9
Nursing Care of the Neuro-Rehabilitation Patient

ANTHONY APRILE AND KELLY REILLY

The Role of Rehabilitation Nurses

Rehabilitation nurses are licensed professionals (registered nurses) with additional training and experience in rehabilitation. Training typically consists of an orientation to the hospital followed by a didactic component related to care of the rehabilitation patient and a preceptorship of varying lengths dependent on previous experience. Rehabilitation nurses can become credentialed through certification in rehabilitation nursing through the Association of Rehabilitation Nurses (ARN) or further credentialed in neuro rehabilitation nursing by obtaining certification in Neuroscience Nursing through the American Association of Neuroscience Nurses (AANN). Appendix 1 lists a number of professional associations of interest to the rehabilitation nurse. Clinical judgment, skills and an evidence-based approach to practice must be maintained through continuing education, training, and the ongoing evaluation of neuro-specific competencies to validate proficiency of care of the neuro rehabilitation patient. These are continuous processes that must be sought by nurses to maintain expertise in the rapidly advancing fields of neuroscience and neurorehabilitation. Professional associations, like the ARN and AANN, provide professional development through education, advocacy, collaboration and research within the specialty (Doble et al., 2000).

Nursing rehabilitation of the neurological patient begins in the acute phase of the injury or illness (Barker, 2002, pp. 477–500), and can extend beyond acute care, through various phases (acute, subacute) of inpatient rehabilitation and into the home or other long-term care setting. The rehabilitation nurse must integrate specialized knowledge, skills, experience, and a compassionate attitude, in order to meet the needs of the patient and family. The application of these skills and expertise can occur through administrative and/or clinical roles and functions.

Administratively, rehabilitation nurses can function as case managers, especially common in acute care and acute rehabilitation settings. In this role, nurses must advocate for patients and families by representing concerns regarding care both within and outside of the clinical setting. The case manager must review each patient's case for the appropriate treatments and services. If expected treatments or services are omitted from the plan of care or denied by the insurance companies,

the case manager will appeal the decision in order to try and obtain the care or services the patient requires. The nurse case manager must be involved from the beginning of care, before admission into rehabilitation, to help the patient and family transition from the medical management to rehabilitative phases of care; and then from inpatient to outpatient and/or home-based services, facilitating a smooth transition and adjustment. Nurse case managers also help obtain needed health care and social/financial services. These can include financial assistance, medical benefits, visiting nurse and/or attendant care, independent living arrangements, elder or adult care, transportation, day treatment programs, hospice care, and preventive health care. The needs of the patient and family will guide what services are sought and implemented (Barker, 2002, p. 477–500). A more detailed discussion of the role and responsibilities of the case manager can be found in Chapter 10.

Clinical Neuro-Rehabilitative Nursing Care

From the vantage point of the rehabilitation nurse, the main focus of rehabilitation is to assist the patient to move toward increasing independence in self-care. Dorothea Orem's model of self-care defines a system that includes wholly compensatory systems, partly compensatory systems, and supportive educative systems (Edwards, 2000). A wholly compensatory patient system refers to self-care needs being met solely through help of others. A partially compensatory system includes the patient meeting his or her own self-care needs with the partial support from others. And a supportive educative system includes the patient meeting his or her own self-care needs through the instruction and encouragement of others (Edwards, 2000). Based on the nurse's and other interdisciplinary team members' assessments, an initial plan of care for a neurorehabilitation patient is developed as a partial compensatory system if basic activities are successfully initiated in the acute care setting. The goal for the patient will then be to progress to a supportive educative system enabling self-care in the rehabilitative setting (Edwards, 2000).

Ms. Jones is an 87-year-old female admitted into the neuro rehab unit 3 weeks status post-hemorrhagic stroke. Upon admission, Ms. Jones is noted to have left-sided hemiplegia with self-care deficits secondary to impaired mobility. She has reduced safety awareness and is impulsive. Ms. Jones is able to assist with bathing, toileting, and dressing but lacks the motor skills, endurance, and cognitive abilities to complete these tasks on her own. Through collaborative assessment and training from her occupational therapist, and carryover/reinforcement by nursing staff of skills learned in therapy, Ms. Jones is taught proper body mechanics and encouraged to rest and time her activities to increase her endurance, thus increasing her ability to become more independent in her own care.

