Moderately	Mildly	Not			
			Compromised					
	1	2	3	4	5			
	Circle the patient's baseline reading on D1							
Patient has been reviewed by SLT and where applicable picture/ communication board/ speech aids and hand gestures have been used as appropriate.								
Where applicable patient has been encouraged and assisted to wear glasses and hearing aids.								
Level of communication used is appropriate to the patient's current cognitive status								
Adequate time and patience has been given to the patient when they are communicating with staff								
Nursing Outcome Score is (Insert score where applicable)								
NURSING DIAGNOSIS: IMPAIRED URINARY & BOWEL ELIMINATION	**NURSING OUTCOME: URINARY & BOWEL ELIMINATION**							
What's the optimum outcome rating (1-5)? …….. *How often is the outcome score to be measured? ……..* *Tick relevant OUTCOME INDICATORS from SVUH approved list:* Elimination pattern ☐ Urine amount/odour/colour/clarity ☐ Empties bladder completely ☐ Recognition of urge ☐ Nocturia ☐ Urinary frequency/incontinence/retention ☐ Pain/burning/hesitancy/ Urgency with urination ☐ Control of bowel movements ☐ Stool colour/amount ☐ Stool soft & formed ☐ Ease of stool passage ☐ Passage of stool without aids ☐ Blood in stool ☐ Pain with passage of stool ☐	Severely	Substantially	Moderately	Mildly	Not			
			Compromised					
	1	2	3	4	5			
	Circle the patient's baseline reading on D1							
Episodes of urinary & bowel incontinence have been recorded appropriately								

POSSIBLE COLLABORATIVE PROBLEMS	MI, HEART FAILURE, ASPIRATION PNEUMONIA, UTI, DVT, PE, DELIRIUM, DEHYDRATION, MALNUTRITION, PRESSURE SORES, ORTHOPAEDIC COMPLICATIONS & CONTRACTURES.

ENSURE EACH NURSING DIAGNOSIS IS COMPLETED AND OUTCOME SCORE IS CALCULATED FOR EACH ONE

NURSING DIAGNOSIS: RISK FOR INEFFECTIVE CEREBRAL TISSUE PERFUSION	**NURSING OUTCOME: TISSUE PERFUSION-CEREBRAL**
What's the optimum outcome rating (1-5)? …….. *How often is the outcome score to be measured? ……..* *Tick relevant OUTCOME INDICATORS from SVUH approved list:* Systolic/ Diastolic BP ☐ Headache ☐ Restlessness ☐ Unexplained anxiety ☐ Agitation ☐ Vomiting ☐ Syncope ☐ Fever ☐ Impaired cognition ☐ Decreased level of consciousness ☐ Impaired neurological ☐	Severe Substantial Moderate Mild No **Deviation from normal range** 1 2 3 4 5 Circle the patient's baseline reading on D1

DATE:							

Each date covers the 24-hour period from 0800-0800hrs for that 'dd' +'nd'

INTERVENTIONS: day duty (dd) & night duty (nd) staff fill out each intervention at the end of the shift, with: their initials, N/A, or 'V' for variance. In the case of 'V' detail findings on the 'Variance Sheet' & sign date & time entry. Reassess on day 8 OR as the patient's condition indicates.	D1	D2	D3	D4	D5	D6	D7
	dd / nd	dd / nd	dd / nd	dd / nd	dd / nd	dd / nd	dd / nd
Patient remains alert & orientated and the GCS score is monitored regularly as per medical advice and no anomalies noted.							
Vital signs are being monitored regularly as per medical advice and the EWS is documented and are within agreed limits.							
There are no complaints of headache or Nausea &Vomiting.							
Serum electrolytes are being monitored regularly as per medical advice and are within normal limits.							
Where possible excessive noise, unnecessary lighting, turning, suctioning & equipment alarms have been reduced/avoided.							
IV fluids have been administered as prescribed, and the SVUH Peripheral Venous Care (PVC) record is up to date							
Intake and output has been closely monitored and reviewed by medical team regularly.							
IPC (Intermittent Pneumatic Compression) stocking has been applied as advised by medical team.							
Nursing Outcomes score is? (insert score where applicable)							

NURSING DIAGNOSIS: INEFFECTIVE BREATHING PATTERN	**NURSING OUTCOME: RESPIRATORY STATUS**
What's the optimum outcome rating (1-5)? …….. *How often is the outcome score to be measured? ……..* *Tick relevant OUTCOME INDICATORS from SVUH approved list:* RR ☐ Respiratory rhythm ☐ Depth of inspiration ☐ Ability to clear secretions ☐ Anxiety ☐ Choking ☐ Gasping ☐ Nasal flaring ☐ Dyspnoea at rest/with mild exertion ☐ Accessory muscle use ☐ Coughing ☐ Accumulation of sputum ☐ Restlessness ☐ $PaCO_2$ ☐ Drowsiness ☐ Cyanosis ☐ Impaired cognition ☐ SpO_2 ☐ CXR findings ☐ Apnoal respirations ☐	Severe Substantial Moderate Mild No ***Deviation from normal range*** 1 2 3 4 5 Circle the patient's baseline reading on D1

Respiratory rate and O2 saturations are within prescribed limits for the patient							
Patient has no audible, wheeze, cough or breathlessness							
Patient has no evidence of peripheral or central cyanosis							
Nursing Outcomes score is? (insert score where applicable)							

PATIENT NAME:	MRN:							
NURSING INTERVENTIONS CONT'D	DATE dd nd	D1	D2	D3	D4	D5	D6	D7
Where applicable the SVUH 'CONTINENCE CARE PLAN' is being used.								
There is no evidence of urinary retention or constipation and the patient is maintaining normal elimination pattern								
Where applicable FOB has been carried out and reported to the medical team as indicated.								
Where applicable, a urinary catheter has been passed and is draining adequate amounts								
Where appropriate patient has been trialled without urinary catheter and appropriate continence wear has been used where applicable.								
Where applicable bladder scan has been performed as indicated and team informed of same as appropriate.								
Nursing Outcome Score is (Insert score where applicable)								

