

Abstracts from the 2005 World Federation of Neuroscience Nurses (WFNN) Congress

Editor's Note: The quadrennial congress of the World Federation of Neuroscience Nurses was held in May 2005 in Barcelona, Spain. Nurses from around the world met to share their knowledge and experiences, realizing the common factors in our practice. Following are expanded abstracts of presentations from that meeting.

Stiff-Person Syndrome: What's Happening to Me?

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Stiff-person syndrome is a rare, disabling neurologic disease. It is characterized by progressive, predominantly axial muscular stiffness and painful muscle spasms that occur spontaneously or in response to sensory stimuli (Meinck & Thompson, 2005; Vasconcelos & Dalakas, 2003). This syndrome occurs more frequently in women and usually strikes between the ages of 30 years and 70 years.

The etiology of stiff-person syndrome lies in an autoimmune process directed against nerve endings; three main groups have been described:

- Patients with antiglutamic acid decarboxylase (GAD) antibodies (positive for glutamic decarboxylase enzyme), which are directed against terminal neurons and also recognize pancreatic beta cells, hence the relation with insulin-dependent diabetes mellitus.
- Those without anti-GAD antibodies (negative for glutamic decarboxylase enzyme) but with anti-amphiphysin antibodies, which generally derive from an immune response triggered by tumor cells. Therefore, it is considered a paraneoplastic syndrome in these cases. (The case presented below is of this type).
- Idiopathic cases, in which no specific antibody has been found.

Case study. A 49-year-old male was admitted for disabling progressive proximal muscular stiffness in both lower limbs and pain on voluntary movement and episodes of muscle spasms triggered by external stimuli. He was unable to walk without help. Moreover, he suffered from stiffness of the paravertebral musculature that made flexion difficult, and loss of postural reflexes had caused him to fall out of bed on several occasions. Neurologic study detected hyperreflexia in the lower limbs with cutaneous plantar extensor reflex due to bilateral muscle spasm. His gait was slow and stiff (Frankenstein gait).

Electromyography (EMG) detected continuous motor

activity in both the agonist and antagonist muscles.

Complementary tests. Blood test was negative for anti-GAD antibodies and positive for anti-amphiphysin antibodies. The patient was diagnosed with stiff-person syndrome, although no evidence of tumor was present. Chest and abdominal CT scans and whole-body PET scan showed no evidence of an active tumor. Both EMG and clinical condition improved after treatment with benzodiazepine and monthly intravenous administration of immunoglobulins, and the patient recovered the ability to walk. At present, the patient undergoes periodic follow-up examinations to rule out an occult neoplasm and still requires muscle relaxants and monthly injection of immunoglobulins.

Nurses play an important role in the care of these patients, as their clinical condition progressively deteriorates with significant motor incapacity that can lead to psychiatric disorders (depression), alcoholism, and other problems. Furthermore, the stiff-person syndrome is associated with other diseases that require the support of an entire multidisciplinary team (Dalmau & Graus, 1996). Nurses need to be aware of and informed about neurologic diseases that, although uncommon, can be found in daily practice.

References

- Dalmau, J., & Graus, F. (1996). Paraneoplastic syndromes. In M.A. Samuels, & S. Feskes (Eds.), *Office Practice of Neurology* (pp. 925-934). New York: Churchill Livingstone.
- Meinck, H. M., & Thompson, P. D. (2005). Stiff man syndrome and related conditions. *Movement Disorders*, 17(5), 853-866
- Vasconcelos, O. M., & Dalakas, M. C. (2003). Stiff-person syndrome. *Current Treatment Options in Neurology*, 5, 79-90

Classification and Management of Fractures Involving the Dens (Odontoid)

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Fractures of the dens are the most common type of upper cervical spine fracture (Greenberg, 2001). They occur with hyperflexion or hyperextension of the neck. Patients are often asymptomatic with these injuries; although if they are unstable, the consequences can be significant. Early detection and proper diagnosis of the type of dens fracture is crucial for planning the proper treatment.

Three types of dens fractures have been classified by Anderson and D'Alonzo (1974). Type 1 dens fractures are rarely seen in practice. These fractures are classified by a chip avulsion fracture through the tip of the dens.

They are considered stable unless combined with another cervical fracture. Patients with type 1 fractures are usually asymptomatic and do not require medical treatment. Type 1 dens fractures heal spontaneously, although a hard cervical collar may be prescribed.

Type 2 fractures are the most common type of dens fracture. These fractures occur at the base of the dens and are considered unstable; death occurs immediately if the dens is driven into the spinal cord. Although patients generally only present with neck pain, aggressive treatment must be implemented to avoid sudden death. Conservative treatment for type 2 fractures includes the use of a halo brace. External immobilization, however, yields a high rate of nonunion. Any removable orthotic should not be considered an option for treating type 2 dens fractures.

Surgical treatment for type 2 dens fractures is now the mainstay in treatment (Przybylski, 2000). One option is an odontoid screw, inserted via a standard C5-6 anterior cervical discectomy and fusion (ACDF) approach. This procedure does not require bone grafting, and the fusion rate is approximately 96%. To perform this procedure successfully, the transverse atlantal ligament must be intact, and the fracture must be adequately reduced; reduction is verified by using fluoroscopy in the operating room. Complications are similar to those of a C5-6 ACDF and also include misplacement or breakage of the screw. Another anterior approach, transoral odontoidectomy, is performed only if there is a fixed subluxation with cord compression and must be accompanied by posterior fixation.

Posterior approaches may be performed to treat type 2 dens fractures. Occipito-cervical (OC) fusion offers excellent fusion rates but significantly restricts neck movement. This procedure is rarely performed now, as it interferes with daily activities. Posterior cervical wiring is a relatively simple approach for surgeons. Strong cable wires must be used to prevent breakage, however, because traditional wiring has not withstood fatigue testing. Also, the posterior elements of C1 and C2 must be intact for this procedure to be performed. There is a high incidence of pseudoarthrosis with this procedure, and thus it has become a less favorable approach for surgeons. Placement of C1-2 screws is a newer surgical approach that provides an excellent fusion rate for patients with type 2 dens fractures (Subach et al., 1999). During this procedure, screws are placed in the lateral masses of C1 and in the pedicles of C2 and then connected by a small rod on each side. This procedure can be performed via a minimally invasive approach and provides minimal loss of rotational movement for the patient. There is a low risk of vertebral artery injury with this procedure, but blood loss may occur with epidural bleeding, which can be significant and time consuming to control.

Type 3 dens fractures extend through the body of C2 and are therefore usually considered C2 body fractures rather than dens fractures. These fractures are more

stable than type 2 fractures but can become displaced. Symptoms usually include neck pain as well as muscle spasm, and the pain is generally more intense than the pain associated with type 2 fractures. These fractures normally heal well with the use of a hard collar for immobilization. Analgesics and muscle relaxants are crucial for symptom relief during the healing process.

Although Anderson and D'Alonzo (1974) classified three distinct types of dens fractures, type 2 fractures are the most commonly diagnosed and treated type of dens fracture. Early diagnosis and immobilization is critical in the successful treatment of this type of fracture. Surgery is the treatment of choice for type 2 dens fractures whenever possible, and newer approaches that preserve mobility are gaining popularity among surgeons and patients (Weis, Cunningham, Kanayama, McLaughlin, & Comey, 1996).

References

- Anderson, L. D., & D'Alonzo, R. T. (1974). Fractures of the odontoid process of the axis. *Journal of Bone and Joint Surgery*, 56, 1663-1674.
- Greenberg, M. S. (2001). *Handbook of Neurosurgery*. Lakeland, FL: Greenberg Graphics.
- Przybylski, G. J. (2000). Introduction to odontoid fractures: Controversies in the management of odontoid fractures. *Neurosurgery Focus*, 8(6). Retrieved September 27, 2005, from www.aans.org/education/journal/neurosurgical/june00/intro.pdf
- Subach, B. R., Monroe, M. A., Haid, R. W., McLaughlin, M. R., Rodts, G. R., & Comey, C. H. (1999). Management of acute odontoid fractures with single screw anterior fixation. *Neurosurgery*, 45(4), 812-819.
- Weis, J. C., Cunningham, B. W., Kanayama, M., Parker, L., & McAfee, P. C. (1996). In vitro biomechanical comparison of multistrand cables with controversial cervical stabilization. *Spine*, 21(18), 2108-2111.

Coping with Long-Term Neurological Illness: Implications for Nursing

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To be an individual with a long-term neurological illness means having to cope with a number of profound changes in order to adapt to the mental, physical, and social limitations imposed by the illness. Patients must use strategies to keep emotional balance, maintain a satisfactory self-image, retain the feeling of capability, have control over the situation, maintain relations with family and friends, and prepare for an uncertain future. The illness trajectory in long-term neurological disease is described in the form of a model developed by Sullivan (1997) that was modified to fit the characteristics of the neurological patient population. This model with its four stages provides a framework whereby the illness situation and the accompanying coping are better understood.

Sullivan's modified model comprises four stages:

1. Debut and diagnosis—the exclusion process. Studies show that the experiences of the initial symptoms and

being informed of the diagnosis of a long-term neurological disease are very stressful and involve emotional distress (Isaksson & Ahlström, in press). The usual reactions are feelings of helplessness and hopelessness, fatalistic thoughts, denial, stoic acceptance, and fighting against exclusion from a normal and healthy life. Research has shown that patients benefit from knowing the diagnosis even if it is perceived as a threat to their lives. Patients become vulnerable, and it is vital that the nurse acknowledge this vulnerability and provide the needed support right from the beginning of the illness trajectory.

2. Care and treatment period—the medicalization process. Any acute care setting can be foreign and confusing for the patient. Suddenly the patient is more like a collection of disease symptoms and a medical diagnosis than a living and breathing person. This initial and probably unavoidable medicalization process can be softened by always being sure to see the person behind the disease. In the beginning, it can be difficult for the patients to interpret the symptoms and that can lead to uncertainty and anxiety. When the care context becomes more familiar to patients, the strangeness of a paralyzed body, aphasia, or other symptoms comes into focus. But even if the patients are aware of bodily defects, they may not grasp their future implications.

3. Shifting to living at home—the normalization process. The first time at home, the patient has to find new daily routines because of limitations imposed by the disease. It is a question of normalization, which is living or pretending to live as normal a life as possible. Normalcy for individuals with chronic disease means upholding a valued self or self-image. When a person is ill and dependent on the help of others, self-esteem can be difficult to maintain. Self-esteem is easily threatened, and it can be difficult to insist on being treated with the respect. An experience endured by the chronically ill is the loss of self that occurs when they observe their former self-image crumble away without having the opportunity to develop an equally valued new self-image. In this vulnerable stage or transition of the illness trajectory, it is important to tailor nursing care to the specific needs of patients and not to waste opportunities that can help patients' efforts to cope and adapt to a new life situation.

4. The balance in everyday life—the including process. Most persons describe how, over time, they feel better psychologically and come to terms with being prematurely forced to leave work or feeling ashamed of limitations imposed by the illness. Some of them recount how physical and cognitive limitations have been included or become a natural part of everyday life. Time is felt to be a prerequisite for the adaptation to the limitations and developing competence in handling everyday life. Time also plays a major role in adapting to the perceived gap between what is desired and what is possible (Boström, 2005).

This theoretical division of the different stages of the illness trajectory, as highlighted in the modified version of Sullivan's model, has been empirically verified in a series of studies on patients with long-term neurological illness (Ahlström, 1994; Boström, 2005; Edvardsson & Ahlström, 2005; Isaksson & Ahlström, in press).

Knowledge about the meaning of an illness from the patients' perspectives and their ways of coping gives the opportunity to design clinical nursing interventions in accordance with the stages of the illness trajectory. Interventions can be applied systematically during all stages of the illness trajectory: diagnosis, stay in hospital, early after the discharge from the hospital, and thereafter regularly to offer help if everyday life is experienced as a burden. The aim of intervention is to support coping and thereby facilitate the recovery process by

- supporting the patient's *searching for a solution* to practical as well as emotional problems
- guiding the patient to find a proper level of *struggling* to reach his or her goals
- supporting the *reappraising of life values* to find meaning in the new situation
- supporting *maintaining hope*, having realistic and positive thoughts about his or her situation
- supporting *social comparison* with appropriate reference groups to boost self-esteem
- supporting an atmosphere of humour with *laughing and joking*
- supporting the patient's *caring about self* with focus on his or her own needs and wants (Edvardsson & Ahlström, 2005).

Nurses need to employ systematic methods to support these coping strategies. Counselling methods can be used to listen, understand, and respond as well as intervene purposefully (Nichols, 2003). Other methods are concerned with the timely provision of informational and educational care, which provides the needed information and training at the right time (Nichols, 2003). The nurse, supporting the patient's coping as a systematic method of promoting recovery, enables the patient to live a good life, in spite of a severe neurological illness. This is clearly seen when the including process is successful.

References

- Ahlström, G. (1994). Consequences of Muscular Dystrophy. Impairment, disability, coping and quality of life. Dissertation, Uppsala University.
- Boström, K. (2005). Living with Deteriorating and Hereditary Disease: Experiences over ten years of persons with muscular dystrophy and their next of kin. Dissertation, Örebro University.
- Edvardsson, T., & Ahlström, G. (2005). Illness-related problems and coping among persons with low-grade glioma. *Psycho-Oncology*, 14(9), 728-738.
- Isaksson, A.-C., & Ahlström, G. (in press). From symptom to diagnosis: Illness experiences of multiple sclerosis patients. *Journal of Neuroscience Nursing*.
- Nichols, K. (2003). *Psychological care for ill and injured people: A clinical guide*. Philadelphia, PA: Open University Press, USA.

Stroke Therapies

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Until recently, patients presenting with ischemic stroke had no treatment options to limit disability. In 1996, tissue plasminogen activator (tPA) was approved for treatment of acute ischemic stroke patients within 3 hours of symptom onset. Approval of an intervention that limited disability prompted a reevaluation of acute stroke care management. Controversial treatments, such as heparin and aspirin therapies, were reexamined to draw some conclusions related to efficacy for early intervention. With promotion of early intervention, emphasis on time to treatment became crucial to maximize optimal outcomes.

Utility of heparin and aspirin therapies has been debated for many years. Heparin may prevent additional stroke, but its use increases the risk of intracranial hemorrhage. Guidelines from the American Stroke Association (ASA) in 2003 recommended that routine anticoagulation not be used in the early treatment of patients with acute ischemic stroke (Adams et al., 2003). These recommendations were made after careful consideration of published research, including the International Stroke Trial (IST-1997), the Trial of Org 10171 in Acute Stroke Treatment (TOAST-1998), and the Heparin Acute Embolic Stroke Trial (HAEST-2000). The ASA review of literature included unfractionated and low-molecular-weight heparinoids. More studies are required to determine whether urgent anticoagulation would be beneficial in certain subgroups (e.g., cardioembolic strokes or hypercoagulable states).

Another perplexing question has been whether aspirin, as an antiplatelet agent, is beneficial in the acute phase after ischemic stroke. After reviewing the Chinese Acute Stroke Trial (CAST-1993), the International Stroke Trial (IST-1997), and a combined analysis of CAST and IST, the ASA (Chen et al., 2000) made another recommendation that aspirin should be given within 24 to 48 hours of stroke onset in most patients, with the exception that aspirin not be considered adjunctive therapy during the first 24 hours for ischemic stroke patients treated with thrombolytic therapy. Another antiplatelet therapy that has recently gained attention for acute coronary syndromes and may be helpful in ischemic stroke is glycoprotein IIb/IIIa receptor inhibition. Clinical trials are under way. The Abciximab in Emergent Stroke Treatment Trial (AbESTT II) uses abciximab within 5 hours of stroke symptom onset and the Combined Approach to Lysis Utilizing Eptifibatid in Acute Ischemic Stroke (CLEAR) trial uses eptifibatid in combination with tPA within 3 hours of acute ischemic stroke.

Today, formal recommendations serve to guide care. Research is flourishing. There are currently more than 100 ongoing clinical trials internationally for acute stroke intervention therapies. With a focus on time to treatment

and increased knowledge of clot formation and composition, many efforts have been implemented to examine combination of the therapies. The future is bright for increased opportunity to limit disability in acute ischemic stroke. Additional trials of interest are Dose Escalating Study of Desmoteplase in Acute Ischemic Stroke (DEDAS), which uses a new fibrinolytic agent derived from vampire bat venom that may be beneficial up to 9 hours from initial symptom onset; Interventional Management of Stroke Study (IMS-II), which combines intravenous and intraarterial tPA; and additional trials using ultrasound assisted fibrinolytic therapy.

References

- Adams, H. P., Jr, Adams, R. J., Brott, T., del Zoppo, G. J., Furlan, A., Goldstein, L. B., et al. (2003). Guidelines for the early management of patients with ischemic stroke. *Stroke*, *34*, 1056-1083.
- Chen, Z. M., Sandercock, P., Pan, H. C., Counsell, C., Collins, R., Liu, L. S., et al. (2000). Indications for early aspirin use in acute ischemic stroke: A combined analysis of 40,000 randomized patients from the Chinese acute stroke trial and the international stroke trial. [On behalf of the CAST and IST collaborative groups.] *Stroke*, *31*, 1240-1249.
- International Stroke Trial Collaborative Group. (1997). The International Stroke Trial (IST): A randomized trial of aspirin, subcutaneous heparin, both, or neither among 19,435 patients with acute ischaemic stroke. *Lancet*, *349*, 1569-1581.

Quality Improvement of Observation Frequency for Patients in a Neurosurgery High Dependency Unit

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The focus of neurosurgical critical care is to prevent secondary brain injury (Chamberlain, 1998; Persson & Enblad, 1999; Wong, 2000). Assessment of the patient's neurological, circulatory, respiratory, and nutritional status is an essential component. The condition of a neurosurgery patient may change rapidly. Thus the patient requires continuous assessment and nursing interventions. These parameters must be assessed frequently to detect changes in the patient's condition as early as possible and to inform the doctor (Chamberlain).

The Neurosurgery High Dependency Unit in Uppsala, Sweden, is a critical care unit where patients with brain tumors, stroke, slipped disc, and trauma are monitored. The patients at the unit must be respiratory stable. There are two categories of patient. The first category comprises patients who have undergone a planned surgery. They are monitored postoperatively for 24-48 hours according to standardized care plans for each diagnosis, for example, brain tumors. After that, these patients go back to the nursing ward. The second category comprises emergency patients who often need a

high level of monitoring. The monitored time can range from 1 day up to 1 month. For these patients there were no guidelines for observation frequency. Each nurse decided how frequently to monitor the patients. The observation frequency could change throughout the day depending on the nurse's experience. A standardized instrument was created to improve observation quality for these patients. The doctors, nurses, and assistant nurses were educated in how and when to use the observation instrument before it was introduced. A study was then conducted to compare the observation frequency of neurological, circulatory, respiratory, blood glucose, and temperature before and after introduction of a standardized observation tool.

A prospective chart review was conducted by using an observation instrument that was created by the researcher and a neurosurgeon. Patients were chosen consecutively, and the medical records were reviewed before and after introduction of the observation instrument. The frequency of observations was counted and compared to the standardized observation instrument. The first 24 hours for each patient was reviewed. Forty-four medical records were reviewed before the instrument was introduced and thirty-five medical records after. Four medical records were excluded at the second review because no observation level was ordered.

Observation frequencies ranged from every 30 minutes to every 8 hours. The observation level is ordered each day by the doctor with regard to the patient's condition and documented in the patient's medical record.

The results showed a significant difference between the frequency of neurological observations before and after the observation instrument was introduced ($p = 0.005$, $t = -3.867$, $df = 34$); the frequency of neurological observations was higher after the instrument was introduced. There was no significant difference in measurement of circulation, respiration, blood glucose, and temperature. The introduction of the observation instrument at the Neurosurgery High Dependency Unit has increased the frequency of observations.

References

- Chamberlain, D. J. (1998). The critical care nurse's role in preventing secondary brain injury in severe head trauma: Achieving the balance. *Australian Critical Care*, 11(4), 123-129.
- Persson, L., & Enblad, P. (1999). Neurointensive care of aneurysmal SAH. *Acta Neurochirurgica*, 72, 73-80.
- Wong, F. W. (2000). Prevention of secondary brain injury. *Critical Care Nurse*, 20(5), 18-27.

Magnesium: The Other Electrolyte in Subarachnoid Hemorrhage

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Magnesium is involved in every major biological process including generation of cellular energy and synthesis of nucleic acids and proteins. It also plays a role in stabilizing the electrical state of membranes, regulating muscle contraction, nerve conduction, and vascular tone. Without magnesium, metabolism of oxygen and glucose for use by brain tissue via oxidative phosphorylation would not occur. Decreases in magnesium levels can lead to increased excitability of muscles and nerves, inability to generate ATP, and a cascade of events resulting in acidosis and aggravating ischemia.

The role of magnesium in subarachnoid hemorrhage (SAH) has been somewhat controversial. Literature suggests that magnesium may play a more vital role in the management of cerebral vasospasm than previously understood. Our clinical experience suggests that maintaining high normal levels of magnesium may contribute to reducing the incidence and duration of cerebral vasospasm following aneurysmal SAH.

Polderman, van Zanten, Girbes, and Armand (2003) suggested that magnesium might provide neuroprotection by scavenging free radicals. Low magnesium can potentially lead to vasoconstriction and hypertension in cerebral arteries. A 14-patient study by Brewer, Parra, Lynch, Chilukuri, and Borel (2001) evaluated the effects of a 5-gram intravenous bolus of magnesium on blood velocity through the middle cerebral artery (MCA) using transcranial Doppler (TCD). No significant difference in MCA velocity response was seen between the magnesium and placebo administration, despite a mild systemic decrease in pressure in the magnesium group. In the four vasospasm patients, no significant change in response was evident after magnesium administration when compared to placebo. Veyna et al. (2002) prospectively randomized 40 patients with SAH to receive magnesium treatment. In the treatment group, serum magnesium values were maintained between 4.0 and 5.5 mg/dL, well above the normal magnesium of 1.5-2.5 mg/dL. Each group was measured for the outcomes of TCD-measured MCA velocity and the presence of clinical vasospasm. The group found that high levels of magnesium did not interfere with neurological assessment, anesthesia during surgery, or other aspects of clinical care. In the magnesium-treated group, no decrease in clinical vasospasm was seen compared to the placebo group.

In support of magnesium therapy, Chia, Hughes, and Morgan (2002) followed 23 patients who presented with aneurysmal SAH. A magnesium protocol was used to maintain magnesium levels of 1.0-1.5 mmol/L (2.4 to 3.5 mg/dL). Of the 13 patients receiving magnesium therapy, two developed vasospasm (15%). Of the 10 patients without magnesium replacement, seven developed vasospasm (70%). This difference was significant ($p < 0.008$) and suggests that maintaining magnesium

may play a role in vasospasm prevention. Van den Bergh et al. (2005) used a continuous infusion of magnesium in 283 patients with SAH randomized to receive either a continuous infusion of 64 mmol/day magnesium or standard treatment. Delayed cerebral ischemia (DCI) served as their primary outcome measure. Results suggest that magnesium reduced DCI, but more definitive study is needed.

The effect of magnesium on SAH remains unclear. Current research and clinical experience suggest that maintaining high normal serum magnesium levels may limit the incidence or duration of cerebral vasospasm. Use of a protocol based on the current magnesium level and previous day's dose can facilitate achieving consistent magnesium levels. Further research is indicated.

References

- Brewer, R. P., Parra, A., Lynch, J., Chilukuri, V., & Borel, C. O. (2001). Cerebral blood flow velocity response to magnesium sulfate in patients after subarachnoid hemorrhage. *Journal of Neurosurgical Anesthesiology*, 13, 202-206.
- Chia, R. Y., Hughes, R. S., & Morgan, M. K. (2002). Magnesium: A useful adjunct in the prevention of cerebral vasospasm following aneurysmal subarachnoid haemorrhage. *Journal of Clinical Neuroscience*, 9, 279-281.
- Polderman, K. H., van Zanten, A. R. H., & Girbes, Armand R. J. (2003). The importance of magnesium in critically ill patients: A role in mitigating neurological injury and in the prevention of vasospasm. *Intensive Care Medicine*, 29, 1202-1203.
- van den Bergh, W. M., Algra, A., van Kooten, F., Dirven, C. M., van Gijn, J., Vermeulen, M., et al. (2005). Magnesium sulfate in aneurysmal subarachnoid hemorrhage: A randomized controlled trial. *Stroke*, 36(5), 1011-1115
- Veyna, R. S., Seyfreid, D., Burke, D. G., Zimmerman, C., Milynarek, M., Nichols, V., et al. (2002). Magnesium sulfate therapy after aneurysmal subarachnoid hemorrhage. *Journal of Neurosurgery*, 96, 510-514.

Improving Care Through Research

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In spite of the fact that nursing care has been carried out for over 10,000 years, formal nursing research is a relatively new concept. Many international healthcare and nursing organizations, including The World Health Organization (2004), the International Council of Nurses (1999), and the Workgroup of European Nurse Researchers (2001), have stressed the importance of nursing research. Nursing research nevertheless still seems to be treated as an optional extra rather than a fundamental part of nursing. Now and in the future, research should assume a greater importance in the life of nurses, largely because of the vast amount of information available to the individual healthcare professional and the public via the Internet and other media. Patients are no longer willing to accept information at face value, and professional standards should be evidence based.

For some time now national governments have been looking for cost-efficient systems of care (Department of Health, 2000). Nurses participate in the continuing development of high standards of holistic well-coordinated care, which they need evidence to justify, but the pace is slow. What are the bottlenecks to that progress?

The most significant obstacle to progress is lack of funding. As a result, most nursing research comes out of higher education and therefore has limitations of time, supervision, and size of research project because these are controlled by course and university regulations. Creative yet ethical ways should be found for raising additional funding, especially if larger-scale research over longer-time scales is to be pursued. Such research would have greater applicability within the healthcare system.

There is also a cultural research practice issue that could be overcome by greater communication between researchers and clinicians. This is beginning to change with the introduction of clinical doctorates and the appointment of directors of nursing with doctorates. It is hoped that new methodologies will result from better funding and more experienced researchers.

Organizations, such as the World Federation of Neuroscience Nurses, could provide additional support for research issues by joining forces with regional or national organizations to endorse conferences and symposia even if they cannot finance them. Conferences with other specialist organizations on common themes (e.g., brain tumors or spinal injuries) can promote not only promote the work of the organizations and specialties but research as well. In the wider world, research priorities should reflect the needs of the healthcare system and nursing structures. Advanced technological research may not be the priority of nations that have little money, water, or food. Until research becomes the natural part of everyday nursing, there is a need for research-mindedness at every level of the nurse's career and at every stage in the patient's pathway.

References

- Department of Health [UK]. (2000). Towards a strategy for nursing research and development. Retrieved September 27, 2005, from www.dh.gov.uk/assetRoot/04/07/66/47/04076647.pdf
- International Council of Nurses. (1999). Position statement: Nursing research. Retrieved September 27, 2005, from www.icn.ch/psresearch99.htm
- Work Group of European Nurse Researchers. (2001). A position paper: Nursing research. Retrieved June 7, 2005, from www.wenr.org
- World Health Organization. (2004). World report on knowledge for better health: Strengthening health systems. Geneva: Author. Retrieved September 27, 2005, from www.who.int/rpc/wr2004

Neurosurgery Nurse Practitioner: The Australian Experience

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Australia's first nurse practitioner (NP) was certified to practice in 2000 after 10 years of negotiation, dedication, and perseverance. The implementation of the NP into the Australian healthcare system has been the responsibility of individual states and territories; the authorization processes differ throughout these areas. Approximately 59 are NPs authorized to practice in New South Wales (NSW). Two methods of authorization exist, either through completion of an approved master's degree program or through the submission of a package of evidence and peer review (Nurses Registration Board, 2003)

Authorized NPs in NSW are granted the following extended privileges: prescription of medication, initiation of diagnostic investigations, and referral of patients to other medical specialties. These privileges must be used in accordance with approved clinical practice guidelines (Nurses Registration Board, 2003)

The first neurosurgical NP service in Australia was established at Royal North Shore Hospital, Sydney, in 2003. The neurosurgical NP promotes a multidisciplinary approach to maximize recovery for neurosurgical patients and provides best practice care. (Northern Sydney Health, 2003)

The practice model used by the neurosurgical NP is acute primary advanced practice case management. It differs from other advanced nursing positions because the NP role has at least a 60% direct patient care component. The role is divided into four domains of practice: clinical practice, service delivery, clinical leadership, and professional development.

Because of the uniqueness of this role within Australia, there has been little previous experience from which to glean knowledge. Challenges include role ambiguity, vast service needs rendering an immediate and demanding workload, and lack of guidance and support required for the practitioners themselves. Benefits include a reduction in service gaps and treatment time for patients, a personalized service for patients and families, and improved communication. Future work will include establishing standardized quantifiable measures of these benefits.

Establishment of the NP role has created the potential for expansion of clinical nursing career pathways. Increased job satisfaction is crucial, especially when considering the recruitment and retention of advanced specialty nurses. Introduction of NPs into the Australian healthcare system continues to evolve.

References

- Northern Sydney Health. (2003). Position description: Neurosurgical nurse practitioner. Northern Sydney Health, Sydney, Australia.
- Nurses Registration Board of New South Wales. Nurse practitioner in New South Wales information brochure. Retrieved September 27, 2005, from www.nmb.nsw.gov.au/np_info.pdf

Body Weight: A Heavy Problem in Post-Stroke Nursing Care?

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Nutritional problems after stroke have been reported in previous studies (Kumlien & Axelsson, 2002; Westergren, Ohlsson, & Rahm Hallberg, 2001). Body mass index (BMI) has been emphasized as an important measure in primary and secondary prevention (Hart, Hole, & Smith, 2000; "Poor nutritional status on admission predicts poor outcomes after stroke: Observational data from the food trial," 2003; Song, Sung, Davey Smith, & Ebrahim, 2004). Registration of weight and BMI is not often found in patients' records (Kumlien & Axelsson, 2002). Weight loss may be a consequence of dysphagia, eating problems, or depression, but stroke patients may also gain weight because of immobilization. There are no large prospective population-based studies following body weight and nutritional problems for post-stroke patients. The purpose of this study was to identify whether changes in weight and nutritional problems are common after stroke and whether the weight changes were related to impaired glucose metabolism, depression, age, or hypertension.

Four hundred sixteen patients (56% female, 44% male, mean age 74 years) with first-ever stroke occurring between March 1, 2001 and February 28, 2002 were included from a population of 234,505 inhabitants representing the local catchment area of Lund University Hospital. Weight and height were measured for all patients on admission and BMI (body weight in kg/[height m x height m]) was calculated. After a median period of 4 months after stroke onset and 1 year later, body weight was registered again for 305 survivors; glycosylated hemoglobin (HbA1c, upper normal limit = 5.3%; Norhammar et al., 2002) and blood pressure were also measured; depression was screened with the Swedish-adapted Geriatric Depression Scale (GDS-20; Gottfries, Noltorp, & Norgaard, 1997).

At the 1-year follow-up, 88 of the 416 patients were deceased. Follow-up could not be obtained for 20 patients declining to participate, 1 patient not being located, and 2 patients being very ill. BMI cut-off points were defined according to WHO criteria as follows: underweight (UW) <18.5, normal weight (NW) 18.5–24.9, overweight (OW) 25–29.9, and obesity ≥30. From inclusion to the first follow-up, 74 patients (24%) had lost 3–30 kg, and 30 patients (10%) had gained 3–9 kg. Between the first and second follow-ups, 55 patients (18%) had lost 3–19 kg, and 73 (24%) had gained 3–17 kg. Changes in BMI were registered as follows for 183 men and 122 women from inclusion through the two follow-ups: Group UW

men stayed at 2%, women increased from 6% to 10%; Group NW men stayed at 39%, women decreased from 44% to 39%; Group OW men decreased from 48% to 43%, women increased from 35% to 39%; and Group Obesity men increased from 11% to 14%, and women decreased from 15% to 12%. Eating difficulties in the following areas were registered: ingestion ($n = 10$), deglutition ($n = 18$), and energy ($n = 16$). In nursing homes, the personnel were usually not aware of the patients' changes in weight, and measures were not been taken to investigate nutritional problems. Depression (score ≥ 6) was screened for 39% of the men and 48% of the women. A stepwise regression analysis showed that increased BMI was related to elevated HbA1c and hypertension, whereas decreased BMI was associated with advanced age and depression.

Body weight is an important measure in post-stroke care, especially in nursing homes. A program with a nurse specialist following up patients in the year after stroke is a possible method to detect changes in weight and related problems and if necessary, to initiate measures to be taken.

References

- Gottfries, G. G., Noltorp, S., & Norgaard, N. (1997). Experience with a Swedish version of the geriatric depression scale in primary care centres. *International Journal of Geriatric Psychiatry*, 12(10), 1029-1034.
- Hart, C. L., Hole, D. J., & Smith, G. D. (2000). Comparison of risk factors for stroke incidence and stroke mortality in 20 years of follow-up in men and women in the Renfrew/Paisley study in Scotland. *Stroke*, 31(8), 1893-1896.
- Kumlien, S., & Axelsson, K. (2002). Stroke patients in nursing homes: Eating, feeding, nutrition and related care. *Journal of Clinical Nursing*, 11(4), 498-509.
- Norhammar, A., Tenerz, A., Nilsson, G., Hamsten, A., Efendic, S., Ryden, L., et al. (2002). Glucose metabolism in patients with acute myocardial infarction and no previous diagnosis of diabetes mellitus: A prospective study. *Lancet*, 359(9324), 2140-2144.
- Poor nutritional status on admission predicts poor outcomes after stroke: Observational data from the food trial. (2003). *Stroke*, 34(6), 1450-1456.
- Song, Y. M., Sung, J., Davey Smith, G., & Ebrahim, S. (2004). Body mass index and ischemic and hemorrhagic stroke: A prospective study in Korean men. *Stroke*, 35(4), 831-836.
- Westergren, A., Ohlsson, O., & Rahm Hallberg, I. (2001). Eating difficulties, complications and nursing interventions during a period of three months after a stroke. *Journal of Advanced Nursing*, 35(3), 416-426.

Experiences of Kinship with a Person with Muscular Dystrophy

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Few studies exist concerning next-of-kin experiences over time and how life changes for those close to a person with an incurable progressive disorder. Therefore, the aim of this study was to elucidate next of kin's present and past experiences when an adult family member suffers from the disabling effects of muscular dystrophy (MD). Thirty-six persons with MD chose one person to be his or her next of kin, and the following kinds of relationships were present: 14 partners, 7 parents, 8 children, 6 siblings, and 1 cousin's wife (referred to as a sibling in the result). Of these, 22 were women and 14 men. Fifteen persons (partners and one parent) shared the household with the afflicted person, but 21 did not. The average age was 52 years (range from 21 to 80 years). Open-ended tape recorded interviews were carried out, and a latent inductive content analysis was used in data analysis (Graneheim & Lundman, 2004). Four comprehensive themes emerged: exposure of the family, between obligation and love, striving for an ordinary life, and being vigilant to protect and support.

Exposure of the Family. The next-of-kin relationships were colored by worries about the hereditary nature of MD. Will they, siblings, children, or grandchildren present MD in the future? Statements related to anticipatory losses and the future as a threat, as well as the ability to cope with the enormously trying situation, were seen. The social networks for those living close to the disabled had shrunk, and they had fewer core relationships. Others saw an increasing vulnerability in their sick relative as the circle of friends became limited.

Between Obligation and Love. The feelings of obligation and love were the two anchor points in a continuum describing how the next of kin perceived his or her relationship to the person with MD. Orientation toward tasks and duties was linked to feelings of being weighed down by demands. Emotional ambivalence was expressed; it was difficult to identify whether the need for support was related to consequences of illness or laziness. Orientation toward the relationship was connected with feelings of mutual dependence, and the next of kin were confident that the persons with MD wanted to take responsibility for tasks they still could manage. Men and women differed; men were more of practical problem solvers, while women described more emotional engagement.

Striving for an Ordinary Life. The next of kin strove to achieve an emotional balance in everyday life. Illness-related changes were explained as part of normal developmental changes occurring in any family over time. However, changes affecting the next of kin clearly emerged, such as increased difficulty with ambulation and the need for more practical support. Changes in rou-

tines and roles over time, as a consequence of the progressive nature of the disease, were seen as a natural part of everyday life. Strategies included not making plans or thinking about the future, and maintaining habits despite overwork and increased dependency on the part of the persons with MD was both a goal and a strategy. Having close friends and relatives to spend time with was important.

Being Vigilant to Protect and Support. Wanting to protect the self-esteem of the person with MD, the next of kin put the needs of the sick person ahead of his or her own. Many next of kin made great efforts to find new forms of cooperating and of maintaining a close fellowship. There was an overall desire to protect the self-esteem of the person with MD, facilitate the other's life, and minimize the risk for stigmatization when out in society.

The next of kin interviewed in this study stated that quality of life is not only his or her own well-being, but also the well-being of the affected family member, highlighting the fact that the quality of life of any member of the family influences that of the others. Next of kin experienced a greater burden with a sense of obligation manifest as ambivalence toward the afflicted person. This highlights the importance of being aware of carer's perceptions of the demands of the caring role. Love alone was not always sufficient to sustain a commitment to care for the next of kin. A strong sense of duty or obligation was helpful to carrying out the necessary care tasks during the prolonged illness and its trajectory. Men and women perceived the caring situation differently. This finding is in line with that of Almqvist, Jansson, Grafström, and Winblad (1998), who found gender to be one of the factors that affected how caregivers' experienced burden and quality of life.

Next of kin had a deep desire to protect the person with MD. This intention was critical in being able to manage everyday life despite having an illness-stricken family member. This emphasizes the importance of regarding the family as the basic unit, giving nursing support to persons with MD and their next of kin. In addition, nurses need to be precise when asking about changes due to disease progression when they plan and implement nursing interventions, as they otherwise might overlook the support needs of spouses and other family members.

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The Ethics Committee at Örebro University Hospital, Sweden, has approved this study.

References

Almqvist, B., Jansson, W., Grafström, M., & Winblad, B. (1998). Major strain and coping strategies as reported by family members who care for aged demented relatives. *Journal of Advanced Nursing*, 25, 109-116.

Graneheim, U. H., & Lundman, B. (2004). Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today*, 24, 105-112.

A Retrospective Review of the Impact of the Neuro Activation Program on Complex Disabled Patients: A 2-Year Patient Profile

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Bridgepoint Health is an integrated network of healthcare facilities and services in the Greater Toronto area, Ontario, Canada, and one of the largest providers of healthcare services in Canada that focuses on patients with complex rehabilitation and complex care needs. The neurological activation program is one of many programs offered at Bridgepoint Health. The goal of the neuro activation program is to maximize patient abilities by offering a variety of interdisciplinary services such as occupational therapy, physiotherapy, speech language pathology, recreation therapy, counseling and support, and wellness programs. Patients, families, and the care team jointly design individualized therapy treatment plans that focus on specific functional goals. This moderately intense, slower-paced rehabilitation program is designed for individuals who have demonstrated small but steady improvements in function after sustaining a severe stroke, acquired brain injury, or other neurological event. The uniqueness of this program is in the complexity of the patients (at least 4-5 medical diagnoses) and the program length (6-12 months).

The objectives of this study were to determine (a) the sociodemographic and clinical characteristics of patients admitted during the 12-month study interval; (b) the effect of the program on functional outcomes; (c) resource use (RUG) and discharge disposition; and (d) the effect of pain and depression on the progress of patients admitted to the program.

A retrospective review of patients admitted to the activation program was conducted using Minimum Data Set (MDS) for the fiscal year 2001-2002. MDS is a clinical assessment tool consisting of over 500 data elements—demographics, cognitive, and behavioral data, physical functioning, and special treatments and procedures (Morris, 2004; Morris, Hawes, & Fries, 1990; Snowden et al., 1999). The Ontario Ministry of Health mandated the submission of chronic care data using this tool in 1995 and 1996. Descriptive statistics were used to describe the patient profile. Regression analyses were used to assess associations

among social, demographic, and clinical characteristics of patients and their outcome dispositions. Physical, cognitive, and emotional functions were examined on admission and on a quarterly basis over the study interval to explore any patterns of change over time under treatment conditions. Patients were classified into early-discharge groups (before first quarter assessment; $N = 17$) and late-discharge groups (second assessment before discharge; $N = 14$).

Thirty-one patients with complete data were included in the study; 39% were discharged home. Patients admitted to the program met the admission criteria of complexity and reached their maximum potential within 6–12 months. The late-discharge group showed improved activities of daily living, improved cognitive and social functioning, lower depression scores, and reduced number of health conditions. The prevalence of pain and depression were 42% and 23%, respectively, and affected progress and discharge potential. Most patients who were discharged home were not depressed. Patients who were discharged from the program early had higher depression scores. Patients who remained in the program benefited the most considering their scores of depression improved upon discharge.

The presence of significant pain and depression is important and deserves further study. The late-discharge group benefited from the program based on the finding of statistically significant improvements in the following areas: ADL function, pattern of improving cognitive and social functioning, lower depression with no difference in the amount of resource use, maintenance of the number of MDS diagnoses, decreased number of health conditions (by 50%), fewer cases of infection, and a doubled number of aids and devices.

These study findings have implications for program planning and resource allocation. Review of program admission criteria is recommended. The need to complete MDS assessment on those patients discharged before 90 days is highlighted to ensure more complete MDS data for future studies.

References

- Mor, V. (2004). A comprehensive clinical assessment tool to inform policy and practice. Applications for the minimum data set. *Medical Care*, 42(Suppl. 4), III-50-III-59.
- Morris, J. N., Hawes, C., Fries, B. E. (1990). Designing the National Resident Assessment Instrument for nursing homes. *Gerontologist*, 30, 293-302.
- Snowden, M., McCormick, W., Russ, J., Srebnik, D., Comtois, K., Bowen, J. (1999). Validity and responsiveness of the Minimum Data Set. *Journal of the American Geriatric Society*, 47(8), 1000-1004.

Family Love—The Impact of Family Members on the Brain Injury Rehabilitation Process

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Patients sustaining a traumatic brain injury require a multidisciplinary approach to their rehabilitation and long-term care as the injury causes life-long impairments in physical, cognitive, behavioral, and social functions. Family difficulties following head injury frequently include increased burden, psychological distress, and social isolation associated with negative changes in their family member's cognitive functioning, personality, and behavior. Literature provides firm evidence that head injury hurts families socially, emotionally, and financially (Serio, Krutzer, & Gervasio, 1995).

A posttraumatic brain injury patient was admitted to the Liverpool Hospital brain injury rehabilitation unit for rehabilitation. Interaction in a consultative process with family members who denied the patient the required rehabilitation involved serious struggles. The long-term effects of these decisions resulted in a premature discharge home from the rehabilitation unit. Staff members struggled with feelings of accomplishing less than they knew they could.

Patients with a traumatic brain injury require high-level multidisciplinary rehabilitation (Kosciulek, McCubbin, & McCubbin, 1993; Lario, 2003). Families' lived experiences, core values, and morals affect the rehabilitation process in a variety of ways (Cicerone, 2004). A collective group of professionals essentially could not do its job to potentially achieve the best possible outcome for the patient. The multidisciplinary team was left lamenting what could have been.

References

- Cicerone, K. D. (2004). Participation as an outcome of traumatic brain injury. *Journal of Head Trauma & Rehabilitation*, 19(6), 494-501.
- Kosciulek, J. E., McCubbin, M. A., & McCubbin, H. I. (1993). A theoretical framework for family adaptation to head injury. *Journal of Rehabilitation*, 3, 40-45.
- Lario, F. (2003). The family systems approach to treating families of persons with brain injury: A potential collaboration between family therapist and brain injury professional. *Brain Injury*, 17(2), 175-187.
- Serio, C. D., Krutzer, J. S., & Gervasio, A. H. (1995). Predicting family needs after brain injury: Implications for intervention. *Journal of Head Trauma & Rehabilitation*, 10(2), 32-45.

Preventing Infection with Lumbar Drains

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A lumbar drain (LD) is used for a variety of indications. Indications include traumatic dural fistulae and cerebrospinal fluid (CSF) leak due to a dural tear (Shapiro & Scully, 1992). The LD may be used in this instance to facilitate closure of a repaired CSF leak by decreasing pressure at the site to promote healing. Another indication is communicating hydrocephalus due to aneurysmal subarachnoid hemorrhage (SAH). An LD may also decrease the incidence

of vasospasm in this situation (Klimo et al., 2004). An LD may also be used for the diagnostic evaluation of adult onset normal pressure hydrocephalus (NPH).

Like any other invasive procedure, LD insertion places patients at risk for infections. Potential infections include meningitis and *Staphylococcus aureus* discitis (Shapiro & Scully, 1992), among others (Coplin, Avellino, Kim, Winn, & Grady, 1999). It is therefore imperative that nurses caring for patients with LDs demonstrate a high level of competency to minimize the risk of infection.

Coplin et al. (1999) found a low risk of meningitis in their retrospective study, suggesting that LDs, "seem to offer a safe alternative to ventriculostomy or serial lumbar punctures." The incidence of LD acquired bacterial meningitis in their study of nine patients with SAH and four patients with traumatic or iatrogenic CSF leak was 4.2%. Coplin et al. further suggested that LDs may pose less risk for infection than a ventriculostomy. Skin organisms (coagulase negative staphylococci, *Corynebacterium minutissimum*, and *S. epidermidis*) among others have been identified as a common cause of infections occurring within 24 hours of drain insertion. Presence of pleocytosis was not found to be statistically related to meningitis (Coplin et al.). This was thought to be because pleocytosis can be caused by inflammation from a foreign body, such as the drain itself.

According to Clevenger (1990), an LD also has been used for the temporary treatment of communicating hydrocephalus due to SAH and ventriculitis. A ventriculoperitoneal (VP) shunt was contraindicated at the time because the patient was afebrile. After a course of antibiotics treatment, the LD was removed. The CSF was tested intermittently while the LD was in place and did not yield evidence of infection.

Prevention of infection begins at the time of insertion. The LD can be inserted at the bedside, intraoperatively, or in the radiology department using aseptic technique. Once in place, the LD system is a closed system. The nurse at the bedside must monitor the patient's neurological status and vital signs, especially temperature, closely. Findings to report that may indicate infection include temperature greater than 38.5°C and changes in CSF color from clear to cloudy, sometimes with sediment or blood. The patient is also monitored for changes in mental status that could indicate signs of meningitis. The nurse also monitors the LD catheter insertion site closely for signs of infection, ensures the transparent occlusive dressing is intact and the catheter insertion site is visible underneath, and assesses for CSF leakage under the transparent dressing. If ordered, the nurse administers prophylactic antibiotics; however, antibiotic prophylaxis is controversial.

The LD system stays open to drainage at all times except during patient transport or a procedure. As a safety measure to keep the LD system intact, the nurse routinely ensures that all ports are secured and that the tubing has no kinking. The physician should be notified about any

break in the integrity of the tubing or catheter. In some institutions, the nurse will clamp the LD system using a sterile Kelly clamp if the catheter breaks. The broken catheter should be removed in a timely manner to prevent infection. The nurse should empty the LD chamber into the attached drainage bag every 4 hours and record the amount and color of drainage.

The safe and successful use of LDs has been established in a number of studies. Safety and success, however, depends on competent nursing care. Nurses caring for patients with LDs must be knowledgeable and demonstrate a high level of competency in managing the LD to prevent infection.

References

- Clevenger, V. (1990). Nursing management of lumbar drains. *Journal of Neuroscience Nursing*, 22(4), 227-231.
- Coplin, W. M., Avellino, A. M., Winn, H. R., Grady, M. S. (1999). Bacterial meningitis associated with lumbar drains: A retrospective study. *Journal of Neurology, Neurosurgery and Psychiatry*, 67, 468-473.
- Klimo, P., Jr., Kestle, J. R., MacDonald, J. D., Schmidt, R. H. (2004). Marked reduction of cerebral vasospasm with lumbar drainage of cerebrospinal fluid after subarachnoid hemorrhage. *Journal of Neurosurgery*, 100, 215-224.
- Shapiro, S. A., Scully, T. (1992). Closed continuous drainage for cerebrospinal fluid via a lumbar subarachnoid catheter for treatment or prevention of cranial/spinal cerebrospinal fluid fistula. *Neurosurgery*, 30(2), 241-245.

Nursing Practice to Inform Learning: The Clinical Accreditation Program

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The Clinical Accreditation Program (CAP) is a component of the Graduate Certificate in Neuroscience Nursing Course, offered by Northern Sydney Central Coast Health (NSCCH) in collaboration with the University of Technology Sydney (UTS). The year-long course comprises three compulsory academic subjects offered by the UTS and completion of either a fourth academic subject or the CAP, which is available only to employees of NSCCH.

The CAP is a structured, clinical, competency-based program founded on the standards of neuroscience nursing practice set by the Australasian Neuroscience Nurses' Association (ANNA, 2000). The theoretical foundation of the CAP promotes engagement in critical reflection on practice-based learning experiences, using appropriate theory related to neuroscience nursing. Toward this end, CAP participants develop a portfolio that contains evidence of clinical experience: performance development documentation, five compulsory competency assessments, two elective competency assessments, three case

presentations, one critical incident essay, and one reflective essay.

The results of an evaluation undertaken in 2004, which examined the views of all stakeholders of the CAP run in 2003, including the CAP participants and staff supporting these participants, indicated an overall satisfaction with the CAP. The feedback showed a perceived increase in the clinical competence of the CAP participants and a perception that CAP is instrumental in staff retention. These views were obtained by collecting responses to a questionnaire, in areas of orientation and structure of the CAP, clinical and course support, clinical learning strategies, and completion of the CAP. Shortcomings identified included a perceived lack of support by CAP participants and lack of understanding of what was involved in CAP on behalf of those supporting the participants. Stroke units in general wards were viewed as having limited opportunities for CAP participants to gain the same level of neuroscience nursing experience as those in neuroscience specialized units.

Based on this evaluation, recommendations for the CAP included increasing preceptor awareness of the CAP participants' support needs and increasing the opportunities of participants to practice in neuroscience units and experience neuroscience related practices. The CAP is a crucial component of the Graduate Certificate in Neuroscience, and key in clinical competence and staff retention.

Reference

Australasian Neuroscience Nurses' Association. (2000). Standards for nursing practice. Melbourne: Author.

Cerebral Revascularization: Controversies, Techniques, and the Neuroscience Nurse's Role

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Cerebral revascularization is a means of restoring or rerouting cerebral blood flow to improve or maintain cerebral perfusion. In 1951, Fisher discussed the theoretical basis for cerebral revascularization. Yasargil, Krayenbuhl, and Jacobson (1970) reported the first superficial temporal artery to middle cerebral artery (STA-MCA) bypass. Procedures used today include carotid endarterectomy, thrombectomy, fibrinolysis, and extracranial-intracranial (EC-IC) bypass (Sekhar & Kalavakonda, 2002; Tummula, Chu, & Nussbaum, 2003). EC-IC bypass involves microsurgical anastomoses of blood vessels to create new pathways for blood flow when structural abnormalities or planned repair of those abnormalities could compromise blood supply. These abnormalities

include complex aneurysms such as giant and fusiform, moyo moyo disease, tumors of the skull base, head and neck cancers, and ischemic disease. The most common procedure is the superficial temporal artery to middle cerebral artery anastomosis.

Controversy regarding the STA-MCA anastomosis arose in 1985 when the *New England Journal of Medicine* published a study of 1,377 patients demonstrating that this particular procedure was not an effective approach for preventing cerebral ischemia in patients with preexisting atherosclerotic disease in the carotid and middle cerebral arteries. Anecdotal reports in the literature since that time (Nussbaum & Erickson, 2000) indicate positive outcomes in patients with cerebrovascular disease after the procedure, but appropriate patient selection remains a point of contention. Studies continue and, as evidence grows, so too will the clarity as to which populations will be best served (Wanebo et al., 2004).

Determination of the appropriate graft procedure is key to successful blood flow restoration. The size of the recipient vessel, the availability of donor vessel and graft material, and the extent of blood flow augmentation required all factor into the decision as to which bypass graft to use. Standard graft conduits include interpositional vein grafts, free arterial grafts, and pedicled arterial grafts. Depending on which type of graft is used, flow rate can vary from high flow (70–140 mL/min) to low flow (15–25 mL/min).

Neuroscience nurses working with patients having EC-IC bypass should have a strong command of cerebrovascular anatomy. It is critical for them to understand the multiple complexities involved including the rationale behind selecting a specific grafting procedure and the potential alterations in cerebral blood flow that can occur following surgery. An awareness of the vascular territory involved in the bypass and the associated structures is critical to tailoring neurological assessments to each patient and effectively establishing and implementing a plan of care.

References

- Fisher, M. (1951). Occlusion of the internal carotid artery. *Archives of Neurology and Psychiatry*, 65, 346–377.
- Nussbaum E. S., & Erickson, D. L. (2000). Extracranial-intracranial bypass for ischemic cerebrovascular disease refractory to maximal medical therapy. *Neurosurgery*, 46, 37–43.
- Sekhar, L. N., & Kalavakonda, C. (2002). Cerebral revascularization for aneurysms and tumors. *Neurosurgery*, 50, 321–331.
- Tummula, R. P., Chu, R. M., & Nussbaum, E. S. (2003). Extracranial-intracranial bypass for symptomatic occlusive cerebrovascular disease not amenable to carotid endarterectomy. *Neurosurgical Focus*, 14, Article 8, 1–4.
- Wanebo, J. E., Zabramski, J. M., & Spetzler, R. F. (2004). Superficial temporal artery-to-middle cerebral artery bypass grafting for cerebral revascularization. *Neurosurgery*, 55, 395–399.
- Yasargil, M. G., Krayenbuhl, H. A., & Jacobson, J. H. (1970). Microneurosurgical arterial reconstruction. *Surgery*, 67, 221–233.

High-Quality Orientation of a New Employee: Theoretical Background

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Quality is a central topic in nursing and health care. One key factor leading to high-quality nursing is an effective orientation process for new employees. Each new employee should be introduced to his or her duties, working environment, and conditions, as well as health and safety regulations. A well-planned orientation positively affects the productivity and the quality of work; people make fewer mistakes and equipment is used properly. Faster adaptation to work and greater satisfaction to one's duties occur; realistic job expectations develop as well. A positive attitude toward one's job will almost certainly decrease absences from work. All this will help to create a positive corporate image in the long term (Bumgarner, 2000; Hilden, 2002; Lepistö, 2000.)

Orientation is a short-term guide for a newcomer to the organization, decision-making processes, chain of actions, and values and goals. Orientation can be seen as a three fold process that includes planning, execution, and evaluation. Orientation helps newcomers to adapt, do things correctly from the start, and find capabilities and knowledge. Furthermore, it removes uncertainties, increases interest in work, and influences career development. Orientation saves time in the future by raising cooperation, improving quality of the work, decreasing mistakes, and forming a good attitude toward work (Bumgarner, 2000; Lepistö, 2000.)

Proper planning is the cornerstone for successful orientation. Planning should be done by the immediate superior of the newcomer as he or she has the best knowledge about the duties and working environment. The superior has to analyze the forthcoming situation, working experience, and expectations and make an individualized plan for the orientation. Learning style and character of the new employee should be taken into consideration along with adult learning principles. At least one or two personal preceptors should be appointed, and orientation time must be considered on a case-by-case basis. Cooperation is needed, and shared responsibility is important (Fahje, 2001).

Effectively executed orientation is a key factor in placing the new employee into a new working environment. Orientation can be seen to consist of two parts: general orientation and guidance to one's specific duties. General orientation means introducing places and routes in the organization and also key persons. Guidance to duties includes correct, healthy, and safe ways to work and use machines and equipment. It is also important to teach the values and unwritten rules because they are central

in the socialization process. Preceptors must be careful to avoid drowning a newcomer in a flood of information. A good preceptor should have theoretical and practical knowledge about the work and be a role model, follow standards, and have good communication skills (Fahje, 2001; Fawcett, 2002).

Evaluation is needed not only to further guide the employee but also to develop the orientation process. Evaluation is based on a worker's own goals. Evaluation should address the work attitude, reliability, diligence, and work. During an evaluation, the superior, preceptor, and newcomer should be present. Evaluation is an excellent way to motivate everyone. Evaluation should not be taken as criticism but as a tool for learning. Negative feedback should be given privately and not targeted at a person but at an action. Evaluation is continuous and reciprocal (Fahje, 2001; Lepistö, 2000).

References

- Bumgarner, S. (2000). A patient-centered approach to nurse orientation. *Journal of Nursing Staff Development, 16*(6), 249-256.
- Fahje, C. (2001). When new employee orientation doesn't go as planned: "It is time for plan B...but, what is plan B?" *Journal of Nursing Staff Development, 17*(3), 137-143.
- Fawcett, D. (2002). Mentoring—What it is and how to make it work. *AORN Journal, 75*(5), 950-954.
- Hilden, R. (2002). Ammatillinen osaaminen hoitotyössä. (Professional know-how in nursing practice) Hygieia-series. Tammer-Paino Oy, Tampere [in Finnish].
- Lepistö, I. (2000). Työpaikkakouluttajan käsikirja. (On-the-job training handbook) Työturvallisuuskeskus. (Center of Occupational Safety). Kirjapaino Oy Merkur, Helsinki [in Finnish].

Symptom Reduction Obtained by Subthalamic Deep Brain Stimulation Improves Everyday Life and Health Perception in Parkinsonian Patients

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Bilateral subthalamic nucleus (STN) deep brain stimulation (DBS) has been shown to reduce Parkinson's disease (PD) symptoms and medication use by approximately 40%–50% (Krack et al., 2003). Reports on the influence of DBS on a person's life, however, are few. Studies using the Parkinson's Disease Questionnaire 39 (PDQ 39) in patients treated with bilateral STN DBS have shown that patient perceptions of health improves during the

first 3–24 months postoperatively (Martinez et al., 2002; Lezcano et al., 2004). However, standard questionnaires do not capture individual needs nor desires of patients. This information is of interest when the effects of the DBS treatment on everyday life are analyzed and may also indicate what kind of activities the patients can perform postoperatively. Thus, the main aim of this study was to determine whether patients fulfilled their preoperative-defined goals and whether their health perception changed postoperatively.

Twenty-five patients selected for bilateral STN DBS surgery during 2002 and 2003 were included. A neurologist evaluated disease severity pre- and postoperatively with the motor part of the Unified Parkinson's Disease Rating Scale (UPDRS III; Fahn & Elton, 1987). The patients were tested in different medication conditions: after 12 hours withdrawal of antiparkinsonian drugs and during an L-dopa challenge test (defined on); postoperatively with DBS turned on and turned off was added. The patients defined their goals preoperatively. A DBS-specialized nurse asked the patients what they would like to do if during a major part of the day, they experienced a condition similar to that experienced during the L-dopa challenge test. The goals were recorded, and 1 year after surgery, the patients evaluated goal fulfillment. The patients also estimated (in percentage) the amount of time each day they had a mobility corresponding to the ability to fulfill their goals with satisfaction. SF-36 was used to measure health perception pre- and postoperatively (Sullivan et al., 1995).

The median age was 64 years (range from 48 to 76 years) and disease duration at surgery was 14 years (5–30 years). DBS settings (mean \pm SD) were 2.7 ± 0.7 V, 63 ± 10 μ s and 157 ± 30 Hz. As compared to preoperative medication off condition, the PD symptoms were reduced by a median of 57% ($p < 0.0001$) by the DBS. There were no statistical differences between the preoperative defined on and the postoperative with DBS on tests. The PD drugs (L-dopa equivalents) were reduced with 60% ($p < 0.0001$). The patients' goals were categorized in subcategories. In the category motor goals the subcategories were mobility, housekeeping, personal care, and driving; in the social goals category, socialization, leisure activities, traveling, and well-being. All patients reported either total or partial overall fulfillment of their goals. Total fulfillment was reported by 46% and 44% in motor or social goals, respectively. However, four and seven patients reported inability to fulfill a specific goal included in the motor or social categories, respectively. There were no statistical differences between the groups reporting total or partial overall fulfillment of goals preoperatively. However, there were postoperative differences. The patients with total overall fulfillment had statistically significant positive changes postoperatively compared to preoperatively in subscales in SF-36, and

they scored better in subscales than the group reporting partial fulfillment. Furthermore, in this group (total overall fulfillment) the patients had more than 80% (range from 80% to 100%) good mobility during a day. Overall, 82% of the patients reported either somewhat or much better health during the first postoperative year (SF-36, item 2). Significant positive changes were seen in the SF-36 subscales ($p < 0.045$): Physical functioning, role—physical; general health; vitality; role—emotional and social functioning.

Patients have beneficial effects of bilateral DBS in STN in everyday activities chosen by themselves. The condition to which the patients refer to when defining their goals is relevant because the condition achieved with medication and DBS on did not differ statistically from the preoperative defined on condition. The differences were parallel both in SF-36 changes, goal fulfillment, and mobility, which were interpreted as a support of reliable goal evaluations.

Symptom reduction with DBS treatment in STN affects PD patients' daily lives and health perceptions. The patients make use of the improvements and are able to accomplish individually desirable activities.

References

- Fahn, S., Elton, R. L., & members of the UPDRS development committee. (1987). The Unified Parkinson's Disease Rating Scale. In S. Fahn, C. D. Marsden, D. B. Calne, & M. Goldstein (Eds.), *Recent developments in Parkinson's disease*. Florham Park, NJ: Macmillian Healthcare Information.
- Krack, P., Batir, A., Van Blercom, N., Chabardes, A., Fraix, V., Ardouin, C., et al. (2003). Five-year follow-up of bilateral stimulation of the subthalamic nucleus in advanced Parkinson's disease. *New England Journal of Medicine*, *349*, 1925–1934.
- Lezcano, E., Gomez-Esteban, J. C., Zarranz, J. J., Lambarri, I., Madoz, P., Bilbao, G., et al. (2004). Improvement in quality of life in patients with advanced Parkinson's disease following bilateral deep brain stimulation in subthalamic nucleus. *European Journal of Neurology*, *11*, 451–454.
- Martinez-Martin, P., Vallderiola, E., Tolosa, E., Pilleri, M., Molinuevo, J. L., Rumiá, J., et al. (2002). Bilateral subthalamic nucleus stimulation and quality of life in advanced Parkinson's disease. *Movement Disorders*, *17*, 373–377.
- Sullivan, M., Karlsson, J., & Ware, J. (1995). The Swedish SF-36 Health Survey-1. Evaluation of data quality, scaling assumption, reliability and construct validity across general populations in Sweden. *Social Science Medicine*, *41*, 1349–1358.

Biochemical Markers in Cerebral Ischemia: A Review

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Therapeutic interventions for acute stroke are based on accurate and rapid diagnosis, which is currently limited to diagnostic imaging. Biochemical markers

are blood chemical changes resulting from biochemical mechanisms associated with cerebral ischemia. They may help in early diagnosis of stroke, prediction of infarct size, as well as identification of high-risk populations developing atherothrombosis.

Biochemical markers that correlate with the ischemic response in the brain have been identified. Animal and human studies have shown that only a few biochemical markers are elevated in the first 6 hours following stroke onset and include S100B protein, interleukin-6 (IL-6), tissue necrosis factor (TNF), and the vascular cell adhesion molecule. Five markers correlate with infarct volume noted on neuro-imaging and include S100B protein, TNF, IL-6, matrix metalloproteinase-9 (MMP-9), and neuron specific enolase (NSE). Efficacy of thrombolytic therapy can be predicted by IL-6, TNF, and MMP biochemical markers (Castillo & Rodriguez, 2004).

Biochemical markers have the potential to predict outcomes. Markers are associated with early signs of cerebral ischemia seen on neuro-imaging, final infarct volume, efficacy of thrombolytic therapy, early neurological deterioration, hemorrhagic transformation, and malignant ischemic syndrome. In addition, function as measured by the modified Rankin scale and mortality are linked to specific biochemical markers in stroke. For example, S100B and interleukin-6 have been found to be correlated with functional outcomes at 3 months (Herrmann, Vos, Wunderlich, de Bruijn, & Lamers, 2000; Smith et al., 2004).

No single marker has yet been shown to be predictive enough for it to serve as a clinically useful diagnostic test. Research continues in the study of biochemical markers in stroke. Advances and interest in acute stroke require that nurses stay abreast of the latest strategies to guide timely and appropriate care.

References

- Castillo, J., & Rodriguez, I. (2004). Biochemical changes and inflammatory response as markers for brain ischaemia: Molecular markers of diagnostic utility and prognosis in human clinical practice. *Cerebrovascular Disease, 17*(Suppl. 1), 7-18.
- Herrmann, M., Vos, P., Wunderlich, M. T., de Bruijn, C. H., & Lamers, K. J. (2000). Release of glial tissue-specific proteins after acute stroke: A comparative analysis of serum concentrations of protein S-100B and glial fibrillary acidic protein. *Stroke, 31*, 2570-2677.
- Smith, C. J., Emsley, H. C., Gavin, C. M., Georgiou, R. F., Vail, A., Barberan, E. M., del Zoppo, G. J., Hallenbeck, J. M., Rothwell, N. J., Hopkins, S. J., & Tyrrell, P. J. (2004). Peak plasma interleukin-6 and other peripheral markers of inflammation in the first week of ischaemic stroke correlate with brain infarct volume, stroke severity and long-term outcome. *BMC Neurology, 14*, 4.

Effects of a Comprehensive Oral Care Protocol for the Intubated Neuro ICU Patient

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Pneumonia is the second most common hospital-associated or nosocomial infection (Centers for Disease

Control [CDC], 2004). Patients receiving continuous, mechanically assisted ventilation have 6-21 times the risk for acquiring nosocomial pneumonia compared with patients not receiving ventilator support (CDC, 2004). Morbidity and mortality associated with the development of ventilator-associated pneumonia (VAP) is high with mortality rates ranging as high as 41% (Heyland, Cook, Griffith, Keenan, & Brun-Buisson, 1999). Development of VAP can increase ventilator days, intensive care unit (ICU) and hospital lengths of stay, and thousands of dollars in additional hospitalization costs. Oral and dental hygiene have been identified as an important preventive nursing intervention in decreasing the incidence of VAP in ventilated patients (Munro & Grap, 2004).

Current literature remains elusive when frequency, efficacy of mechanical, and pharmacological products are investigated in promotion of oral health for critically ill patients in the ICU. Furthermore, although nurses acknowledge the importance of providing oral care, studies demonstrate oral care may in fact be neglected (Grap, 2003). Frequency of oral care has been recommended from every 2-4 hours to every 2-6 hours, or to every 12 hours.

The lack of good oral hygiene results in the accumulation of plaque, and proliferation of oral bacteria results in colonization of oropharynx. In addition, medications such as corticosteroids, diuretics, opiates, and high-dose antibiotics and use of oral airways and oral intubation contribute to the formation of dry mouth or xerostomia (Fitch, Munro, Glass, & Pellegrini, 1999). Little information exists in the literature that addresses aspects of toothbrushing duration, optimal techniques, and operator techniques (Munro & Grap, 2004).

Implementation of a standard oral care protocol is hypothesized to be effective in reducing VAP and improving oral health in critically ill neurological ICU patients. Various strategies, aimed at reducing the VAP rate and improvement of oral hygiene among adult neurological patients in the ICU, should be developed and studied for efficacy.

References

- Centers for Disease Control. (2004). Guidelines for prevention of health-care-associated pneumonia 2003. Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee. *Morbidity and Mortality Weekly Report, 53*(RR-3), 1-36.
- Fitch, J. A., Munro, C. L., Glass, C. A., & Pellegrini, J. M. (1999). Oral care in the adult intensive care unit. *American Journal of Critical Care, 8*, 314-318.
- Grap, M. J., Munro, C. L., Ashtiani, B., & Bryant, S. (2003). Oral care interventions in critical care: Frequency and documentation. *American Journal of Critical Care, 12*(2), 113-8.
- Heyland, D., Cook, D., Griffith, L., Keenan, S. P., & Brun-Buisson, C. (1999). The attributable morbidity and mortality of ventilator-associated pneumonia in the critically ill patient. *American Journal of Respiratory Critical Care Medicine, 159*, 1249-1256.
- Munro, C. L., & Grap, M. J. (2004). Oral health and care in the intensive care unit: State of the science. *American Journal of Critical Care, 13*, 25-33.