The initial rehabilitation nursing assessment must be thorough, valid, and reliable, as it provides the basis for developing the nursing plan of care. It must include a history, as the general health of the patient before the injury or illness must be established in order to determine the patient's capacity to return to an

optimal level of functioning. The assessment will span physical, neurological, and functional components, including level of consciousness (LOC), vital signs, visual and pupil evaluation, motor and sensory functioning, cranial nerve functions, cognition, communication, and behavior (Barker, 2002, p. 477–500). The Functional Independence Measure (FIM) provides a standardized, objective way of measuring the patient's current motor and cognitive abilities (Hawley et al., 1999), and is commonly utilized in acute rehabilitation settings to measure outcomes. Subsequent assessments must focus on the areas of deficit from the initial assessment, and can help determine the patient's progress.

Level of Consciousness

Nursing assessment of level of consciousness includes determination of the patient's state of arousal, awareness to person, place and time, and responsiveness to environmental stimuli (Barker, 2002, p. 53). It can be performed by using the Glasgow Coma Scale (GCS), which evaluates eye opening, motor and verbal responses (which can range from spontaneous to responsive to speech, to pain, to no response) and is a reliable measure of consciousness (refer to Chapter 2, Table 2.1).

Vital Signs

Vital sign assessment of the neuro rehabilitation patient can show telltale signs of deterioration of neurological status. Patients with increased intracranial pressure (IICP) present with bradycardia secondary to the stimulation of the brainstem; the presence of bradycardia, hypertension, and widening pulse pressures are considered to be a late finding of IICP (Barker, 2002, p. 77). The pupil evaluation assesses the size, shape, equality and reaction of the pupils. Normal assessment findings include regular-shaped, reactive pupils. Unequal and/or oval pupils are indicators of IICP and as a new assessment finding could indicate a herniation of the brain from an area of higher pressure to lower pressure (Barker, 2002, p. 71).

Motor Function

Motor function and mobility assessments identify deficits in the interactions of muscles, peripheral and central nerve processes, and the impact on mobility. The assessment requires that bilateral extremities be evaluated at the same time. Muscle strength, bulk, and tone are evaluated in the upper and lower extremities. A muscle-strength grading scale rates muscle strength from total paralysis to active movement against full resistance and is a good tool for comparison to determine improvement in the patient's condition (Edwards, 2000). If the patient is unable to understand simple commands, motor function is assessed by the use of a painful stimulus. Central stimulation includes trapezius pinch, sternal rub, supra orbital pressure**,** and nipple or testicle pinch that stimulates a total body response; however, these are contraindicated in patients with brain injury. Peripheral stimulation can

differentiate affected areas of the body and include nail bed pressure and pinching the inner aspect of the arm or leg (Barker, 2002, p. 65–69).

Mobility is assessed through range of motion, balance, bed mobility, transfer ability, wheelchair mobility, ambulation, neuromuscular problems, coordination and sensory function, and the ability to understand and follow instructions. Impaired mobility affects all body systems including the skin, bladder and bowel, respiratory system, and increased contractures of ligaments and muscle atrophy. For mobility-impaired patients, nursing staff need to provide frequent turning and positioning, use pressure relieving surfaces, monitor for incontinence of bladder or bowel, ensure adequate nutrition, monitor lung sounds, provide regular gentle exercise, assess for deep vein thrombosis, assess for postural hypotension, and use recreational therapy to stimulate social interaction (Edwards, 2000).

Based on the initial nursing assessment, Ms. Jones requires moderate assistance to transfer from the bed to a chair or wheelchair. Impaired mobility puts Ms. Jones at risk for potential complications. The nursing care plan includes head to toe skin assessment and risk assessment each shift along with frequent turning and positioning, every two hours with more frequent assessments of the areas at risk for injury (e.g., bony prominences). A pressure relieving mattress is in place to help alleviate areas prone to pressure ulcers. Frequent assessments of bowel and bladder habits help to plan for appropriate intervals of toileting. Ms. Jones will be toileted every 3–4 hours through the day and night. A nutrition consult is ordered to ensure adequate dietary intake for optimal healing. Routine vital signs and monitoring of respiratory or circulatory complications will occur daily to prevent potential complications of impaired mobility.