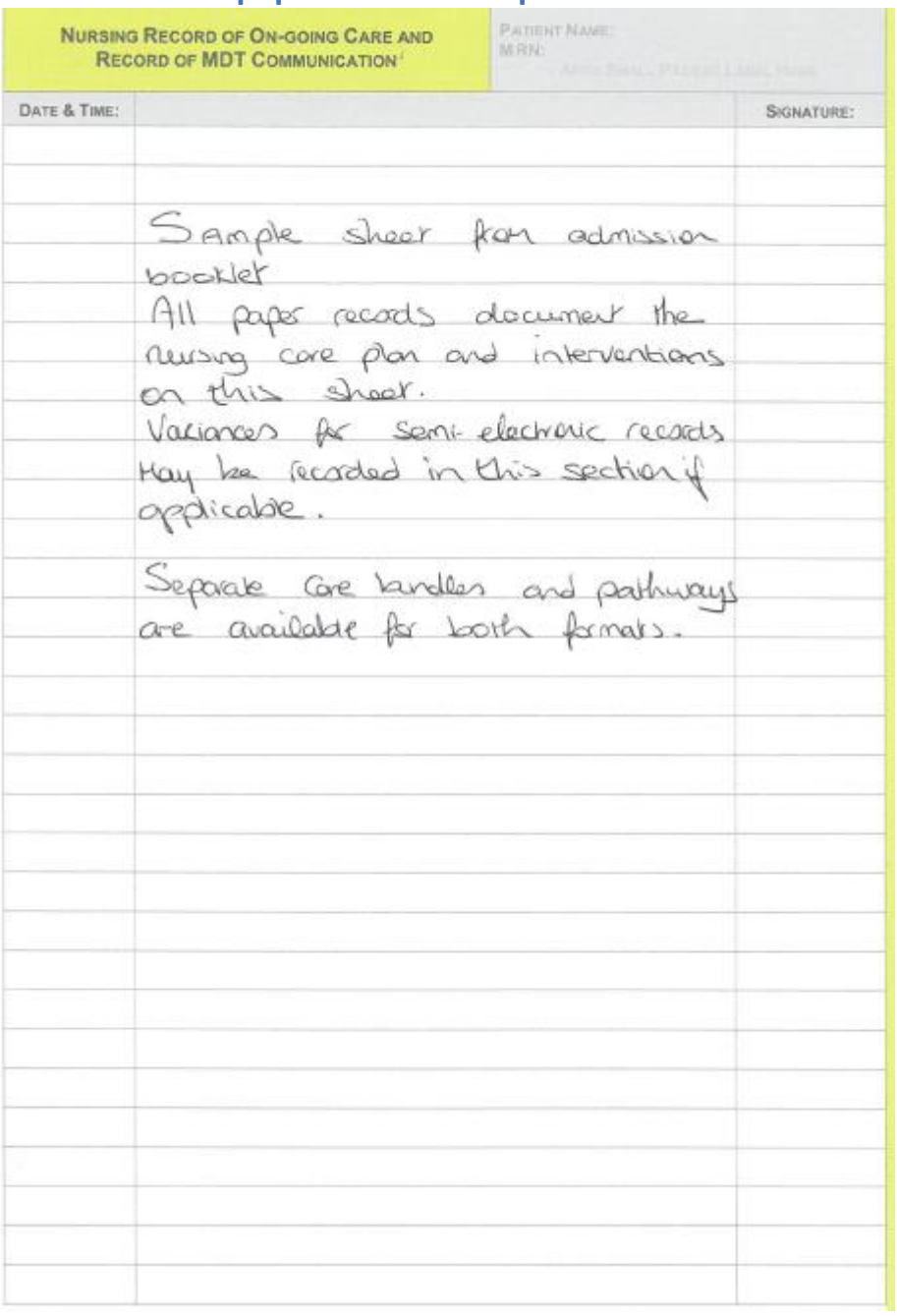
NURSING DIAGNOSIS: IMPAIRED PHYSICAL/BED MOBILITY	**NURSING OUTCOME: MOBILITY**				
What's the optimum outcome rating (1-5)?	Severely	Substantially	Moderately	Mildly	Not
How often is the outcome score to be measured?			***Compromised***		
Tick relevant OUTCOME INDICATORS from SVUH approved list: Balance ☐ Coordination ☐ Gait Muscle/Joint movement ☐ Body positioning performance ☐ Transfer performance ☐ Walking ☐ Moves with ease ☐	1	2	3	4	5
	Circle the patient's baseline reading on D1				

The full extent of arm and/or leg weakness has been assessed and documented							
The full extent of the patient's ability to move independently has been assessed, and where applicable aids such as hoists have been used							
The call bell is at hand, and the patient has been advised to call for assistance when moving or transferring to avoid the risk of injury.							
The 'Bedrail' consent form has been completed and all appropriate actions implemented and assessed.							
The patient's dignity is maintained at all times during transfers & turns							
The patient has been reviewed by the physiotherapist, and exercises and treatments have been incorporated into the daily care							
There is no evidence of any skin breakdown or discolouration & Waterlow Score is up to date, and where applicable SVUH Pressure Area Care chart is implemented.							
Nursing Outcome Score is (Insert score where applicable)							

NURSING DIAGNOSIS: SELF-CARE DEFICIT	**NURSING OUTCOME: SELF-CARE : ACTIVITIES OF DAILY LIVING**				
What's the optimum outcome rating (1-5)?	Severely	Substantially	Moderately	Mildly	Not
How often is the outcome score to be measured?			***Compromised***		
Tick relevant OUTCOME INDICATORS from SVUH approved list: Eating ☐ Dressing ☐ Toileting ☐ Bathing ☐ Grooming ☐ Hygiene ☐ Oral hygiene ☐ Walking ☐ Wheel chair mobility ☐ Transfer performance ☐ Positions self ☐	1	2	3	4	5
	Circle the patient's baseline reading on D1				

Routine **Barthel Index** score has been carried out on weekly basis.							
Patient has been assessed by OT, and all instructions have been implemented, and appropriate equipment utilised							
Patient is encouraged to perform ADLs to the level of their ability, but assistance is provided when patient is unable to perform activities							
Tick in the 'S' box on the day the patient received a shower	S ☐	S ☐	S ☐	S ☐	S ☐	S ☐	S ☐
Nursing Outcome Score is (Insert score where applicable)							
OVERALL THERE ARE NO VARIANCES WITH ANY OF THE COLLABORATIVE PROBLEMS							

Appendix 1a: Free text paper record care-plan



NURSING RECORD OF ON-GOING CARE AND RECORD OF MDT COMMUNICATION

PATIENT NAME:
MRN:

DATE & TIME:		SIGNATURE:
	Sample sheet from admission booklet All paper records document the nursing care plan and interventions on this sheet. Variances for semi-electronic records may be recorded in this section if applicable. Separate care bundles and pathways are available for both formats.	

