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Australasian Journal of Neuroscience

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Vicki Evans
Editor

This edition sees a number of manuscripts from around Australia and Indonesia. It begins with what was originally the winning poster at the 2015 ANNA Conference, in which their study proposed local (rural) management of TLSO braces without the need for tertiary referral.

In 2014, the Indonesian Neuroscience Nurses Association came into being through the drive and determination of a few Indonesian neuroscience nurses. The following paper outlines the struggle for recognition of neuroscience nursing in a country in which geography, economic, political and cultural factors influence decision making. This is a collaborative piece which shows the way ANNA members can effect change through collaboration with nurses outside of their own country.

Detecting neurological change is a pivotal point in neuroscience nursing and nurses are required to be at the "top" of their game to ensure that any change is met with appropriate action. The article *Top of the Charts* gives insight into the importance of detecting change with another approach to charting.

Nursing handover has been in the forefront of comment of late and the EPIC article gives and excellent account of the way neurosurgical clinical handover should support a timely, relevant, structured report that is paramount to ensure a safe and optimal outcome.

The *Life and Trials of a Pseudomeningo-coele* is an interesting case study that highlights the Chiari malformation as well as the complications following surgery and how nurses are best equipped to influence outcome.

We have also republished an excellent manuscript, *A Neurological Integrated Care Pathway*, due to the previous unforeseen omission of two images.

Enjoy!



Linda Nichols
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Aneurysmal Subarachnoid Haemorrhage: Stroke or Not?

I have always had an interest and have been a strong advocate for improving epidemiological research attention. For the last few years my research area has been aneurysmal subarachnoid haemorrhages (aSAH). Like many before me I have noted that they are marginalised and isolated from general stroke research by their small numbers and indifferent symptom presentation and the fact that they are often classed as a 'neurosurgical condition'. Despite this there are distinct common threads pertaining to the presentation of aSAH and ischaemic stroke, including time to treatment, the importance of timely intervention and the crucial role of early rehabilitation. It is perhaps these parallels that need to be explored further in justifying the inclusion of aSAH in stroke epidemiological databases and national stroke registries.

The advent of thrombolytic treatment as a registered stroke treatment changed the identity of stroke forever. The transition and global research focus on ischemic events and time to treatment occurred almost effortlessly. However, this transition has had a detrimental effect for the treatment of hemorrhagic strokes, particularly aSAH.

The global emphasis on ischaemic events has resulted in a lack of clarification pertaining to the definition of stroke. Has anyone looked closely at a literature search utilising just the word "stroke"? When one does, the result is an assumption by many authors that the reader will naturally assume the word stroke to be associated with ischaemic events.

To reconcile the misrepresentation of stroke as primarily an ischaemic event, haemorrhagic events and in particular aSAH, need to be acknowledged in the literature and public awareness campaigns as stroke subtypes. Likewise a clear context statement or definition that limits published research to ischaemic events would also aid clarification.

The pathway to enhancing stroke care can only be achieved through an integrated system of monitoring at a national level. The narrowed definition and primary focus on ischaemic events has led to haemorrhagic events, particularly aSAH, being disengaged and not represented in national level data. The impact of stroke on the Australian population, whilst well documented, is not representative of all stroke subtypes.

Likewise, whilst the natural history and best medical practice following an aSAH has been

well established, existing guidelines do not focus on preventative initiatives and the role of public awareness campaigns or epidemiological data collection.

Nurses play a key role in health promotion and are well positioned to increase public awareness and advocate for the inclusion of both ischemic and haemorrhage stroke in national stroke registries. In the coming year I look forward to seeing a change and all stroke subtypes included in the national registry.



The World Federation of Neuroscience Nurses

Neuroscience Symposium

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Support My Spine ASAP. A Rural Tele-health care model for patients being managed with a Thoracic Lumbar Sacral Orthotic (TLSO).

Ryan Gallagher, Jane Morison, Michelle Giles, Judith Henderson, Sarah Zehnder

Abstract

Question: Does a Telehealth model of care facilitating treatment in rural hospitals for patients requiring a TLSO eliminate the need for transfer to a tertiary referral hospital?

Design: Quantitative pre and post intervention design.

Participants: Physiotherapists, nursing and medical staff at rural hospital pilot sites.

Intervention: Pre and post intervention data collection provided patient demographics, and length of stay data around model of care implementation. Pre intervention staff surveys identified knowledge gaps informing educational packages which were provided with a mobile Telehealth link.

Outcome measures: Primary: Number of patients managed under the new model of care.

Secondary: Length of stay, travel distance eliminated and complications.

Results: 30 patients fitted with TLSO's and managed under this model of care to date. Length of stay has reduced from 9.14 days pre intervention to 3.8 days post intervention. Approximate savings of \$6840 per patient have been identified, with over 6000kms of patient travel eliminated. No complications have occurred. Rural Physiotherapists have been successfully up skilled in managing patients requiring TLSO fitting.

Conclusion: This intervention successfully created a model of care to facilitate local management of patients requiring TLSO fitting with Telehealth support from a tertiary referral hospital. Considerable savings have occurred from this model of care for patients and the health district. This model is currently being implemented district wide.

Key Practice Points:

- Telehealth model of care can be successfully implemented to TLSO management
- Multidisciplinary team role is critical role in redesigning models of care
- Telehealth increase the efficiency of healthcare resources

Key Words: Telehealth, TLSO brace

Introduction

Thoracic Lumbar Sacral Orthotics (TLSO's) are prescribed when a spinal fracture is determined not to require surgical management (Agabegi, Asghar & Herkowitz, 2010). Patients with injuries in the thoraco-lumbar spine can be prescribed TLSO's to aid with stabilisation, pain relief and initiate mobilisation (Bailey, Dvorak & Thomas, 2009). However, TLSO's must be correctly fitted and managed, as non-optimal fitting can lead to increased pain, pressure areas and decreased compliance, which may cause delayed healing (Moffatt & Eley, 2010).

In Hunter New England Local Health District (HNELHD) all patients with spinal fractures

requiring a TLSO (approximately 100 annually) were previously fitted by Physiotherapists at the John Hunter Hospital. HNELHD covers a geographical area the size of England and has within its boundaries regional, rural and remote areas. Long distance transport to and from their hospital of origin prolonged and fragmented the patients journey (Figure 1). This led to delayed: fitting, pain relief, prolonged immobilisation and increased in the adverse events that accompany immobilisation. This results in prolonged length of stay (LoS), extra expense for patients as well as increased health care costs associated with air ambulance transfers (approximately \$3000 one way).

Aim

To develop and implement an innovative telehealth model of care for patients with spinal fractures requiring treatment with a TLSO that reduced the need for patients in rural and regional communities to travel to

Questions or comments about this article should be directed to Ryan Gallagher, Senior Physiotherapist Neurosciences, John Hunter Hospital at ryan.gallagher@hnehealth.nsw.gov.au

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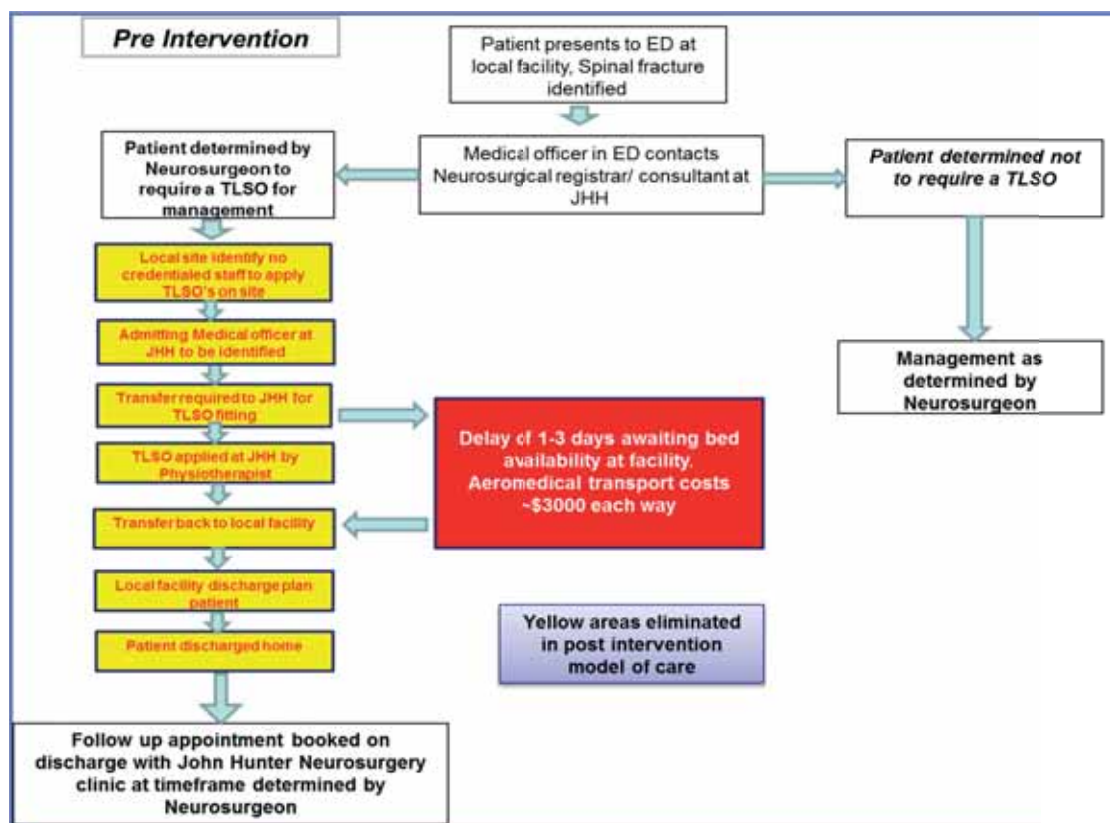


Figure 1 (Above): Pre-implementation patient journey

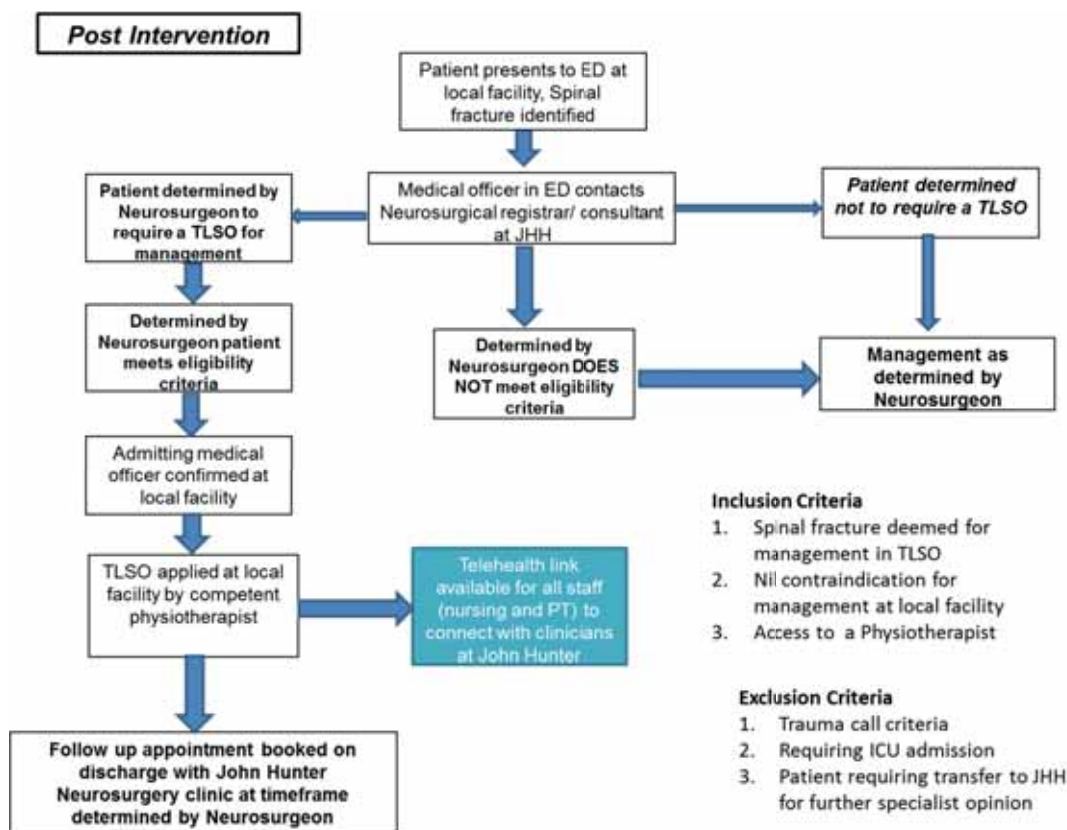


Figure 2 (Above): Post-implementation patient journey.

John Hunter Hospital for specialist fitting and management.

Method

This quantitative study had a pre and post intervention design. Data collection provided: Patient demographics, mapped patient journeys and identified mean LoS. A pre intervention staff survey identified knowledge gaps in managing patients requiring TLSO's. This informed development of educational resources.

A workshop and educational package provided clinicians with education on TLSO fitting and ongoing management. Telehealth technology was established to at the site support staff as required.

Results

To date 41 patients have been managed by this model of care and as a result patient care is less fragmented (Figure 2). Patients access specialist care in their local communities and rural clinicians are empowered to deliver and manage this care.