Sensory Function

Sensory assessments evaluate superficial and deep sensations that may show deficits with regard to the peripheral nerves, spinal roots, spinal cord, brainstem, thalamus and cerebral cortex. All sensory assessments are evaluated bilaterally. Superficial assessments include light touch evaluated by strolling the patient's skin, superficial pain evaluated by the use of a pinprick, and skin temperature assessed with hot or cold water. Evaluation of deep sensations includes assessment of the sensation of vibration, position sense, and deep pain.

The nurse must assess the hearing and visual ability of the patient, including interviewing the family regarding the patient's pre-morbid hearing/visual status, and ensuring the patient has access to necessary devices (e.g., hearing aid, corrective lenses). Deficits in hearing or vision can be a result of injury or illness that can be partial or complete. If a hearing deficit is identified, the nurse must ensure patient safety by validating that the patient understands instructions, and accommodating the patient by using alternative methods of communication, such as written notes or sign language (Edwards, 2000). Visual deficits can include disturbances in the visual fields or reduced visual acuity. The nurse must instruct the patient to scan the visual field and provide a safe environment with adequate lighting and free of obstructions (Edwards, 2000).

Cognitive/Communication Disorders

The patient's cognitive status is a reflection of the resiliency of memory, judgment, reasoning, and problem-solving ability, and will impact his or her ability to utilize/benefit from nursing education and interventions. The nurse's assessment of the cognitive status of patients with ABI includes orientation to person, place, and time as well as their ability to understand and follow directions. The patient must also be observed for confusion, impulsivity, perseveration, memory impairment, emotional lability, disinhibition, and agitation. Nursing interventions include repetitive review and cuing for orientation; use of memory aids (e.g., calendars, notebooks) consistency with the environment, staff, and schedules; use of bed, chair or door alarms; establishing structured supplemental activity routines during nontherapy hours; encouraging family involvement and providing education and guidance. Nursing interventions for communication impairments (e.g., receptive, expressive aphasia) can include repetition, control of the environment, use of short simple sentences, and family education on effective communication techniques. Working with the speech-language pathologist to develop alternative communication strategies (e.g., picture board) to help the patient express basic needs is essential.

For patients with behavioral challenges (e.g., agitation), it is important to maintain a calm and controlled approach to the patient, including giving simple instructions and avoiding scolding. Physical restraints are an intervention of last resort, and can often be avoided by behavioral strategies such as providing verbal redirection, rest periods, limiting visitors, and reducing environmental stimuli (Edwards, 2000). Documentation of type and duration of behavioral challenges will enable appropriate strategies/interventions to be developed by the neuropsychologist and/or medical staff.

Safety

Patients with acquired brain injuries are at risk for many safety related issues, including elopement and falls. Careful monitoring of ambulatory, yet disoriented, patients to prevent inadvertent wandering off or elopement is critical. Staff and family education will help decrease the risk of elopement.

Potential for injury related to falls is assessed initially by review of the patient's history. Patients at risk include those with cognitive impairment, a history of falls, impaired mobility, a history of syncope, or use of an assistive device (Corrigan et al., 1999). A further assessment of sensory function, urinary function, gastrointestinal function, mental status, neurological status, and medication assessment for potential alteration in level of consciousness will help identify risk factors and appropriate interventions. Fall prevention programs should be based on safety related interventions that involve the patient and family. Interventions for risk of falls include a frequent reorientation to person, place, and time, placing the call bell within reach with instructions (visual and/or verbal, as would benefit the patient) on use, assuring that the patient has his/her own assistive device, toileting the patient frequently, assessing recent administration of diuretics, assessing GI function, maintaining the bed in a low position with brakes on, ensuring adequate

lighting, and monitoring side effects of medications. Nurses must communicate their assessment findings and any clinical updates to each other when changing shift and to other members of the neurorehabilitation team. Additionally, if the patient is at significant risk of falls, increased supervision by ancillary staff can help maintain patient safety (CDC, 2005).

Ms. Jones is at risk for falls due to her impaired mobility and impulsivity. Both Ms. Jones and family members are educated to her risk for falls and appropriate interventions including use of call bell and ensuring the bed is in the lowest position and brakes are on. Due to memory impairments, a sign is posted in her room reminding her to "Use the call bell if you need assistance." Ms. Jones will be toileted frequently and supervised by ancillary staff when attempting activities of daily living to ensure safety is maintained.