Appendix 2: Ethics Proposal & Responses to Ethics Committee

Research proposal Outline

6.2.1 Name and relevant background of researcher (state employment location unit), Educational Institution

Principal Investigator : **Ms Lorraine Lalor, CNM 3,** Nurse Education & Practice Development Centre, St Vincent's University Hospital **(SVUH)** & Year 2 MSC Health Informatics @ Trinity College Dublin.

6.2.2 Introduction

Background and statement of issue for Research Study including a summary literature review.

For decades now eHealth Ireland has been working in the background to produce a national Electronic Health Record (EHR), and in May 2016 a business case was finalised and approved by the Health Service Executive (HSE) (eHealth Ireland 2017),. This programme represents a significant transformation in the use of technology and data to support safe and efficient care for future generations. As we prepare towards electronic Health Records, this study will compare semi-electronic and paperbased documentation of nursing assessment.

Nursing processes are recorded are in A) semi-electronic format, using NANDA I, Nursing Interventions Classification (NIC) and Nursing Outcomes Classifications (NOC) (NNN), and B) traditional paper based nursing care plans using traditional Roper Logan Tierney nursing process,(Roper et al 2000). Comparisons will be deduced from both styles of documentation. Therefore literature on the topic is presented as a prelude and to demonstrate a sample of current work in this field.

The (Nursing and Midwifery Board of Ireland (NMBI), 2015)assert legal and professional issues regarding the management and collation of nursing documentation and believe that the quality of records maintained is a direct reflection of the quality of care delivered to patients. Inaccurate

documentation of a patient's care plan, the actual care delivered, and the consequences of poor documentation can lead to adverse events for patients.

The development of nursing language to be used for documentation is, through research, evolving since the 1980's with the use of Standardised Nursing Language (SNL) being described as a means of increasing descriptors of nursing practice, supporting daily care and improving patient safety (Saranto *et al.*, 2014).

(Rutherford 2008) believes (SNL) use in documentation is vital to the nursing profession and has many benefits, including better communication, increased visibility of nursing interventions and the role nurses play in patient care. (Clarke & Lang, 1992) focussed on actual nursing diagnoses rather than medical diagnoses and the recognition of an explicit language to better establish nursing standards and ensure patient safety.

(Scherb and Weydt, 2009) infer that nursing practice is more easily defined when they have a better understanding of the interventions required that ensure particular outcomes are achieved for their patients. (Bulechek and McCloskey, 1995) describe the coding in Nursing Intervention Classification (NIC) as an aid to represent the very essence of nursing and (Herdman and Kamitsuru, 2014) explains Nursing Outcome Classification (NOC) as standardised outcomes, developed to measure the effects of nursing. (Jones *et al.*, 2010) concur with an emphasis on the notion that SNLs as a strategic means to demarcate nursing practice.

(Scannapieco, Missier and Batini, 2005) defines dimensions of data quality including accuracy, completeness, time related dimensions and consistency, and each dimension will be captured on the audit tool. See Appendix 1.0

6.2.3 Research Question

The nursing assessment: Are there differences between semi-electronic and paper based documentation?

6.2.4 Aims and Objectives of study.

The aim is to compare semi-electronic and paper based styles of documentation of the nursing assessment. Data will be audited for accuracy, completeness, timeliness and validity. Following statistical analysis comparisons or similarities will be deduced.

The objective is to observe and compare if either style of documentation is of greater benefit to patient care or the nursing process.

6.2.5 RESEARCH DESIGN

The study is a prospective non-experimental, point prevalence chart review and cross-sectional analysis of pre-anonymised and aggregated data of the nursing assessment documentation. Chart reviews will be from a total of four wards, two of which use a semi-electronic format for documentation and two using a paper based format and who have not yet introduced semi-electronic care plans.

Content from the audit tool to be used is based on the web based tool entitled 'Test Your Care' (TYC) which was developed in the UK and adapted by Nursing & Midwifery Planning Development (NMPD) Quality Care-Metrics as a measure to monitor patient safety and promote quality evidence based care, (HSE, 2015). The audit tool is an open access 'nursing metric audit tool'. Permission and guidance to use the tool and a guide for clinical audit is given by the HSE Quality and Improvement division, HSE Quality Improvement division, (2015), eHealth Ireland (2014). In addition local permission has been requested and granted from the SVUH policy document owner and no SVUH specific metrics will be used other than data contained in the open access document.

6.2.6 Sample and sampling technique.

Random sampling of medical record charts from a total of four wards, focussing only on nursing assessment documentation.

Charts will be only audited from Medical Wards and all wards follow a specific nursing process which guides nurses towards an individual care plan, **two** ward locations use **semi-electronic SNL** and **two** wards use **paper based documentation.** Documentation on the nursing assessment, using the open access audit tool as per HSE guidelines on clinical audit, appendix 1.0 (Sections from the audit tool

that relate to documentation of nursing assessment and patient risk are highlighted in yellow). Sections that will not be used have been removed or 'strikethrough' entered.

The number of charts chosen for audit will be 25% of the total number of patient on the ward at time of audit and the patients must have been admitted for at least twenty four hours prior to conducting the audit because the nursing assessment section must be completed within twenty four hours of admission as per the Nursing and Midwifery Board of Ireland (NMBI) guidelines. G *Power analysis may be used to calculate effect size if indicated and confirm the 25% of total charts on the ward as an acceptable sample size.

6.2.7 Inclusion/Exclusion criteria.

Inclusion Criteria

Documentation from patients charts who have been admitted for a minimum of twenty four hours.

Exclusion Criteria

Documentation from patients charts who have been admitted for a period of less than twenty four hours.

6.2.8 Data Collection method(s) and timing of data collection

Data will be collected from patient record charts between April and May 2018. The data will consist of the risk/assessment documentation in the nursing care plan and is highlighted in yellow Appendix 1.0. Data will be analysed using statistical methods and content analysis.

A summary of risk management occurrences for the four areas will be obtained, with permission from the Director, from the Quality & Risk department.

No patient will be identified; all data will be collected and stored anonymously with no traceability as per national and organisational data protection laws.

6.2.9 Ethical considerations, including proposed measures to assure confidentiality and maintain staff anonymity.

(DPC Ireland 2017) and eHealth Ireland 2016 describe the principals around safe collection and storage of data within an organisation, collection of data for this study is in line with current data protection Acts of 1988, 2003 and also the new elements that will be introduced under the General Data Protection Regulation (GDPR) due to be enforced in May 2018.

All data collected will be coded and divided into two categories, wards where charts used paper based documentation and wards where SNL was used for documentation. Every patient's identity will remain anonymous because no patient details will be collected at any time. No patient Medical Record Number (MRN), name nor Date of Birth (DOB) will be recorded at any point during data collection. Anonymised data extracted from charts will remain on an excel sheet, SPSS and/or Le Sphinx programme, coded and saved on researchers work computer. A summary of patient adverse events may be used for analysis/reference purposes with permission from the director of Quality and Risk Department.

6.2.10 Timescale

Data collection –> Mid April – Mid May 2018

Analysis of data –> April 2018

Writing paper –> May – June 2018

6.2.11 Facilities required from SVUH to support the study, including details of staff involvement, location/department.

Ms Geraldine Regan -> Director of Nursing → Permission to access wards to conduct chart reviews.

Ward Clinical Nurse Managers (CNM), →Permission to access ward and patient notes at a convenient time will be sought from the CNM on duty. I will introduce myself and arrange a suitable time to conduct chart review.

Dr Ian Callanan -> Audit Department, guidance on conducting and analysing data.

Dr Alan Smith -> Quality and Risk Department -> Permission for and provide a summary of risk management occurrences.

6.2.12 Plans for the dissemination of results, including internal dissemination.

Present final draft to Trinity College Dublin as final module towards MSc in Health Informatics.

After examination boards and Trinity College process is complete the author hopes to present findings at nursing executive and nursing research innovation group meetings. In addition the author hopes to collaborate with Dr Ian Callinan and senior nurse managers with an intention to publish further work on this topic in nursing, informatics and science journals.

6.2.13 Bibliography

Bulechek, G. M. and McCloskey, J. C. (1995) 'Nursing interventions classification (NIC).', *Medinfo. MEDINFO*, 8 Pt 2, p. 1368. doi: 10.1097/00129191-200301000-00011.

Herdman, T. H. (Ed) and Kamitsuru, S. (Ed) (2014) 'NANDA International nursing diagnoses: definitions and classification 2015-2017', *Nursing diagnoses 2015-2017 : definitions and classification*, pp. 31–561. doi: 10.1007/s13398-014-0173-7.2.

HSE (2015) *Guiding Framework for the Implementation of Nursing & Midwifery Quality-Care Metrics in the Health Service Executive*. Ireland.

HSE Quality Improvement division (no date) *Routine Audit Tools Acute Hospital Services - Ireland's Health Service*. Available at: https://www.hse.ie/eng/about/who/qid/other-quality-improvement-programmes/auditsupport/raudittoolsacute.html (Accessed: 15 April 2018).

Jones, D. *et al.* (2010) 'Standardized nursing languages: essential for the nursing workforce.', *Annual Review of Nursing Research*, 28, pp. 253–294. doi: 10.1891/0739-6686.28.253.

Nursing and Midwifery Board of Ireland (NMBI) (2015) *NMBI Code of Professional Conduct and Ethics - Standards and Guidance*, *NMBI Publication*. Available at: https://www.nmbi.ie/Standards-Guidance/Code (Accessed: 10 December 2017).

Saranto, K. *et al.* (2014) 'Impacts of structuring nursing records: a systematic review', *Scandinavian journal of caring sciences*, pp. 629–647. doi: 10.1111/scs.12094.

Scannapieco, M., Missier, P. and Batini, C. (2005) 'Data Quality at a Glance', *Datenbank-Spektrum*, 14(January), pp. 6–14. doi: 10.1.1.106.8628.

Scherb, C. a and Weydt, A. P. (2009) 'Work complexity assessment, nursing interventions classification, and nursing outcomes classification: making connections.', *Creative nursing*, 15(1), pp. 16–22. doi: 10.1891/1078-4535.15.1.16.

Roper, N., Logan W W., & Tierney A.J. (2000). ***The Roper-Logan-Tierney Model of Nursing: Based on Activities of Living****. Edinburgh: Elsevier Health Sciences.* ***ISBN*** ***0-443-06373-7****.*

www.ehealthireland*.ie/Case-Studies-/Nursing-Midwifery-Quality-Care-Metrics [Accessed 5th Jan 2018]*

www.ehealthireland.ie/Strategic-Programmes/Electronic-Health-Record-EHR- [Accessed 5th Jan 2018]

https://www.hse.ie/eng/about/who/qid/other.../auditsupport/routineaudittools2.html [Accessed Jan 2018]

https://www.hse.ie/eng/about/who/qid/other-quality-improvement-programmes/auditsupport/nursing-care-plans.xlsx [Accessed 14th April 2018]

https://www.hse.ie/eng/about/who/qid/other-quality-improvement-programmes/auditsupport/falls-metrics.xlsx [Accessed 14th April 2018]

https://www.hse.ie/eng/about/who/qid/other-quality-improvement-programmes/auditsupport/nursing-documentation-metrics.xlsx [Accessed 14th April 2018]

https://www.hse.ie/eng/about/who/qid/other-quality-improvement-programmes/auditsupport/pressure-ulcer-metrics.xlsx [Accessed 14th April 2018]

https://www.hse.ie/eng/about/who/qid/other-quality-improvement-programmes/auditsupport//medication-management-metrics.xlsx [Accesses 14th April 2018]

Appendix

Appendix 1.0

Only data in the highlighted sections of this audit tool will be used to assess nursing assessment/risk assessment; i.e. the data set and not the full template.

SVUH Audit: Acute Services Metrics (Nursing Quality Care Metrics) for 2018 -> Version removed

1. Medication Management

Medicinal Product Storage & Custody Quality Care-Metric	1	2	3	4
MEDICATION STORAGE AND CUSTODY AND MDA DRUGS IS UNDERTAKEN JUST ONCE IN A MONTH FOR EACH WARD				
1. A Registered nurse/midwife is in possession of the keys for Medicinal Product Storage				
2. All medicinal products are stored in a locked cupboard or locked room				
3. All medication trolleys are locked and secured as per local organisational policy and open shelves on the medication trolley				

are free of medicinal products when not in use				
N.B. (Do not audit until further notice) 4. A drug formulary is available on all Med Trolleys	N/A	N/A	N/A	N/A
MDA Drugs Quality Care-Metric				
1. MDA drugs are checked & signed at each changeover of shifts by nursing staff. (By member of Day Staff & Night Staff) (72 Hrs)				
2. Two signatures are entered in the MDA Drug Register for each administration of an MDA drug (72 Hrs)				
3. The MDA Drug cupboard is locked and keys for MDA cupboard are held by designated nurse/midwife				
4. MDA drug keys are kept separate from other medication keys				

Medication Administration Quality Care-Metric	1	2	3	4	5	6	7	8	9	10
Name of Ward Area: (Please write name in top box for each chart audited)										
1. The Individuals' prescription documentation provides details of individuals' legible name and health care record number on each page/screen										
2. The Individuals' identification band has correct and legible name and healthcare record number or photo ID is in use										
3. The allergy status of the individual is clearly identifiable on the front page of the prescription chart										
4. Prescribed medication not administered has an omission code entered (72 Hrs)										
5. The individuals' locker and bedside/ or surrounding environment are free of unsecured prescribed medicinal products										
4. Medication Prescription										

2. Nursing Care Plan Quality Care-Metric

Nursing Care Plan: Personal Details	1	2	3	4	5	6	7	8	9	10
1. The Individuals' name and healthcare record number are on each page/screen (72 Hrs)										
2. Presenting complaints/reason for admission/attendance and the admission date and time are recorded										
3. Past medical/surgical history are recorded										
4. The allergy status is clearly identifiable on relevant nursing documentation										
5. Infection status/alert is recorded										

Nursing Care Plan	1	2	3	4	5	6	7	8	9	10
1. A Nursing care plan is evident and reflects the individuals' current condition										
2. All risk assessments have been completed within a set timeframe as per local organisational policy										
3. Nursing Interventions are individualised, dated, timed and signed.										
4. Evaluation of the Nursing Care plan is evident and has been updated accordingly										

NMBI Guidance	1	2	3	4	5	6	7	8	9	10
1. All entries are dated and timed (24 hour clock) (72 Hrs)										
2. All written records are legible, in permanent ink and signed										
3. All entries are in chronological order (72 Hrs)										
4. All abbreviations/grading systems are from a national or local approved list/system										
5. Alterations/corrections are as per NMBI Guidance										

6. Student entries are countersigned by the supervising nurse or midwife (72 Hrs)										

3. Pressure Ulcer Quality Care-Metric

Pressure Ulcer Assessment	1	2	3	4	5	6	7	8	9	10
1. A Pressure Ulcer risk assessment was conducted on admission/transfer to the unit/ward and was dated, timed and signed by the assessing staff member										
2. There is evidence of a re-assessment of pressure ulcer risk in accordance with organisational policy										
3. If the individual is identified at risk, a Care Plan with pressure ulcer prevention measures is evident										
4. If identified as at risk, a daily skin inspection has been recorded on the care plan/ skin inspection chart (72 Hrs)										
5. If a pressure ulcer is present, the grade is recorded on the relevant documentation										

4. Falls Quality Care-Metric

Falls Assessment	1	2	3	4	5	6	7	8	9	10
1. A Falls Risk Assessment was conducted on admission/transfer to the unit/ward, which was dated and signed by the assessing staff member										
2. If the individual is identified as at risk, a Care Plan with identified interventions to minimise the risk of falls is evident										
3. If the individual has fallen, post falls documentation has been completed										

5. NEWS (National Early Warning Score)/Observations Quality Care-Metric

NEWS/Observations	1	2	3	4	5	6	7	8	9	10
1. The individuals' name and healthcare record number are recorded										
2. Vital Signs are assessed at least 12 hourly in the last 72 hours (72 Hrs)										
3. The NEWS is dated and timed using the 24 hour clock for each entry (72 Hrs)										
4. In each entry, Respiratory Rate, SpO2%, Fi02%, Blood Pressure, Heart Rate, Temperature and AVPU are recorded (72 Hrs)										
5. 24hr cumulative balances are evident on all fluid balance charts for the last 72hrs (Do not audit)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6. In each entry, the NEWS is completed and totalled correctly for the last 72 hours										
7. There is evidence that the care was escalated to the appropriate level as per escalation protocol (Team/On Call SHO/Registrar/Consultant as appropriate) (72 Hrs)										
8. There is evidence of an increase in the frequency of monitoring and recording of vital										

signs in response to the detection of abnormal physiology (72 Hrs)										

6. Invasive Medical Devices Quality Care-Metric

Invasive Medical Devices	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. An assessment of the insertion site (of the PVC) is recorded **daily** on the care plan (72 Hrs)										
2. The clinical indication for insertion of the indwelling urinary catheter is recorded (Do not audit)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

7. Discharge Planning Quality Care-Metric

Discharge Planning	1	2	3	4	5	6	7	8	9	10
1. There is documented evidence of Discharge Planning										
2. A Predicted Date of Discharge is documented (Do not audit until further notice)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3. There is evidence of Individual and Family involvement in communication in the Discharge Plan										

Glossary of Terms

ABA	An Bord Altranais
NANDA-I	Formerly known as North American Nursing Diagnosis, 2018 referred to as NANDA-I
HSE	Health Service Executive
NIC	Nursing Interventions Classification
NOC	Nursing Outcomes Classification
NMBI	Nursing and Midwifery Bord of Ireland
SNL	Standardised Nursing Language
EHR	Electronic Health Record

Appendix 3: Ethics Approval letters

Clinical Strategy and Programmes Division

Nursing & Midwifery Planning & Development
Clinical Strategy & Programmes Directorate
Health Service Executive, Dublin North
Swords Business Campus
Balheary Road
Swords, Co. Dublin

Tel: 01 8131810/802/830

14th May 2018

Lorraine Lalor,
CNM3 Nurse Practice Development,
St Vincents University Hospital,
Elm Park,
Dublin 4.

Re: Permission to Utilise the HSE ONMSD Acute Nursing Quality Care-Metrics Suite for Research

Dear Lorraine,

This letter grants you permission to use the Acute Nursing Quality Care- Metric (QCM) suite (2015) for the purpose of collecting data for your MSc in Health Informatics. The ONMSD must be credited for the use of the QCM tool in your research and in any future publication of your research.

I understand that approval for the study has been granted by SVUH Research & Innovation committee pending clarification on permission to use the Quality Care-Metrics audit tool.

I wish you all the very best with your research.

Yours sincerely,

p.p. Clare White

Dr. Anne Gallen,
QCM National Project Lead,
Director NMPD North West

Office of the Nursing & Midwifery Services Director

ST. VINCENT'S
HEALTHCARE GROUP

St. Vincent's Healthcare Group
Elm Park, Dublin 4, Ireland

T +353 1 221 4000

IC/NE

Ms Lorraine Lalor,
CNM3 in Nurse Practice & Education,
SVUH

6th April 2018

Dear Lorraine,

Re: Audit titled : A comparison of a standardised nursing documentation language in semi-electronic format versus conventional paper based documentation of the Nursing Risk Assessment.

Your audit submission proforma has now been approved by the Clinical Audit Committee with Chairman's approval. We would be obliged if you would keep the Clinical Audit Department informed of your progress while carrying out this audit. Should you need any assistance in developing an audit tool, data collection, measuring or analysis we are happy to help.

On completion of the audit, we require a Clinical Audit report outlining the Aims, Objectives, Methodology and Results of the audit. More importantly we will require recommendations for improvement out of the audit to complete the audit cycle.

If you have concerns around any of these requirements the Clinical Audit Department will be more than happy to assist, so do please make contact with us.

Please quote audit no **2088** on the top of your audit report when you are submitting same.

Yours Sincerely,

Ian Callanan MB, FRCSI, MBA
Group Clinical Audit Facilitator
St Vincent's Healthcare Group

Cc Ms Carolyn Donohoe, ADON Nurse Practice Development – Audit Sponsor

ST. VINCENT'S
UNIVERSITY HOSPITAL
Elm Park

St Vincent's University Hospital
Elm Park, Dublin 4, Ireland

T +353 1 221 4000

Ref: GR/BF

Ms Lorraine Lalor
Clinical Nurse Manager 3/Research
Nurse Practice Development
Nurse Education Centre
St Vincent's University Hospital
Elm Park, Dublin 4

Research Study: A comparison of a Standardised Nursing Language in Semi –Electronic form versus conventional paper based documentation on Nursing Assessment

Dear Lorraine

The SVUH/UCD Nursing Research & Innovation Committee meeting was held on Thursday 14th February 2018 an your research your proposal, 'A comparison of a Standardised Nursing Language in Semi-Electronic Format v Conventional Paper Based documentation of Nursing Assessment' was tabled at the meeting and it was agreed your proposal is approved by the committee subject to you making the following changes:

- 6.2.9, second paragraph, sentence 2. Add 'No' to the beginning of the sentence to read' No Patient Medical Record Number or Date of Birth will be recorded at any point during data collection.

I would be grateful if you could please submit your final proposal with the above recommendations to my office.

The committee wishes you every success with your study and looks forward to reading the final report.

Yours sincerely,

Ms Geraldine Regan,
Director of Nursing,
St. Vincent's University Hospital
Elm Park, Dublin 4

cc. SVUH/UCD Nursing Research & Innovation Committee

ST. VINCENT'S
HEALTHCARE GROUP

ST. VINCENT'S
UNIVERSITY HOSPITAL
Elm Park

St. Vincent's University Hospital
Elm Park, Dublin 4, Ireland

T +353 1 221 4000
www.stvincents.ie

Ref: GR/BF

Ms Lorraine Lalor
Clinical Nurse Manager 3/Research
Nurse Practice Development
Nurse Education Centre
St Vincent's University Hospital
Elm Park, Dublin 4

17th April 2018

Research Study: A comparison of a Standardised Nursing Language in Semi –Electronic form versus conventional paper based documentation on Nursing Assessment

Dear Lorraine,

The SVUH/UCD Nursing Research & Innovation Committee meeting was held on Thursday 14th February 2018 an your research your proposal, 'A comparison of a Standardised Nursing Language in Semi-Electronic Format v Conventional Paper Based documentation of Nursing Assessment' was tabled at the meeting.

It was agreed your proposal is approved by the committee subject to you making some changes, of which you re-submitted your proposal with each specific change that was suggested addressed and are listed for clarity in a separate document.

The committee wishes you every success with your study and looks forward to reading the final report.

Yours sincerely,

Geraldine Regan

Ms Geraldine Regan,
Director of Nursing,
St. Vincent's University Hospital
Elm Park, Dublin 4

cc. SVUH/UCD Nursing Research & Innovation Committee

LL Response to suggestions of changes to Proposal for MSc Thesis
by Research and Innovation Committee April 2018
Approval initially given following February 2018 meeting.

Comment:	Response:
6.2.2 "Discusses semi electronic v's paper based assessments, all risk assessments are in printed booklet which is the same across the hospital no difference there, it's the subsequent care plan that is paper based or pre-printed, so need clarification of the link between this standard documentation and the semi electronic /paper based, not clear in the proposal when SNL about diagnosis/outcomes/interventions in the semi electronic format".	Nursing assessment documentation will be looked at in relation to 'data quality'. Both forms of documentation will be audited, as per audit tool. Once data collected, **and after analysis**, the documentation will be compared and themes will be deduced. Ref 2nd last sentence in second paragraph: "Comparisons will be deduced from both styles of documentation" after data collection. The Nursing care plan is part of the audit tool, (Nursing & Midwifery Board of Ireland [NMBI]), the nursing assessment leads to the patients care-plan, which will be wither semi-electronic or paper based. Patient adverse outcomes may be looked at in relation to relevant/accurate appropriate documentation and subsequent care plan.
6.2.2 "For Falls – 2 out of the 3 Qs in the standard admission booklet, 3rd Q in variable sectors, not specific to SNL care plan., not the best example to use for the research question on nursing assessment"	Agree that the falls assessment not enough to capture data, also if this was the only parameter the audit would require a larger number of charts to ensure validity, therefore, the following **sentence was removed:** **6.2.2** First paragraph, last sentence; "The author intends to focus on one nursing related adverse event in the nursing documentation care plan (Falls) and data relating to falls is captured in the "Patient Handling Risk Assessment" section of the Care Plan". Because falls risk is only one section of the assessment to be looked at.
6.2.4 Aims and objectives not separated or clearly defined	6.2.4 Aims and objectives amended, separated and clearly defined.
6.2.5 Is this a prospective or retrospective chart review?	6.2.5 Changed to 'point prevalence' chart review as suggested by committee.
6.2.5	

Trinity College Dublin,

The University of

TCD Research Ethics WebApp

Documentation of the Nursing Assessment: Comparison of a standardised nursing language in semi-electronic format versus paper based conventional model.

Current Status	Submission date	Last Status Update	Academic Supervisor / Lead Researcher	Application Number
Approved	Friday, April 6, 2018 - 09:30	Thursday, April 19, 2018 - 12:59	dberry	20180401

No workflow transitions are possible at this time.

Final Comments from the Research Ethics Committee

This application has received extgernal approval. This research may proceed according to the instructions laid out as part of the external approval.

Status:
Approved

Timeline of state changes for this application

Appendix 4: Copy of falls risk screens and prevention care plan

FALLS RISK SCREEN	COMPLETE ON ADMISSION		REASSESSMENT 1		REASSESSMENT 2		REASSESSMENT 3	
Tick As Applicable	Date & time		Date & time		Date & time		Date & time	
	YES	NO	YES	NO	YES	NO	YES	NO
Is the patient 65 years and older?	❑	❑	❑	❑	❑	❑	❑	❑
Is the patient between 50 – 64 years old? **AND** - had a fall in the past year / admitted with a fall **OR** - help / supervision needed to transfer / walk **OR** - has a fear of falling **OR** - a medical condition that, in your judgement, would increase falls risk; such as stroke, amputee, etc.	❑	❑	❑	❑	❑	❑	❑	❑
Is the patient under 50 years old **AND** -had a fall in past year / admitted with a fall	❑	❑	❑	❑	❑	❑	❑	❑
	Signature		Signature		Signature		Signature	

If YES to any question, this patient is AT RISK OF FALLING – COMPLETE the 'FALLS RISK FACTORS' & 'FALLS PREVENTION CARE PLAN' ON THE NEXT PAGE

FALLS RISK SCREEN	COMPLETE ON ADMISSION		REASSESSMENT 1		REASSESSMENT 2		REASSESSMENT 3	
Tick As Applicable	Date & time		Date & time		Date & time		Date & time	
	YES	NO	YES	NO	YES	NO	YES	NO
Is the patient 65 years and older?	❑	❑	❑	❑	❑	❑	❑	❑
Is the patient between 50 – 64 years old? **AND** - had a fall in the past year / admitted with a fall **OR** - help / supervision needed to transfer / walk **OR** - has a fear of falling **OR** - a medical condition that, in your judgement, would increase falls risk; such as stroke, amputee, etc.	❑	❑	❑	❑	❑	❑	❑	❑
Is the patient under 50 years old **AND** -had a fall in past year / admitted with a fall	❑	❑	❑	❑	❑	❑	❑	❑
	Signature		Signature		Signature		Signature	

If YES to any question, this patient is AT RISK OF FALLING – COMPLETE the 'FALLS RISK FACTORS' & 'FALLS PREVENTION CARE PLAN' ON THE NEXT PAGE

FALLS RISK SCREEN	COMPLETE ON ADMISSION		REASSESSMENT 1		REASSESSMENT 2		REASSESSMENT 3	
Tick As Applicable	Date & time		Date & time		Date & time		Date & time	
	YES	NO	YES	NO	YES	NO	YES	NO
Is the patient 65 years and older?	❑	❑	❑	❑	❑	❑	❑	❑
Is the patient between 50 – 64 years old? **AND** - had a fall in the past year / admitted with a fall **OR** - help / supervision needed to transfer / walk **OR** - has a fear of falling **OR** - a medical condition that, in your judgement, would increase falls risk; such as stroke, amputee, etc.	❑	❑	❑	❑	❑	❑	❑	❑
Is the patient under 50 years old **AND** -had a fall in past year / admitted with a fall	❑	❑	❑	❑	❑	❑	❑	❑
	Signature		Signature		Signature		Signature	

If YES to any question, this patient is AT RISK OF FALLING – COMPLETE the 'FALLS RISK FACTORS' & 'FALLS PREVENTION CARE PLAN' ON THE NEXT PAGE

Appendix 5: Copy of Pressure Ulcer/skin integrity assessment

WATERLOW SCORE CHART

Build/ Weight for Height	*	Skin Type Visual Risk Areas	*	Sex / Age	*	Special Risks Tissue Malnutrition	*
Average	0	Healthy	0	Male	1	*Example:*	
Above average	1	Tissue paper	1	Female	2	Terminal Cachexia	8
Obese	2	Dry	1	14 - 49	1	Cardiac Failure	5
Below Average	3	Oedematous	1	50 - 64	2	Peripheral Vascular Disease	5
		Clammy (temp ↑)	1	65 - 74	3		
		Discoloured	2	75 - 80	4	Anaemia	2
		Broken spot	2	81+	5	Smoking	1

Continence	*	Mobility	*	Appetite	*	Neurological Deficit	*
Complete/catheterised	0	Fully	0	Average	0	*Example:*	
Occasional Incontinence	1	Restless/fidgety	1	Poor	1	Diabetes	
Cath/incontinent of faeces	2	Apathetic	2	N.G. Tube/fluids only	2	M.S.	4-6
Doubly incontinent	3	Restricted	3	Nil by Mouth/Anorexia	3	C.V.A.	
		Inert/Traction	4			Motor/sensory Paraplegia	
		Chairbound	5				

Score	Major Surgery/Trauma	*	Medications	*
10 + At risk	Orthopaedic – Below waist		Cytotoxics	
15 + High risk			High dose steroids	
20 + Very high risk	Spinal	5	Anti-inflammatory	4
J. Waterlow 1991, Revised 1999	On table > 2Hrs			

For patients at risk of, or who have broken skin, implement the SVUH Pressure Area Care Chart

SCORE - TO BE DONE ON ADMISSION AND EVERY 7 DAYS THEREAFTER
(Score categories 10 + At risk 15 + High risk 20 + Very high risk)

If the patient has a Waterlow Score of 10+ then a 'Pressure Area Care Chart and skin assessment chart' must be implemented.