The implementation of the telehealth model has produced the following outcomes:-

- Reduced LoS, from a mean 9.14 days pre implementation to a mean 3.8 days post implementation.
- Eliminated over 6900 km's in patient transfers for specialist treatment.
- Eliminated transports costs of up to \$6000 per patient (Moffatt & Eley, 2010).
- Estimated efficiency savings of \$6840 per patient (NSW Health Policy: Health Services Act, 1997).
- Decreased fragmentation of the patient journey allowing for stronger community support.
- Reduced patient and family financial burden by remaining in local community for ongoing treatment.
- Developed and supported clinician knowledge, skills and confidence by providing targeted training packages.
- Increased capacity for telehealth utilisation.

Conclusion

This project has demonstrated that the integration of telehealth into a specialised model of care can empower rural clinicians to provide specialist services previously provided by tertiary level hospitals. As a result of staff edu-

cation and telehealth patients now have access to specialist fitting not available prior to this project.

This project has also demonstrated the capacity to significantly improve the patient's outcomes resulting in reduced length of stay in hospital and reduced financial burden to both patient and the healthcare organisation.

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Note: This paper was originally presented as a poster at the 2015 ANNA Conference and won the Poster Prize.

Neuroscience Nursing in Indonesia: Striving for Recognition through Education and Regional Collaboration.

Linda Nichols, Enny Mulyatsih

Abstract

As a speciality practice area, neuroscience nursing is internationally recognised. In 2014 the Australasian Neuroscience Nurses Association celebrated its 40th anniversary. For Indonesian neuroscience nurses, 2014 marked the inauguration of the Indonesian Neuroscience Nurses Association. The following paper provides an overview of health care in Indonesia and development of neuroscience nursing as a speciality through educational and regional collaboration. Postgraduate educational opportunities are open to all nurses in Australia, including neuroscience as a speciality for nurses. However within Indonesia, the focus has been on meeting basic nursing demands, with postgraduate specialisation still in its infancy. The focus on training and producing large numbers of nurses at a basic level has resulted in little regard for the ongoing development and acknowledgement of speciality practice areas, such as neuroscience nursing. The following paper outlines the challenges faced by Indonesian nurses as they strive towards the recognition of neuroscience nursing as a speciality. Through the provision of an overview of current nursing and the health care system in Indonesia, this paper will explore the geographical, economic, political and cultural factors that require consideration when translating experience and expertise.

Key Words: Neuroscience nursing, education, Australia, Indonesia

Introduction

Neuroscience nurses care for individuals with acute and chronic neurological conditions involving a complex mix of cognitive, sensory motor and emotional impairments. Neurological disorders constitute an increasing share in the burden of disease, with health care systems in both developed and developing countries inadequately resourced to meet the complex array of chronic and acute care needs. In pursuing professionalism and recognition as a specialist field, neuroscience nursing must take into account the vital role of postgraduate education (Slusarz, Ireland, & Green, 2012). In accordance with established nomenclature, postgraduate clinical specialisation is recognised as coursework, where Graduate Certificate and Graduate Diploma level qualifications prepare nurses to undertake roles within specialised practice settings. Building on this at a Clinical Masters level, nurses are further prepared for leadership roles within a range of practice settings. Regional collaborations are vital to the provision of postgraduate qualifications, with Aus-

tralia and other western countries playing host to international students. For partnerships to prosper, consideration of the geographical, economic, political and cultural factors faced by Indonesian nurses are vital.

Background

Building on the background of informal ties and collaborations between Indonesian and Australasian Neuroscience nurses, the opening of the National Brain Hospital, Jakarta, in 2013, provided the opportunity for more formal collaborations between both countries. This celebration was also marked with the agreement between the Australasian and Indonesian Neuroscience Nursing Associations recognising the importance of supporting both formal and informal education for Indonesian Neuroscience nurses. The role of the Indonesian Neuroscience Nurses Association is fundamental; firstly to shape and represent neuroscience nurses and to secondly drive the formulation of a definition and competency criteria that both practice and educational standards can be measured against. Hennessy, Hicks, Hilan, and Kawonal (2006a) highlight this role as integral, as care standards can only be addressed when there are formal regulatory frameworks for education and practice. A second important role of such an organisation is

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the assessment of current service delivery so that educational programs can be specifically targeted. Historically this drive for academic recognition has been overlooked in pursuit of technical competence (Andrew & Robb, 2011). Managing practical factors such as the availability of resources and education from a central point can overcome many of the accessibility challenges, whilst also providing motivation for individuals through a shared vision. Importantly as an organisation there is the ability to collaborate and share resources with other countries and neuroscience nursing organisations.

Within Indonesia, specialised nursing education has previously been focused on the generalised community, medical and surgical specialties, where there are larger gains to be made in terms of patient outcomes. However, economic growth and improved standards of care are reflected in the recognised need to focus on speciality nursing education, particularly within the neuroscience field. Melnyk and Fineout-Overholt (2011) maintain that quality patient outcomes are achieved when nurses improve knowledge within a speciality field and thus contribute to evidence based practice. Hamlin and Brown (2011) and Smith (2006) identify that in Indonesia, nursing has traditionally been considered a low status profession and that nurses are not used to leading and initiating change. This is further historically supported by Shields and Hartati (2003) who suggest that it has been an absence of evidence on the value of specialist nurses that has been the most significant factor in hindering recognition and support, particularly at a policy and government level. Whilst the educational needs of neuroscience nurses might be met in some part through hospital based educational programs, given the underlying complexities of neurological conditions and events, Smith (2006) identifies that the development of specific education is inherently difficult and complex and that educational programs should be academically supported.

For health care systems to continue to provide effective and efficient nursing care there needs to be an investment in the training and academic recognition of nurses as specialists within their field. Nurses must be accountable for participation in ongoing speciality education to ensure that decisions and actions are based on current standards of practice (Slusarz et al., 2012). Recognising this necessity, the Indonesian Ministry of Health has invested heavily in facilitating off shore post-

graduate nursing education for nurses. However, Nursalam, Dang, and Arief (2009) suggest that the effort is insufficient compared to the actual need. This in part can be attributed to the fact that offshore studying has previously been limited to Research Masters and Doctoral Degrees, with the concept and value of speciality clinically focused nursing programs poorly understood. Slusarz et al. (2012) identify that speciality postgraduate education provides neuroscience nurses with the skills required to assume broader organisational roles contributing to health promotion, leadership and education, as well as the skills to undertake advanced nursing practice roles. For the status of nursing in Indonesia to improve, there needs to be recognition of the importance of both clinical and academic education at a postgraduate level.

Health Care in Indonesia

Like many developing countries, Indonesia is facing a number of health related difficulties including a rapidly expanding population and limited resources. During the Asian economic crisis (referred to as *krismon* in Indonesia) unemployment, malnutrition and preventable disease rates all increased (Firman, 1999). Limited resources, a decentralised system and geographical challenges have resulted in inequalities in the accessibility and provision of health care (Hennessy, Hicks, Hilan, & Kawonal, 2006b). Although the Indonesian economy has recovered, the impact has been significant. This has also been linked to a rapid increase in chronic and degenerative health conditions with diseases of the circulatory system now ranked within the top ten causes of death (Widiatmoko & Gani, 2002). The outcome of this is evidenced through increased neurological disorders and events that are being seen in increasingly younger populations, with the mean age of stroke only 58.8 years (Kusuma, Venketasubramanian, Kiemas, & Misbach, 2009). Given that disorders of the nervous system account for more and longer-term hospitalisations than other chronic conditions (Cowan & Kandel, 2001), it is paramount that funding and recognition of neuroscience nursing improves. Neuroscience nurses will need the skills and the ability to influence future policy as well as the opportunities within the health care services to create solutions to the changing health care setting.

There are approximately 1133 hospitals in Indonesia with around 35% of these facilities privately funded by religious groups, chari-

ties, foundations (*yayasan*) or as commercial enterprises (Rosser, 2012; Shields & Hartati, 2003). The quality of services in both private and public hospitals is managed by the Ministry of Health with all hospitals in Indonesia complying with National Accreditation Committee requirements (Widiatmoko & Gani, 2002). Despite this, Indonesia faces considerable administrative challenges, with the 34 provinces within the country comprised of nearly 400 regencies or districts that are responsible for the administration of government services at a local level (Lock, 2011). Whilst the central government has retained influence and responsibility for health care funding, following the Asian economic crisis, management of the public health system was transferred to a district level (Rosser, 2012). Previously in Indonesia, neurological care was provided within larger hospital systems however, specialised care (particularly stroke care) is now recognised as requiring specialised high quality nursing teams. With a number of major public and private hospitals now providing care, referral to the most appropriate hospital continues to be difficult to achieve. There are approximately 9671 primary health care facilities (*Puskesmas*) that are the main access and referral point for the majority of Indonesians seeking health care. Delays in referrals can have significant consequences as a number of interventions, such as post stroke thrombolysis, are time dependant.

Within Indonesia, hospitals are classed depending on size and the services available. However one of the major criticisms of this system is the lack of governance to manage referrals to larger centres (Rosser, 2012). The public health care system provides different levels of care depending on access to private health insurance or the ability to pay for services (Dewi, Evans, Bradley, & Ullrich, 2014). The nation's poorest are provided for through free health schemes, such as the Health Insurance for the Population, the *Jaminan Kesehatan Nasional* or National Health Insurance scheme (Rosser, 2012). The majority of the health system operates on a "user pay system" where payment is required for equipment, medications and consultations (Rosser, 2012; Shields & Hartati, 2003). The costs associated with neurological events can be significant, particularly given that a high proportion of events are not curable and individuals often require long term care. Thus the challenge for nurses in Indonesia is to not only develop the clinical skills required, but also to practice in adverse

environmental conditions often with limited resources (Hennessy et al., 2006b). As a speciality, neuroscience nurses need to demonstrate their efficiency, effectiveness and cost benefits to ensure that their role is recognised as an integral part of the health care system. Central to this is building on core themes identified by Hickey (1993) who recognised that empowerment for neuroscience nursing is centred on being proactive and demonstrating an understanding of the complexity of neuroscience practice.

The majority of nurses in Indonesia are female. For example from a staff of 320 nurses at the National Brain Hospital only 27.9% are male and male nurses tend to work in areas such as the emergency room, operating room and critical care. Based on Indonesian culture, women have a responsibility to serve others, including caring for ill or unwell family within the home environment. Whilst female nurses can take care of both female and male patients, this interaction is limited as most Muslim patients prefer to be cared for by someone of their own gender.

Indonesian culture, especially the Muslim population, believe that the most important thing in their lives is togetherness and helping their family, relatives and extended family. Indonesian's culture also encourages family to visit patients and pray for them. Therefore, almost all patients are accompanied 24 hours a day by at least one family member during hospitalisation. This is in contrast to the Australian health care system that can only generally support this for paediatric patients and during palliative settings. This part of Indonesian culture impacts the hospital system in terms of space and seating. Within the critical care setting, twice daily visiting times were allowed until the hospital accreditation in 2012, when this was reduced to daily visiting to minimise hospital infections.

Nursing Education in Indonesia

The Indonesian nursing sector has been marred by rapid growth, a weak accreditation system and the lack of a competency based system to certify graduates (Rokx, Marzoeki, Harimurti, & Satriawan, 2009; Shields & Hartati, 2003). Two institutional bodies manage nursing education in Indonesia at a national level. The National Board for Development and Empowerment of Health, Human Resources Ministry of Health, which manages the Diploma in Nursing, and the Bachelor program which is managed by the Director of

Higher Education (Munir, Ramos, & Hudtohan, 2013). Prior to 1997, when the minimum educational standard for nursing entry to practice was established, nurses could graduate from a basic nursing course "*Sekolah Perawat Kesehatan*", at the age of 17. Despite no longer being offered, nurses that were trained under this system still represent an estimated 60% of nurses practising, with close to 40% of nurses holding Diplomas. Only 1% of nurses are educated at a Bachelor or above level (Depkes, 2005; Hennessy et al., 2006a). The Bachelor of Nursing Degree "*S1 or sarjana keperawatan*" is a four year course that is offered at selected government Universities, with admission based on a national examination. The program has developed significantly using the national curriculum or *Kurikulum Ners* and is arranged by the Indonesian Nursing Board and Asosiasi Institusi Pendidikan Ners Indonesia. With natural attrition, positions are being increasingly filled by nurses with a Diploma or Bachelor level, however it is still rare for nurses in rural areas to hold a Bachelor degree or higher, with University trained nurses tending to work in the larger centralised hospitals (Depkes, 2000; Rokx, Giles, Satriawan, Marzoeke, Harimurti, & Yavuz, 2010; Rokx et al., 2009).

The Indonesian government is positively progressing towards standardisation and accreditation for nursing education, registration of practising nurses and an ongoing commitment to provide a legal basis for nurses. However, despite the submission of the Nursing Practice Bill in 2005 and Ministry of Health Decree No 1239/2001 (Ministry of Health, 2005), considerable misunderstanding and misperception remains in terms of defining nurses' rights and duties (Nursalam et al., 2009). This has left Indonesian nurses struggling to increase their capability and competency, with Sitorus, Hamid, Azwar, and Achadi (2012) suggesting that despite educational developments the quality of nursing care in Indonesian hospitals has not improved. Improving health care and the recognition of neuroscience nursing as a specialty requires a change in the perception in terms of postgraduate nursing education. George, Roach, and Andade (2011) identify that clinical specialisation is essential, as nursing care improves when led by nurses with specialist higher degrees. However, the clinical skills and knowledge required as a specialist nurse cannot be achieved through a higher degree that is purely research focused. Herein lies the difficulty, as nursing continues to be

viewed as a dual profession, comprised of those who teach and research and those who practise clinically (Andrew & Robb, 2011). The recognition and validation of clinical qualification is essential and agreement to recognise and legitimise the concept of speciality clinical qualifications is vital to the future identity of nursing in Indonesia.

Education is perhaps one of the most limiting factors when striving for specialist recognition, with poor educational profiles reflected in suboptimal clinical standards. Hennessy et al. (2006b) contend that within the context of restricted resources, a significant challenge is presented for Indonesian nurses. Indonesia struggles to fill academic positions and nurses are often employed in teaching roles immediately after graduating, thus lecturers have not had exposure to clinical practice or time to consolidate their skills (Nursalam et al., 2009; Shields & Hartati, 2003). In contrast to Australia where university lecturers hold a degree above the one that is being taught, the majority of lecturers in Indonesia have not had the opportunity to progress their qualifications. Without the status of professionalism, nurses are faced with a disempowered position and reduced capacity to advocate for change. Recognising the need to improve the educational preparation and skills of nurse education has been a priority for the Minister of Health with collaborations developed with a number of international Universities, enabling nurses to study Masters and Doctoral degrees abroad.

This recognition includes the opportunity for Indonesian nurses to complete a one year professional nursing course following the completion of the Bachelor of Nursing (Munir et al., 2013). The Ministry of Education and Culture also formed the Health Professional Education Quality Institution and implemented the compulsory Indonesian Nurses Competencies Examination. In addition, the Indonesian Neuroscience Nurses Association is developing a model of Neuroscience Nursing competencies which is classified into four levels. Whilst each level is equal to one level higher than the General Nurses Competencies, they lack an underlying qualification based framework. Hennessy et al. (2006a) notes that it is impossible to monitor the delegation, quality, roles and work undertaken by nurses in Indonesia. In the absence of standards that are specific in terms of scope of practice related to educational preparation, nurses can undertake the same tasks and have the same level of responsibility and accountability regardless

of education (Hennessy et al., 2006b). Indonesian nurses are also restricted by a curriculum that is focused on the biomedical model, with the current course design failing to impress or promote independence or professional practice (Munir et al., 2013). Brown, Rickard, Mustriwati, and Seiler (2013) describe nursing practice in Indonesia as being based on routine and ritual, where there is limited application of clinical judgement and thus there is no analysis of weaknesses or a systematic method for improving clinical performance. This is in contrast to Australian expectations where nurses undertake self-directed learning that involves critical thinking, designing needs, formulating goals and evaluating outcomes. In light of the forces of globalization, Indonesian nurses face the ongoing challenge of embracing a global perspective. However opportunities are limited while nursing education is taught in Indonesian and students are not prepared to explore global literature on topics. To embrace global perspective, nurses must be able and willing to challenge their conventional values, roles and practice (Nursalam et al., 2009). The success of this lies with specialty associations such as the Indonesian Neuroscience Nurses Association who are striving towards the incorporation of international literature and critical thinking into nursing education.

In Indonesia, the General Nursing Competencies are directed by the Indonesian National Nurses Association (PPNI) and are divided into Diploma and Bachelor of Nursing Competencies. However, the specialty competencies (Cardiovascular, Oncology, Critical Care, Emergency and Neuroscience) were developed by the related nursing associations. These competency standards are very specific and are focused on clear competency skills that are related to clinical practice as a nurse and specific physical tasks. This in contrast to the Australian Nursing and Midwifery Council National Competency Standards that are broad and can be applied to a variety of settings. Nursalam et al. (2009) discuss the need to move away from rote learning to awaken the curiosity in students to become life long learners. This is vital for neuroscience nurses as the field of neuroscience is so vast it is insurmountable to class an expert or specialty nurse as one who knows every drug, disease process and treatment. Smith (2006) identifies that neuroscience nursing education needs to be balanced in terms of broad principles of care and disease specific information. Whilst the introduction of the professional year has

been a significant move towards modern educational notions, it is still predominantly focused on the biomedical model rather than a humanistic or holistic paradigm. Change is occurring and it is being recognised that nurses can no longer focus on clinical skills and that nurses must be proactive in influencing policy and meeting future challenges with creative solutions that are nurse led and driven. This includes reviewing regulatory processes and enhancing the diversity and experiences of nursing students. Essential to lifelong learning and the development of nurses who can function effectively in complex health environments, are the skills of problem solving, critical thinking and the emotional intelligence for clinical decision making (Dalley, Candela, & Benzel-Lindley, 2008; Hegarty, Walsh, Condon, & Sweeney, 2009).

While the opportunities and potential for Indonesian nurses to study offshore appear promising, the transfer of internationally gained qualification can be difficult. The Indonesian Directorate General of Higher Education has made a number of recommendations that expresses concern with the certificate assessment guidelines of foreign college graduates. The procedure and translation of a foreign degree in Indonesia can be varied, with an evaluation team reviewing each case individually. This has particular implications for Indonesian nurses who wish to undertake education at a Clinical Masters level in countries such as Australia. Unlike a traditional Master by Research, the Clinical Masters program focuses on critical thinking, conceptualising within specific specialities and providing nurses with the knowledge and leadership skills to practise at an advanced level. Within Indonesia both the Doctoral degree (S3) and the Masters program (S2) are research based with the expectation of a thesis component. The thesis component is considered important, with the inclusion of a thesis also a significant component of the Bachelor degree. Changing the conceptual thinking and the focus on a thesis component for postgraduate education is vital to improving opportunities for neuroscience nurses to explore offshore educational opportunities.

English proficiency is also a significant challenge for Indonesian nurses when looking at offshore educational opportunities. Bahasa Indonesia is the national language and the medium for instruction in both nursing education and daily conversation (Munir et al., 2013). Whilst offering an English-based

nursing course in Indonesia would initially appear to be the logical solution, the question remains as to who would teach it? As a significant number of Indonesian nursing lecturers are only able to communicate in Indonesian, the growth of nursing and the inclusion of global and international perspectives are limited. Perhaps one of the most challenging aspects for developing neuroscience nursing as a speciality for Indonesian nurses is that the main textbooks and most recent literature are published in English. Suwandono, AnhariAchadi, and Aryastami (2005) identify the quality of some educational programs coupled with teacher capabilities and a reduced capacity to speak and write in English as the main reasons for this high level of unemployment. Australia has an English Language Testing System (IELETS) Registration Standard score of 7 or above, with most universities setting an IELETS score of 6 to 6.5 to study nursing or postgraduate nursing courses. Given the limited exposure to formal English education, it is expected that Indonesian nurses would struggle to meet the expected IELETS score for postgraduate study within Australia. Herein lies the importance of mentorship and the support that can be offered through collaborative practices and regional partnerships.

Conclusion

Neuroscience nursing is a relatively new speciality within Indonesia. Developing adequate resources and collaborative partnerships to support the recognition of neuroscience nursing in Indonesia is a large challenge. However, Indonesian nurses are motivated to change practices and strive towards a more professional standing of nursing in Indonesia. This includes ensuring that nurses receive appropriate postgraduate qualifications. The founding of the Indonesian Neuroscience Nurses Association has enabled the development of competency criteria as well as working towards defining the scope of practice for neuroscience nurses. With this status, Indonesian neuroscience nurses will be instilled with the skills to achieve wider societal gains. Nursing leadership is focused on change and improvement, motivation and enthusiasm for interventions and collaborations, which leads to improved practices (Brown et al., 2013). As neuroscience nursing continues to develop as a specialty so will quality standards. The translation of the experience to the Indonesian setting requires consideration of geographical, economic, political and cultural factors. The development of national practice competencies, clear definitions of grades of

nurses as well as national registration are all vital developments for Indonesian nurses. Without these changes it is difficult to benchmark current practices and plan for future training and skill development needs (Hennessy et al., 2006b). To optimise the development of nursing education in Indonesia collaboration is vital to enable benchmarking, to increase exposure to new and dynamic practices as well as examples of nursing leadership. This includes the continued support of English-based learning opportunities through both formal learning as well as collaborative and informal opportunities and the support of international professional bodies.

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Top of the Charts: Detecting neurological deterioration more efficiently through improved documentation.

Rhiannon Carey, Christine Holland

Abstract

The Glasgow Coma Scale is a practical tool, accepted and utilised worldwide, to assess a patient's conscious level. Despite the introduction of other tools, the Glasgow Coma Scale still remains the most reliable and effective method of detecting neurological deterioration.

Detecting neurological change in an individual requires skilled observation and must rely on the ability of the clinician to carry out an accurate and reliable assessment. A large limitation of the Glasgow Coma Scale is that observer assessments may vary from clinician to clinician. What one individual may observe as neurological deterioration, another may not notice.

It was recognised by senior nursing staff that if a neurological chart could be designed, that enhanced the ability to see the trends in a patient's conscious level and instructed clinicians on when to report a finding, deterioration may be identified earlier and managed more efficiently.

This study outlines a new neurological chart implemented at a busy private hospital in Melbourne and discusses the impact that clear and concise observation and documentation has on the ability to detect neurological deterioration.

Key Words: *Glasgow Coma Scale, neurological observations, neurological assessment, conscious level assessment.*

Introduction

Neuroscience nurses are very familiar with the Glasgow Coma Scale. It is a reliable tool that most nurses in the neuroscience setting would use on a daily basis to assess their patients. Many neuroscience nurses would go as far as saying that they perform the Glasgow Coma Scale assessment so often, it almost comes as a second nature to them. However, what about those nurses that are not neuroscience trained and are not as familiar with the use of the tool? How confident do they feel utilising the tool and knowing that they are performing it correctly? There have been numerous studies carried out which suggest that when the Glasgow Coma Scale is utilised by individuals who are not highly trained in performing the tool, the chances of missing critical information to suggest neurological decline increases.

The Glasgow Coma Scale was first intro-

duced in Glasgow in 1974 by two men, Graham Teasdale and Brian Jennett. The purpose of the tool was to provide a relatively simple method of assessing and recording the level of consciousness in individuals who had experienced head trauma (Matis & Birbilis, 2008). Initially, the tool was used to assess and grade the severity of head injury in the first six hours following head trauma. However, over time, the intentions of its use have expanded and it is now commonly used to predict a patient's overall outcome (Balestreri, Czosnyka, Chatfield, Steiner, Schmidt, Smielewski, Matta & Pickard, 2004). The Glasgow Coma Scale is not only utilised to assess the depth and duration of coma and impaired consciousness; it can also help to gauge the impact of a wide variety of conditions such as acute brain damage due to traumatic and vascular injuries, infections and metabolic disorders (Matis & Birbilis, 2008).

The Glasgow coma score uses the following criteria to assess level of consciousness:

- Eye opening Score 1-4
- Best verbal response Score 1-5
- Best motor response Score 1-6

By adding the scores, the final score is be-

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tween 3 and 15.

The Glasgow Coma Scale quickly became a simple, standardised tool used throughout the world (see Figure 1). Its simplicity meant that doctors, nurses and other healthcare professionals could all use the one system to assess and grade their patients (Fischer, Ruegg, Czaplinski, Strohmeier, Lehmann, Tschan, Hunziker & Marsch, 2010). Unfortunately over the recent years, a large limitation to the tool has become apparent and that is the ability of the person carrying out the tool to do so reliably and consistently (Fischer et al., 2010).

In many neuroscience settings, there are nursing staff that do not have a strong background in neuroscience nursing. For example, agency staff and new graduate nurses commonly work in these settings without necessarily having the desired amount of experi-

Aim

To create a neurological observation chart that shows clear parameters for reporting clinical deterioration and to assist nurses who are not as experienced at performing the Glasgow Coma Scale by providing them with prompts for clinical escalation.

Method

A study was conducted between January 2015 and June 2015 on a busy neurosurgical ward in Melbourne. 26 medical records were reviewed for patients undergoing craniotomy procedures. 1089 sets of neurological observations were audited to see how many nurses were documenting their neurological observations correctly. The criteria for correct documentation included:

- Date and time of assessment
- A mark was placed on the chart for each of the assessment criteria of eye opening, best verbal and best motor response.
- The Glasgow score was added up correctly.
- The Glasgow score was written down.

*Limb strength documentation was not included in the audit, as this is a separate assessment from the Glasgow Coma Scale.

A new neurological observation chart was then created and implemented on the neurosciences ward within the hospital (see Figure 2). Staff were provided with formal in-services on how to utilise the new chart. They were also re-educated on how to perform an accurate conscious level assessment. Neurosurgeons working within the clinical area were also consulted and asked of their opinions when it came to creating guidelines as to the use of the chart.

The chart was trialed for 8 months. At the conclusion of the trial period, the chart was audited according to the same criteria as the previous audit. Once again, 1089 sets of neurological observations were reviewed.

Results

Pre implementation audit was undertaken on 26 medical records. The initial audit on the old neurological observation chart returned a result of 62% correct documentation. Of the 1089 sets of neurological observations, 677 sets of observations were correctly documented.

The post implementation audit was undertak-

Figure 1 (Above): The old neurological observation chart formerly used throughout the hospital.

ence to accurately detect clinical deterioration. It was felt that if a neurological observation chart could be created, that would prompt nursing staff on what to do in the event of neurological decline, the chances of missing the critical signs of patient deterioration could potentially be reduced.

Figure 2 (Above): The new neurological observation chart that was introduced in 2014.

en on 27 medical records. The second audit on the new observation chart returned a result of 87% correct documentation. Of the 1082 sets of neurological observations, 940 sets of observations were correctly documented.

Discussion

The accurate neurological assessments of a nurse enable quick detection of neurological changes and prompt actions by the by the medical team to improve survival outcomes of patients and minimise long-term effects (Chu, 2014). There is strong evidence to suggest that conscious level assessment is critical in identifying patients who may require escalation in their care, however serious errors in assessment can lead to a failure to detect or deal with complications in a timely manner. Nurses are required to have sound anatomical and physiological knowledge if they are to accurately interpret an assessment of level of consciousness (Chu, 2014). A study carried out by the Joanna Briggs In-

stitute qualified a nurse as having adequate experience in performing a Glasgow Coma scale (GCS), if they had at least two years post-registration experience, with one of those years spent practicing neurological nursing. The study went on to report that knowledge and experience were the most critical factors in determining a nurse's assessment of a patient's conscious state (Chu, 2014).

A study carried out by Rowley and Fielding compared the ability of experienced neuroscience nurses, as opposed to newly graduated and student nurses, to carry out a GCS. The study found that experienced nurses were more consistent and confident with their GCS scoring than those that were less experienced (Gabbe, Cameron & Finch, 2003).

The new neurological chart designed was effectively the same as the old chart, however it had a few new changes to assist nurses in recognising clinical deterioration. The new

chart was colour-coded to represent the severity of the GCS score. The colour coding was based on the guide to head injury, provided by the Joanna Briggs Institute. Mild head injury was represented with a score of 13-15; moderate head injury was given a score of 9-12; and severe head injury a score of 3-8 (Joanna Briggs Institute, 2013). A GCS score of 9 or below was colour-coded in purple so that it would prompt an emergency response by nursing staff. A score of 10-12 was colour-coded in orange to allow staff to recognise that their patient may need clinical review. A score of 13-15 was coloured in white, to represent a stable patient. The idea of the colour coding was to push staff to recognise deterioration early, ideally before the patient deteriorates into the purple zone.

Whereas the old chart required nursing staff to write a number in the box to correlate with the patient's GCS score, the new chart asks the staff member to place a dot in the box corresponding with the appropriate GCS total. Effectively, it creates a graph of the patient's Glasgow Coma Score over a twenty-four hour period. This method was named the "track and trigger" method, where the staff member can visually track the GCS score and pre-empt the beginnings of clinical deterioration.

The new chart provides much stricter guidelines to its use and as to when nursing staff must contact a doctor. Staff must report according to the colour coding on the chart. This does not mean that they cannot report if they are simply concerned about their patient. A guideline was put in place that the staff member must report to the doctor if a patient's GCS score drops by 2 points or more, if the result lies in an orange or purple area. For instance, if a patient with a score of 15 drops to a score of 13, the nurse is not required to take any action because a GCS of 13 still lies within the white zone. However, if the GCS were to drop one point more to 12, which lies within the yellow zone, the nurse would be required to seek clinical review of that patient.

Discussions with relevant Neurosurgeons prior to the release of the new chart enabled relevant guidelines to be put in place. It was decided that staff did not have to report variations in patients' pupil sizes unless they were two or more sizes different. It was felt that pupils that only differed in size by one point was not enough evidence to suggest the beginnings of neurological decline.

A new area was added to the chart to enable additional observations to be recorded. Such observations may include objective or subjective data, such as noticeable facial droop and slurred speech or things the patient may tell staff. For example, feelings of pins and needles in a limb or blurred vision. The additional observations area also allows nurses to write down specific orders relevant to the patient. For example, an alteration in the frequency of observations or a specific instruction from a doctor. Having this specific area allows for improved communication between staff members and informs nurses about how to adequately respond to the changes in their patients' neurological status'.

Conclusion

Creating a new neurological observation chart is never going to replace the need for nurses to have sound assessment skills and critical thinking. Staff need to be educated on how to perform a thorough, accurate conscious level assessment. A neurological observation chart that includes strict guidelines and visual prompting is a step forward in the right direction when it comes to the accuracy of clinical documentation. However, further audits and reviews will need to be conducted in the future in order to narrow the discrepancies between staff member interpretation and documentation of conscious level assessment.

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The EPIC (Excellent Practice in Communication) Project. Neurosurgical Nursing Clinical Handover Improvement Practices among acute inpatients: a Best Practice Implementation Project.

Kylie M. Wright

Abstract

The nursing handover normally occurs at the beginning of a nurse's shift and is considered essential for continuity of care. Nursing handover has the potential to communicate accurate information about a patient's condition, treatment and anticipated needs but also has the potential to be ineffective or even harmful if information is incomplete or omitted. The Australian Commission on Safety and Quality in Health Care (ACSQHC) has recognised clinical handover as a National Standard, thus reinforcing its importance.

This project aimed to conduct an audit of nursing clinical handover practices, to implement evidence-based best practice recommendations and to maximise the effectiveness of clinical handover in a neurosurgical unit of a large tertiary hospital.

The project used the Joanna Briggs Institute's (JBI) Practical Application of Clinical Evidence System (PACES) and Getting Research into Practice (GRiP) audit tool for promoting change in healthcare practice. A baseline audit of 30 observations of nursing clinical handover was conducted and measured against seven best practice recommendations, followed by the implementation of targeted strategies and follow up audits.

The baseline audit revealed deficits between current practice and best practice in four of the seven criteria. Barriers for implementation of nursing clinical handover best practice criteria were identified by the project team and a neuroscience specific nursing handover framework and bundled education strategy was implemented. There were improved outcomes across the best practice criteria in the follow up audit.

The findings showed how audit may be used to promote best practice in healthcare and that focussed education and provision of relevant resources can have an immediate and positive impact on clinical practice. Some of the measured criteria improved to a moderate degree, leaving plenty of room for improvement, however by the end of the project attitudes towards nursing clinical handover had been 'transformed' from a passive, routine 'must do' task, to an active process with a focus on safety and patient/carer engagement. Future audits are planned to ensure sustainability.

Keywords: *Nursing clinical handover; evidence implementation; best practice; audit; acute neurosurgical inpatients.*

Background

The nursing handover normally occurs at the beginning of a nurse's shift and is considered essential for continuity of care (Clemow, 2006; Evans, Pereira and Parker, 2008; Currie, 2002; Fenton, 2006; Sexton, Chan, Elliott, Stuart, Jaya-

suriya and Crookes, 2004; Davies and Priestley, 2006; Hopkinson, 2002; McFetridge, Gillespie, Goode and Melby, 2007). The purpose of nursing handover is to safely transfer the care of a patient from one nurse and shift to another. Communicating information regarding the patient and formally handing over the responsibility for a patient to another nurse/shift is also key in providing guidance and support to the nurses (Evans, Pereira and Parker, 2008). A safe and accurate nursing handover is of utmost importance as

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this will directly impact the care provided by the following nursing shift (Currie, 2002; Fenton, 2006). Nursing handover has the potential to communicate accurate information about a patient's condition, treatment and anticipated needs but also has the potential to be ineffective or even harmful if information is incomplete or omitted. This has important implications for neurosurgical nursing staff as they often deal with fluctuating or subtle changes in neurological symptoms that if not communicated effectively can lead to rapid and life threatening deterioration in this challenging cohort of patients.

The Australian state of New South Wales (NSW) mandates the implementation of standard key principles for all types of clinical handover (New South Wales Ministry of Health, 2009). The associated policy has identified clinical handover as the transfer of information, accountability and responsibility for a patient or group of patients which aids in effective, concise and complete communication in all clinical situations, thus facilitating care delivery which will contribute to improved safety during patient care. These principles are to be used by all clinicians regardless of a patient's clinical diagnosis, location or the time of day. The purpose of this policy directive indicates that compliance will improve patient outcomes and experiences. Mandatory requirements include health service implementation, evaluation, training and orientation. The policy also includes roles and responsibilities of the health service executives responsible for clinical operations and governance, and of hospital, facility, clinical stream, unit managers and heads of departments.

This project aimed to conduct an audit of neurosurgical nursing clinical handover practices, to implement evidence-based best practice recommendations and assess the impact of these changes in improving the effectiveness of nursing clinical handover in a neurosurgical unit of a large public tertiary referral hospital and major trauma centre in Sydney, Australia. The hospital has a strong commitment to teaching and research across a wide range of disciplines and serves between 1.3 and 1.4 million people in the South West of Sydney, with the most culturally diverse population in the state with 39% of people from non-English speaking backgrounds (NESBs). The hospital has well

established policy directives on nursing clinical handover for inpatients including established roles and responsibilities of clinicians to ensure their work practices are standardised. Key principles embedded within this policy directive include leadership, valuing handover, participation, timing, location, process and identifying deteriorating patients.

Objectives

The overall purpose of this project was to increase staff compliance with nursing clinical handover best practice recommendations and ensure there was timely, relevant and structured clinical handover that supported safe patient care. Objectives included:

- To improve the local practice of delivering nursing clinical handover
- To ensure nursing staff have been educated regarding standards and the policy of clinical handover
- To ensure patient and family engagement in the clinical handover process

An evidence-based practice approach underpins the entire implementation project.

Methods

The project used the Joanna Briggs Institute (JBI) Practical Application of Clinical Evidence System (PACES). JBI PACES is an online tool for health professionals and/or researchers to use for collection and comparison of data and to conduct efficient audits in small or large healthcare settings. PACES has been designed to facilitate the use of audits to promote evidence informed health practice and includes the Getting Research into Practice (GRIP) framework that may be used to help identify factors underpinning gaps between practice and best practice and strategies to overcome them. The project involved three phases as follows:-

Phase 1: Baseline audit

A baseline audit of neurosurgical nursing clinical handover practices was conducted. A core group of key stakeholders was formed to support the work of this project. The project team included the Clinical Nurse Consultant, Nursing Unit Manager, Clinical Nurse Educator, Registered Nurses, the Hospital Library Manager and a consumer representative. Involvement of the project team was in varying capacities

of support, data collection, data entry and/or participation.

The objectives of the baseline audit were to establish the size and nature of the gap between practice and best practice in neurosurgical nursing clinical handover. The JBI best practice recommendations related to clinical handover are based on a structured search of the literature and selected evidence-based health care databases. Seven criteria based on these best practice recommendations were audited throughout this project. The seven identified criteria for data collection were measured as follows:

1. Verbal (face to face) communication has occurred

This criterion was considered met if the handover had occurred at the bedside in the presence of the patient (and family members if applicable).

The nurse/s from the concluding shift must have communicated to the nurse/s on the preceding shift and engaged in discussion about care coordination with the patient/family members in a face-to-face manner.

The event should have commenced with a statement to the patient/family member that handover was occurring and team members were going to speak about their clinical care.

Note: this event was expected to occur on all patients despite level of consciousness, and for all non-English speaking patients/family members.

2. Standardised documentation has been used.

This criterion was considered met if handover had been delivered using standardised documentation including use of an electronic nursing handover tool.

3. The patient had been identified.

This criterion was considered met if the patient's full name had been stated clearly in the handover communication and the patient's identification (ID) band had been checked. *Note: Unknown patients remain unknown for 24hrs.*

4. Relevant History of the patient had been stated.

This criterion was considered met if the reason for hospital admission and relevant medical/clinical history had been clearly stated.

This must have included:

- Presenting symptoms/events on admission/provisional diagnosis
- A brief synopsis of treatment to date / test results – including recent Medical Emergency Team & Clinical Review Criteria calls, Falls etc
- Relevant medical history and co-morbidities

Note: Sensitive information was discussed in a private area outside the patient's room e.g. Not for Resuscitation (NFR) orders

5. Detailed observations of the patient had been stated.

This criteria was considered met if reference to the patient's vital sign status, Glasgow Coma Score (including a breakdown of E,V,M), motor sensory status, frequency and other relevant observations have been stated including altered haemodynamic parameters (altered calling criteria), if applicable, and bedside observations charts are checked together. Vital signs included:

- Blood pressure
- Pulse rate
- Respiratory rate
- Temperature
- Oxygen saturations
- Pain Score
- Glasgow Coma Score (if applicable)
- Motor Sensory scores (if applicable)

Other relevant observations (if applicable) included:-

- Post Traumatic Amnesia score
- Pressure area risk
- Falls risk score
- Fluid balance
- Drains
- Blood Glucose level

It was acceptable to state that the patient's vital signs were 'Between the Flags' if there were no abnormalities, however bedside observation charts should have still been checked together.

If the patient's vital signs were NOT between the flags, there should have been specific mention of this particular vital sign.

Note: If the patient was on an end of life care pathway, this was stated and no observations were performed.

Note: The Between the Flags program is a state wide standardised safety initiative

that aims to improve early recognition and response to clinical deterioration. This program includes several different measures that have been implemented to improve the ongoing recognition and response to clinical deterioration. Key aspects of the program include a structured clinical assessment tool and a communication tool.

6. The handover process included an agreed plan of care for the patient.

This criterion was considered met if the care required for the following shift was clearly described and assessments / nutritional status / tests / procedures / medications / documentation pending were stated (e.g. Nursing Admission Form, Falls Risk Assessment and Management Plan – FRAMP, External Ventricular/Lumbar Drain management)

7. Transfer of responsibility of the patient from one nurse/shift to another nurse/shift had occurred.

This criterion was considered met if time had been provided to clarify and ask any questions (nurse and/or patient, parent, family member) and the nurse/s receiving handover accepted responsibility and accountability for care.

This may have included a verbal statement or written entry in the progress notes that the nurse had received handover and had accepted care, or a question such as “Are you happy to take over care?”

Nursing staff within the neurosurgical unit were notified of the project before commencement. This involved a description of the proposed project and how it involved them as well as distribution of a Participant Information Sheet/Statement. Nurses were given the opportunity to opt out by provision of an opt out form. If clinicians exercised this right, none of their clinical handover interactions were audited. The nurses were informed during ward meetings that auditing would occur during selected dates but were not given those exact dates. Nurses absent from ward meetings were informed of the project via an individual or small group meeting and given the Participant information Sheet/Statement by the ward based investigators. A poster informing staff of the study with processes for obtaining a Participant information Sheet/Statement and opt out processes and forms was also displayed prominently in the

unit.

Audits occurred during Monday to Fridays and included a combination of night to morning shift and morning to afternoon shift handovers. 30 episodes of clinical handover were included in the sample of each criterion. One auditor, the Clinical Nurse Consultant (CNC), was nominated to undertake all 30 episodes of data collection.

To assess the compliance of each audit criterion, the CNC, aligned to the unit, who might normally participate in a nursing clinical handover as part of her everyday work joined the bedside handover and performed an observational audit. During this routine bedside handover, the CNC audited the content of the handover against the 7 criteria, as well as the time and day of the week the handover was occurring. The investigator (CNC) made simple marks in a ‘yes’, ‘no’, ‘N/A’ box on a data collection form whilst listening to handover. The form was discreet and easily held within normal handover paperwork hence nurses were not aware exactly when their handover was being audited. Baseline data was collected over a two week period and entered into the PACES program.

Phase 2 – GRIP Strategy

The objectives for the second phase of the project were to gain an understanding of the barriers underpinning gaps between practice and best practice found in the baseline audit and implement tailored strategies to close gaps and address barriers.

Using the PACES program, baseline audit results were analysed and discussed by the project team with the aim of proposing strategies for improving compliance with best practice nursing clinical handover principles. This process was implemented using the JBI Getting Research into Practice (GRIP) tool, a module of the PACES program, and facilitated the change management process.

Open communication and engagement with all with stakeholders was maintained and welcomed at all times throughout the project and provided the platform to suggest and discuss strategies for improvement. Via a fortnightly, face-to-face meetings, using practice development principles and e-mail correspondence between the project team, the best practice criterion was reviewed and

strategies for improved compliance were formulated.

Furthermore, potential barriers and strategies to overcome such barriers, as well as resources required to implement change strategies were identified, discussed and formally documented into the GRIP framework. The GRIP strategies are presented in the results section of this report.

A GRIP report matrix was generated and fostered the project team engagement by keeping them informed, as well as providing a means of gathering and recording their opinions and clearly outlining the implementation plan and the team involvement. As described further in the results section, a major strategy identified to close the gap between practice and best practice was the development of an education 'bundle' and neuroscience nursing clinical handover framework used to educate clinicians on the 7 best practice recommendations for nursing clinical handover and imbed them into practice. These strategies, were implemented during Phase 2 of the project which was conducted over a 4 month period.

Phase 3: Follow up audit

The objective of the post intervention follow up audit was to assess whether any improvement in compliance with best practice had been achieved and identify any areas requiring further focus and improvement. The repeat audit used the 7 criteria defined in Phase 1. There were no variations to the topic, the criteria, the sample size, the characteristics or location of the project during the follow up cycle.

The follow-up data was entered into the PACES program and data analysis compar-

ing follow-up results with those of the baseline audit were undertaken to examine any change in compliance rates. Phase 3 was conducted over a 4 week period.

The project received formal approval by South Western Sydney Local Health District Research Ethics Committee (NSW).

Results

Baseline Audit

The percentages for compliance with each audit criterion from the baseline audit are shown in Figure 1.

The best baseline performance was found for Criterion 1, which measured that verbal face to face communication had occurred, Criterion 2 which measured the use of standardised documentation with nursing clinical handover and Criterion 7 which measured that transfer of responsibility of the patient from one nurse/shift to another nurse/shift had occurred. In 100% of cases there was evidence of these practices occurring via the use of bedside handover practices and an electronically generated handover document that was well established and embedded into practice. Furthermore, Criterion 6 displayed 90% compliance with the handover including an agreed plan of care for the patient, and Criterion 5 displayed a 73% compliance with details of patient observations being stated.

Performance emerged as very poor in the baseline audit for the remaining two criteria. Identifying the patient (Criterion 3), which encompassed stating the patient's full name and reviewing the identification band, scored extremely poor at 0% and stating the relevant history of the patient (Criterion 4) showed compliance of only 60%.

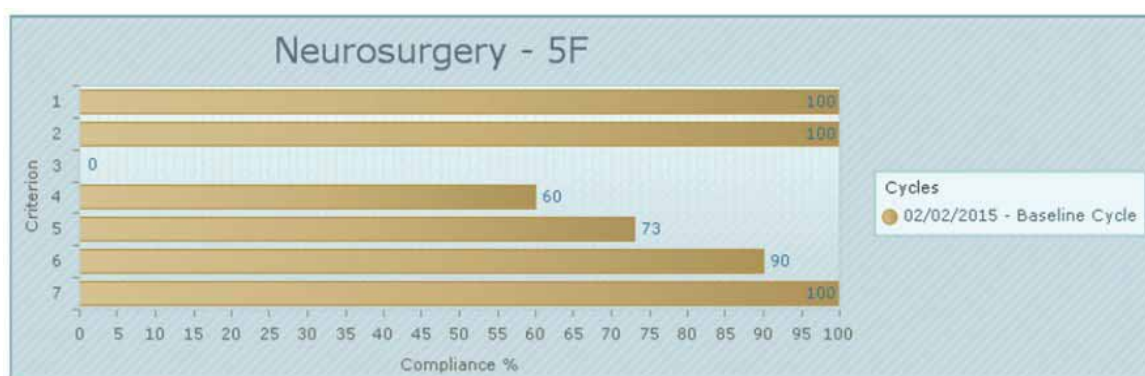


Figure 1 (Above): Baseline audit results

Phase 2: Strategies for Getting Research into Practice (GRiP)

Providing education to the nursing staff was elected by the project team as a feasible strategy to address the identified deficits in compliance to best practice for neurosurgical nursing clinical handover. An education 'bundle' focusing on the 7 best practice criteria identified by JBI was developed. This package included:

1. A powerpoint presentation detailing the project team, study design, best practice recommendations and baseline results. This presentation was loaded onto unit based computers and could be accessed by all staff.
2. Development of an in-house video demonstrating an incorrect and a correct handover based on the 7 identified best practice criteria to be utilised as a teaching tool.
3. Intensive education sessions regarding the project and highlighting the 7 best practice criteria. The video was utilised in these sessions.
4. Recruitment of a 'Clinical Handover Champions' to support and role model the education strategies.
5. A3 sized wall posters, to be displayed prominently in clinical areas highlighting the 7 best practice criteria.
6. A4 size best practice criteria signs presented in a table format, displayed in patient bedside charts. These signs highlighted the 7 best practice criteria accompanied by a practical checklist indicating tasks that satisfy each criterion.
7. A credit-card sized checklist tabling the

seven best practice criteria was developed to clip onto each nurses' identification badge. All nurses were issued with this checklist as an easy reference.

Further to this, a neuroscience nursing clinical handover framework or 'ground rules' was collaboratively developed to assist in addressing identified deficits in compliance to best practice for neurosurgical nursing clinical handover (See Appendix 1). Using practice development methodology in a neuroscience / brain injury community of practice group, this tool was developed with input from frontline staff and was made available in the neuroscience clinical areas, embedded into the unit orientation, and became 'the rules' around conducting handover.

Table 1 shows the barriers to nursing clinical handover best practice that emerged from the project team discussion of the phase 1 results. It also identifies the necessary resources required to implement the strategies and outcomes.

Phase 3: Follow-up audit

The percentage of compliance for the audit criteria found in the follow-up audit together with the results from the baseline audit are displayed in Figure 2. Looking at the results of the follow up audit, compared with those in the baseline audit, there has been an overall improvement in compliance of implementing best practice clinical handover recommendations.

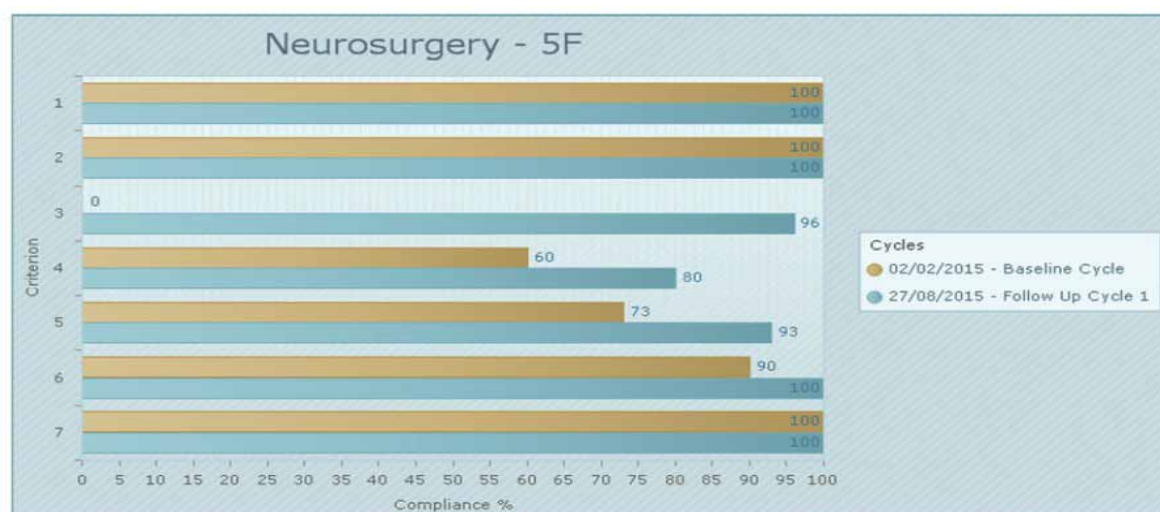


Figure 2 (Above): Follow-up cycle 1 audit results

Table 1 (Below and over page): Barriers & resources to nursing clinical handover

Barrier	Strategy	Resources	Outcomes
Educating a large number of nursing staff in a systematically and coordinated manner.	Implementation of an agreed timeline for the education period Use standardised information & resources Recruitment & training unit 'nursing handover champions' to assist with implementing the education & imbedding the best practice criteria into normal routine practice	Formation of an agreed timeframe / timeline Development of a presentation and handover framework Development of a generic video to utilise as a teaching tool to demonstrate /compare a correct vs incorrect handover to highlight the best practice criteria Development of posters, laminated checklists & ID size badges identifying the 7 best practice criteria & highlighting points that contribute to satisfying each criterion. Project team members had undergone Practice Development and Leadership courses hence these skills were employed during the discussion component of the education sessions to guide and enable staff. Solution focused techniques centred around improved communication were used emphasising improved patient safety and care Development and display of a video demonstrating incorrect vs correct handover to demonstrate feasibility and practicality of best practice criteria	Completion of the education component by agreed date Target of >90% of nursing staff attended education sessions
Overcoming nursing staff misconceptions that the nursing clinical handover would take longer to complete if adhering to best practice criteria	Employing practice development strategies during the education sessions to discuss nursing staff concerns Conduct solution focused sessions to address anticipated / perceived issues with time constraints in implementing all best practice recommendations for clinical handover Development of an in-house video as a teaching tool to demonstrate incorrect vs correct handover and practical time frames	Project team members had undergone Practice Development and Leadership courses hence these skills were employed during the discussion component of the education sessions to guide and enable staff. Solution focused techniques centred around improved communication were used emphasising improved patient safety and care Development and display of a video demonstrating incorrect vs correct handover to demonstrate feasibility and practicality of best practice criteria	Facilitated discussion occurred as part of the sessions Improved follow-up audit results Staff articulated that they felt confident in utilising identified strategies
Nursing staff concerns related to maintaining patient confidentiality at the bedside in multi-bed rooms	Employing practice development techniques during the education sessions to discuss nursing staff concerns and conduct solution focused sessions to address anticipated / perceived issues with maintaining patient confidentiality during the handover process	Using practice development methodology project team members guided & enabled staff to identify probable situations/scenarios that could compromise patient confidentiality during clinical handover. Nursing staff identified strategies to prevent breaches of confidentiality eg: discussing sensitive information outside the patient's room or at the nurse's station Using practice development methodology project team members guided and enabled staff	Nil complaints recorded from patients related to perceived or actual breaches in their confidentiality Improved follow-up audit results
Nursing staff concerns re checking patient identification (ID) bands eg: waking or isolated patients..	Employing practice development techniques during the education sessions to discuss	Using practice development methodology project team members guided and enabled staff	Staff articulated that they felt confident in employing identified strategies to complete a patient ID

Table 1 continued (Below and previous page): Barriers & resources to nursing clinical handover

Barrier	Strategy	Resources	Outcomes
Nursing staff not participating in the practice of reviewing bedside charts together during clinical handover	Displaying & discussing results of baseline audit, whilst employing practice development techniques during the education sessions, regarding current barriers to checking bedside charts together during handover Solution focused discussions conducted to support practice change, emphasis placed on the critical role that bedside chart review plays in maintaining patient safety	Using practice development methodology project team members guided and enabled staff to identify probable situations/scenarios that could negatively impact on patient safety and care, related to not checking bedside charts during clinical handover Nursing staff identified strategies to assist with embedding the practice of checking charts during handover eg: referring to checklist, reminding each other every shift to implement and maintain best practice (Criterion 5)	Improved follow-up audit results for Criterion 5, stating detailed observations of the patient
Nursing staff concerns re checking ID bands on patients eg: waking patients, patients isolated due to infection prevention, offending patients who expect nurses to already know their identity and be familiar with their admission	<ul style="list-style-type: none"> Employing practice development techniques during the education sessions to discuss nursing staff concerns and conduct solution focused sessions to address anticipated / perceived concerns with checking the patients ID band during the handover process 	Using practice development methodology project team members guided and enabled staff to identify probable situations/scenarios that could impair their ability and desire to check a patients ID band during clinical handover. <ul style="list-style-type: none"> Nursing staff identified strategies to overcome concerns about patient ID band checks eg: explaining to the patient the rationale for checking their ID band 	Staff articulated that they felt confident in employing identified strategies to complete a patient ID check during nursing clinical handover Nil nursing reports of any compromises in patient confidentiality Nil patient complaints recorded related to breaches in confidentiality Improved follow-up audit results for Criterion 3, patient identification.