Nutrition

Nutritional assessments can help identify issues that would lead to potential negative complications. A complete nutritional assessment is used to identify the proper protein, carbohydrate, fat, vitamin, and fluid intake to meet the metabolic demands of a healing body. In collaboration with the dietician and/or nutritionist, this should include analysis of weight, dietary history, interest and choices, muscle wasting, fat stores and lab results (Barker, 2002, p. 248). When oral intake is not possible, patients will receive nutrition via a gastrostomy tube (G-tube) and the nurse must perform ongoing assessment of the patient's fluid intake, weight, and serum albumin. Nursing care of the patient with a G-tube includes thorough skin assessments and skin care around the insertion site, and assessing placement of the G-tube by checking for residual stomach contents. The patient's position must be upright greater than 30 degrees for feedings to decrease risk of aspiration. Patient and family education begins with the type, time, and frequency of feedings. Care of the insertion site and initiation and discontinuation of feedings should be taught progressively to validate understanding (Barker, 2002, p. 248–251).

A swallowing assessment is needed to minimize the risk of aspiration in the neuro rehabilitation patient. A patient with impaired swallowing may exhibit drooling, ineffective coughing, need for suctioning, and respiratory difficulty when eating. Related difficulties may include slurred speech, inability to smile, purse lips, presence of facial droop, pocketing of food, inadequate swallowing with first attempt, and increased time to finish a meal (Edwards, 2000). Appropriate interventions for patients at risk for aspiration due to impaired swallowing include a referral for a swallowing evaluation to detect/diagnose the impairment, and the consistent implementation of strategies, typically established by the speech-language pathologist. These may include sitting the patient upright, ensuring foods have proper consistency, nonmixing of solids and liquids, placing food on the unaffected side of the mouth, and using small mouthfuls. Cuing/compensatory strategies include minimizing environmental distractions, teaching the patient to concentrate on chewing and swallowing before taking another mouthful, providing additional time and supervision. Patients should remain upright 20–30 minutes after eating (Barnes, 2003).

Patients who cannot tolerate feedings by mouth will be started on hyperalimentation via a centralized venous catheter. Hyperalimentation gives the patient fluid, protein, carbohydrates, and fats through the veins via total parenteral nutrition (TPN) and lipids to ensure adequate nutrition is maintained. Nursing care of the patient receiving TPN includes central line assessments and dressing changes. The assessment of proper nutritional requirements based on routinely ordered labs are necessary to meet the changing needs of patients and the assessment, monitoring and evaluation of the patient for therapeutic results and signs and symptoms of complications is required on a shift by shift basis. The eventual goal is to slowly introduce feedings by mouth and reduce the need for hyperalimentation (Edwards, 2000).

Bowel and Bladder Function

As described in Chapter 5, changes in continence are common following acquired brain injury. Nurses must ask patients specific questions related to difficulties with continence to help determine their needs in this area. Careful observation and documentation is also necessary, since many patients will be unable to reliably report their needs, due to sensory, cognitive or behavioral impairments. In designing interventions, nurses must take into account cognitive status, ability to participate in interventions, age, mobility, and gastrointestinal disturbance (e.g., constipation) (Barker, 2002, p. 489–490), in addition to the cause of incontinence. It is important to ensure regular toileting during the day and night. Using input/output records to identify fluid intake, time of voiding, sensation of fullness and feeling of emptying the bladder can be beneficial. Intermittent catheterization, condom catheters, and indwelling catheters provide a way to handle and measure urinary drainage (Barker, 2002, p. 489–490). The patient and or family can be taught to plan fluid intake and bladder emptying prior to activities.

Bowel function assessment includes patient history of bowel patterns including time and characteristics of last stool, medications that affect function, and medical or psychological problems that affect function (including infection, trauma or stress). Constipation and diarrhea need to be assessed and treated. Nutritional assessment must include sources of fiber and proper hydration to maintain proper bowel function. Planning for bowel movements after meals often ensures emptying. Patients and families must be taught the importance of regular bowel elimination and the complications of constipation and diarrhea (Barker, 2002, p. 490–493).

Wound Care

A primary goal of nursing care is to prevent and, when necessary, heal pressure ulcers. Risk factors that identify patients at risk for altered skin integrity include age, underlying disease processes, neurological injuries, impaired circulation, impaired mobility, impaired sensation, low serum protein albumin, poor nutrition, and bladder or bowel incontinence. Factors that increase incidence of pressure related injury include sustained pressure from surfaces or devices, and complications of stomas and related equipment. Shearing forces, which are defined as adjacent surfaces

moving across each other, and friction, the rubbing of one surface on another, contribute to the increased incidence of pressure related injury and therefore need to be managed (Makelbust & Sieggreen, 2000).

Nursing interventions for the neuro rehabilitation patient at risk for skin related injury include the use of a risk assessment scale to detect if the patient's status is improving or declining. The Braden scale (Brown, 2004) is commonly used to predict pressure ulcer risk in patients. The scale assesses patients' sensory perception, mobility, activity, moisture, nutrition, and friction and sheer. Each section is scored from 1 to 3 or 4 points. The lower the score on the assessment the higher the risk of pressure related injury (Brown, 2004). Additionally, a daily nutritional assessment must be done to ensure adequate metabolic requirements are being met. Patients must be assessed for frequent turning and positioning determined by the heightened risk of the skin assessment. Turning and repositioning schedules are evaluated based on the patient's assessment score and the use of assistive equipment if available. Current technology incorporated into the beds and mattresses have turn and assist functions that support the patient's needs for frequent turning and positioning. Manual turning and positioning should occur at a minimum of every 2 hours and be adjusted according to the nurse's assessment and incorporated into the plan of care. Shear and friction need to be managed by positioning the head of the bed no greater than 30 degrees and a lift sheet or other device should be used to move or reposition the patients to decrease friction and shear. Skin care includes a daily inspection of the skin, keeping the skin clean and dry, minimizing exposure to moisture, and avoiding massage of bony prominences. Patient teaching begins with the nurse's use of the assessment tool, nutrition assessment and care of the skin. If interventions are needed teaching should include treatments, expected course of healing and complications associated with pressure ulcers (Makelbust and Sieggreen, 2000).

Nurses must maintain competency in staging and the treatment of pressure ulcers. Documentation needs to be factual and accurate describing the location and size of the wound, description of the wound base, sinuses and color and consistency of drainage. Staging is based on severity of the injury. Stage I includes changes to the skin color, consistency, and temperature. Stage II includes partial tissue loss of the epidermis and the dermis. Stage III is a full thickness skin loss through the subcutaneous tissue. Stage IV is a full-thickness skin loss through the fascia to the muscle or bone. Any changes noted to the patient's skin need to be reported and evaluated to prevent the extensive complications of pressure ulcers (Makelbust & Sieggreen, 2000).

Pain Management

Pain is a sensory experience that evokes emotional, social, spiritual, and physical responses. The clinical definition of pain is "whatever the person says it is, existing wherever the person says it does" (McCaffery, 1999). Patients at risk for undertreatment of pain include the elderly and the cognitively impaired (Galloway & Turner, 1999). Nurses must assess pain on an ongoing basis. The initiation of the plan of care should occur during the admission process, at regular intervals, and

with any new reports of pain. A thorough pain assessment includes location, intensity, timing, quality; a description of what makes the pain worse and what makes it better, the patient's pain goal, and what changes in behavior occur with pain. Pain-assessment scales identify the severity or intensity of pain and include a 0 to 10 scale (Pasero et al., 1999) and a noncommunicative assessment that evaluates behavioral cues (Pasero et al., 1999). Pharmacological interventions should be based on the patient's reports of pain with appropriate score (Pasero et al., 1999). Nonpharmacological interventions and complementary therapies should be based on what decreased the pain as reported by the patient. Reassessment of pain must be done after implementation of an intervention. Effectiveness should be documented and communicated. Breakthrough pain, or transitory episodes of moderate to severe pain, can be a significant barrier to participation and progress in rehabilitation, and must be comprehensively managed. Patients are at risk for breakthrough pain with activity, which usually presents as extreme pain that causes distress. Management involves specific dosing to be included in the medical treatment of pain, and includes coordination with other members of the neurorehabilitation team (e.g., PT, OT), particularly around timing of medication administration. Nurses must anticipate, prevent and treat the side effects of analgesia, which can include constipation, nausea and vomiting, sedation, pruritis (itching), mental status changes, and respiratory depression. Nurses also need to educate the patient and family on pain management (St. Marie, 2002).

Barriers to effective pain management can occur from a knowledge deficit of pain-management theory, inadequacy of the pain-assessment cycle, concern for the side effects of pain medication, and/or fear of addiction. Addiction occurs in less than 0.1% of patients using narcotics for medical purposes (Pasero et al., 1999). To prevent withdrawal, weaning of narcotics should be established in the plan of care. Education regarding tolerance, dependence, and addiction need to be addressed for the patient receiving pain management, in order to alleviate any misconceptions regarding receipt of pain medication (St. Marie, 2002).

Sleep Disturbances

Neuro-rehabilitation patients are at risk for alteration in sleeping patterns related to the brain injury, pain, and/or the effects of medications. The normal progression of traumatic brain injury or stroke can lead to an initial reversal of the day/night cycle (Edwards, 2000). Co-morbidities and medications can also affect sleep. Nursing interventions include helping and teaching patients to keep a routine, use comfort and alternative measures (e.g., music) to relax, toilet before sleep, create a quiet environment, and treat pain timely and effectively (Barker, 2002, p. 258–259).

Sexual Dysfunction

Neuro-rehabilitation patients are at risk for alteration in sexual function and reproduction, and the rehabilitation nurse often takes on the role of educating the patients on the effects of injury, illness, or medications on sexual function and reproduction.

Knowledge of factors that influence the dynamics of a relationship and the physical and psychological aspects of sexual functioning is required. The nurse must create an environment of acceptance and be aware of resources that are available for support in this sensitive area; referral to specialists (neuro-urologist, neuropsychiatrist, and psychotherapist) may be indicated (Chandler & Brown, 1998).

Family Training

The neurorehabilitation team must provide family-centered care to restore the patient and family to optimal health. Patients and families should be setting goals and be involved in all levels of care planning. As many neurorehabilitation patients will need continued assistance with self-care upon discharge from an inpatient setting, it is vital to include the family in most educational and training interventions. Language and cultural differences need to be evaluated and taken into account (Edwards, 2000) as should the relationships between spiritual beliefs and health and religious practices. The availability and interpersonal dynamics of the patients' social support systems must be assessed (Barker, 2002, p. 477–499).

Discharge training starts upon admission to the neuro rehabilitation unit. Patient and family education is started at the beginning of rehabilitation and progressed to the point at which the patient and family have the ability to manage their own care at home. Patients and families need to understand the compensatory mechanisms that occur after a brain injury and the adaptive devices used to assist motor and sensory functioning. When communication is an issue, families are taught alternative methods for communicating to meet the needs of patient, via a collaborative approach between the speech-language pathologist and nursing staff. Safety interventions are implemented and strategies for applications to the home settings should be discussed prior to discharge so that arrangements can be made in advance. Medication regimens should be adjusted from an inpatient-oriented, around the clock schedule, to a home schedule for ease of compliance. Understanding of the purpose, timing, and side effects of medications needs to be validated prior to discharge. Nutritional requirements and assessments should be understood prior to discharge and arrangements of proper foods, amount and consistency, should be in place at home for the patient to maintain optimal dietary intake. If tube feedings are necessary, the patient or family needs to be competent in initiating and discontinuing feedings, and skin care around the insertion site. Complications of bowel and bladder incontinence, pressure ulcers, pain, sleep disturbances, and sexual dysfunction must also be understood to ensure adequate resources are supplied and optimal transition occurs from the inpatient to outpatient setting.

Ms. Jones' team has been preparing for an anticipated discharge in 1 week. Ms. Jones will require a walker, nutritional supplements, pain and medication management, and continued outpatient therapies upon discharge. Ms. Jones will be going home to her daughter's house so that she will have supervision and assistance. PT and OT review and train the family in equipment usage and transfer techniques. The nutritionist discusses the increased caloric needs of healing and explains to Ms. Jones and her daughter that to meet the increased caloric needs, dietary supplementation will be needed. These supplements are available at

most stores and her daughter is able to have them available at the house when Ms. Jones arrives. The R.N. reviews names, times, and side effects of all medications that Ms. Jones takes daily. Both the patient and family verbalize understanding of all medications that Ms. Jones will be going home on, including the use of pain medications before physical therapy. The patient and family are educated to the signs and symptoms of complications from pain, pressure injury, bowel or bladder incontinence, and sleep and sexual dysfunction. Follow-up appointments and contact numbers are given prior to discharge to ensure that the proper resources are in place.

Conclusion

The nurse is an integral part of the interdisciplinary neurorehabilitation team, whose goal is to meet the needs of patients and families by restoring the patient to an optimal level of health and improving his or her quality of life. It is a well-organized team that results in a reduction of deaths, disability, and need for long-term institutions. Teams must communicate regularly to discuss patient's assessments, problem identification, short- and long-term goals, and decision-making (Langhorne & Legg, 2003). The R.N. plays a vital role in the communication of patient status to family members and other members of the health care team. The nursing assessment and plan of care needs to be fully integrated into the interdisciplinary plan of care to ensure holistic management and achievement of the patient and family's goals.

Patients are estimated to spend 8–13 % of time engaging in therapeutic activities throughout the day (Thorn, 2000) leaving them in the care of the R.N. for a majority of the time spent on an inpatient neuro-rehabilitation unit. It is the nursing department that is in the unique position to observe patients and communicate important patient information to the physician when changes in vital signs or responsiveness occur, to the neuropsychologist when changes in cognition or behavior occur, to PT/OT when mobility issues are apparent, and to speech therapy when nutrition/swallowing issues are identified. Nursing can also facilitate carryover of goals established in therapies by other disciplines and communicate back to those disciplines to facilitate adjustments in interdisciplinary rehabilitation management. With the patient and family as the central focus, the neuro-rehabilitation team can maximize the potential for the patient with acquired brain injury to achieve the goals of reducing disability and acquiring new skills and strategies that maximize activity (Barnes, 2003).

References

Barker, E. (2002) *Neuroscience Nursing: A Spectrum of Care,* 2nd ed. St. Louis, Missouri: Mosby (Original work published 1994).

Barnes, M. (2003) Principles of neurological rehabilitation. *Journal of Neurology, Neurosurgery, and Psychiatry* 74:3–7.

Brown, S. (2004) The braden scale: A review of the research evidence. *Orthopedic Nursing* 23(1):30–38.

Centers for Disease Control and Prevention. Web-based Injury Statistics Query and Reporting System (WISQARS) [Online]. (2005) National Center for Injury Prevention and Control, Centers for Disease Control and Prevention (producer). Retrieved June 18, 2006, from www.cdc.gov/ncipc/wisqars.

Chandler, B., Brown, S. (1998) Sex and relationship dysfunction in neurological disability. *Journal of Neurology, Neuroscience, and Psychiatry* 65:877–880.

Corrigan, B., Allen, K., Moore, J. et al. (1999) Preventing falls in acute care. In Abraham, I., Bottrell, M., Fulmer, T., & Mezey, M. (eds.): *Geriatric Nursing Protocols for Best Practice.* New York: Springer Publishing Company, Inc., pp. 77–99.

Doble, Rosemary K., Curley, Martha A.Q., Hession-Laband, Eileen. Marino, Barbara L., Shaw, Susan M. (2000). Using the synergy model to link nursing care to diagnosis-related groups. *Critical Care Nurse* 20(3):XX–XX.

Edwards, P.A. (2000) *The Specialty Practice of Rehabilitation Nursing: A Core Curriculum*, 4th ed. Glenview, IL: Association of Rehabilitation Nurses.

Galloway, S., Turner, L. (1999) Pain assessment in older adults who are cognitively impaired. *Journal of Gerontological Nursing* 25(7):34–39.

Hawley, C.A., Taylor, R., Hellawell, D.J., Pentland, B. (1999) Use of the functional assessment measure (FIM+FAM) in head injury rehabilitation: A psychometric analysis. *Journal of Neurology, Neurosurgery, and Psychiatry* 67:749–754.

Langhorne, P., Legg, L. (2003) Evidence behind stroke rehabilitation. *Journal of Neurology, