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Australasian Neuroscience Nurses Association

Journal of Neuroscience Nursing

c/- PAMS, PO Box 193, Surrey Hills.

Victoria. 3127.

Tel: (+61 3) 9895 4461

Fax: (+61 3) 9898 0249

ANNA website – www.anna.asn.au

Journal Editor

Vicki Evans

editor@anna.asn.au

Editorial Board

- Jacqueline Baker
- Jeanne Barr
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president@anna.asn.au

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Editorial

Editor - Vicki Evans

Have you ever wondered if you made a difference? How can you make a difference when surrounded by budgets in deficit, staffing issues and endless rainy days?

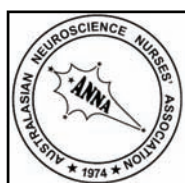
Then you find someone that makes it all worthwhile. I found that person recently on a visit to another ward— an orthopaedic unit where I was asked to see a multitrauma patient who had a CHI with frontal contusions. She was 64yrs old, “inappropriate” and “confused at night”. We expect ‘frontal behaviour’ in the neuro units, but they don’t in other wards. Her husband was anxious, as was their grownup daughter. We talked about head injuries, post traumatic amnesia (PTA) and analgesics in the presence of head injury. She was where I would expect her to be - given her injuries and mechanism of injury. This family just needed some of my time. I answered their many questions, explained the mechanism of injury, had her analgesics changed and we had a rehabilitation plan in progress. I made a difference.

The following Guest Editorial is from a man who makes a difference — Paul van Keeken. Paul is the President of the European Association of Neuroscience Nurses (EANN). The EANN is an organisation that aims to promote high standards of neuroscience patient care and continuing professional neuroscience education through supporting the exchange of information between neuroscience nurses across Europe. EANN Members include— Belgian, British, Croatian, Danish, Dutch, Finnish, Icelandic, Swedish and Swiss Associations of Neuroscience Nurses.

We’re all neuro nurses. We make a difference all the time, but rarely do we stop to think about it. Where did you make a difference today?

Cheers,

Vicki



Guest Editorial



Paul van Keeken

President, European Association of Neuroscience Nurses (EANN)

Connecting people ~

It’s the famous slogan of Nokia, producer of communication devices. I think it’s an excellent slogan because it’s very simple, attractive, universal and it explains the complete mission and core activities of a big company in just two words. It’s so brilliant I wish I’d invent it, but I’m not that creative!

Connecting people is what happens all over the world these days. Communication tools like Facebook and Twitter are booming. They create worldwide social networks where people meet, exchange information, work together and solve problems.

Connecting neuroscience nurses is one of the core activities of national associations of neuroscience nurses. By connecting nurses, managers, researchers and educators in workgroups and task forces all associations work on the interests of the profession of neuroscience nurses. They provide evidence for neuroscience nursing care, build a body of knowledge, develop curriculum education and so on. More and more you see those associations use modern communication techniques on the internet. Those techniques make sharing information easier and they facilitate cooperation time and place independently. Sometimes those initiatives develop into real social networks for neuroscience nurses.

Organisations like the World Federation of Neuroscience Nurses and the European Association of Neuroscience Nurses support the connection of neuroscience nurses on an international level.

They publish international newsletters, provide travelling grants and organise international congresses. Modern communication techniques make those organisations strong by facilitating worldwide communication, exchange of ideas and cooperation. Now it is possible to form a worldwide group of researchers in the field of

neurosciences and let them work together and communicate via the internet.

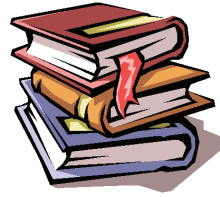
Another example is educators and teachers sharing curricula, lessons and learning materials. Together they can develop courses and educational content like patient cases and patient videos, which is efficient and saves costs.

Connecting neuroscience nurses is one thing. There is also a tremendous need to connect neuroscience nurses with other groups and organisations. New chances and opportunities are very big and could be expensive, eg: the development of e-learning tool. To make use of all possibilities that modern techniques offer, organisations have to deal with finances and how to organise and run new systems. They need to cooperate with strategic partners like the International Council of Nurses (ICN) and World Health Organisation (WHO) to help them. In return, those partners need neuroscience nurses to solve problems caused by, for example, the aging population in western countries or to provide professional care in developing countries.

'It's a small world' is the title of the previous inspiring column of WFNN President Virginia Prendergast. Let's work on creating open social networks for neuroscience nurses, improving international cooperation and cooperation with strategic partners. In doing this, neuroscience nurses can make a difference and contribute to solutions for big problems. We can make this world a little bit smaller.

Paul

President, EANN
p.vankeeken@neuro.umcn.nl



Book Reviews

By **Dr Geoffrey Herkes**, Head, Dept of Neurology, RNSH. Clinical Assoc. Prof of Medicine, Northern Clinical School. University of Sydney.

Automated EEG-Based Diagnosis of Neurological Disorders by Adeli and Ghosh-Dastidar. CRC Press, 2010.

This monograph is authored by two bioengineers with extensive experience in signal analysis, and discusses electroencephalographic (EEG) analysis from this viewpoint. The book is divided into several sections, with the introductory segments being of especial interest to a clinician wishing to understand the concepts of automated signal analysis. Sections on analysis of waveforms in epilepsy follow, which are also useful discussions of this area. Some of the mathematics may appear daunting to the clinician, but generally the book is well set out, and has useful illustrations to guide the reader. A method of EEG analysis for seizure detection is presented which uses sub-band analysis, and the results are discussed as being of greater diagnostic usefulness than other current methods. The final few chapters discuss Spiking Neural Networks and give some views as to the future areas for research.

Overall, this is a useful book to clinicians or technologists working in the area of EEG or its analysis. My only criticism of the book is that some of the claims of the usefulness of the technique (eg the subtitle: "Inventing the future of Neurology") is unproven and speculative. However, the book is still of interest to biomedical engineers, students and neurologists.

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Letters to the Editor



From: Serene Tan -
APN Intern. Tan Tock Seng Hospital, Singapore.

I have just completed my 18-month Masters of Nursing studies at the National University of Singapore and am

currently embarking on my new role as an Advanced Practice Nurse (APN) Intern in Neurosurgery. As part of my development as a Neurosurgical APN, I made arrangements for a four-week clinical attachment with Sydney's Royal North Shore Hospital. The objectives of the attachment were to gain insights into the roles, responsibilities and scope of work of a Neurosurgical Nurse Practitioner (NP) in an Australian setting.

The clinical attachment was an exciting and enriching one. Not only did I get to observe and job-shadow two Neurosurgical Nurse Practitioners, special arrangements were made for me to learn and observe the roles of the Clinical Nurse Consultants from Neuroscience, Stroke, Spine and Rehabilitation. In addition, I was able to observe neurosurgical procedures in the operating theatre; follow the registrar on-call to the emergency room; participate in the ward round; see patients in the outpatients' clinic and attend ward-based in-services. I was glad to be given an opportunity to share with the ward nurses about "Nursing in Singapore".

The multidisciplinary case conference facilitated by the NPs demonstrated much communication, collaboration and team work among the Neurosurgical Nursing, Medical and Allied Health team.

Another aspect of the APN role which I admired was the involvement and willingness in sharing and imparting knowledge to the nurses. The NPs and CNCs are involved in the academic teachings in the university and are actively engaged in presenting papers at neurosurgical nursing conferences.

I want to thank RNSH and the neurosurgical team for allowing me to learn from you. I want to take this opportunity to thank all involved in making my trip possible and encouraging me to share my experience.

- Serene Tan

Visiting Academic



Prof. Nobuko Okubo

Last year, under the auspices of WFNN, I was approached by a member of the Japanese Association of Neuroscience Nurses

with a request to mentor a Nursing Professor during her sabbatical to Australia. She was also spending time in the UK and USA during 2010.

Nobuko Okubo is an Associate Professor of Nursing from St Luke's International Hospital in Tokyo, Japan. Her goals were to look at the differing roles of Neuroscience Nurses in Australia, UK and USA, to formulate a global plan of care for the dysphagic patient, to observe the differing ways Stroke is managed, to look at the wide range of nursing positions available in each country and how they interact for the benefit of the patient, and to put into practice at home, what she has learnt abroad.

After many months of correspondence and paperwork, Nobuko arrived in Sydney on April 10th. I had liaised with many neuroscience colleagues throughout Sydney to assist in this study, including the teams at the following hospitals — Royal North Shore, Gosford, Wyong, Westmead, Westmead Private, and the University of Technology, Sydney.

Whilst here Nobuko had the chance to participate in education sessions, including giving a picture of neuroscience nursing in Japan as well as presenting her paper—"Backless Chair for sitting position without Back Support". She observed the nursing roles of EN, TEN, EEN, RN, CNS, NUM, CNE, CNC and NP, as well as the multidisciplinary team members on the neurosurgical service.

Occasions such as this allow for promotion of international relations as well as potential for collective research.

Currently Nobuko is undertaking a neurosurgical nursing course at the Barrow Neurological Institute in Phoenix, Arizona. She will publish her research findings with us next year.

Vicki Evans - Editor

Long Term Facilitation of a Hospital-based Brain Tumour Support Group: Trials and Triumphs of a Seven Year Journey.

Kylie M Wright, Theresa Simpson

Abstract

The diagnosis of a brain tumour (BT) is a catastrophic life event. Surgery, radiation therapy and chemotherapy encompass the biological, disease-related facets of this condition yet the psychosocial effects of a brain tumour diagnosis and its treatment have enormous impacts on quality of life. These patients and their family members are a vulnerable group, with specific needs, requiring immense support.

The Liverpool Hospital Brain Tumour Support and Education Group (BTSEG) commenced in September 2003 with the aim of providing practical and emotional support to BT patients and their family members. This collaborative initiative, between the Liverpool Hospital Department of Neurosurgery and Cancer Therapy Centre, has been evaluated on an ongoing basis and group participants have continually highlighted the positive benefits gained from these meetings and reinforced the necessity for continued support.

This paper describes the processes for planning and maintaining a BTSEG including the team, program development and delivery, group evaluation patient/carer feedback, and long term progress. Experiences, achievements, and secondary projects that have occurred throughout the seven-year journey will be highlighted.

Key Words: Brain Tumour, Support Group

Background

The number of newly diagnosed primary brain tumours in Australia is over 1400 cases each year (Cancer Council Australia, 2009), and although this is a small number when compared to other cancer groups, such a diagnosis has disastrous and disproportionate effects on patients and their caregivers. The sequelae of BT include physical, cognitive and behavioural impairments that can result in significant disablement and reduced quality of life (Weitzner, Meyers, and Byrne, 1996; Huang, Wartella, Kreutzer, Broadus, and Lyckholm, 2001; Simpson, Koh, Simpson, Wright, Firth, Whiting, and Younan, 2008). Following a brain tumour diagnosis, people are compelled to adapt to multi-layered life changes. As the disease progresses particularly in the high grade sub-group, the patient may undergo profound physical, cognitive, personality and behav-

ioural changes, and require high level care and 24 hour supervision. The course of the disease is complicated and unpredictable and as a result, individuals often experience anxiety and depression (Huang et al, 2001; Simpson et al, 2008). These patients and their family members require immense support due to their specific needs.

In general, support groups offer an opportunity to share experiences and emotions as well as exchange information. They are also a possible source of emotional support and therefore can contribute to the quality of life of patients (Ahlberg and Nordner, 2006; Catt, Chalmers, and Fallowfield, 2008; Leavitt, Lamb, and Voss, 1996). Specific brain tumour support groups have been available internationally for many years, but Liverpool Hospital in Sydney, Australia had traditionally not provided this type of service. Instead, these patients were integrated into existing general cancer support groups. Data reveals BT patients are a group with complex needs that differ from those of patients with other cancers (Catt, et al, 2008). General cancer support groups do not cater for the special needs and unique challenges associated with neuropathology. Hence, following

Questions or comments about this article should be directed to Kylie M. Wright, Clinical Nurse Consultant/ Case Manager, Liverpool Hospital
kylie.m.wright@swsahs.nsw.gov.au
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review of the literature and reflection of clinical experience, the overwhelming effects and extraordinary stressors experienced by patients and their family members after a diagnosis of BT was identified and the need for development of a BT specific support group was highlighted to provide optimal support to patients and carers during what is often the most difficult time of their lives.

Planning the Sydney South Western Area Health Service (SSWAHS) -Western Zone BTSEG

The broad aims behind starting the BTSEG was to cater for the special needs of people with BT and their families by:

Support

- Providing practical and emotional support to BT (malignant and benign) patients and carers
- Providing a setting that encourages supportive discussions about BT/cancer
- Building on a person's coping skills
- Encouraging social opportunities amongst people affected by BT/cancer

Education

- Further developing a person's knowledge of BT
- Offering a forum for people to meet and learn from others who have similar experiences and
- to provide this group at a local level, accessible to the people of SSWAHS.

The Team

An innovative method involving a coordinated approach between the Department of Neurosurgery and the Cancer Therapy Centre (CTC) was utilised. A patient-centred, multi-disciplinary care model was created by collaborating the services across surgery and cancer therapies, as well as nursing and allied health with the aim to provide optimal cancer care management. A planning trio consisting of the Neurosurgical Clinical Nurse Consultant and two senior Social Workers initially convened to:-

- Gain financial, administrative and professional support from medical colleagues, allied health staff and hospital administration.

- Review the existing cancer education programs (Anti-Cancer Council of Victoria, 1997), as well as relevant literature on group work and brain cancer.
- Use the Delphi Consensus Technique (Dick, 2000) to identify educational needs and relevant topics, and
- Draft a 10-session BT support and education program.

The plan was to have the group facilitated by two leaders, a senior neurosurgical clinical nurse consultant educated in neuro-oncology nursing and a senior oncology social worker with many years' experience working with cancer patients, experience with leading support groups, and a masters degree in counselling. The roles of the group coordinators was to create a non threatening atmosphere, provide structure and information, foster support, and encourage and facilitate discussion regarding the sharing and exchanging of experiences, emotions and information.

Program Development

The supportive care issues and needs of patients with BT are diverse and well described in the literature (National Institute of Clinical Excellence, 2009; Davis and Higginson, 2003). Informational and emotional support is important for holistic, patient-centred care and is critical to improving quality of life for patients (Ahlberg and Nordner, 2006; Jefferies, 2002; Veronesi et al, 1999) hence it was recognised that the support group would have the dual focus of providing information and educating participants via formal education sessions as well as providing a social, supportive focus via a social event program.

It was acknowledged that educational topics to be potentially presented at the BTSEG needed to address the wide range of physical, cognitive and behavioural impairments as well as their impact in terms of disabilities and restrictions (World Health Organisation, 2001). Via various focus groups and brainstorming sessions, special needs and relevant topics of this patient group were identified and initially a 10-session program was devised by the group facilitators with input from hospital neurosurgeons, oncologists, allied health staff, and consumers (See Table 1).

It was anticipated that some group participants were likely to present with some neurological deficits, including attention span difficulties, therefore shorter sessions were planned and strategies requiring recognition rather than recall memory were implemented. These included the development of a series of information resources, "Fact

Session	Topic	Presenter
Inaugural Program Outline – 10 sessions		
Session 1	Introduction and Sharing Stories	Group Facilitators
Session 2	What is a Brain Tumour?	Neurosurgical CNC
Session 3	Treatment for Brain Tumours: Surgery Radiotherapy Chemotherapy	Neurosurgeon Radiation Oncologist Medical Oncologist
Session 4	Functional Changes: Physical Communication Vision	Physiotherapist Speech Pathologist Orthoptist
Session 5	Living with a Brain Tumour: Seizures Managing Medications Driving – Restrictions & the law	Neurosurgical CNC Neurosurgical CNC Rehabilitation Consultant
Session 6	Challenges, Resilience & Community Resources	Cancer Therapy Social Worker
Session 7	Changes to Cognition- Personality & Behaviour	Cl. Neuropsychologist
Session 8	Diet and Brain Tumours Sexuality, Relationships & Body Image	Cancer Therapy Dietitian BIU Senior Social Worker
Session 9	Stress Management and Relaxation	Clinical Psychologist
Session 10	Surviving a Brain Tumour	Group Facilitators
Additional:	Fatigue – “How to look after yourself”	Oncology CNC
	Cognitive re-training	“Headway” rep.
	How an OT can help you	Occupational Therapist
	Carer’s Assoc. What they can offer!	“Carer’s Association” rep.
	Carer’s Experiences – at home	Carer
	Tai Chi – An Introduction class	Tai Chi Instructor
	Cant seem to get started?? Apathy	Clinical Psychologist
	Panel of Experts – Come with your questions	MD, CNC, OT, Npsych, Oncologists, Social Work

Table 1: Program Outline

Sheets", and a Brain Tumour Resource CD-ROM to assist people with memory impairments.

Participants

Group members are recruited by mailing an invitation to attend within four weeks of diagnosis. All primary malignant and non-malignant brain tumour patients (including pituitary adenomas) and their families are invited. Group co-ordinators speak directly with patients and family members whilst they are inpatients on the neurosurgical ward, introduce them to the concept of the group and leave them with written information about the program. Furthermore, posters and brochures are displayed advertising the group program on the neurosurgical ward, cancer therapy centre and in the neurosurgeon's private consultation rooms.

Program Delivery

Invited speakers are selected on the basis of their expertise in neuro-oncology and their capacities to communicate complex information into simple plain English.

The group is registered with Regional Cancer Care Services, the NSW Cancer Council, the NSW Cancer Institute, the International Brain Tumour Alliance, the Brain Injury Association of NSW, and Headway – Adult Development Program. Referrals from these organisations are also welcomed as well as from other Sydney-based Area Health Services.

The Liverpool Hospital BTSEG held the inaugural meeting in September 2003. An initial evaluation of the first meeting and the following 10 session program showed extremely positive results with participants increasing their understanding in all subject areas and enjoying being part of the group. An ongoing evaluation process was factored in to all group sessions and seven years later the group continues with great success. For the first two years the group was held on a fortnightly basis and from 2006 onwards meets monthly. Evening sessions were chosen, initially, to maximise the opportunity for carers to attend but also facilitate the attendance of individuals with BT who were dependant on their carer for driving and transport. In 2009, the time was re-scheduled from an evening to a daytime meeting which saw an increase in attendance.

Evaluation

Overall, the development of a BTSEG has been a successful and positively evaluated initiative. Throughout the seven years, the group has been well attended by patients (n=60) as well as carers and family members (n=48). A diverse range of

topics are covered and continually refined based on group member requests and evaluations. Evaluations occur on an on-going basis by conducting pre and post group questionnaires at each group meeting and a formal bi-annual evaluation of the group program. A purpose designed 8-item evaluation measure was devised to assess support group sessions. Four items assess pre and post participant knowledge of the BT topic being presented, and an additional 4 items assess the workshop content and process. Items are rated on a 4-point Likert scale (where 1 = 'not at all' and 4 = 'a lot' or 1= very poor and 4=very good) measuring the participant's knowledge and thoughts on the session in general. Participants complete the evaluation prior to the session commencing and then at the conclusion of the meeting (average response rate =92%). Furthermore, an overall evaluation measure was also purpose designed allowing participants to evaluate all aspects of the BT support group over a 6 monthly time frame. This tool similarly uses a 4-point Likert scale (where 1= very poor and 4=very good) and allows the opportunity to provide qualitative information about the session content, group process, and areas for improvement. This evaluation is administered on a bi-annual basis (average response rate 86%).

Throughout the past seven years, recurrent themes have emerged from analysis of these evaluations. These include comments that patients, their carers and family members enjoy the opportunity to talk with each other, and discovering that they are not alone by discussing their stories. Participants have continually highlighted positive benefits, including knowledge of their diagnosis, coping skills, supportive discussion, and the forum to share similar experiences. Testimonials and numerous letters and cards of thanks received from past and present group members support the positive influence such a forum has on the group participants.

Some written comments from members of the group include:-

Spouse/Carer: Age 35

"Since attending the group I have seen John's confidence, health and enjoyment of life improve dramatically."

Male patient: Age 40

"These meetings are always very informative, and they are well run and everyone is encouraged to participate and exchange opinions, views and experiences."

Female patient: Age 52

"It's the most fantastic support and information program – we meet every two weeks and get the opportunity to listen to speakers and interact with other patients and carers."

Mother/Carer: Age 67

"I know that future patients recovering from surgery or after being diagnosed with a brain tumour will get immense benefit from what the group provides."

Male patient: Age 56

"I have met and been able to talk to others, which has been a great help to me. The girls, who run the group are very helpful, as they explain our questions in ordinary language not doctor talk. During my time with the group I have learnt a lot about brain tumours and why things happen the way they do. I hope to continue enjoying my time with the group and meeting others to share experiences."

Spouse/ Carer: Age 62

"I wanted to tell you how much your programme meant to us throughout the 9 months that Margaret was ill"....."you really made a difference for us".

Bi-annual evaluation of the BT group has continually refined program content resulting in new topics such as 'Fatigue' and 'Apathy'. Furthermore the evaluations have highlighted the topics group members find most helpful and hence topics such as 'Seizures', 'Driving and the Law', and 'Changes to Personality and Behaviour' are repeated regularly, by request, and to meet the needs of new members to the group. Overall, when surveyed, all group members believed they have a better understanding of BT and feel more supported from their attendance at the group.

As a consequence of ongoing evaluation, the BTSEG program has evolved over the past seven years and now includes presentations of 25 different topics (See Table 1) and a regular social event program.

In addition to evaluating group participants, during December 2008 neuro-oncology patients undergoing treatment at SSWAHS who did not attend the support group (n= 52) were surveyed via a phone based questionnaire. Group coordinators contacted BT patients and/or their carers and asked three questions:

1. reasons why they have not attended the group,

2. if not interested what would make them interested in attending the group,
3. if they would still like to receive the information that was mailed out about group details and events.

Results showed that the primary reasons why patients/carers did not attend the BTSEG was the 'time of day' the group was conducted, and transport to the venue, as many patients are legally no longer permitted to drive and public transport systems within the area are very poor. Furthermore, the group was held in a room within the hospital and some potential group members did not want to return to the hospital stating it was too 'emotional' for them. Non-English speaking patients and families also were a group that did not attend as they felt they would have difficulty with language barriers within the group. Despite all these reasons, all patients not attending the support group requested to continue to receive the regular mail-outs and invitations provided.

Social Day Events

Social group outings have strengthened attendee relationships, have offered participants the possibility for sharing experiences and emotions and to receive emotional support with others in a similar situation. The objectives of the social day events are to provide opportunities for these patients and their families to enjoy outings, socially interact and form companionships. The social events program has been very successful and has allowed group members to bond, form friendships, and support each other in an informal environment away from the formal group setting. 'Pizza Lunches' are a regular, well attended occurrence and organised day outings and bus trips are very popular. Ongoing evaluations show BT group participants, both patients, carers and other family members, enjoy the mix of formal sessions and informal 'social' gatherings.

Achievements

In July 2005 a *Booklet of Factsheets* was designed specifically for patients with a diagnosis of BT and their carers. The booklet was produced by the coordinators of the support group and included an accumulation of fact sheets written by multidisciplinary experts from Liverpool Hospital on topics pertinent to patients suffering from BT. The *Fact Sheets* are a 1-2 page summary of topics discussed at the group meetings and can be used as an ongoing reference for group participants.

Over time, the development of numerous fact sheets has occurred and hence the combination

and ongoing review of these resources has made the booklet, now in its 2nd 2008 Edition. It is believed the booklet and its direct link to a BT specific support group is the first of its kind in Australia and some of the topics addressed in the booklet have never before been written about for the layperson. To date this inaugural resource has received very positive responses.

Topics covered in the Fact Sheet booklet are listed in Table 2 and *Fact Sheets* are available on the Liverpool Hospital Cancer Therapy Centre Website. <http://www.sswahs.nsw.gov.au/sswahscancer/default1.htm>

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|---|
| <ul style="list-style-type: none"> • What is a Brain Tumour? • Treatment for Brain Tumours: Surgery • Radiation Therapy • Side Effects of Brain Tumour: Radiation Therapy • Chemotherapy • Living with a Brain Tumour: Seizures • Living with a Brain Tumour: Managing Medications • The Multidisciplinary Team • The Effect of a Brain Tumour on Physical Function • Strategies for Communication and Swallowing • Diet and Brain Tumours • Brain Tumours and the Effects on Vision • The Effect of a Brain Tumour on Driving • Cognitive Problems following Neurological Illness • Sexuality after a Brain Tumour • Cancer related Fatigue • Stress Management • Community Resources / Services |
|---|

Table 2: Fact Sheet Topics

A further notable achievement originating from work with the BTSEG included the initiation of a research project addressing cognitive and behavioural sequelae of BT patients. This project involved trialling a Behavioural Consultancy Model and the development of a number of educational fact sheets and information resources covering a range of issues such as apathy, perseveration

and impulsivity. These fact sheets have been disseminated through national and international networks and have been translated by overseas brain tumour advocacy groups. They are available in English at http://www.cancerinstitute.org.au/cancer_inst/nswog/groups/neuro.html

A follow-up study comparing the use of various screening tools to detect cognitive and behavioural changes in brain tumour patients has also taken place and development of a phase II trial of the EDUCATE psycho-educational program, 'Managing changes to cognition, emotions and behaviour after brain tumour' is in progress. This research has been published and presented at various national and international conferences and is the recipient of three national awards.

The SSWHAS BTSEG coordinators have been nursing and social work representatives at the Cancer Institute New South Wales (NSW) Neuro-oncology group since its inception in 2005. This group is a state-wide expert advisory panel to ensure that specialised neuro-oncology clinical care is optimally coordinated throughout the state. Experiences from coordinating a long term BTSEG have contributed towards many achievements of this advisory committee and the coordinators have been involved in successful Cancer Institute projects including:-

- Lobbying for Neuro-oncology care coordinators to provide a vital service to patients and carers with complex care trajectories and hence the Cancer Institute NSW Health Innovations Grant "Implementation of a Neuro-oncology Care Coordinator" (2010-11) has been awarded.
- Organising committee for Annual Brain Tumour Support and Education Forums.
- Working party to develop a brochure entitled '*Brain Tumours and Driving: a guide for patients and carers*', and associated liaison with the Roads & Traffic Authority, NSW.
- Working party for the Brain Tumour Nursing Education project – an education module for nurses working with brain tumour patients.

Furthermore, the BTSEG coordinators are members of the NSW Cooperative Trials Group for Neuro-oncology (COGNO) which aims to work on strengthening clinical trial opportunities for patients with brain tumours.

Due to the success and multiple achievements of the SSWAHS BTSEG, the coordinators are contacted regularly by nursing and social work colleagues in other Area Health Services and states across Australia to provide expert advice, guidance and resources to set up and facilitate similar groups. The early and ongoing work of this group has been widely presented and shared and has been instrumental towards the development of other existing brain tumour groups within Australia.

Challenges

The challenges of maintaining a BTSEG are primarily issues surrounding facilitation of the group as well as ongoing funding. Dealing with patients with cognitive and behavioural impairments and attendee loss/bereavement from the disease has the potential to detrimentally impact group dynamics and such issues need to be handled with care.

Behavioural and cognitive changes have been noted in patients diagnosed with a primary brain tumour and dealing with such impairments can prove challenging within the group environment and represent an important management issue for group coordinators. When group participants display communication impairments such as talking too much in a conversation, talking about topics or asking questions which may not be appropriate for the situation, frequently interrupting the conversation of others and/or the guest speaker, and/ or talking out of turn, group coordinators need to skilfully and carefully implement planned strategies to guide the BT patient's behaviour and ensure the aims and rules of the group are maintained. Further issues such as group participants with inappropriate social/sexual behaviour, poor attention or concentration, perseveration and egocentricity have also proved challenging within the group environment and have required the expertise of the coordinators to use principles of behaviour management and the Behavioural Consultancy Model to appropriately and sensitively avoid negative consequences for the wider group.

Another challenging issue is when a regular group member dies. An outstanding feature of the BTSEG is the intense cohesion and strong bonds that are formed between members facing similar cancer journeys. Group participants swap phone numbers and addresses and begin contacting one another outside the group and hence friendships are formed. The first time the BTSEG reconvenes after a death or attendance at a funeral can be very confronting and emotional for the remaining group participants. This is further complicated when new members join the group at this

particular time. Group coordinators are always aware of these issues and plan ahead by setting aside time to address the loss and bereavement, talk to affected group members separately from new members about what is happening, what they are going through, their emotions and provide a safe, supportive and accepting environment. The loss is acknowledged by sending a sympathy card to the spouse on behalf of the BTSEG and on numerous occasions group members and coordinators will attend the funeral together.

The death of a group member also creates challenges with the ongoing support of the widows and widowers who have been active members of the group. Some spouses prefer to remain in the group and are welcomed to attend all social events. Others feel they need the ongoing support the group offers but do not want to be an upsetting reminder to others of their impending loss. The coordinators of the BTSEG plan to implement a secondary bereavement group for family members of deceased BT patients to address this issue.

Ongoing financial assistance has also been challenging and difficult to secure. The group is funded by small donations and a minimal hospital contribution. The lack of financial support has been an ongoing concern and threat to the group's future and strategies are being explored to secure the longevity of the group from a financial perspective.

Conclusion

Brain Tumour patients and their families are a vulnerable group with specific needs. Support groups are an important source of emotional and informational support for neuro-oncology patients and provide the opportunity to share emotions and experiences with others in a similar situation. The Liverpool BTSEG was developed using a patient centred, multidisciplinary model collaborating services across neurosurgery and cancer services. The program was designed specifically to meet the needs of these individuals and like all groups serve to connect members with one another.

Continual evaluation of the group highlights the benefits gained and needs for additional support. Patients enjoy the opportunity to talk with each other, gain knowledge of their diagnosis, explore coping skills and be involved in supportive discussion. Furthermore the social day events allow social interaction and ongoing companionships to be formed.

Achievements of the SSWAHS BTSEG include

the development of a Booklet of Fact Sheets, involvement in world-first research and representation on the NSW Cancer Institute Neuro-oncology advisory panel. The successful long-term facilitation of a BTSEG is feasible, requires experienced professionals to act as facilitators, and is very rewarding, but comes with unique challenges that reflect the specific needs of this patient group.

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References

- Ahlberg, K. & Nordner, A. (2006). The Importance of Participation in Support Groups for Women with Ovarian Cancer. *Oncology Nursing Forum*, 33(4):E53-E61.
- Anti-Cancer Council of Victoria (1997), *Living with Cancer Education Program : Facilitators Manual*. Melbourne: Anti-Cancer Council of Victoria.
- Cancer Council Australia.
www.cancercouncil.com.au, 2009.
- Catt S, Chalmers A, Fallowfield L (2008). Psychosocial and supportive-care needs in high-grade glioma. *Lancet Oncology*, 9:84-91.
- Davis, E. Higginson, I.J. (2003). Communication, information and support for adults with malignant glioma: a systematic review. *Support Care Cancer*, 11:21-29.
- Dick, B., (2000) 'Delphi face to face' [On line]. Available at <http://www.scu.edu.au/schools/gcm/ar/arp/delphi.html> 13/6/03.
- Huang, M.E., Wartella, J., Kreutzer, J., Broadus, W. & Lyckholm, L. (2001). Functional outcomes and quality of life in patients with brain tumours: a review of the literature. *Brain Injury*, 15(10):843-856.
- Jefferies, H. (2002) Ovarian cancer patients: Are their informational and emotional needs being met? *Journal of Clinical Nursing*, 11:41-47.
- Leavitt, M.B., Lamb, S.A., Voss, B.S. (1996). Brain Tumour Support Group: content themes and mechanisms of support. *Oncology Nursing Forum*, 23: 1247-56.
- National Institute of Clinical Excellence (NICE). Service guidance for improving outcomes for people with brain and other central nervous system tumours (2006). <http://www.nice.org.uk/csgbraincns> (accessed October 19, 2009).
- Simpson GK, Koh E-S, Simpson T, Wright K, Firth R, Whiting D, Younan K. The impact of cognitive and behavioural sequelae in patients with primary brain tumours on family members. *Asia-Pacific Journal of Clinical Oncology*, 2008; 4 [Suppl 2]: A136.
- Veronesi, U., von Kleist, S., Redmond, K., Costa, A., Delvaux, N., Freilich, G., Glaus, A., Hudson, T., McVie, J.G., Macnamara, C., Meunier, F., Pecorelli, S. & Serin, D. (1999). Caring about women and cancer (CAWAC): A European survey of the perspectives and experiences of women with female cancers. *European Journal of Cancer*, 35:1667-1675.
- Weitzner, M.A., Meyers, C.A. & Byrne, K. (1996). Psychosocial functioning and quality of life in patients with primary brain tumors. *Journal of Neurosurgery*, 84:29-34.
- World Health Organisation (WHO). (2001) ICF. International Classification of Functioning, Disability and Health. Geneva: World Health Organisation.

FAST- Enough in Hospital

Shae Miller

Abstract

At a recent Smart Stroke conference in Sydney, Australia, the importance of early recognition of stroke and its impact on treatment and good outcomes was highlighted. In particular, stroke symptom recognition in the general public was seen to be instrumental to people in the community getting to hospital and commencing treatment. The commencement of time-dependent treatment was emphasised. Another issue recognised was that strokes also happen to patients in hospital. Patients in hospital for a non stroke condition or treatment can subsequently have a stroke particularly if they have the associated risk factors. In the same way that stroke symptom recognition in the general public was seen to be instrumental in improved outcome for patients in the community, it would follow that staff ability to recognise stroke symptoms could also, improve management and outcomes. The FAST acronym will be explained as part of a tool used in this survey to gain information about staff's understanding and actions when a stroke is suspected.

Key words: Stroke recognition, nursing staff, stroke management, FAST

At a recent Smart Stroke conference in Sydney, Australia, the importance of early recognition of stroke and its impact on treatment and good outcomes was highlighted. In particular, stroke symptom recognition in the general public was seen to be instrumental to people in the community getting to hospital and commencing treatment. The commencement of time-dependent treatment was emphasised. This is the basis of the FAST program promoted by the National Stroke Foundation (2005, 2009).

The FAST program used the acronym F (Face) A (Arm) S (Speech) T (Time) as a verbal prompt, (which was modified later to include visual cues), to assist members of the community in recognising the three most common signs of stroke and to act fast by calling '000'.

Another issue recognised at the conference was that strokes also happen to patients in hospital.

Patients in hospital for a non stroke condition or treatment can subsequently have a stroke particularly if they have the associated risk factors. In the same way that stroke symptom recognition in the general public was seen to be instrumental

in improved outcome for patients in the community, it would follow that staff ability to recognise stroke symptoms could also, improve management and outcomes.

As a nurse educator, I was interested in whether staff in non- stroke areas would demonstrate knowledge of the symptoms of stroke and the appropriate interventions once stroke symptoms were identified. Stroke symptom recognition and early intervention were the underlying principles of the FAST program (National Stroke Foundation, 2005). I could see an application of the FAST principles as a means of improving stroke recognition and early interventions in inpatients. An education program which incorporated the FAST principles, supported by guidelines for stroke management as a guide to intervention, could address the recognition and management of inpatients who have had a stroke.

This paper will describe the study that was undertaken to examine the issue of whether staff in non - stroke areas would demonstrate knowledge of the symptoms of stroke and the appropriate interventions once stroke symptoms were identified.

Literature review

A search of the literature indicates many articles focusing on stroke symptom recognition in the community and the response made by those in the community once stroke symptoms are recognised. Barr, McKinley, O'Brien and Herkes (2006) looked at factors that influenced delay in seeking treatment for stroke or TIA. Two factors included

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SHMiller@nscchhs.health.nsw.gov.au

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patient perception of severity of symptoms and mode of travel to hospital.

Sadler (2006) made comment on the results of a survey in the United Kingdom on stroke symptom recognition in the general public. The survey showed that one quarter of the 1000 respondents did not recognise the symptoms of stroke and 40 percent would not call an ambulance if someone had the three most common signs – facial weakness, arm weakness or speech difficulty.

Kleindorfer, Miller, Moomaw, Alwell, Broderick, Khoury, Woo, Flaherty, Zakaria and Kissela (2007) examined the effectiveness of taking the FAST message to a community setting in the United States of America. The aim was to improve public stroke symptom recognition and timely intervention i.e. early transport to hospital or medical intervention. The study found that the FAST message resulted in 88.9% of stroke/TIA identification by members of the general public.

Wall, Beagan, O'Neill, Foell, and Bodie-Willis (2008) looked at the effectiveness of an education tool using the "Stroke Heroes Act FAST" message in improving public stroke sign and symptom recognition. They found that in the post test and 3 months after the FAST campaign, there was significant retention of the concept of symptoms of stroke - facial droop and arm weakness/numbness, calling emergency services if a stroke was suspected and that the presence of only one symptom is enough to suspect someone of having a stroke. The researchers proposed that FAST could be a useful tool for improving knowledge and appropriate intervention by the community.

Studies by Miller, King and Kleindorfer (2007), Williams and Noble (2008), and Kleindorfer, Miller, Sailor-Smith, Moomaw, Khoury, and Frankel (2008), looked at ways of educating the public about stroke warning signs and stroke prevention particularly in high risk social groups. In this study, the 'high risk' groups were cited as being African-American and low socio-economic groups. By taking the education to the community settings, and using novel approaches to education (such as targeting meeting places like beauty parlours where people talk), the studies found that the knowledge about stroke in the people in these high risk social groups improved.

The reporting of studies involving health professional recognition of stroke symptoms and /or knowledge of the appropriate intervention was limited in comparison to that of the community.

Fernandes, Avelar, Mory, Hansen and Li (2009), examined the responses of health professionals

in a mobile unit of an emergency medical service. The study looked at both the professionals' ability to recognise stroke symptoms and their attitude to early intervention for a person with symptoms of stroke. It was noted that the professionals recognised anterior circulation stroke symptoms but their attitude to early intervention did not consider, as a matter of course, the patient as a potential candidate for thrombolysis if they present within the "3-6 hour therapeutic window" (Fernandes et al 2007).

Sadler (2006) also commented on health professional recognition of symptoms and early intervention. The author says that despite the development of stroke care delivery milestones as a result of a report called the National Service Framework for Older People and campaigns increasing awareness of stroke symptoms and early interventions, there were still patients with unrecognised stroke symptoms and even if they are recognised as having a stroke, they are not getting the early intervention such as having a early CT.

There was no available literature that examined staff responses to stroke in non-stroke areas, including their ability to recognise stroke symptoms or their knowledge of the appropriate action to take if a stroke was suspected.

Method

To investigate this, nursing staff on three medical wards and one surgical ward at the hospital where I am employed, were surveyed to examine the knowledge of stroke symptom recognition. A 10 item survey/questionnaire was used to gather information about staff knowledge in this area. Nursing staff from two wards where patients were likely to have stroke risk factors and two wards where this was less likely participated in the survey. Ethics approval was gained prior to distribution of the surveys.

The participating wards where it was considered patients had a higher chance of having risk factors for stroke included a cardiac ward and aged care ward. The participating wards where it was considered patients had a lower chance of having risk factors for stroke, included an orthopaedic and a general medical ward.

The survey consisted of ten questions including 4 items identifying demographic information; 3 multiple choice items including stroke definition and symptom recognition; 1 yes/no item on FAST recognition, 1 short answer question on FAST components; and an open-ended question about what the nurse would do if he/she suspected a patient had had a stroke. The survey was based on a

similar one used to investigate stroke symptom recognition in the community (rural health service) and as part of the Stroke Awareness promotion at our hospital earlier in the year (Jude & Mohr, 2009). Changes were made to tailor the questions to the hospital setting and to a study addressing staff instead of community.

Each ward was asked to participate in the study and information about the study and its purpose was provided. Staff participation was voluntary and the survey occurred over a two week period to enhance the number of responses. All levels of nursing (AIN, TEN, EEN, RN) could respond. One hundred surveys were delivered to the wards with the aim of receiving at least fifty percent response rate in each ward. The completed surveys were then collected anonymously and there were no identifying details collected from the participants.

Results

The overall return rate was 48% from the original 100 surveys. There was a male to female ratio of 1:11 respondents. Of the 48 surveys returned, the designation of the respondents was as follows: RN-39, EEN-5, and AIN/TEN-4. AINs and TENs were included as they make up staffing numbers and would be in a position to identify patients having changes in their condition without necessarily having a deep understanding of the processes involved. The respondents' years post registration or enrolment ranged from 0.5 years to 43 years, with a median of 4 years.

Regarding a definition of stroke, 92% correctly chose the correct definition of "When the blood supply to the brain is stopped or blocked". Three most common symptoms of stroke as cited by the National Stroke Foundation (2005), - arm weakness, face weakness and speech difficulties, were identified as stroke warning signs by 76-92% of respondents. The respondents did well to recognise other symptoms of stroke. They include dizziness (56.3%), numbness (70.8%), headache (58.3%), difficulty in

swallowing (51%), and loss of vision (46.9%). Two non stroke symptoms of chest pain and stress were identified by a small number of respondents (14.3 and 4.1% respectively).

In response to the questions about FAST and its components, 33% of respondents had heard of or recognised FAST. Forty percent of respondents were able to name all or some of the components of the acronym FAST and 82% of those respondents could name all the components of FAST as promoted by the National Stroke Foundation (2005). An unexpected result was that four respondents attempted to name all the components

of FAST even though they claimed not to have heard of FAST and 3 answered correctly.

Responses to the question about nursing management of a patient with a suspected stroke, the answers were scored against the Northern Sydney Central Coast Area Health Service (NSCCAHS) Guidelines for Stroke Management (O'Brien, 2009). The expected responses were:

- The nurse to check the patient's Neurological observations and vital observations.
- Inform resident medical officer (RMO) of change of the patient's status
- To administer O²
- If the patient's GCS has decreased by 2 points there should be an immediate review of the patient by the medical officer
- Keep patient nil by mouth
- Position the patient with the head of the bed at 30° or the patient is placed in the side lying position.

The area where staff responses best matched the expected responses was to check the patient's neurological observations and vital signs (47.9% and 54.2% respectively) and to inform the resident medical officer (RMO) of a change in the patient's status (85.4%). Fewer nurses wrote about administering oxygen (27.1%), calling the doctor if the Glasgow Coma Scale (GCS) fell 2 points or more (16.7%), and keeping the patient Nil By Mouth (6.3%). None of the responses mentioned positioning of the patient.

Discussion

Given that there is nothing in the literature which examines this topic, it is not possible to make any comparisons. The survey yielded some positive results. The majority of nurses surveyed could correctly describe what a stroke was and thus it could be inferred that the basic underlying pathology of a stroke was known.

A large number knew the most common signs of stroke i.e. facial weakness, arm weakness and difficulty in speaking. These coincidentally are the common symptoms of stroke and hence are the symptoms promoted in the FAST campaign (National Stroke Foundation, 2007).

Those who knew about FAST correctly identified the components which indicates that the FAST

campaign message is permeating to the general public, including health professionals.

A large number of nurses recognised that requesting an RMO review for potential stroke was an appropriate intervention. Having a stroke patient's condition reviewed by a medical officer is important in getting timely intervention and time to treatment is recognised as factor impacting outcome (National Stroke Foundation, 2007). Some nurses were able to recognise that a drop of two or more GCS points was an indicator of significant deterioration (Waterhouse, 2005).

Implications

The study identified areas of knowledge deficit which is the basis of educational opportunities for nursing staff. Information about the range of possible symptoms of stroke should be addressed. On the whole, staff appear to be familiar with the common symptoms of stroke encompassed by the FAST program. By increasing the non-stroke nurses' familiarity with the less common symptoms of stroke perhaps their ability to recognize stroke, and therefore institute early intervention, will be enhanced.

An additional educational opportunity would be to improve the non-stroke nurses' knowledge about the appropriate intervention for stroke. This would have to include disseminating more widely the Guidelines for Stroke Management (NSCCAHS, 2005), with supporting education about the rationale and the benefits of early intervention. Based on the disparity between the responses in the survey and the expected responses as outlined in the NSCCAHS Guidelines for Stroke Management, the areas that seem to need more attention in the education include the role of oxygen delivery, the rationale for positioning and the implications of a drop of two or more points in the GCS.

One educational strategy that should be considered is using the FAST promotion message as a starting point for education, stroke symptom recognition and early intervention. The results of this study indicate that the FAST message is known to at least some staff and is memorable. The acronym would be helpful as a prompt to staff to consider symptoms of weakness in face/arm, and/or speech difficulties as indications of a potential stroke. Acronyms are used frequently in educational programs as a way of enhancing recall of key ideas (Ullius, 1997).

Though staff in this study demonstrated knowledge of stroke symptoms and appropriate management, this does not demonstrate that it is translated to practice. Consequently, further re-

search is required to determine the outcome in an actual patient case. One strategy may be to conduct a retrospective audit of patient records, where the patient had sustained a suspected or actual stroke while as an inpatient for other medical reasons, for evidence that practice reflects the knowledge of stroke symptoms and management.

Certainly this survey identifies an area for training outside the Acute Stroke Unit. There are two areas of knowledge deficit: the range of stroke symptoms and the recommended management of a suspected stroke. These issues should be encompassed in an inservice program.

Limitations

While the survey produced some useful information there were some limitations. The results may reflect the impact of recent Stroke Awareness Week activities at the hospital, which was held two weeks before the survey was undertaken. This would mean that the information about stroke symptoms and management that the participants provided could be retained from the earlier event. It would be necessary to assess what information is retained after a much longer period. This would give a more accurate assessment of the level of staff knowledge as well as providing an idea of the permanence of the FAST message that staff may have taken up during Stroke Week.

Another limitation is the selection of respondents being not statistically rigorous. The ward units were chosen in a deliberate manner and based on experiential knowledge about the patient groups seen in those wards. The respondents were self selecting i.e. they chose to fill in the survey or not and one could say that the sampling method was of one of convenience.

The number of respondents was small and not tested for statistical significance. It would be interesting to replicate the study in more wards to not only increase the numbers of respondents but also to see if there is a pattern depending on the patient profile seen in the other wards.

Conclusion

Strokes do not just occur outside the hospital. They also occur when patients are in hospital for other medical reasons. Nurses on wards outside the stroke unit need to be able to recognise the symptoms of stroke and know the intervention they should take if they suspect a stroke.

To explore this further, a simple survey of staff from four wards in a large teaching hospital was conducted. Staff were asked to identify stroke symptoms and to indicate their actions if they

suspected a patient had had a stroke. It was satisfying to see that many staff could identify a stroke, what the common symptoms of stroke were and many of the interventions they needed to take.

While it was pleasing to see that their knowledge was good, there are a few areas that need to be addressed. To address the knowledge of the range of stroke symptoms and expected nursing intervention, a ward level education inservice program is planned and it will include this information amongst the topics covered. It is anticipated that the wards which participated will be targeted first.

A preliminary audit of health care records of patients (three in total) admitted after the study to the Acute Stroke Unit, where those patients were admitted for other treatment, demonstrated that nurses in those wards took appropriate actions when they suspected a stroke. More records need to be audited in order to make a generalisation.

A more statistically rigorousness study needs to be undertaken to understand the impact of Stroke Week on the results and to explore the extent to which the findings can be generalised. Both time and funding constraints make this less feasible at this time.

References

- Barr, J, McKinley, S, O'Brien, E and Herkes, G (2006) Patient Recognition of and Response to Symptoms of TIA or Stroke. *Neuroepidemiology*, 26. pp 168-175.
- Barr J, (2008) GE2008_006 *Guidelines for Neurological Observations in Neurology and Neurosurgery Units North Shore Ryde*, Northern Sydney Central Coast Area Health Service
- Fernandes, PT, Avelar, WM, Mory, SM, Hansen, R and Li, LM (2009) Perception and Attitude towards Stroke by Professionals of Emergency Medical Service in an Urban City in South eastern brazil, *Journal of Stroke and Cerebrovascular Diseases*, Vol 18, no. 3 (May-June). pp195-197
- Jude, M & Mohr, K. (2009) *Assessing the Awareness and Understanding of The National 'Fast' Campaign In A Rural Setting. Wagga Wagga Base Hospital Stroke Unit*. Poster presented at Smart Strokes , Sydney 2009.
- Kleindorfer,D, Miller, R, Moomaw, CJ, Alwell, K, Broderick,,JP, Khoury,J, Woo, D, Flaherty, ML, Zakaria, T & Kissela, BM (2007) Designing a Message for Public Education Regarding Stroke : Does FAST Capture Enough Stroke? *Stroke*, Oct, 38, pp. 2864-68
- Kleindorfer, D, Miller, R. Sailor-Smith, S., Moomaw, CJ, Khoury, J, Frankel, M. (2008) The Challenges of Community Based Research: The Beauty Shop Stroke Education project, *Stroke*, Oct, 39, pp. 2331-2335
- Miller, ET, King, KA, Miller, R and Kleindorfer, D (2007) FAST Stroke Prevention Educational Program for Middle School Students: A pilot study results. *Journal of Neuroscience Nursing*, Aug, 39(4) pp 236-42
- National Stroke Foundation (2007) Clinical Guidelines for Acute Stroke Management. National Health and Medical Research Council. Melbourne
- O'Brien, E (2009) GE2009_086 *Guidelines for Neurological Observations for Stroke/TIA – North Shore Ryde HS , Northern Sydney Central Coast Area Health Service*
- Sadler, C. (2006) Raising the awareness of stroke symptoms *Nursing Standard*, Nov 8, Vol 21, No. 9. pp20-22.
- Ullius, D. (1997) ART: Acronyms reinforce training. *Training & Development*; Feb 1997; 51, 2; 9
- Wall, HK, Beagan, BM, O'Neill, J, Foell, KM and Bodie-Willis, CL (2008) Addressing stroke signs and symptoms through public education: the Stroke Heroes Act FAST Campaign. *Preventing Chronic Diseases*, April, 5 (2).pp1-10.
- Waterhouse, C (2005) The Glasgow Coma Scale and other neurological observations. *Nursing Standard*, Vol 19, No. 33, pp56-64.
- Williams, O.and Noble, J. (2008) "Hip-Hop Stroke: a stroke educational program in elementary school children living in a high risk community. *Stroke*, Oct, 39 (10), pp. 2809-16.

Restraint Minimisation in the Acute Neurosurgical Setting

Jeanne Barr, Alicia Agius, Marianne O'Reilly.

Abstract

Restraint minimisation has been successfully achieved in acute and nursing home settings over the last decade without compromising patient safety. Unfortunately these studies are limited to hospital wide results rather than specialty-specific information.

The purpose of this project was to identify, report and facilitate improvements in evidenced based restraint minimisation practise in the acute neurosurgical setting of a tertiary referral centre. Pre and post audits of restraint practise were conducted, followed by feedback and practice development activities to change practice in identified areas of need. During the first audit period, 2-5/50 of all the patients within the unit in a twenty four hour period had some type of restraint related activity as part of their care. Of the total episodes of restraint related activity (n=32), 20/32 had alternatives to restraints in place and 12/32 had restraints in place. Strategies to reduce restraints were developed. This began with a review of current evidence related to restraint use and practice development activities such as group work to explore restraint related practice. The second audit period followed a program of education that included the legal and ethical issues surrounding restraint and the use of 'individual patient special' for patients at risk of injury. In the second audit period there were 4-10/50 episodes of restraint related activity in a 24 hour period; 24/74 had alternatives in place and 50/74 were restrained. In the final audit period, 2-6/50 of restraint-related activity in 24 hours showed 17/38 having alternatives in place and 21/38 with restraints applied. Comparison of the three audit periods indicated variation in use of restraints with greater consideration of alternatives. Initiatives such as the introduction of "restraint rounds" as a means of providing staff with expert advice followed the final audit.

Key Words: Restraint, restraint minimisation.

Background

Restraint minimisation has been successfully achieved in nursing home settings over the last decade without compromising patient safety. Successful restraint reduction programs have also been reported in acute care settings (Whitman, Davidson, Rudy and Serekia, 2001; Minnick, Mion, Johnson, Catrambone and Leipziger et al, 2007; Braine, 2005; Demir, 2007; Knox, 2007; Evans, Wood, Lambert and Fitzgerald 2002). The rates of restraint use within the acute care setting reportedly range from 3.4-21% (Evans et al 2002). These results are often reported as hospital wide rates rather than specialty-specific so it is difficult to extrapolate the rate for high risk areas such as neurosurgery.

Anecdotal reports suggest that many neurosurgical nurses believe that the use of restraints in the acute neurosurgical setting is necessary to maintain safety. Additionally, strategies used to reduce restraints in long term care facilities may not be appropriate for the younger age group that make up the acute neurosurgical casemix (Markwell, 2004).

Various rationales for the use of restraints are documented in the literature. Reasons identified for restraint use include: perceived patient safety, management of agitation, facilitation in the delivery of treatment and to help achieve organisational goals. However, patient safety has repeatedly been refuted as a rationale for the application of restraints through the identification of adverse events such asphyxiation and increased risk of falls. (Joanna Briggs Index [JBI], Pt 1, 2002). It has also been suggested that the use of restraints in the acute setting can impact negatively on the rehabilitation of older people (Mott, Poole and Kenrick, 2005). Additionally, there are numerous ethical, professional and legal issues

Questions or comments about this article should be directed to Jeanne Barr, Clinical Nurse Consultant, Royal North Shore Hospital at
JBarr@nscchhs.health.nsw.gov.au
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that surround the use of restraints in health care (Evans et al 2002).

Programs of *restraint minimisation* or *restraint free care* have been introduced in an attempt to ensure the appropriate use of restraints in residential and acute care facilities with some success (JBI, Pt 1&2, 2002). The successful elements of restraint minimisation programs have included changing organisational culture through education of staff and providing alternative strategies and activities to restraint use.

Neuroscience specialties have been identified as one of the major users of restraint (Whitman et al, 2001; Braine, 2005). Following a review of practice within an Australian metropolitan Area Health Service (AHS) it was identified by senior nursing management that there was a need for the AHS to formally adopt a minimal use of restraints perspective. This led to the 'Restraint Minimisation' project reported here.

Purpose

The purpose of the project was to:

- 1) identify if current policy, according to best practice, supports minimisation of restraint use;
- 2) ensure that staff members are educated in the use of restraints in the neurosurgical setting; and
- 3) facilitate the integration of restraint minimisation into the culture of the neurosurgical unit.

Methods

The process of audit, feedback and reaudit was used for the project, as outlined by Jamvedt, Young, Kristoffersen, Thomson, O'Brien and Oxman (2003) as an effective process for improving professional practice. An audit tool (see Table 2) was developed to capture information related to the audit criteria as well as data the project team believed would be useful. Additional information collected included patients who had alternatives in place as it was important to recognise this as part of everyday practice. Other information collected included the patient's medical diagnosis and Glasgow Coma Scale (GCS) Score.

The planning stage included team agreement on the localisation of the audit criteria, definition of a restraint within the unit and availability of resources. No theoretical definition of restraint was identified by the project team. Instead, a practical definition of restraints was agreed to (see Table 3) A patient was restrained when one or more of the devices were in place. For example, when bedrails were used, staff members were asked about the reason for their use in order to identify them as being a restraint. All members of the project team received instruction about the audit tool and were involved in the collection of data. The progression of the project involved feedback to the staff of the findings and the identification of opportunities for practice change. To identify the opportunities for practice change a practice development framework was used (Manley and McCormack, 2003).

AUDIT CRITERIA	YES	NO	COMMENT
1. Is the patient mechanically restrained (If YES go to Question 4)?			
2. Have restraints been considered as part of their care (If "YES" go to question 3)?			
3. What alternative methods have been used to prevent the use of restraints?			
4. Does the patient care plan reflect the organisation policy regarding restraint?			
5. Is there documented assessment identifying the need for restraint?			
6. Is there documented rationale for the level of restraint applied?			
7. Is the restraint is applied as per manufacturer's instructions?			

Table 2: Audit Criteria

Table 1: PACES Criteria

Criteria	Local Interpretation
Criteria 1 Patient care plan reflects the organisation policy regarding restraints.	Documentation reflecting the organisational policy had to occur in the care plan and on the AHS restraint form. Partial compliance was rated as a 'no'
Criteria 2 There is documented assessment identifying the need for restraint.	The alternatives to restraint had to be documented at any point in the patient's health record.
Criteria 3 There is documented rationale for the level of restraint applied.	The diagnosis on the Area restraint form had to have been completed.
Criteria 4 All staff received education regarding the correct use of restraints.	All staff members received a copy of the local unit policy and completed their competency.

Setting and sample

A twenty-five bed neurosurgical ward in a metropolitan tertiary facility was the setting for the project. All patients in the unit were eligible for inclusion in the audit if they were subject to some form of restraint related activity i.e. they were using alternatives to restraints or had restraints in place. This sample was selected as the project team wanted to capture information about restraint minimisation that already took place within the unit.

All twenty-five patients theoretically could have an episode of restraint related activity and this activity was measured at two time intervals per day over 10 days (the audit took place Monday to Friday over two weeks). Consequently, there were potentially 50 episodes of restraint related activity per day or 500 over 10 days. The final sample included 50 episodes of restraint related activity (out of a potential 500) in the first audit, 74 episodes of restraint related activity in the second audit and 38 episodes of restraint related activity in the third audit.

The Joanna Briggs Practical Application of Clinical Evidence System (PACES) audit criteria for *restraint in the acute and aged care setting* (JBI 2006) were used to form the basis of the audit. The criteria were adapted to capture the elements of local practice. Additional criteria to identify the frequency and type of alternatives to restraint were also developed. The PACES criteria and local interpretation are described in Table 1. A yes or no was allocated to each criterion to identify it as being fulfilled.

1.	L mitten
2.	R mitten
3.	Both mittens
4.	Posie vest
5.	Bed rails
6.	L wrist
7.	R wrist
8.	Both Wrists
9.	L ankle
10.	R ankle
11.	Both ankles

Table 3: Restraint devices.

tify it as being fulfilled.

Initially data collection was to take place daily at one time interval over a four week period. However, when the audit tool was trialed it was discovered that one time interval did not capture the dynamic nature of restraint practice within the unit. Thus, data collection occurred over a two week period at two time intervals which were alternated every second day (i.e. 1000hrs and 1300hrs on day one and 1000hrs and 1500hrs on day two) in order to capture differences in and out of visiting hours when the level of supervision from relatives and other carers varied.

All data was entered into the Joanna Briggs Insti-

tute (JBI) PACES program where strategies for improvement were also identified (JBI 2006). Ethics approval was not sought for the project as it was an observational study of nursing practice (allied health often contributed to the care of the restrained patient but rarely, if ever, initiated the application of restraints) within the unit.

Results

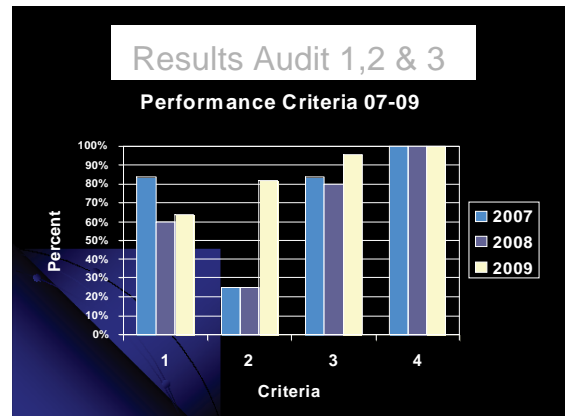
Results are presented as the number of patients receiving restraint related activity as part of their therapy in a twenty four hour period compared to the total number of potential episodes of restraint related activity. This was then divided into those patients who had alternatives in place and so were not restrained and those who had restraints in place. The audit criteria (Table 2) were measured against those patients who were identified as having restraints in place.

During the first audit period in 2007, between 2 and 5 patients within the unit in a twenty four hour period, had some form of restraint related activity as part of their care. In the two week audit period, of the total episodes of restraint related activity ($n=32$), 20/32 had alternatives to restraint in place and 12/32 were restrained. The most common reason given for restraining a patient was identified as a "high falls risk" and the most commonly used restraint was a chest restraint. The average GCS was 14. Restrained patients most commonly had suffered an intracranial haemorrhage (ICH).

Audit criteria one, (Table 1) the 'care plan reflects organisational policy' and criterion three 'documented rationale', were met in 10/12 episodes when the patient was restrained. Criteria two (documented assessment) was met in 3/12 episodes where the patient was restrained. Criteria four (staff education) and criteria five (manufacturer's instruction) were met in 12/12 episodes where the patient was restrained.

During the second audit period (2008) between 4 to 10 patients within the unit in a twenty four hour period had some form of restraint related activity as part of their care. Of the total episodes of restraint related activity during the two week (10 day) audit period ($n=74$), 24/74 had alternatives to restraint in place and 50/74 had restraints in place. The most common reason given for restraining a patient was to prevent the removal of a "nasogastric" or "tracheostomy tube" and the most commonly used restraint was a wrist restraint with a bedrail (of note is that the organisational policy does not stipulate that a reason for bedrail use be documented as is required for other forms of restraint). The average GCS was 12. As in the first audit, restrained patients most

commonly had suffered an intracranial haemorrhage (ICH). Audit criterion one (care plan reflects organisational policy) dropped from 83.3% to 60%. Criteria two (documented assessment) remained the same at 25%. Criterion three (documented rationale) had a small drop to 80%. Again, criteria four and five were met 100% of the time (Graph 1 and Table 4).



Graph 1: The Y axis represents the percentage of compliance to the four criteria and the X axis represents the criteria. Results from audit one is depicted in blue, audit 2 in violet and audit 3 in yellow. Criteria 4 remained constant throughout the audit period.

During the third audit period (2009) between 2 and 6 of all the patients within the unit, in a twenty four hour period had some form of restraint related activity as part of their care. Of the total episodes of restraint related activity ($n=38$), 17/38 had alternatives to restraints and 21/38 had restraints in place. The most common reasons given for restraining a patient were identified as prevention of falls and removal of feeding tube. The average GCS was 14. Restrained patients most commonly had suffered an intracranial haemorrhage (ICH).

Audit criteria one (care plan reflects organisational policy) was met 64% of the time. Criteria two (documented assessment) was met 82% of the time. Criteria three (documented rationale) was met 96% of the time. Criteria four (manufacturer's instruction) was met 100% of the time. Comparisons of all audit results are shown in Graph 1 and Table 4.

The results of the initial audit provided the foundation for practice improvement. GRIP (getting research into practice) strategies provided the framework for promoting a restraint minimisation culture within the unit. The strategies focused on organisational culture, inadequate systems to support best practice and no standardised policy and procedures.

Organisational Culture

This element was a process of both situational analysis, as per the GRIP process identified through the JBI PACES program (JBI 2006) and reflective practice and was achieved by the following actions. The project team established how dissemination of culture occurs e.g. through the orientation program to the environment and by speaking to nursing staff and reviewing local policy and related documents. This was followed by identifying the local (unit) policy and comparing elements against facility policy and documented neuroscience best practice. All relevant forms and notes within the health record were reviewed in order to determine if unit documentation reflected the policy. Using a practice development framework (PD) the attitudes and beliefs of the clinical environment about the use of restraints were discussed and at times some attitudes were challenged and opportunities provided to discuss alternatives and promote change.

The Practice Development process was the most successful strategy that was used as it provided an opportunity to re-evaluate the target audience to progress the change from the coalface clinicians to the senior nursing staff within the unit. Practice development in this context was focused on the development and empowerment of the staff to improve the delivery of care (Morrison, Fox, Burger, Goodloe, Blosser and Gitter, 2000). Successful execution required some trial and error. The first feedback session was poorly attended and the layout of the room allowed the group to be segregated. Both these factors, as well as poor preparation contributed little if any to the progress of the project. As such, a second feedback session was organised and took a very different approach. The second session was attended by twice as many staff and included the unit's physiotherapists. The staff were initially asked to write down how they felt about the use of restraints in the unit and what they would change about the use of restraints in the unit. These elements were discussed and followed by smaller group work. The groups were provided with a list of alternatives to restraints that were identified in the literature and were asked to consider a patient that they had looked after who had been restrained. The groups were then asked to identify what alternatives had been used that had been unsuccessful and what alternatives they would now consider if resources were not a barrier. This activity generated a lot of discussion and provided the opportunity to reflect on practice. Though there were only a few small actions that came from the group work, one of the patients used for the group work was still in the unit at the time. The staff tried one of the very few

Criteria	Results 2007; 2008; 2009
Does the patient ward documentation reflect the organisation policy regarding restraint?	83%; 60%; 64%
Is there documented assessment identifying the need for restraint?	25%; 25%; 82%
Is there documented rationale for the level of restraint applied?	83%; 80%; 96%
Is the restraint applied as per manufacturer's instructions?	100%; 100%; 100%

Table 4: Audit results 2007-2009

alternatives (a toileting regime) that had not been used on the patient before with some success.

This event and the activities during the feedback process, in conjunction with the team building activities occurring in parallel to the project, created an environment where staff embraced reflective practice and made restraint minimisation a high priority. An action plan was created utilising some of the information collected in the feedback group work session and with the senior nursing staff.

Inadequate systems to support best practice

This element focused predominantly on how restraint minimisation was supported at a unit and organisational level and included the following actions: identifying the availability of resources within the clinical area that support best practice e.g. manufacturer's instructions and identifying whether the policy states that assessment and documentation are required for every occasion where physical restraints are being considered. As well, the project team investigated whether there was dedicated space for documentation of assessment on the restraint form. Other considerations were if the policy stated that a rationale, consideration for alternatives and documentation were required for every occasion when restraints are/have been considered. This was followed by the provision and implementation of resources

where gaps were apparent.

No standardised policy and procedures

This element was essential in the change process, as the unit had to adopt the elements of restraint minimisation. Policy and procedures about restraint based on best practice within the facility were easily accessible and were used appropriately by staff.

Discussion

The identified aims and objectives for the project as outlined previously were achieved to a varying degree through the strategies discussed. It must be noted that the rate of and approach to restraint use in the unit, though not completely evidence-based (as per the criteria), did in fact reflect a tendency toward a culture of restraint minimisation. The rate of restraint is consistent with that reported in a study conducted in the United States in a thirty one bed neuroscience setting where the observed rate of restraint on a daily basis ranged from 6-16% (the rate did not include number of patients with restraint alternatives in place) (Morrison, et al 2000). Similarly the rate for restraint use in an Australian metropolitan facility was 9.4% (Irving, 2004).

The first objective regarding policy and systems was met. There were deficiencies at organisational and local systems level. The unit had developed over time, a local policy for the use of restraints which had been adopted by staff. The content of the policy did in fact echo that of the organisational policy and through the course of the project the senior nurses identified that the need for a separate local policy no longer existed. The senior nurses chose to maintain a local competency process to address the potential risks involved when restraining a patient.

Though the use of alternatives to restraint was emphasised within the organisational and local policies there was little if any instruction or direction for documenting this element of practice. The nurses were reluctant to adopt a formal method of documentation of alternatives as they felt it would be time consuming. Instead it was agreed that the process for documentation needed to be addressed in a larger forum and so interim changes were made to the *Area Restraint Form* to enable staff to identify what alternatives had been attempted.

The considerable drop in the rate of compliance in Objective One (adherence to organisational policy) can be attributed to the acuity of the unit at the time of the second and third audits. Educa-

tion regarding restraint use and minimisation was provided to 100% of the staff in the unit and focused primarily on providing information at orientation and completing the competency despite the policy dictating that monthly education should occur.

Objective Two (appropriate level of staff education) was achieved through the practice development process. The team identified that continuing education about restraints was a priority for the unit. The education program developed by the senior nurses focused on engaging all staff members in the delivery of restraint minimisation education. This was recognised as having two purposes: an opportunity to keep restraint minimisation as part of the unit culture as well as, by allocating the delivery of education on a rotational basis, contributing to the professional development of the staff.

Objective Three (facilitate the integration of restraint minimisation into the culture of the neurosurgical unit) was the most difficult to achieve. As stated earlier the unit had a tendency towards restraint minimisation but was experiencing cultural, political and environmental change, in addition to significant staff shortages and decrease in experience level. These challenges have been identified by many as posing significant barriers to change (Shaw, Cheater, Baker, Gillies, Hearnshaw, Flottorp and Robertson, 2007). The ability to make changes to practice can also be influenced by the perception that there is no room for change as current practice is appropriate (Wright, 1998). This proved to be a significant obstacle to the project and was overcome with the use of practice development (again with the parallel team building activities) that provided the opportunity for the staff to reflect on what they were currently doing and how this could be enhanced. The nurses were also frustrated with the lack of successful alternatives as in many situations the best alternative was constant observation which could be provided by an individual patient special (IPS), a costly alternative.

Of note is the change in the reason for restraint. In 1996 the Joint Commission on Accreditation of Healthcare Organisations mandated standards for the use of restraints in the United States of America. Since the introduction of this mandate the reason for restraint moved from falls prevention to preventing interruptions to therapy (Minnick et al 2007). As reflected in the results this change also occurred even though the medical diagnosis remained the same which could be suggestive of a shift in perspective.

Following the final audit a 'restraint round' was

introduced and conducted by the Neurosurgical Nursing Unit Manager and Clinical Nurse Consultant (Neuroscience) on a weekly basis. The purpose of this round was to analyse all restraint episodes. That is, not only looking at those patients who were restrained but also those with alternatives in place. Additionally, patients at risk of being restrained were reviewed prior to any escalation with the goal of putting restraint alternatives in place. This innovation provided the opportunity for staff to reflect on their practice. There was a noticeable trend towards improvement in documentation and adherence to organisational policy. Additionally, there was an increase in staff awareness and involvement in the decision making regarding the need for appropriate interventions to minimise restraint use.

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References:

- Braine ME. The minimal and appropriate use of physical restraint in neuroscience nursing. *British Journal of Neuroscience Nursing*. 2005;1(4):177-184.
- Demir A. Nurses use of physical restraints in four Turkish hospitals. *Journal of Nursing Scholarship*. 2007;39(1):38-45.
- Evans D, Wood J, Lambert L, Fitzgerald M. Physical restraint in acute and residential care. A systematic review. The Joanna Briggs Institute 2002. Systematic Review Number 22.
- Irving K. Inappropriate restraint practices in Australian teaching hospitals. *Australian Journal of Advanced Nursing*. 2004;21(4):23-27.
- Jamtvedt G, Young JM, Kristoffersen DT, Thomson O'Brien MA, Oxman AD. Audit and feedback: effects on professional practice and healthcare outcomes. *The Cochrane Database of systematic reviews*. 2003;3.
- JB, 2002 Physical Restraint – Pt 1: Use in acute and residential care facilities, *Best Practice* Vol 6 Iss 3, Blackwell Publishing Asia, Australia.
- JB, 2002 Physical Restraint – Pt 2: Use in acute and residential care facilities, *Best Practice* Vol 6 Iss 4, Blackwell Publishing Asia, Australia.
- Knox J. Reducing physical restraint use in residential aged care: implementation of an evidence-based approach to improve practice. *International Journal of Evidence Based Healthcare*. 2007;5:102-107.
- Manley K, McCormack B. Practice development: purpose, methodology, facilitation and evaluation. *Nursing in Critical Care*. 2003;8(1):22-28.
- Markwell S. Long-term restraint reduction – one hospital's experience with restraint alternatives. *Journal of Nursing Care Quality*. 2005;20(3): 253-260.
- Minnick AF, Mion LC, Johnson ME, Catrambone C, Leipzig R. Prevalence and variation of physical restraint use in acute care settings in the US. *Journal of Nursing Scholarship*.
- Morrison EF, Fox S, Burger S, Goodloe L, Blosser J & Gitter K. A nurse-led, unit based program to reduce restraint use in acute care. *Journal of Nursing Care Quality*. 2000;14(3): 72-80.
- Mott S, Poole J, Kenrick M. Physical and chemical restraints in acute care: Their potential impact on the rehabilitation of older people. *International Journal of Nursing Practice*. 2005;11: 95-101.
- Shaw B, Cheater F, Baker, Gillies C, Hearnshaw H, Flottorp S, Robertson N. Tailored interventions to overcome identified barriers to change: effect on professional practice and health are outcomes. *The Cochrane Collaboration Library*. 2007;4: <http://ovidsp.tx.ovid.com/spb/ovidweb.cgi>, February 7, 2008.
- The Joanna Briggs Institute. Practical Application of Clinical Evidence System (PACES) user guide (updated 2006 Aug. Available at: www.joannebriggs.edu.au)
- Whitman GR, Davidson LJ, Rudy EB, Serekia SM. Practice patterns related to mechanical restraint use across a multi-institutional health care system. *Outcomes Management for Nursing Practice*. 2001;5(3):102-109.
- Wright SG (Ed). *Changing nursing practice*, 2nd edn. London: Arnold Publishers, 1998; 54-70.

Nurses' Expectation and Caregivers' Participation in Caring for Patients with Stroke during Hospitalisation.

Sabarisah Hashim, Urai Hatthakit, Ploenpit Thaniwattananon

Abstract

This study aimed to identify levels of functional disability of stroke patients, nurse's expectation on caregivers' participation in caring and caregivers' participation in caring for stroke patients. This study also examines the relationship between nurses' expectation and caregivers' participation in caring for the stroke patient.

A cross-sectional study was conducted on the medical/surgical wards of Hospital University of Science Malaysia (HUSM). The instruments of this study consisted of the Functional Independence Measure (FIM) tool for stroke patients, Nurses' Expectation of Caregivers' Participation in Care Questionnaire (NEPCQ) and Caregivers' Participation in Care Questionnaire (CPIC).

Of the fifty-one (51) stroke patients enrolled in this study, thirty-one (31) or 61 % had cerebral infarction and twenty (20) or 39% had a diagnosis of haemorrhagic stroke. The results showed that stroke patients required a moderate level of assistance from caregivers due to their modified functional ability. Also, that nurses had a high expectation of caregiver's participation in caring. The mean level was 136.7 however it ranged from 41 to 164 (SD=13.3). Caregivers scored at moderate level of participation in caring for stroke patients during hospitalisation. The mean level of family caregivers' participation was 109.8 and the range was from 41 to 164 (SD=21.1). In bivariate analysis using 'Pearson correlation' there was no correlation between nurses' expectation and caregivers' participation in caring ($r = -0.06$, $p > 0.05$).

Further research is needed with regards to caregivers' involvement in caring for stroke patients during hospitalisation.

Keywords: Stroke, functional disability, caregivers' participation, nurses' expectation

Background and literature review

Stroke is considered as a major chronic illness in Malaysia. It causes death and disability. Stroke is a disruption of blood supply to a part of the brain characterised by rapidly developing symptoms, resulting in ischaemia and tissue death with corresponding neurological deficits and/or signs of focal and at times global loss of cerebral function, with symptoms lasting more than 24 hours or leading to death with no apparent cause other than that of vascular origin (Davenport & Denis, 2003).

Stroke causes chronic disability to an individual. It may affect all functions: motor, sensory, auto-

nomic nervous system, balance, ambulation, speech, perceptual, cognitive and mood (Jauch and Kessela 2009; Dobkin 2005; Brauer, Schmidt & Pearson, 2001). A stroke often leaves an individual physically disabled, experiencing the need for total or some assistance with activity of daily living (ADLs) (Claiborne 2006, Dobkin 2005). Stauffacher, Lindquist, & Sarik, (2000), stated that stroke patients required long-term hospitalisation for specific investigation, treatment and rehabilitation and frequently required a caregiver to help them meet their healthcare needs. The degree of assistance required depends on the severity of the disability, concurrent cognitive and behavioural issues and medical deficits (Dobkin, 2005, Ozer, 2000).

Nurses who cared for stroke patients within the hospital setting expected families' or caregivers to participate in the caring process especially in meeting the stroke patient's health care needs, including ADLs (Cross & Walker, 2008; Brereton

Questions or comments about this article should be directed to Sabarisah Hashim, Senior Lecturer, Science University of Malaysia at risha@kck.usm.my
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& Nolan, 2002; Bull, Hansen & Gross, 2000). Involvement by caregivers will provide beneficial outcomes to nursing practice and stroke patients such as to improve the quality of care for the stroke patient (Ostwald, Davis, Hersch, Kelly and Godwin 2008; Stauffacher et al. 2000; Ozer, 2000), to enhance caregivers' knowledge about stroke and to learn the specific skills that relate to the management at home and prevent secondary problems (Cross et al 2008; Brereton et al 2000; Bull et al 2000). Participation of caregivers was expected to decrease the economic burden of the health care system, on the stroke patient and on their caregivers (Stauffacher et al 2000; Ozer, 2000).

Failure of caregivers involvement will cause an increase length of hospital stay (Ozer, 2000), increase rate of stroke complication such as pneumonia, a breakdown in skin integrity, urinary tract infection and painful shoulder (Indredavik, Rohweder, Naalsund and Lydersen 2008), depression (Pfeil, Gray and Lindsay 2009; Johnson, Minarik, Nystrom, Bautista and Gorman 2006; Lightbody, Autom, Baldwin and Gibbon 2007) and increase rate of readmission (Bull et al 2000). Studies showed that stroke patients who had families participating in caring during hospitalisation were able to return home and demonstrated a more favourable outcome compared to those who did not have positive family participation (Kautz & Horn, 2009; Ostwald et al 2008; Watson, Modeste, Catolico & Crouch, 1998).

A caregiver is an individual (usually a family member) who assumes primary responsibility for providing support and assistance to another person or group with evident or anticipated needs in order to improve a human condition or lifestyle (Rosenbaum, 1986). Stroke caregivers are required to be involved and interact with healthcare staff to assess and determine the stroke patients' healthcare needs, participate in the planning of care and decision-making and the implementation and evaluation of care (Congdon et al 2006). Caregivers of stroke patients have a right to be involved in caring for their family members and it has been said that caregivers have little awareness of their rights and responsibilities to participate in caring for their family member during hospitalization, such as to acquire information and advice and being prepared for care-giving role. Current research showed that participation in caring during hospitalisation is often perceived negatively by families because they reported that they often receive little or no preparation for the care giving role. (Schirm & Collier, 1992; Congdon, 1994).

There are factors that influence and inhibit the

caregivers' participation in caring such as attitude of caregiver, attitude of nurses towards caregivers' participation in caring, age of the stroke patient, severity of illness and the ability to communicate (Kautz & Horn, 2009; Congdon, 1994; Laitynen & Isola 1996). Lack of caregiver involvement in care of hospitalized patient noted that healthcare professionals' failure to involve caregivers in caring process (Bull et al. 2000). Caregiver and nurse should maintain a good relationship and have open communication to enhance caregivers' participation in caring. The caregiver-nurse relationship should be based on basic interpersonal skills of respect, trust, authenticity and courtesy (Kautz et al, 2009; Gallant, Beaulieu and Carnevale 2002).

In conclusion, the nurse needed to implement strategies to help caregivers to participate in caring process, such as how to provide personal care, perform treatment, and prevent complications from disability of stroke patient.

Purpose

The purpose of this study was to determine the level of functional disability after having a stroke, the nurses' expectation of caregivers' participation in caring for that patient and the levels of caregivers' participation in caring for the stroke patient during hospitalisation.

Research questions

The study aimed to answer the following research questions:

1. What is the level of the functional disability of stroke patients during hospitalisation?
2. What is the level of caregivers' participation in caring for stroke patients during hospitalisation?
3. What is the level of nurses' expectations of caregivers' participation in caring for stroke patients?
4. Is there any relationship between nurses' expectation of caregivers' participation in caring and caregivers' participation in caring for stroke patients?

Theoretical framework of this study

The concept of nursing process is used in developing the framework of caregivers' participation in caring and nurses' expectation on caregiver participation in caring for stroke patient with disability during rehabilitation stage (Figure 1). A stroke

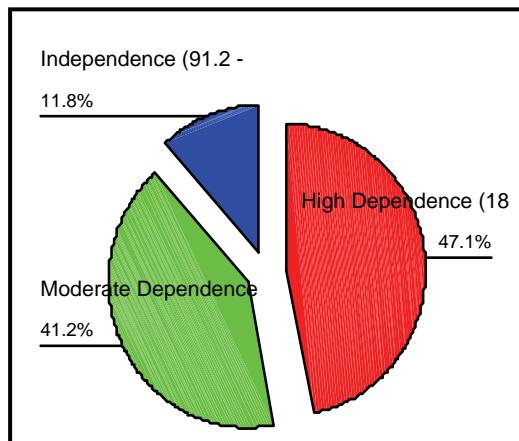


Figure 1: Level of Functional Disability of Stroke Patients During Hospitalisation.

patient with persisting neurological alteration following a stroke frequently has alteration in physical and psychosocial functioning. The stroke patients are usually disabled in many areas of functional abilities which include mobility, activities of daily living, communication and psychosocial and frequently depend on others in meeting their needs in maintaining health and in activities of daily living (Jauch, 2009; Dobkin 2005; Brauer et al 2001). They frequently need assistance in those activities. The assistance may include human assistance from another individual, structural assistance such as adaptive equipment and assistive devices, or prolonged time requirement (Derstine & Hargrove, 2001). Level of functional disability was determined using Functional independence Measure (FIM) tool.

It is important for caregivers to participate in caring process in relation to enhance caregivers' knowledge about stroke and to learn the specific skills that relate to the management at home (Cross et al, 2008; Brereton et al, 2002; Bull et al, 2000). Caregivers' participation is an active process, where caregivers were involved in identifying stroke patients' problems, taking part in care-planning and decision-making, performing clinical or daily living skills and evaluating outcome of care received from the time of admission until discharge (Cross et al, 2008). Caregivers' participation in caring for stroke patients was measured using *Caregivers' Participation in Caring Questionnaire* (CPCQ).

A nurses' expectation on caregivers' participation in caring activities during hospitalization of stroke patient is aim to enhance a good care for the person with disabilities by minimizing the effects of disability (Kautz et al, 2009; Derstine et al 2001; Secrest, 2002). Caregivers' participation in caring during hospitalization is important to improve the quality of care to stroke patients and to en-

hance caregiver knowledge and competence in care giving skill (Kautz et al, 2009; Cross et al, 2008). While nurse expectation of Caregivers' participation in caring for stroke patients was measured using *Nurses' Expectation of Caregivers' Participation in Caring Questionnaire* (NECPC).

Methodology

Design

The study was a cross-sectional study conducted during July to August, 2003.

Sample

The population of this study was hospitalised stroke patients during 1st July to 31st August 2003 with caregivers and staff nurses who were working in the medical/surgical HUSM (Malaysia). The inclusion criteria for stroke patients are as follows: (1) diagnosed as having stroke, either infarction or haemorrhage and (2) hospitalised more than three (3) days. The inclusion criteria for caregivers are (1) 18 years or older (2) primary caregiver of the hospitalised stroke patient (3) willing and able to participate in caring during the hospitalisation period (4) able to communicate with the researcher.

Sample size

The data was collected at HUSM over a two month period (2003). The total admission of stroke patients both infarction and haemorrhagic at HUSM was 250 to 300 per year (Record Office, HUSM, 2001). A total of sixty – seven (67) stroke patients were admitted. Of these, fifty-one (51) patients (76.1%) fulfilled the inclusion criteria and had caregivers to help during hospitalisation. The total number included in the study was 51 stroke patients with their caregivers and 51 nurses. All nurses who worked in the medical/surgical ward who cared for stroke patients during the rehabilitation phase were invited to partake in the study. There were 56 nurses, out of these 51 nurses responded to the questionnaires.

Instrumentations

The instruments of this study consisted of:

1. *Functional Independence Measurement* (FIM) tool used to determine the level of functional disability. The FIM consists of two domains, motor and cognitive function. Motor function is divided into four (4) sub-domains; i.e self-care, sphincter control, transfers and locomotion. Cognitive function is divided into two (2) sub domains; i.e communication and social cognition (Bottemiller, Bieber, Basford & Harris, 2006; Dodd, Martin, Stopor, & Dego, 1993).

2. *Questionnaire for Caregivers' Participation in Caring (CPCQ)* was used to measure the level of caregivers' participation in caring for stroke patients. The CPCQ consist of a forty one (41) item questionnaire. The items were constructed based on literature related to stroke patient's care during rehabilitation and caregivers' participation in caring (Jauch, 2009; Dobkin 2005; Brauer et al, 2001; Brownlea, 1987).

3. *Nurses' Expectation of Caregivers' Participation in Caring Questionnaire (NEPC)* was used to measure level of Nurses' expectation on caregivers' participation in caring. The NEPC consists of forty one (41) items and the questionnaire composes of four (4) processes of participation in caring for stroke patient during rehabilitation in hospital. (Jauch, 2009; Dobkin 2005; Brauer et al, 2001; Brownlea, 1987; Stauffer et al, 2000; Ozer, 2000).

Validity and reliability of instruments

The FIM scale is a standardised tool, and was tested for its validity (Bottemiller et al, 2006). The inter-rater reliability was 0.91 and interval consistency total items found with the correlation coefficient of 0.96. The reliability was tested in this study over 4 day period in a sample of 10 in-patient with head injury. A significant correlation was found in all items and the value of Cronbach's Alpha for FIM was 0.96.

Content validity and reliability of the Caregivers' Participation in Care (CPCQ) and Nurse Expectation of Caregivers' Participation in Care questionnaires were tested before collecting the data.

Content validity of the English version of the Caregivers' Participation in Care and Nurse Expectation of Caregivers' Participation in Care questionnaires (NEPC) was reviewed and analyzed by 2 experts in medical-surgical nursing and one from community nursing of the Faculty of Nursing, Prince Songkla University, Thailand. Each item was evaluated on the degree of relevance with constructed variables of caregivers' participation in care and nurse expectation of caregivers' participation in care for stroke patients. The instruments were revised according to the expert's suggestions.

Reliability of both instruments (CPCQ & NEPC) was tested among 12 caregivers and 10 nurses before data collection. Cronbach's alphas were calculated for internal consistency using correlation coefficients. Cronbach's Alpha coefficient of CPCQ was .94 and NEPC was .92.

Procedure

Data collection procedures consisted of (1) Selecting subjects both stroke patients and caregivers according to the sampling criteria (2) Explaining objectives of the study to each subject and assuring them of confidentiality, anonymity and freedom to withdraw from the study (3) Obtaining written consent for participation (4) Assessing level of functional disability using FIM tool for stroke patients (5) Having caregivers answer the questionnaire (CPCQ) and (6) Selecting nurses according to the inclusion criteria and having them answer the questionnaire (NEPC).

Ethical consideration

Permission for conducting data collection was obtained from the Hospital Director, HUSM. A consent form for respondents in this study includes statements about the researcher, purposes of the study, assurance of subjects' anonymity, the voluntary nature of participating in the study, freedom to withdraw from the study at any time, anticipated usefulness of results, and the name, address of the researcher and other contact person. Respondents signed consent, before the assessment and questionnaire. A code number was put in each questionnaire instead of using the person's name. The questionnaires were coded according to the entering sequence of the samples. A code number was put in every questionnaire and was deleted afterwards.

Results and discussion

Level of functional disability

A total of fifty one (51) stroke patients were diagnosed as having an intra-cerebral haemorrhage or infarction based on the CT scan report. Thirty-one (31) samples (61%) were diagnosed as having cerebral infarction and twenty (20) samples (39%) as having haemorrhagic stroke. The result of this study showed that the stroke patient's age ranged from 35 to 84 years old ($M = 61.39$, $SD = 11.55$). The analysis of the result showed that 58% were 55 to 74 years old. All patients were assessed using the functional ability level by FIM assessment. The result showed that the mean of the total FIM score was 62.5 ranged from 18 to 126 ($SD=37.2$), it indicate that majority of stroke patients are categorised of moderate and high dependence of assistance (Figure 1). The result revealed that stroke patients were completely or moderately dependent on others to help in meeting their needs of daily living such as self-care, sphincter control, transfers, and locomotion during recovery stage. It is similar to the statement by Jauch, (2009), Claiborne, (2006) and Dobkin (2005), the after a stroke patients frequently be-

come hemiplegic or hemiparetic as a result of damage to the motor area of the cortex or to the pyramidal tract fibers. In terms of a cognitive function, the result of this study showed that the majority of stroke patients were unable to communicate effectively, interact with another person and environment, solve problems and remember previous events. This is similar to the statement by Chin, Finocchiaro and Rosebrough (1998) where stroke can cause disruption to the reticular activating system (RAS), leading to various neurobehavioral deficits such as disorientation or confusion, memory loss, apathy, lack of initiation, decreased attention, impaired judgment, poor problem to transfer learning from one situation to another and inability to calculate, reason, abstract thought, control emotions, and lack insight.

Level of nurses' expectation

There were 51 nurses working in the medical/surgical wards who participated in this study. In order to participate in the study the staff were

Degree of Participa-	Range	Frequency	%
Low Expectation	41.0 - 82	0	0
Moderate expectation	82.1 - 123	0	0
High expectation	123.1 - 164	51	100

Table 1: Degree of nurses' expectation on caregivers' participation in caring for stroke patients.

required to have experience in caring for stroke patients during the recovery stage. The result showed that the total scores was in high level of expectation categorised from high expectation range [123.1- 164], moderate expectation range [82.1 -123] and low expectation range [41-82] (Table 1).

The result of the study showed that nurses expected caregivers to participate in assessing and determining stroke patient problems and health-care needs; that caregivers should be involved in knowing what had happened to their family member such as observing changes in patient's condition, gain information concerning stroke illness, the seriousness of the patient illness, the impairment in physical and psychosocial health, the prognosis for recovery and treatment required, skin integrity, ability to assess patients' ability in self-care activities of daily living, promoting communication and provided psychosocial support.

The result of the study showed that the majority of nurses expected caregivers to learn the caring skills i.e. positioning technique, maintain patient

with enough oxygenation such as suctioning procedure and monitoring oxygen administration, mobilise and transfer technique, exercises, activities of daily living such as eating, hygienic needs, elimination needs, promote communication and provide psychosocial support to the stroke patient.

In addition nurses expected caregivers to be more comfortable to ask questions, to report and discuss with the nurses or physicians about the treatments and care provided to the stroke patients.

Level of caregivers' participation

The total of 51 caregivers was recruited in this study. Caregivers' age ranged from 18 to 65 years ($M = 40$ $SD = 13$). Most caregivers were women (84.3%). The majority of caregivers were from a low socio-educational status, i.e., 74.4 % have primary and secondary level of education, 11.8% have no education and 68.6 % were unemployed. Most of the caregivers in relation to stroke patients were their parent (51%), whereas others were spouses (31.4 %) or close relatives or grandmother/father or parent of the stroke

Degree of Participa- tion	Range	Fre- quency	%
Low Participation	41.0- 82.0	0	0
Moderate participa- tion	82.1 - 123.	27	52.9
High Participation	123.1 - 164.0	24	47.1

Table 2: Degree of caregivers' participation in caring for stroke patients.

patient (17.7%) and 68.6 % reported having an experience of taking care of stroke patients. The result of study showed that the total level of caregivers' participation was 109.80 ($SD = 21.1$). There was a moderate level of participation which was categorised from high participation range [123.1-164], moderate participation range [82.1 -123] and low participation range [41-82] (Table 2).

The results revealed that there was a high level of caregivers caring for their sick family member especially with simple activities, i.e. observing changes in the patient's condition such as mobility, hygiene, ability to swallow and communicate, social interaction, decision making and the emotional response to daily living skills such as nutritional needs, hygiene needs, toileting, providing

psychosocial support and intervention to prevent falls.

However, caregivers moderately participated in caring activities that required an interaction with nurses and the skill that required some knowledge and training such as observation of skin integrity, mobilization from bed to chair/wheelchair or vice versa using correct transfer techniques, limb exercises, speech-therapy, communication and to improve patient orientation.

Caregivers' participations were low especially in complicated activities that required special training such as positioning every second hourly, suctioning procedure, feeding of the stroke patient via tube and monitoring oxygen administration.

Relationship between caregivers' participation and functional disability and between caregivers' participation and nurses' expectation

The result of correlation between nurses' expectation on caregivers' participation in caring and caregivers' participation in caring for stroke patients gives a non significant negative correlation ($r = -.060$, $p > .0676$). The negative correlation between caregivers' participation in caring with level of disability and nurses' expectation may be due to many reasons such as socio-demographic variables, caregivers uncertainty about state of illness, lack of communication between caregiver and nurses, lack of attention of nurses to caregivers, level of caregivers knowledge and experience, caregivers' and nurses' attitude in caring for stroke patients, length of hospitalisation was perhaps due to the small sample size. However to have a significant correlation a longer period of data collection is required. The researcher strongly suggests that the results should be used as information and guidance to enhance the quality of care for stroke patients.

Conclusion

We strongly recommended that caregivers' participation in caring is important during hospitalization of stroke patient is important. Caregivers need skills and training in enabling the person with the stroke to be cared for safely, self-confidence and independent initiatives to access resources as needed in helping stroke patients to have early recovery and to prevent stroke complications.

References

Brauer, D. J., Schmidt B. J. & Pearson, V. (2001). A framework of caring during the stroke experience. *Rehabilitation Nursing* 3(26),88-94. 2.

Brereton, L. & Nolan M. (2000). You do know he's had a stroke, don't you? Preparation for Family Care giving-the neglected dimension. *Journal of Clinical Nursing*, (9), 498-506.

Brownlea, A. (1987). Participation: Myths, realities and Prognosis. *Social Science Medicine*. 25 (6), 605-614.

Bottemiller, K. L., Bieber, P. L., Basford, J. R., & Harris (2006). FIM score, FIM efficiency and discharge disposition following inpatient stroke rehabilitation. *Rehabilitation Nursing*, 31 (1); 22, 4 pgs

Bull, M. J., Hansen, H. E. & Gross, C. R. (2000). A Professional-Patient Partnership Model of Discharge Planning With Elders Hospitalized With Heart Failure. *Applied Nursing Research*, 13 (1), 19-28.

Chin, P. A., Finocchiaro D, and Rosebrough, A. (1998). *Rehabilitation Nursing Practice*. New York: Mc Graw Hill - Health Professions Division.

Claiborne, N. (2006). Effectiveness of a Care Coordination Model for Stroke Survivors: A Randomized Study. *Health & Social Work*, 31(2), 87, 10 pgs

Congdon, J. G. (1994) Managing the incongruities: The hospital discharge experience for elderly patients, their families and nurses. *Applied Nursing Research*, 7, 125-131.

Congdon, C., & McCarthy, G. (2006). Lifestyle changes following acute myocardial infarction: Patients' perspectives. *European journal of Cardiovascular Nursing*, 5, 37-46

Cross & Walker (2008). Stroke care: a nursing perspective. *Nursing Standard*, 22 (23), 47, 11 pgs

Davenport R, Denis M. (2003). Neurological emergencies: Acute stroke. *J Neurol Neurosurg Psychiatry*, (68), 277-88.

Derstine, J.B., & Hargrove, S.D. (2001). *Comprehensive rehabilitation nursing*. Philadelphia: W.B. Saunders.

Dobkin B.H. (2005). Rehabilitation after stroke. *Rehabilitation after Stroke*. The New England Journal of Medicine, 352,16; pg. 1677, 8 pgs

Dodd, T. A., Martin, B P., Stopor, W. C., Dego, R. A. (1993). A validation of the functional measurement and its performance among rehabilitation inpatients. *Archives of Physical Medicine and Rehabilitation*, 74, 531-536.

- Gallant, M. H., Beaulieu, M. C. & Carnevale, F. A. (2002). Partnership: an analysis of the nurse-client relationship. *Journal of Advance Nursing*, 40 (2), 149-157.
- Indredavik B., Rohweder G., Naalsund E., & Lydersen S. (2008). Medical Complication in a comprehensive Stroke Unit and an Early Supported Discharge Service, *Stroke*.39;414
- Jauch E.C. & Kessela B. (2009). Acute Stroke management. Emedicine from <http://emedicine.medscape.com/article/1159752>
- Johnson J,L. Minarik, P.A. Nyström,K,V., Bautista, C. & Gorman M. J. (2006). Post Stroke Depression Incidence and Risk Factors: An Integrative Literature Review. *Journal of Neuroscience Nursing*. Park Ridge
- Kautz, D. D. & Horn, E. V. (2009). Promoting Family Integrity to Inspire Hope in Rehabilitation Patients: Strategies to Provide Evidence- Based Care. *Rehabilitation Nursing*, 34 (4); ProQuest Health and Medical Complete, pg 168
- Laitinen, P. & Isola, A. (1996). Promoting participation of informal caregivers in the hospital care of the elderly patient: informal caregivers' perception. *Journal of Advanced Nursing*, 23, 942-947.
- Lightbody, C.E. Autom, M., Baldwin R., Gibbon, B. et al., (2007). The use of nurses' and carers' observations in the identification of poststroke depression. *Journal Of Advance Nursing*, 60(6), 595-604
- Ostwald S.k., Davis S., Hersch G., Kelley C.,Godwin K.M.(2008). Evidence-Based Educational Guidelines for Stroke Survivors After Discharge Home. *Journal Of Neuroscience Nursing*, 40 (3), 178-186.
- Ozer, M. N. (2000). Management of person with chronic neurologic illness. Bostan: Butterworth Heinemann, 57-89.
- Pfeil, M., Gray, R., & Lindsay, B. (2009). Depression and stroke: a common but often unrecognized combination. *British Journal of Nursing*, 18 (6).
- Polit, D.F. & Hungler, B.P (1999). Nursing research principles and methods. (6th Ed). Philadelphia: Lippincott.
- Rosenbaum. (initial) (1986). Comparison of two theorists on care. *Journal of Advanced Nursing*, 11, 409-593.
- Schirm, V. & Collier, J. (1992). Nurses' involvement of family care of hospitalized elders. *Journal of Nursing Care Quality*. Special report, 36-43 cited in Bull, M. J., Hansen H.E & Gross, C.R. (2000). Differences in Family Caregiver Outcomes by their Level of Involvement in Discharge Planning. *Applied Nursing Research*, 13 (2), 76-82.
- Secret, J. S. (2002). How stroke survivor and primary support person experience nurses in rehabilitation. *Rehabilitation Nursing*, 27 (5), 176-183.
- Stauffer, Z., M., Lindquist, R. & Sarik, K. (2000). Development of health care delivery system that are sensitive to the need of stroke survivors and their caregivers. *Nursing Administration Quarterly*, 24 (3), 33-42.
- Watson, R., Modeste, N.N. Catolico, O. & Crouch, M. (1998). The Relationship Between Caregiver Burden and Self Deficits in Former Rehabilitation Patients. *Rehabilitation Nursing*, 23 (5), 258-262.

Silver-hydrogel urinary catheters are associated with reduced catheter related bacteriuria in stroke patients - a quality project.

Sharon Eriksson, Lin Perry.

Abstract

Patients with acute stroke are at risk of developing a wide range of complications following a primary stroke event, of which urinary tract infection is the third most common. Urinary infections account for approximately 40% of all nosocomial infections, with up to 80% attributable to the use of indwelling catheters. Urinary infections contribute to increased morbidity and mortality and are associated with increased cost of hospitalisation. Silver-hydrogel coated catheters may reduce the incidence of bacteriuria and infections in catheterised patients.

Over a thirteen-month (13) period, data was obtained on bacteriuria in catheterised patients admitted to the Acute Stroke Unit at a large Tertiary Referral Hospital. The data for the first seven (7) months demonstrated high numbers of patients with catheter related bacteriuria: 70% of female and 44% of male patients. After the first seven (7) months, Foley silver-hydrogel catheters were introduced to replace unmodified Foley silicone catheters. The following six (6) months data demonstrated that only 19% of stroke patients catheterised with silver-hydrogel catheters developed bacteriuria.

Reduction in the number of patients with bacteriuria is reflected in reduced catheter related urinary tract infection (UTI) and associated discomfort following the introduction of the Foley silver-hydrogel catheters. Use of these catheters may also offer cost savings. Nurses should consider these catheters when indwelling urinary catheters are required for stroke patients.

Key Words: Silver-hydrogel catheters, bacteriuria, urinary tract infection, stroke, nursing

Background

Acute stroke is associated with a wide range and high incidence of complications, with urinary tract infection one of the most commonly occurring. Urinary infections account for approximately one third of all hospital-acquired infections, of which up to 80% are attributable to the use of indwelling catheters. In stroke patients, UTIs are associated with poorer outcomes, including increased risk of neurological decline in hospital, increased length of stay and risk of death or disability at three (3) months. Stroke patients are particularly susceptible due to immune suppression, bladder dysfunction and high use of indwelling urinary catheters. Silver-hydrogel coated catheters may reduce the incidence of bacteriuria and infections in catheterised patients but the evidence is not conclusive (Poisson, Johnston and Josephson 2010).

Questions or comments about this article should be directed to Sharon Eriksson, Clinical Nurse Consultant: Stroke, Prince of Wales Hospital at sharon.eriksson@sesiahs.health.nsw.gov.au
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Regular auditing and monitoring is recommended to identify and help address local practice problems (National Stroke Foundation 2007). Leadership is required to establish projects and this occurred in one tertiary metropolitan hospital with the appointment of a Stroke Clinical Nurse Consultant (CNC). A local priority was determined after anecdotal reports that stroke patients treated with an indwelling urinary catheter (IDC) had a high incidence of bacteriuria and subsequent urinary tract infections (UTIs). A project led by the Stroke CNC with support from the Acute Stroke Unit (ASU) nursing staff was formed to investigate and address the anecdotal report.

Urinary Tract Infections in hospitals

Urinary tract infection is the most common nosocomial infection, accounting for approximately 40% of infections (Barnett and Stephens 1997; McLaughlin and Sciuto 1998). UTI is the third most common post-stroke complication, behind falls and skin breaks (Davenport and Keeley 1996). UTI is defined most commonly as a microbial colonisation of the urine and an infection of the structures of the urinary tract. Diagnosis is

dependent on several factors, including cell count in the urine, presence of epithelial cells, presence of organisms and bacteria on culture ($>10^7$) and patient symptoms (including fever, dysuria, abdominal pain) (Barnett and Stephens 1997; McLaughlin et al 1998; Riley, Classen, Stevens and Burke 1995). UTIs can have a major impact on the patient, with increased morbidity, mortality and cost of hospitalisation. Patients are also exposed to the unwanted discomforts associated with UTI, including fever, rigors, abdominal pain, dysuria (Barnett and Stephens 1997; Goetz, Kedzuz, Wagener and Muder 1999; Sienty and Dawson 1999).

In-dwelling catheters

The literature states that the most common cause of nosocomial UTIs are the use of IDCs. IDCs are reported to account for up to 80% of nosocomial UTIs (McLaughlin et al 1998; Goetz et al 1999; Sienty and Dawson 1999; Poisson et al 2010). Each year around the world, millions of IDCs are used. A significant percentage of complications from urinary catheterisation result following bacteriuria: i.e. in the presence of bacteria in the urine. IDCs increase patients' susceptibility to bacteria entering the bladder through two main routes, externally from the urethral meatus along the catheter, and/or intraluminally, from the collection bag or the catheter and drainage tube junction. It is thought that the external route is the most likely port of entry in up to 70 – 80% of women and 20 – 30% of men. Catheters as foreign objects potentially act as hosts for colonisation of bacteria on their surfaces, increasing the risk of UTI (Goetz et al 1999).

Australian Acute Stroke Guidelines advise that up to 43% of stroke patients are incontinent of urine in the first 72 hours after stroke and recommend that 'the use of indwelling catheters should be avoided as an initial management strategy except in acute urinary retention' (National Stroke Foundation 2010). A Cochrane review of strategies to manage incontinence suggested structured assessment and management of care including specialist continence nursing may reduce urinary incontinence after stroke (Thomas, Cross, Barrett, French, Leathley, Sutton and Watkins 2008). However, the 2009 National Audit of Stroke carried out by the National Stroke Foundation reports that, 'one quarter of patients had an indwelling urinary catheter within a week of admission'. Hence one part of the problem may be related to inappropriate use of IDCs. Whether or not an IDC is an appropriate management choice, incidence of UTI may vary with product used.

Silver coated IDCs

The antimicrobial activity of silver has been well known for centuries, due to the toxicity of the element to micro-organisms. Silver-coated catheters were developed to reduce the incidence of IDC-related UTI. The catheter releases silver ions gradually from its silver-based hydrogel coating (internally and externally). These silver ions have a controlled release, with the highest concentration released over the first ten (10) days (the median time that most IDCs are in situ), tapering out over time (about 30 days). These ions act as a bactericide, interfering with the integrity, metabolism and reproduction of bacteria. The silver-hydrogel coating assists in preventing the colonisation of organisms on the catheter surface and minimising their migration along the catheter shaft (Lundeberg 1986; Niel, Arend and van de Broek 2002; Tyco Healthcare).

Trials of the efficacy of silver oxide coated IDCs (coated on the external surface alone) have failed to demonstrate benefit (Johnson et al 1990). However, Saint, Veenstra, Sullivan, Chenoweth and Fendrick (2000) conducted a meta-analysis of four randomised trials from the same research group (Lundeberg 1986; Liedberg and Lundeberg 1990; Liedberg et al 1990; Liedberg and Lundeberg 1993); all showed benefit for silver hydrogel-coated IDCs (coated on the internal and external surface). Five later trials reviewed by Davenport and Keeley (2005) found more mixed results: three showed significant benefit, albeit of smaller magnitude than reported in the meta-analysis (Maki, Knasinski, Halvorson and Tambyah 1998; Bologna, Tu, Polansky, Fraimow, Gordon and Whitmore 1999; Karchmer, Gianetta, Muto, Strain and Farr 2000); one showed benefit only with those catheterised for shorter (up to 5 days) but not longer (14 day) periods (Verleyen, De ridder, Van Poppel and Baert 1990); one failed to find benefit (Thibon, Le Coutour, Leroyer and Fabry 2000). One further trial (Rupp, Fitzgerald, Marion, Helget, Puumala, Anderson and Fey 2004) demonstrated reduced incidence of catheter-associated UTI. Overall, findings demonstrated that silver-alloy coated IDCs provided greater protection against bacteria than uncoated or silver-oxide coated catheters and that the use of silver-hydrogel coated catheters caused a significant reduction in the incidence of bacteriuria and/or nosocomial UTI. Further, there were estimates of modest cost saving associated with their use.

The purpose of this study was to explore whether a change in routine practice, (ie: replacement of the available IDC with the silver-hydrogel Foley), would result in the reduced incidence of bacteriuria suggested by most studies. The aim of the study was to compare the number of patients admitted to the ASU with an acute stroke with

catheter acquired bacteriuria using two different types of IDCs (unmodified Foley and silver-hydrogel Foley catheters). For the purpose of this project the primary outcome was numbers of patients with bacteriuria, derived from urine cultures demonstrating the presence and type of organisms.

Methods

Participants

Patients were eligible for inclusion if they were admitted to the ASU with a primary diagnosis of stroke (ischaemic or haemorrhagic) and were deemed to require insertion of an IDC. Patients were excluded if bacteriuria was demonstrated in the urine specimen obtained on insertion of the IDC: i.e. if bacteriuria predated IDC insertion.

Procedures

In Stage 1, the catheters used were those routinely available at the time - unmodified Foley silicone catheters. Between the first and second stages staff were instructed in the change of catheter type. To support this, stock items were also changed. In Stage 2, silver-hydrogel Foley catheters were used for patients meeting the same inclusion criteria.

For both groups of participants data was extracted including medical record number, age, gender, date the IDC was inserted and removed, presence and type of organisms detected in urine by routine hospital urine culture procedures, and episodes of incontinence of faeces. These were recorded in the nursing notes. Data was extracted for patients admitted between July 2003 and Jan 2004 for Stage 1, from March to Sept 2004 for Stage 2.

Data was collated using Microsoft Access and the two groups compared descriptively. A comparison of the group characteristics and primary outcome data was used non-parametric statistics via SPSS Version 17. As this was a comparison of two routine practices (both catheters were routinely available and used throughout the hospital), formal Human Research Ethics Committee approval was not required.

Results

Over the six and seven month recruitment periods of Stages 1 and 2, 29 and 28 patients received urinary catheterisation, respectively. Ages ranged 48 to 93 years, with mean (SD) age 79.6 (10.1) years. Overall, women predominated with 42 (73.7%) female, 15 (26.3%) male. Women were generally older, at mean (SD) age 81.5 (7.5)

years compared to 73.3 (14.4) years. The age and sex distribution of the two groups was not significantly different (Tables 1 and 3).

	MALE	FEMALE
Number (%)	9 (31.0)	20 (69.0)
Mean (SD) age, years	76.5 (14.3)	80.9 (8.6)
Mean (SD) duration IDC in situ, days	13.2 (7.4)	11.9 (9.7)
At least 1 episode of faecal incontinence, number (%) participants	5 (55.0)	15 (75.0)
Bacteriuria present, number (%) participants	4 (44.4)	14 (70.0)
Number of participants in whom bacteriuria and faecal incontinence coincided	3 (33.3)	11 (55.0)

Table 1: Stage 1 patients, using unmodified Foley silicone catheters.

Nine (9) participants were transferred from the ASU with IDC's still in situ. The mean duration participants retained their catheters on the ASU ranged from 1-40 days, mean (SD) 11.5 (9.6) days. Mean numbers of days the two groups retained their catheters was not significantly different (Tables 1 and 3).

Similar numbers of participants experienced episodes of faecal incontinence (20 and 21 participants) 69.0% and 75.0% of each group, respectively. Whilst more women were affected than men, with 33 (78.6%) of women compared to 8 (53.3%) of men experiencing this, numbers were not significantly different.

In Stage 1, 18 participants were reported to have experienced at least one episode of bacteriuria; in Stage 2, three participants were similarly reported, significantly fewer ($\chi^2=16.146$, $p<0.001$). Of those who experienced bacteriuria, 16 (39%) also experienced faecal incontinence.

Details of Stage 1: Unmodified Silicone Foley Catheters

In Stage 1 more women than men were recruited. Whilst not significantly different, women were

older than men, and more likely to experience bacteriuria and faecal incontinence than the men; their catheters were retained for similar duration (Table 1). Episodes of faecal incontinence expose the patient to potential migration of intestinal organisms found in faecal matter into the bladder. At 62% versus 25%, women were more likely than men to experience both faecal incontinence

Type of Organism	Number (%)
Escherichia Coli	7 (37)
Enterococcus Faecalis	5* (27)
Proteus Sp.	4 (21)
Pseudomonas Aeruginosa	1 (5)
Citrobacter Sp.	1 (5)
MRSA	1* (5)

Table 2: Organisms cultured from Stage 1 patients. (* One patient polymicrobial).

and bacteriuria. In these patients, 85% of the organisms cultured were of human intestinal/ faecal origin (Escherichia Coli, enterococcus faecalis and proteas Sp.; Table 2). With 18 episodes of bacteriuria for 348 catheter days, 51.7 episodes of positive culture were demonstrated per 1,000 catheter days.

Details of Stage 2: Silver-hydrogel Silicone Foley Catheters

In Stage 2, once again there were more women than men, with women older than men. Three women and no men developed bacteriuria (10% of the group, 13.6% of the women of the group). In total, 75% of patients had at least one episode of faecal incontinence (Table 3). Two of the three women who experienced bacteriuria also experienced faecal incontinence. None of the organisms cultured from the three women were of human intestinal/faecal origin, with two of the three women with urine cultures demonstrating Klebsiella Pneumoniae and one demonstrating Pseudomonas Aeruginosa. With three episodes of bacteriuria for 344 catheter days, 8.7 episodes of positive culture were demonstrated per 1,000 catheter days.

In summary, the two groups of 29 and 28 patients were not significantly different in terms of age, sex or mean duration of catheterisation; similar numbers experienced at least one episode of faecal incontinence. However, numbers of participants reported with bacteriuria were significantly

Table 3: Stage 2 patients, using silver-hydrogel coated Foley catheters.

	Male	Female
Number (%)	6 (21.4)	22 (78.6)
Mean (SD) age, years	70.8 (15.0)	82.0 (6.5)
Mean (SD) duration IDC in situ (days)	13.2 (7.5)	11.9 (9.7)
At least 1 episode of faecal incontinence, number (%) participants	3 (50.0)	18 (81.8)
Bacteriuria present, number (%) participants	0	3 (13.6)
Number of participants in whom bacteriuria and faecal incontinence coincided	0	2

different, with 18 (62%) of Group 1 and 3 (10.7%) of Group 2 affected. Consequently, episodes of positive cultures per 1,000 catheter days were also significantly lower for the second group. Different patterns of organisms were found, with human intestinal origin only cultured from Group 1.

Discussion

This was a small non-randomised study with data collected from two sequential cohorts of patients at one site. Findings must be interpreted with caution as other factors beside choice of IDC may have occurred affecting bacteriuria rates. Study outcomes were episodes of positive urine cultures, not established cases of UTI, which accounts for the much greater rates of positive cultures per 1,000 catheter days (particularly in Stage 1) than the rates of UTIs per 1,000 catheter days reported in other studies. For example, Rupp et al (2004) reported UTI rates of 6.13/1,000 catheter-days during 1999-2000 with non-coated catheters compared with 2.62/1,000 catheter-days for silver-hydrogel catheters during 2001-2002.

Urine cultures are an important outcome, as demonstration of microbial growth in urine is a fundamental element of diagnosis of UTI. They are frequently used as study outcomes in preference to the much less-frequent UTI rates. Regular sub-

mission of patient data from this ASU to the Towards a Safer Culture (TASC; see <http://www.cec.health.nsw.gov.au/programs/tasc.html>) stroke database revealed data on 105 patients submitted during Stage 1, 10 of whom were reported with UTIs; during Stage 2, data was submitted for 57 patients, two of whom were reported with UTIs. Whilst the time periods were not exactly synchronous, and TASC may not contain data on all stroke admissions for any given period, the trend demonstrated by TASC data supports that revealed in this study.

Urinary incontinence has been identified as prognostic of poor outcome, including in an Australian cohort (Wang, Lim, Heller, Fisher and Levi 2003). This is likely due to associated stroke severity (Brittain, Peet and Castleden 1998), so high patient acuity amongst these groups was not unexpected. High acuity was probably also reflected in the high rates of faecal incontinence (71.9% of participants), compared to between 31% to 40% of stroke patients reported to experience faecal incontinence in the early stages of hospital admission (Brittain et al 1998). This resulted in high rates of exposure to migration of intestinal organisms found in faecal matter into the bladder. The major importance of faecal incontinence was highlighted for these catheterised patients, with 85% of the cultured bacteria being organisms of human intestinal/faecal origin. This was particularly so for the women, probably attributable to the anatomical proximity of the urethral meatus and anus. As elsewhere (Johnson, Roberts, Olsen, Moyer and Stamm 1990), females were more likely to experience bacteriuria than males.

The important finding of this study was the major decline in the numbers of both female and male stroke patients who experienced bacteriuria when catheterised with silver-hydrogel rather than unmodified Foley catheters. Numbers of women with positive cultures reported reduced from 83.3% to 13.6% of the groups, and for men from 37.3% to 0%. This occurred despite similar total catheter days for silver-hydrogel compared to unmodified IDCs (344 versus 348 days). With similar rates of faecal incontinence (affecting 69.0% and 77.8% of the groups), all but two of the positive cultures of the first group contained organisms of faecal origin, but none of the organisms cultured from the second group were from this source. There may be other reasons for this change in pattern of microbial contamination, but with similarly high rates of faecal incontinence and no other changes in practice noted as occurring during this time, the change of catheter seems at least a likely contributor. Thus the findings of this study are in support of the meta-analysis conducted by Saint et al (2000), that sil-

ver-alloy coated IDCs demonstrated better protection against bacteria than silver-oxide coated catheters. Clinical trials by Bologna et al (1999), Verleyen et al (1999), Karchmer et al (2000) and Rupp et al (2004), also reported that silver-hydrogel coated catheters resulted in significant reduction in the incidence of nosocomial bacteriuria/UTI, associated with modest cost savings.

Conclusion

This small project undertaken in one ASU demonstrated advantage by using silver-hydrogel coated catheters for stroke patients who required urinary catheterisation, with reduction in bacteriuria and likely subsequent UTI, patient discomfort and treatment cost. This was a simple change in practice to implement as silver-hydrogel coated catheters were an available stock item. Nurses working on ASUs should consider choosing silver-hydrogel catheters for those stroke patients that require an IDC.

References

- Barnett BJ, Stephens DS. Urinary tract infection: an overview. *American Journal of Medical Science* 1997;314: 245-249
- Bologna RA, Tu LM, Polansky M, Fraimow HD, Gordon DA, Whitmore KE. Hydrogel-silver ion-coated urinary catheter reduces nosocomial urinary tract infection rates in intensive care unit patients a multicenter study. *Urology*. 1999; 54: 982-7
- Brittain KR, Peet SM, Castleden CM. Stroke and Incontinence. *Stroke* 1998; 29:524-528.
- Davenport K, Keeley F. Evidence for the use of silver-alloy-coated urethral catheters. *Journal of Hospital Infection* 2005;60:4:298-303
- Davenport RJ, Dennis MS, Wellwood IBA, Warlow CP. Complications after acute stroke. *Stroke*. 1996; 7 : 415-420
- Goetz A, Kedzuf S, Wagener M, Muder R. Feedback to nursing staff as an intervention to reduce catheter-associated urinary tract infections. *American Journal of Infection Control* 1999; 27: 402-404
- Johnson JR, Roberts PL, Olsen RJ, Moyer KA, Stamm WE. Prevention of catheter-associated urinary tract infection with a silver oxide-coated catheter: clinical and microbiological correlations. *Journal of Infectious Diseases* 1990; 162: 1145-50
- Karchmer TB, Gianetta ET, Muto CA, Strain BA,

- Farr BM. A randomised crossover study of silver-coated catheters in hospitalised patients. *Archives of Internal Medicine* 2000; 160: 3294-8
- Liedberg H, Lundeberg T, Ekman P. Refinements in the coating of urethral catheters reduces the incidence of catheter-associated bacteriuria. An experimental and clinical study. *European Urology* 1990;17:236-240.
- Liedberg H, Lundeberg T. Silver alloy coated catheters reduce catheter-associated bacteraemia. *British Journal of Urology* 1990; 65: 379-381
- Liedberg H, Lundeberg T. Prospective study of incidence of urinary tract infection in patients catheterized with Bard hydrogel and silver-coated catheters or Bard hydrogel-coated catheters [abstract]. *Journal of Urology* 1993;149:405A.
- Lundeberg T. Prevention of catheter-associated urinary tract infections by use of silver-impregnated catheters. *Lancet* 1986; 2: 1031
- Maki DG, Knasinski V, Halvorson K, Tambyah PA. A novel silver-hydrogel-impregnated indwelling urinary catheter reduces CAUTIs: a prospective double-blind trial [abstract]. *Infection Control and Hospital Epidemiology* 1998;19:682(A10).
- McLaughlin A, Sciuto D. Catheter Patrols: A unique way to reduce the use of convenience urinary catheters. *Geriatric Nursing* 1996; 17: 240-244
- National Stroke Foundation (NSF), Clinical Guidelines for Stroke Management 2010, Melbourne Australia.
- National Stroke Foundation (NSF). National Stroke Audit Clinical Report Acute Services 2009, Melbourne Australia.
- Niel BS, Arend SM, van de Broek PJ. Is there evidence for recommending silver-coated urinary catheters in guidelines? *Journal of Hospital Infection* 2002; 52: 81-87
- Poisson SN, Johnston SC, Josephson SA. Urinary Tract Infections complicating stroke. mechanisms, consequences, and possible solutions. *Stroke*. 2010;41:e180-e184
- Riley DK, Classen DC, Stevens LE, Burke JP. A large randomised clinical trial of silver impregnated urinary catheter: Lack of efficacy and staphylococcal superinfection. *American Journal of Medicine* 1995; 105: 236-41
- Rupp M, Fitzgerald T, Marion N, Helget V, Puu-mala S, Anderson J, Fey P. Effect of silver-coated urinary catheters: Efficacy, cost-effectiveness, and antimicrobial resistance. *American Journal of Infection Control* 2004;32:8:445-450
- Saint S, Elmore JG, Sullivan SD, Emerson SS, Koepsell TD. The efficacy of silver alloy-coated urinary catheters in preventing urinary tract infection: a meta-analysis. *American Journal of Medicine* 1998; 105: 236-41
- Saint S, Veenstra DL, Sullivan SD, Chenoweth C, Fendrick M. The potential clinical and economic benefits of silver alloy urinary catheters in preventing urinary tract infection. *Archives of Internal Medicine* 2000; 160: 2670-5
- Sienty MK, Dawson N. Preventing urosepsis from indwelling urinary catheters. *American Journal of Nursing* 1999; 99: 24
- Thibon P, Le Coutour X, Leroyer R, Fabry J. Randomized multi-centre trial of the effects of a catheter coated with hydrogel and silver salts on the incidence of hospital-acquired urinary tract infections. *Journal of Hospital Infection* 2000;45:117-124.
- Thomas LH, Cross S, Barrett J, French B, Leathley M, Sutton CJ, Watkins C. Treatment of urinary incontinence after stroke in adults. *Cochrane Database of Systematic Reviews* 2008, Issue 1. Art. No.: CD004462. DOI: 10.1002/14651858.CD004462.pub3
- Tyco Healthcare DOVER IC Catheter Product Information
- Verleyen P, De Ridder D, Van Poppel H, Baert L. Clinical application of the Bardex IC Foley catheter. *European Urology* 1999; 36: 240-6
- Wang Y, Lim LL-Y, Heller RF, Fisher J, Levi CR. A prediction model of 1-year mortality for acute ischemic stroke patients. *Archives of Physical Medicine and Disability* 2003;84:7:1006-11



Vale

Agnes Marshall Walker

Most of us knew Agnes. She was ever present at each AANN and WFNN Conference. However, on September 13 2010, Agnes was admitted to hospital in Albuquerque very unwell. She was in/out of consciousness, but spoke up to say she couldn't be sick, she had a hair appointment. For those of you who knew Agnes, her hair told a great story!

Agnes graduated from Northwestern University in Chicago and went on to study in London, Montreal and Toronto. She was passionate about neuroscience nursing and encouraged all to further themselves in study and in life.

She co-founded the American Association of Neuroscience Nurses, established the Journal of Neuroscience Nursing and was the Founder and first President of the World Federation of Neuroscience Nurses.

An AANN Keynote Address is given annually and the WFNN awards a quadrennial neuroscience research grant in Agnes' name in recognition of her many contributions to neuroscience nursing.

Her presence will be missed.
May she rest in peace.

Vicki Evans - Editor



The World Federation of
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Agnes Marshall Research Grant Award (AMRGA)

Agnes Marshall Walker was an inspiration to neuroscience nursing and leaves a lasting legacy for neuroscience nurses.

The WFNN Board of Directors created the Agnes Marshall-Walker Research Grant Award to support neuroscience nurses in their scientific pursuits of scholarly inquiry into patient care and management issues.

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