Date: Time:	Date: Time:	Date: Time:	Date: Time:
Score: Pressure Area Chart required? Yes ☐ No ☐	**Score:** Pressure Area Chart required? Yes ☐ No ☐	**Score:** Pressure Area Chart required? Yes ☐ No ☐	**Score:** Pressure Area Chart required? Yes ☐ No ☐
Signature:	Signature:	Signature:	Signature:

Appendix 6: Copy of Nursing record discharge plan

DISCHARGE NURSING ASSESSMENT

WHAT ARE THE POTENTIAL ISSUES RELATING TO DISCHARGE?

Current Living arrangements:	alone ☐	with family ☐	Other: ☐
ELOS	on admission:	2nd Revised date:	3rd Revised Date:

Patient aware of expected discharge date: Y ☐ N ☐ | Family aware of expected discharge date: Y ☐ N ☐

Plan for convalescence Y ☐ N ☐ Date:

Home circumstances discussed Y ☐ N ☐ Where is the patient's discharge destination:

Can family provide transport on day of discharge Y ☐ N ☐ please specify:

DISCHARGE PATHWAY PATIENT REFERRAL	YES	REFERRAL DATE:	SENT BY: (SIGNATURE)
SOCIAL WORKER (E.G. HOME CARE PACKAGE, FAIR DEAL)			
PHYSIOTHERAPY			
OCCUPATIONAL THERAPY			
OTHER:			

Jamaica', *Journal of Nursing Scholarship*, vol. 48, no. 5, pp. 499–507, viewed 8 April 2018, <http://doi.wiley.com/10.1111/jnu.12234>.

Linnen, D. 2016, 'The promise of big data', *Nursing*, vol. 46, no. 5, pp. 28–34.

Lundberg, C.B., Warren, J.J., Brokel, J., Bulechek, G.M., Butcher, H.K., Dochterman, J.M., Johnson, M., Martin, K.S., Spisla, C., Swanson, E. & Giarrizzo-wilson, S. 2008, 'Selecting a Standardized Terminology for the Electronic Health Record that Reveals the Impact of Nursing on Patient Care', *Online Journal of Nursing Informatics*, vol. 12, no. 2, pp. 1–20.

Maben, J. & Griffiths, P. 2012, *High Quality Care Metrics for Nursing*, *National Nursing Research Unit, King's College London*, London, viewed 19 June 2018, <http://eprints.soton.ac.uk/346019/1/High-Quality-Care-Metrics-for-Nursing----Nov-2012.pdf>.

Mahler, C., Ammenwerth, E., Wagner, A., Tautz, A., Happek, T., Hoppe, B. & Eichstädter, R. 2007, 'Effects of a computer-based nursing documentation system on the quality of nursing documentation', *Journal of Medical Systems*, vol. 31, no. 4, pp. 274–82.

De Marinis, M.G., Piredda, M., Pascarella, M.C., Vincenzi, B., Spiga, F., Tartaglini, D., Alvaro, R. & Matarese, M. 2010, ''If it is not recorded, it has not been done!'? Consistency between nursing records and observed nursing care in an Italian hospital', *Journal of Clinical Nursing*, vol. 19, no. 11–12, pp. 1544–1552.

Matney, S.A., Warren, J.J., Evans, J.L., Kim, T.Y., Coenen, A. & Auld, V.A. 2012, 'Development of the nursing problem list subset of SNOMED CT®', *Journal of Biomedical Informatics*, vol. 45, no. 4, pp. 683–8, viewed 17 November 2017, <http://www.sciencedirect.com/science/article/pii/S1532046411002176>.

McCrae, N. 2011, 'Whither Nursing Models? The value of nursing theory in the context of evidence-based practice and multidisciplinary health care', *Journal of Advanced Nursing*, vol. 68, no. 1, pp. 222–9, viewed 7 May 2018, <https://pdfs.semanticscholar.org/8a53/4da7e9a595747f0dfe6108eb3a87441aac7e.pdf>.

McGuire C, R.D. 2014, 'Developing leadership roles in nursing and midwifery.', *Nursing Standard*, vol. 29, no. 9, pp. 43–49.

Meehan, T.C. 2003, 'Careful nursing: A model for contemporary nursing practice', *Journal of Advanced Nursing*, vol. 44, no. 1, pp. 99–107.

Meehan, T.C. 2012, 'The Careful Nursing philosophy and professional practice model', *Journal of Clinical Nursing*, vol.10. no 8, pp.990-1001.

Menachemi, N. & Collum, T.H. 2011, 'Benefits and drawbacks of electronic health record systems.', *Risk management and healthcare policy*, vol. 4, pp. 47–55, viewed 28 April 2018, <http://www.ncbi.nlm.nih.gov/pubmed/22312227>.

Middleton, B., Bloomrosen, M., Dente, M.A., Hashmat, B., Koppel, R., Overhage, J.M., Payne, T.H., Rosenbloom, S.T., Weaver, C. & Zhang, J. 2013, 'Enhancing patient safety and quality of care by improving the usability of electronic health record systems: Recommendations from AMIA', *Journal of the American Medical Informatics Association*, vol. 20, no. E1, pp. 2–8, viewed 12 May 2018, <http://www.ncbi.nlm.nih.gov/pubmed/23355463>.

Monsen, K.A., Fitzsimmons, L.L., Lescenski, B.A., Lytton, A.B., Schwichtenberg, L.D. & Martin, K.S. 2006, 'A public health nursing informatics data-and-practice quality project', *Comput Inform Nurs*, vol. 24, no. 3, pp. 152–8.

Moorhead, Sue; Johnson, Marion; Maas, Meridean L; Swanson, E. 2013, *Nursing Outcomes Classification (N0C)*, Fifth., Elsevier, St Louis, MO.

Muller-Staub, M, de Graaf-Waar, H, Paans, W. 2016, 'An Internationally Consented Standard for Nursing Process-Clinical Decision Support Systems in Electronic Health Records', *CIN: Computers,*