The results suggest that an emphasis on staff education translated into implementation in practice or sustainability of practice for all criteria. Four out of the four criteria requiring improvement showed positive progress, with the remaining three criteria remaining static at 100% compliance. The criterion measuring that the patient had been identified (Criterion 3), showed the largest increase in compliance over baseline with improved changes of 96%.

Discussion

Results from the baseline audit were not unexpected by the project team. It had not, until recently, been standard nursing practice in all units at the hospital to perform bedside handover at each change of shift. Rather, nursing handover had been performed in the nursing write up bays. The Neurosurgical Unit, however had well established bedside handover practice which essentially involved a cultural change in the way the staff physically approached and performed nursing clinical handover but was now reflected with a willingness by nurses to engage and acknowledge the importance of respectfully including the patient in their own care.

The practice of nurses handing over at the bedside, engaging patients and utilising standardised documentation to assist with the process of clinical handover was well embedded prior to the commencement of the study and was clearly demonstrated in compliance scores of 100%. A standardised nursing clinical handover document was created in the electronic medical record and successfully piloted in the Neurosurgical Unit in 2011 before proceeding to a hospital wide roll-out in 2012. This electronic handover is now used throughout several local health districts and is presently being implemented in others states of Australia.

In contrast to the embedded practice of engaging the patient at the bedside and using standardised documentation, identifying the patient via use of their full name and checking their identification band resulted in very poor compliance of 0%. Nursing staff routinely stated the patient's name as part of the handover, but checking the patient's identification band with the patient and against their charts was not routine practice. Reasons put forward by

staff to account for this included that it would take too long, they were already familiar with the patient and that the patient may expect that the nurses already know their identity and as such, patients may be offended if they were re-identified at every shift change. Also, patients who appeared to be sleeping, or at the least, resting with their eyes closed, should be allowed to continue undisturbed by an identity confirmation. Despite these reasons, there was acknowledgement by the nursing staff that checking patient identification was safe practice especially with non English speaking and cognitively impaired patients. Standard 5 of the ACSQHC, titled Patient Identification and Procedure Matching, is now a key driver of patient identification processes (Australian Commission on Safety and Quality in Health Care, 2012). This standard states, a patient identification and matching system is implemented and regularly reviewed as part of structured clinical handover, transfer and discharge processes. The baseline audit of 0% compliance was extremely alarming but following the education intervention, the follow-up cycle scored a compliance of 96%. The education focused on the evidence and risks of errors related to procedure and medication dispensing with supporting Incident Information Management System (IIMS) data. The 96% improvement reflected an enormous cultural practice shift with identification band checking becoming embedded into the routine hand-over process.

Additional nursing clinical handover practices that were demonstrated in the baseline audit were not unexpected to the project team. Nursing practice often omitted stating the patient's relevant medical history and detailed observations. Instead nurses often made generalised references to their colleagues as there appeared to be a general assumption that all staff were familiar with the patient and if not, they could refer to the standardised electronic handover document at a later point in time for more detailed patient information. The project team speculated that the handover document may have been seen as a written substitute for verbal communication. Further to this, the nature of neurosurgical units often leads to longer patient admissions giving staff more prolonged exposure, resulting in increased patient familiarity. The project team questioned if this discouraged nurses

from repeating a systematic process of nursing clinical handover every shift.

This best practice implementation project achieved improvements in compliance in the best practice recommendations over the six month period. These practices however had a more widespread impact on nursing clinical handover practices across the organisation because strategies were adopted and supported across the hospital and had the underpinning support of the nursing executive and governance structures. Also imperative to the success of this project was consumer participation and their very valuable contributions during every stage of the project implementation. This support is reflected in the improvement in compliance with the audit criteria and changes in practice.

The nursing clinical handover 'education bundle' and neuroscience nursing clinical handover framework incorporating best practice strategies and practical application were effective strategies. The content of the bundle included resources with information in line with the best practice recommendations including what to include in a clinical handover to ensure safe transfer the care of a patient from one nurse and shift to another. A highlight of the education bundle was the custom filmed video case study that was utilised to accompany the nursing education undertaken in phase 2. The video was produced in house and shows an incorrect versus correct version of nursing clinical handover and clearly demonstrates all seven best practice criteria with the use of pop up text embedded into the video. This was used as a discussion point to allow nurses to reflect on their practice and demonstrate how the criteria could be embedded into everyday clinical handover practices. It was positively received by the nursing staff and proved to be a realistic approach providing a practical demonstration of how the criteria could be applied.

Due to difficulties capturing all staff, 'clinical handover champions' were engaged in the education process and were given the education bundle so it could be delivered to after hours and weekend staff. In addition, they were empowered to take informal and formal opportunities to teach their ward colleagues to amplify and personalise the learning and make it ward specific. As a result, the neurosurgical nursing staff received tailored education

and were more aware of the best practice recommendations for nursing clinical handover and how to incorporate this into their clinical practice. By the conclusion of the project 77% of nursing staff had received targeted neurosurgical clinical handover education.

A safe and accurate nursing clinical handover is of utmost importance and is a quality imperative that is directly related to the ACSQHC national standards (Australian Commission on Safety and Quality in Health Care, 2012). It is a priority for the neurosurgical unit to keep the focus on nursing clinical handover and excellent practice in communication in its efforts to improve patient safety and continue to meet this standard. Implementation of the evidence through this project will be sustained by continued analysis of IIMS data and sustainability audits. These principles are transferable to any clinical unit.

Conclusion

It is indisputable that ensuring timely, relevant, structured and accurate nursing handover that supports safe patient care is of utmost importance. The communication of information to enhance patient safety is paramount in any health care setting, and as such, the Australian Commission on Safety and Quality in Health Care (ACSQHC) has recognised clinical handover as a national standard.

The purpose of this project was to increase staff compliance with clinical handover best-practice within an acute neurosurgical unit. This included an audit of nursing clinical handover practices, implementation of evidence-based best practice and assessment of the effects of implemented strategies at maximising the effectiveness of clinical handover. The project succeeded in achieving the objectives as significant improvements in the best practice criteria was demonstrated after a targeted 'Education Bundle' and neuroscience nursing clinical handover framework incorporating best practice was implemented. While it is suggested that the implementation of evidence based best practices and improving clinical handover will improve patient care and outcomes and reduce adverse clinical incidents this cannot be assured on the basis of this project alone. Some criteria measured in this project did not improve to a great degree with moderate increases in compliance

leaving plenty of room for improvement. By the end of the project however, attitudes to nursing clinical handover within the neurosurgical unit been 'transformed' from a passive, routine 'must do' task, to an active process with a focus on safety and patient/carer engagement.

http://www0.health.nsw.gov.au/policies/pd/2009/pdf/PD2009_060.pdf

Future audits are planned to ensure changes are sustained and improved with the aim that the neurosurgical nursing staff not only improves communication and patient safety but can give an individualised, tailored approach and instil confidence in our patients and their carers that the unit is doing all it can to provide them with high quality patient centred care.

Nil conflict of interests are declared.

Thanks are extended to the CB5F Neurosurgical Unit leadership team, clinical handover champions and staff.

(Appendix over page).

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Neuroscience / Brain Injury Community of Practice

Clinical Handover Ground Rules

CB4A - Neurology / Stroke Unit
 BIRU - Brain Injury Community of Practice

Handover is to start PROMPTLY at 0700, 1330 & 2130 hrs

Handover is to occur at the patients bedside

- If the patient is not on the ward during handover, staff are to address the patient & check charts as soon as they return

Confidential issues are to be discussed in a designated area away from the bedside

Patients (or NOK/family members when appropriate) must be engaged in the handover process

Patients are to be referred to by name, NOT bed number

- Ask patients/ family members what they prefer to be called

The electronic handover tool (adhoc) is to be used at all times

- To be up to date and printed before handover commences

All staff, from both shifts are to be present during the handover

All bedside charts to be checked/ completed during the handover

- Including specialty clinical charts E.G. GCS, Spinal Observations, PCA, Rhythm Strips etc.

CB4A & CB5F

If a staff member is late by 10 minutes or more the in-charge must be notified. If this occurs at 2130hrs then handover needs to be given to an appropriate delegate using the above expectations

BIRU

Handover will occur as a team.
All 16 patients will be included in each handover.

Unfinished tasks are to be handed over from shift to shift



Standard 6: Clinical Handover

September 2015

The Life and Trials of a Pseudomeningocele.

Larissa Engel, Maira Manch

Abstract

This case study introduces Ms Z. It discusses her story and the nursing care of her journey with a diagnosis of a pseudomeningocele. This case study was developed using direct interviews with the patient, discussions with the patient's surgeon, research articles, viewing scans, photos and using the patient's clinical notes. The patient's journey with the pseudomeningocele spans over a 20 year period with many up's and downs throughout, resulting with what is hoped to be a better quality of life.

Ms Z's symptoms started at the age of sixteen. She experienced severe headaches when she coughed or laughed and was seen by a neurologist at the time but no clear diagnosis was made. Her symptoms continued and after multiple medical appointments, a diagnosis of Chiari Malformation was made. She had her first surgery in 2013 after which Ms Z reported her complications began to occur. She moved to New Zealand and started to get more unwell and presented to a rural emergency department (ED). She has undergone multiple procedures in New Zealand including long term intravenous (IV) antibiotics resulting from an infection previously undiagnosed. Nursing considerations will be discussed throughout the case study including peri and post-operative care for neurosurgical patients with pseudomeningoceles, complications to be aware of, and holistic support for patients - physical, emotional and psychological.

Keywords: *Pseudomeningocele, infection, cerebellar herniation, nursing care.*

Background

This case study centres on Ms Z, a female in her 30's. Her medical history includes anxiety and obsessive compulsive disorder- with a family history of major psychotic disorders, irritable bowel syndrome and a previous miscarriage.

Symptoms of severe headaches that increased when she coughed, sneezed and laughed first appeared when she was sixteen years old but was not considered significant at the time. She saw several neurologists but all tests could not find anything significant. Finally after suffering pneumonia that had worsened her severe headaches, Ms Z without any focal neurological deficits, underwent a MRI which revealed she had a 14mm Chiari malformation.

A Chiari malformation is a condition where brain tissue extends down into the spinal canal and occurs when the skull is abnormally small (National Institute of Neurological Dis-

orders and Stroke, 2015). She was then referred to a neurosurgeon for surgery.

This decision was further complicated by Ms Z's desire to have a baby, in which case without surgery, her condition could potentially worsen when in labour.

In November 2013 she had a posterior fossa decompression and C1 laminectomy with dural repair using a tissue graft from her back and surgical glue. Post-operatively Ms Z while reflecting on her care commented that perhaps more precautions could have been taken. For example she stated no in-dwelling catheter (IDC) was inserted while on complete bedrest and due to constant morphine injections she developed constipation that was untreated for seven days. Both of these involved straining causing pressure.

Initially Ms Z progressed well, but a few weeks after she was discharged, she started experiencing postural headaches. A MRI revealed complications of a collection of occipital cerebrospinal fluid (CSF). Ms Z was advised to rest in bed for four weeks to attempt to seal the dural membrane conservatively. She was seen by both her neurologist and neurosurgeon. She underwent a second surgery in February 2014 to repair the dural tear

Questions or comments about this article should be directed to Larissa Hines (Engel), Registered Nurse, Christchurch Hospital, New Zealand at Larissa.hines@cdhb.health.nz

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using artificial tissue. Ms Z thought the surgery was successful, and felt well for several months.

She then started to experience increasing pressure headaches and went back to her neurosurgeon in April 2014. After reviewing her MRI, the surgeon reassured her that no further surgery was required. On this MRI a floating object was seen and explained as debris, possibly remnants of the glue used. In July 2014 Ms Z noticed a bulge forming at the back of her neck. Her general practitioner referred her for a second neurosurgical opinion. This occurred in late October when she was told that she had a CSF leak into her posterior neck separating the muscles. This was a pseudomeningocele forming. It was drained by percutaneous aspiration and she was given a tight headpiece to wear to assist with decreasing the swelling. While this procedure was high risk for infection, it seemed to have an effect for a short while. There is limited information that defines a pseudomeningocele due to different etiology. However, to simplify, a pseudomeningocele is a collection of CSF encased by a fibrous capsule resulting from a dural tear either post-operatively or more rarely, a traumatic event (Hawk & Kim, 2000). In Ms Z's case it occurred post operatively.

Dural tears can be difficult to heal due to scar tissue, infection, nutritional deficits and elevated CSF pressure (Dafford & Anderson, 2015). A pseudomeningocele communicates with the CSF space of the brain and spine and differs from a meningocele as it is not lined by dura (Hawk & Kim, 2000). The risk of having a pseudomeningocele after posterior fossa surgery is approximately 15-28% but the pathophysiology of why this happens is poorly understood (Roland, Marple, Meyerhoff & Micky, 1992). Ms Z maintains she was not told that the dural tear occurred.

At this point Ms Z and her partner moved to New Zealand. She presented to a small rural hospital with severe headaches, parasthesia in both hands, mild photophobia and a non-reducible pseudomeningocele. She was transferred to Christchurch Hospital under the care of a neurosurgeon. Image 1 & 2 were taken on arrival at Christchurch Hospital showing a large pseudomeningocele with the floating "debris" seen at the base. Image 3 is Ms Z with a very obvious sub-occipital bulge in her neck.



Image 1 (Above): MRI on arrival.

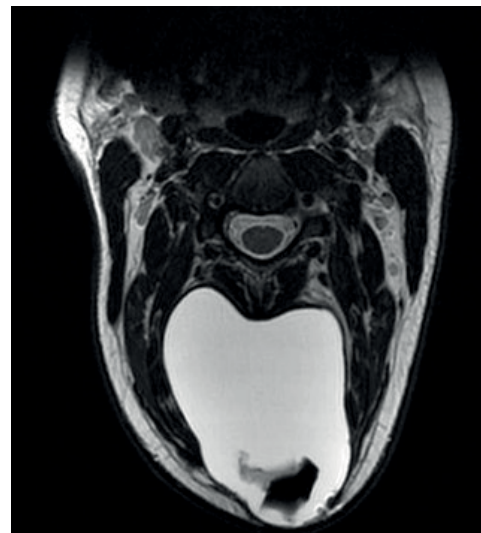


Image 2 (Above): MRI on arrival.



Image 3 (Above): Showing the bulge in the back of the neck.

Treatment in Christchurch

When dealing with a pseudomeningocele the usual non-invasive measures include bedrest, involving elevating the head of bed, acetazolamide (Diamox) and steroids (Couture & Branch, 2003). More invasive treatments include percutaneous aspiration which involves the evacuation of fluid from a space below the skin with a needle, catheter or syringe in a cavity or space. Other treatments involve surgical exploration to determine other factors that can be causing the pseudomeningocele and lumbar drainage involving insertion of an extraventricular drain (EVD) and lumboperitoneal (LP) or ventriculoperitoneal (VP) shunts to drain and divert the flow of CSF (Couture & Branch, 2003).

On admission, Ms Z had a lumbar drain (LD) inserted with an opening pressure of 35mmHg which is considered quite elevated, normally it should be between 0-15mmHg (Barker, 2008). A CSF sample revealed protein levels of 1.86 g/L; normal is considered 15-45mg (Cerebrospinal Fluid, 2013). The white cell and red cell count were unremarkable. The gram stain was negative.

Soon after the insertion of the LD the pseudomeningocele reduced and symptoms were resolving. An LP shunt was then inserted to divert the flow of CSF to allow healing. Unfortunately a CSF culture from the initial LD insertion then grew *Propionibacterium acnes* (*P. acnes*). This is a gram-positive human skin organism that prefers anaerobic growth conditions (Bhatia, Maisonneuve & Persing, 2004). *P. acnes* is suspected to be discreetly involved in post-operative infections. It is of low virulence but found almost everywhere on the skin (Bhatia, Maisonneuve & Persing, 2004). A referral was made to the Infectious Diseases team who recommended treatment of benzylpenicillin and rifampicin which are both sensitive to serious staphylococcal infections (Bamberger & Boyd, 2005).

After two weeks, Ms Z's headaches and pseudomeningocele had returned. Tests showed the infection was still persistent but subclinical. The team decided to remove the LP shunt, continue with the antibiotic therapy and insert another LD. Along with removing the LP shunt the team removed the "debris" seen in the MRI and performed a dural repair with fascia lata graft which involved a graft from Ms Z's thigh muscle. The neurosurgical team worked with a plastic surgeon to perform the left upper trapezius flap reconstruction in which the trapezius muscles were used for

the reconstruction of Ms Z's neck (Yoon, S, Song, Kang, Yoon, Y, Koo, & Oh, 2012). The "debris" was sent for histology and was found to be the source of infection.

Postoperatively CSF samples showed improvement. Ms. Z's surgical wound was healing well and there was no evidence of the pseudomeningocele. The LD was left open for a week, draining 10-15ml/hr. Ms Z was kept in the neurosciences progressive care unit (a four bed unit within the ward allowing 1:2 nursing) post-op for close monitoring during this time.

Further Complications

On day 7, a routine MRI (see image four) revealed asymptomatic cerebellar herniation with the formation of a syrinx. Cerebellar herniation (also known as coning) occurs when the cerebellar tonsils move downward through the foramen magnum causing compression of the brainstem and spinal cord (Barker, 2008). Increased pressure on the brainstem can result in dysfunction of the centres in the brain responsible for controlling respiratory and cardiac function (Barker, 2008). In Ms Z's case, the cerebellar herniation occurred due to the pressure of the LD, which promoted cerebellar sagging causing an abnormal CSF communication and resulted in the syrinx (Rubin, 2014). A syrinx forms due to partial obstruction of CSF flow and the CSF collects into a tubular cyst on the spinal cord. The syrinx resolved on its own when upward shifting of the cerebellar tonsils occurred (Rubin, 2014). The LD was then removed and replaced with a VP shunt. After the VP shunt insertion, Ms Z improved and was discharged home on IV antibiotics given by community health nurses.

Nursing care

Nursing care plays a major role in every patient's recovery. With Ms. Z, it was important that the nurses had the knowledge and skills to look after a patient with a lumbar drain, knew the disease process and what to observe (Palmer & Chiu, 2012). It is emphasised that nurses are skilled in recognising early intracranial pressure (ICP) changes. In Ms. Z's case this was challenging in that she was asymptomatic. It is important to keep patients on bedrest unless specified by the surgeon, and to limit activities that would contribute to increased ICP such as straining, coughing and pain (Hickey, 2009).

Nurses can assist in keeping ICP down by giving the patient adequate pain relief and stool softeners to avoid straining and provid-



Image 4 (Above): showing herniation and syrinx

ing a low stimulus environment. Nurses must remember to clamp the drain for any procedure or activity that would increase patient's ICP such as washing, pressure area cares, voiding, and vomiting (Lumbar CSF drain, 2015). Signs of increasing ICP include decreased level of consciousness, headache and pupillary abnormalities (Hickey, 2009). It is vital that nurses perform neurological observations a minimum of four hourly or more frequently depending on the need and vital signs are monitored. Any changes in the level of consciousness or a drop of two points from the previous Glasgow Coma Scale (GCS) score should be reported to the surgical team immediately. Throughout Ms Z's stay she maintained a GCS of 15/15.

As part of the nursing assessment, CSF should be monitored for any changes in the colour or appearance (Hickey, 2009). Typically normal CSF is clear, colour and consistency changes can indicate the presence of red blood cells, increased protein and increased white blood cells (Hickey, 2009). The drain height, patency, amount of CSF should be checked hourly and documented on the appropriate CSF monitoring form (Lumbar CSF drain, 2015). Observing the LD insertion site for any leakage is important as leakage indicates the drainage system is no longer sterile (Lumbar CSF drain, 2015).

Ms. Z had great support from her father and partner during her time on the ward. Involving the patient's family helps ensure the patient's specific cultural needs are met, especially if this patient is unable to communicate. It is important to explain to the patient and the family the reasons for maintaining certain bed

position or height so they can understand why this is necessary (Lumbar CSF drain, 2015). Involving the family in activities of daily living such as assisting with feeding or washing can help both the patient to feel more at ease and the family to feel more involved.

Low stimuli environments are vital for patient recovery, as stimuli can contribute to increase ICP (Lumbar CSF drain, 2015). Explain the reasoning for this to both the family and patient and emphasise that visiting hours are restricted in order to let the patient rest. Developing good therapeutic relationships with the patient is important, as being in hospital can be difficult and having the support of someone when family isn't around can be beneficial. Unfortunately during her last admission, Ms Z ended her relationship with her partner and this required extra emotional support and understanding from the nursing team.

After treatment

Ms Z was discharged from the ward to the community nurse for ongoing IV antibiotic treatment for a further three weeks. Outpatient follow up occurred three months later where she was found to be well and had no signs of a pseudomeningocele, or infection.

Implications for practice

There is little to be found in the literature surrounding the topic of nursing care of patients with pseudomeningoceles, leaving scope for nurse-led research in this area. The aim of this case study was to raise awareness of this neurosurgical diagnosis. This would help nurses to understand the anatomy and physiology of this condition and its associated complications in order to best address patient care.

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A Neurological Integrated Care Pathway

Kathleen McCoy, Harriet Chan

Abstract

Objective: To assess the feasibility of service integration for neurological care.

Design: Observation study

Participants: A total of 104 admissions for 92 neurological patients treated in a major region hospital and suitable for discharge home were eligible for participation.

Intervention: A neurological integrated care pathway (NICP) was trialled at a major regional hospital between July 2012 and June 2013. Objective data included patients, gender, age, diagnosis, length of hospital stay, referral dates, discharge dates, dates when patients were seen by the community neurological liaison nurse, and readmissions were collated for analyses.

Outcome measures: Targeted outcomes included the estimated service impact on the hospital in terms of reduced length of hospital stay and decreased readmissions and increased referral rate to community neurological support service, and quality of patient care.

Results: The trial saw an increase in efficiency and standard of care despite growth in patient numbers. The CNLN attended to 104 recorded referrals (more than 17 times the number of referrals in 2011), all within 7 days of their referral date (a 77.4% decrease compared to 2011 where patients were attended to up to 31 days). In addition, the average length of hospital stay had decreased significantly from 26 days in 2011 to 9 days (a 65.4% decrease) with a low rate of re-admission (approximately 11.5%).

Conclusion: The NICP improved service efficiency for both the hospital system and the community neurological support service, with high levels of patient satisfaction. In this case the NICP achieved best value from existing resources and provided a viable model of service delivery for chronic neurological conditions.

Key words: integrated care pathway, community neurological support.

Introduction

About 9 years ago the World Health Organisation [WHO] pronounced that "neurological disorders will be one of the greatest threats to public health" (World Health Organization, 2006). Neurological conditions including mental disorders are diseases of the brain, spinal cord, peripheral nerves, and neuromuscular tissues (World Health Organization, 2014). There are more than 600 known neurological conditions (National Institute of Neurological Disorders & Stroke, 2014) of traumatic, primary or acquired nature, and their presentations may range from episodic, progressive or relapsing states. Neurological diseases affect all ages but are more common in people older than 45 years (MacDonald, Cockkerall, Saner & Shorvon, 2000). It is a fact that most neurological conditions pose a degree of disabling impairments, functional limitations and

chronic suffering on the individuals thus increased utility of hospital, health and care services. That is, a person living with a neurological condition often has numerous complex needs which tend to escalate over time and require continuous or periodic input from a wide range of health and support services (Freeman & Thompson, 2000; Boter, Rinkel, de Haan & HESTIA Study Group, 2004).

Though neurological care in Australia accounts for the second largest health expenditure (National Health Priority Action Council, 2006) service gaps exist. This is due to the increasing prevalence of neurological conditions and accumulation of needs and demand of the neurological community by large. In Western Australia (WA) a Neurocare program was developed in late 1990s as a measure to improve access to neurological support by people living within rural regions. The Neurocare program is led by community neurological nurses (CNNs) and funded by the Home and Community Care (HACC) Western Australia Department of Health. The CNN practice is supported by a postgraduate communi-

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Diagnosis	Gender	Age (yr)	No.	LOS (days)	Readmission within 28 days of separation	Days taken to be seen by CNN
Parkinson's disease	M	61	1	28	0	35
Left stroke	F	64	1	32	0	30
Right stroke	M	53	1	21	0	31
Left stroke	M	67	1	24	0	29
Parkinson's disease	M	70	1	42	0	30
Herpes simplex right eye	F	68	1	14	0	32
Mean		63	6	26	0	31

Table 1 (Above): Patient Profile of Referrals to the Neurocare Program in 2011

ty neurological nursing qualification, which emphasizes person-centre wellness principles from the International Classification of Functioning, Disability and Health framework (World Health Organisation, 2002). These CNNs have wide ranging local service knowledge and navigating skills that drive the best health outcomes for people living with a wide spectrum of neurological conditions. They guide, support and connect individuals to primary care, specialists, health care as well as many support and social services. They also provide education to the wider community and other health professionals and caregivers. More importantly this specialised nurse support service plays a vital role in managing health in all stages of a neurological disease, thus it has the potential to free up scarce health resources. The Neurocare program is gaining international standing and recognition; and evidence is mounting that many organizations are beginning to align their disease-specific service with this model of generic nurse-led neurological service. Similar programs of generic community neurology service have been cited in the literature (Jack, Kirton, O'Brien & Roe, 2009).

Nature and Significance of the Problem

In discussions with a WA Health Services senior executive (August, 2011), it was found that neurological patients account for at least one third (39%) of daily hospital bed usage. It was also noted there was an upward demand trend for neurological care which will continue to increase as the population grows and ages. In fact, in 2012 there were 31,804 hospital admissions due to primary nervous system diseases, and these admissions accounted for a total of 340,627 hospital bed-days (Government of WA, 2015).

Furthermore, current resources for neurological services in WA appear to be disproportion-

ately distributed. This has created an inequitable access issue between the metropolitan service hub and services within the rural regions. For example, only one neurologist visit occurs in the mid-west region on a quarterly basis and recently in the great southern region; and occasional telehealth consultations on demand from south-west region. It is common knowledge that this system-wide service access issue will continue to be a challenge over the next decade.

The Neurocare program is the preferred community generic neurological support service provider within major rural regions of Western Australia (Neurological Council of WA, 2015). The provision of evidence based neurological support has up till now been limited to non-hospital involvement, precluding the community neurological nurses from participating in the vital discharge planning and community care coordination for in-hospital patients with neurological conditions. A retrospective review of the south-west region Neurocare service revealed that only 6 referrals from the local regional hospital were received in 2011 (Table 1). Of the 6 patients referred, 4 were males aged between 53 and 70 years, and 2 were females aged 64 and 68 years; 2 males and 1 female had a stroke, 2 males had Parkinson's disease and 1 female had herpes simplex infected right eye; and the average length of hospital stays was 28 days (14 and 42 days). All 6 patients had their referrals initiated on the day of separation from the hospital to home; the average time taken by the community neurological nurse to make contact with these patients was 31 days; and there was no record of any re-hospitalisation within the first month of discharge home. From this review the Neurological Council of WA identified a gap as a key priority for improvement; this gap was the root cause for low referral rate and access delay to community specialised neuro-

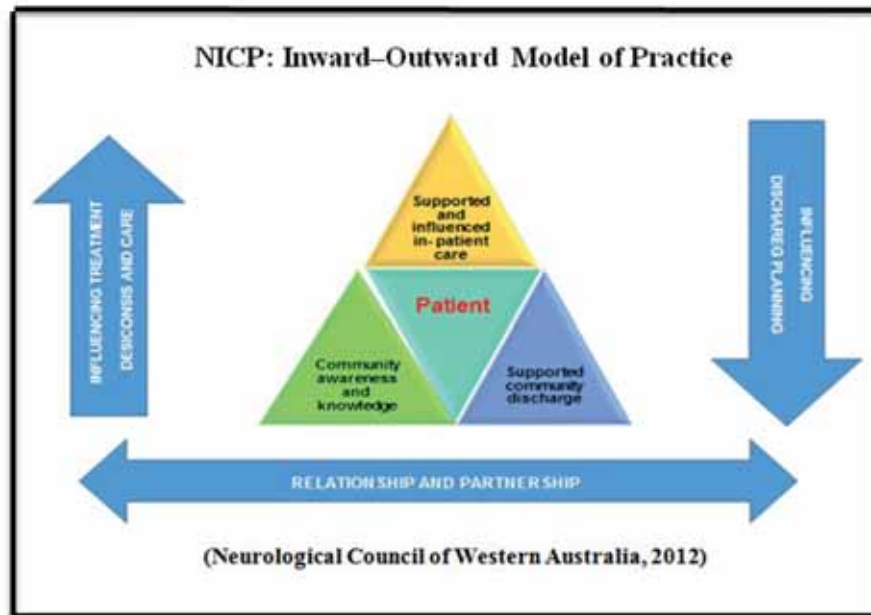


Figure 1 (Above): NICP: Inward-Outward Model of Practice

logical support, increased length of hospital stay and a stymied patient flow system. This gap was deemed to have significant impact on both the hospital system and the community support service delivery, and considered remediable through better utilisation of existing resources.

Setting and Project Design

Both the local regional hospital and the Neurological Council of WA's Neurocare program served to provide hospital care and community neurological support, respectively in the south-west region of WA. In 2011 a unique opportunity arose for service re-design. The local regional hospital and the Neurological Council of WA had been successful in obtaining a grant from the WA Health's Clinical Integration and Innovation Grant of the Quality Incentive Program (QUIP) for a co-design project.

This project involved a new approach to service delivery, a neurological integrated care pathway (NICP), which is based on an inward-outward model of practice (Figure 1). This model integrated acute care and community support services so to create an 'express access to community neurological support' that would improve the discharge process. Operational procedures and documents were developed to formalise this practice change, all framed in the context of what was best for patient care.

A community neurological liaison nurse

(CNLN) position was created and funded by the QUIP grant. The Neurological Council of WA developed the job specification form with selection criteria, and became the governance organization for this position. The successful applicant was a community neurological nurse in the Neurocare program who had the knowledge of locally based services and neurological nursing support expertise. The role of the CNLN had been recognized as a key success factor for the day-to-day partnering and care team processes as well as the overall project.

Key Outcome Measures

The project's key outcomes included estimated service impact on the hospital system and the Neurocare program, and quality of patient care.

Method

Adult neurological patients treated in the major regional hospital and suitable for discharge home were prospectively enrolled into the NICP between July 2012 and June 2013. Nurses were asked to record on each patient's NICP when a referral to the Neurocare program was initiated. The CNLN also recorded the dates on the NICP when she saw the patients. The CNLN served as the 'express referral system', this was made possible through her regular attendance and participation in the weekly multidisciplinary team meetings. The CNLN was responsible for collection of the project data, which included patients, gender, age, diagnosis, length of hospital

Diagnosis	Gender	Age (yr)	No.	LOS (day)	Readmission	Days taken to be seen by CNN
Traumatic Brain Injury (ABI)	M	51	1	16	0	10
Corticobasal ganglionic degeneration	M	68	1	9	0	6
Dementia	M	64-71	5	6 - 10		3 - 9
	F	62-72	10	5 - 13	1	3 - 12
Epilepsy	F	50-51	2	6 - 8	1	6 - 7
Guillain Barré Syndrome	F	49-52	2	9 - 24	1	6 - 13
Huntington's disease	F	49	1	9	0	6
Motor Neurone Disease	M	65	1	13	0	5 - 6
	F	50	1	13	0	7
Multi System Atrophy	F	64	1	8 - 11	1	6 - 9
Muscular Dystrophy	M	46	1	7 - 8	1	6 - 8
Multiple Sclerosis	F	49	1	5 - 12	1	6
Parkinson's disease	M	45-65	33	5 - 13	2	3 - 10
	F	57-62	6	6 - 8		3 - 9
Progressive Supranuclear Palsy	M	63	1	8	1	6
	F	64-65	2	6 - 8		3 - 8
Stroke Syndromes	M	48-57	15	3 - 18	3	5 - 15
	F	63-69	8	6 - 24		3 - 19
Mean		63	92	9	12	7

Table 2 (Above): Patient Profile of Referrals to the Neurocare Program during trialled period.

stay, referral dates, discharge dates, dates patients first seen by the CNLN, and readmissions. This dataset was analysed to ascertain the service impact on the hospital system and the Neurocare program, and quality of patient care including patient satisfaction ratings. Patient satisfaction was assessed by asking the patients or their carers to complete a survey form at 3 months after the initial referral date. All information was treated in a way that complied with ethical requirement of anonymity and confidentiality.

Results and Outcomes

There were 104 admissions for 92 patients as shown in Table 2. Of the 92 patients 39 (42.4%, 33 males aged 45-65 years, 6 females aged 57-62 years) had Parkinson's disease, 23 (25%, 15 males aged 48-57 years, 8 females aged 63-69 years) had stroke syndromes, 15 (16.3%, 5 males aged 64-71 years, 10 females aged 62-72 years) had dementias, and the remaining 15 (16.3%, 6 males aged 46-62 years, 9 females aged 49-65 years) had various neurological diagnoses.

Estimated service impact on the hospital system:

The average length of hospital stay for the cohort was 9 days and there were 12 patients readmitted during the pilot period, approximately 2 readmissions every 3 months. The average length of hospital stay had decreased significantly from 28 days in 2011 to 9 days currently (a 65.4% decrease) with a low rate of re-admission (approximately 11.5%). These results were of clinical importance in terms of efficient hospital bed use and patient flow impact.

Estimated service impact on the Neurocare program:

The 104 referrals represented more than 17 times the number of referrals in 2011. The CNLN attended to all referrals within 7 days of their referral dates, this demonstrated a 77.4% decrease compared to 2011 where patients were attended to up to 31 days. These results showed a promising upward change in service throughput for the Neurocare program.

Quality of patient care: Quality of patient care referred to the deliberate engagement of

Question	Yes	No	Blank	Responses
Did the community neurological liaison nurse (CNLN) meet any of you family and/or your carers in the hospital?	59 (93%)	4 (7%)		I am XX's carer and find so good and caring. I, my husband and daughter met the nurse when she visited us at home
Did you find the information provided by the CNLN useful?	60 (95%)	3 (5%)		Useful and appreciated Very useful, if not for them we would find it a difficult time managing
Did the CNLN visit you at home?	60 (95%)	3 (5%)		I was able to talk to her and my anxiety lessened
Did the CNLN provide you with any help or information that you think you may have not received without her service? (e.g. specialist knowledge/information)	54 (85%)	2 (3%)	7 (11%)	Specialist knowledge and professional experience gave one confidence and hope
Is there ongoing engagement for you in the Community?	55 (87%)	3 (5%)	5 (8%)	Group support meetings are helpful and I hope she can maintain contact
Helpfulness rating of the Community Neurological Nurse Service. Score: 0 = not helpful to 10 = excellent service				
Not very helpful	Score 0 x 5 (8%)		Very helpful	Score 7 x 28 (44%)
Helpful	Score 5 x 5 (8%)		Excellent	Score 10 x 25 (40%)
Any other comments you would like to share? In most instances the journey with PD is like groping in the dark and it is hard to know what is okay and what services can be accessed, this is knowledge and support provided by the Community Neurological Liaison Nurse. Having the Community Neurological Liaison Nurse at the XXX Support group has been excellent. I have been assisted immensely, both in understanding my condition and learning how to keep well and the services available.				

Table 3 (Above): Patient Satisfaction – Results of survey by patients/carers of the cohort (Response Rate was 58%).

patients and their family carers with education and advice relevant to actual and possible effects of their conditions including those self-management skills for living with the particular neurological condition by the CNLN, and the early linkage with the CNLN who would be their primary neurological nurse in the community. Of the 104 referrals 99 were first seen in the hospital and only 5 were first seen one to two days after discharge home by the CNLN. The impact of this deliberate approach to care included high patient satisfaction ratings and low readmissions. Patient satisfaction ratings were obtained from the survey forms completed by 63 patients. As shown in Table 3, the satisfaction ratings were extremely high. The low readmissions rate could be

inferred as less morbidity and relatively good health for the cohort under the support of the Neurocare program.

Conclusion and Discussion

Traditionally referrals to a community service agency occur by chance or are stimulated by crisis and the emergence of a particular problem (Freeman & Thompson, 2000; Boter et al., 2004). Indeed, the NICP with the inward-outward model is superior to that of the traditional referral system for it serves as a continuity thread for smooth transitioning of care between hospital and home. The inter-professional exchange between hospital and community services is in itself an invaluable resource of relationship development and ser-

vice integration (Aspinal, Bernard, Spiers & Parker, 2014). This may include the transfer of understanding, knowledge, insights and skills in self-management, symptoms and lifestyle influencing factors that help in care decisions and problem solving. More importantly the patient journey home was fully supported and positively influenced through this service integration. The NICP with the inward-outward model has been proven to be a practical method of resource utilisation in health service provision, and that it can be easily reproducible and sustainable. This new model of service delivery may also offer a cost-saving opportunity in terms of reduced length of hospital stay, readmissions and hospital bed use as well as improved patient flow.

Whilst acknowledging that the project has ended in June 2013 the new practice continues to be used in its original frame. The continuing flow of referrals to the Neurocare program clearly demonstrates true consolidation of the practice change. In this case service integration has achieved the best value from existing resources and can be regarded as a viable model of service delivery for long term neurological conditions.

Strength and limitations

The strengths of this observational study included a large sample size in a major regional hospital, the inclusion of service impact of both hospital system and community support service and quality of patient care as outcomes. Future work needs to focus on maintaining long-term sustainability of this new model of practice. The limitations include the lack of a control group, and data collection by a person who was not blinded to the study.

Conflicts of interest

None exist.

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This prize is in honour of our colleague Louie Blundell and will be awarded for the best neuroscience nursing paper by a student submitted to the Australasian Neuroscience Nurses Association (ANNA) for inclusion in the *Australasian Journal of Neuroscience* by the designated date each year. The monetary value of the prize is AUD\$500.

Louie Blundell, was born in England, and although she wanted to be a nurse she had to wait until after World War II to start her training as a mature student in her late twenties. Later she and her family moved to Western Australia in 1959. She worked for a General Practice surgery in Perth until a move to the Eastern Goldfields in 1963. Subsequently, she worked at Southern Cross Hospital and then Meriden Hospital. During this time she undertook post basic education to maintain her currency of knowledge and practice, especially in coronary care.

Louie was also active in the community. She joined the Country Women's Association and over the years held branch, division and state executive positions until shortly before her death in 2007. She was especially involved in supporting the welfare of students at secondary school, serving on a high school hostel board for some time.

She felt strongly that education was important for women and was a strong supporter and advocate of the move of nursing education to the tertiary sector, of post graduate study in nursing and the development of nursing scholarship and research, strongly defending this view to others over the years.

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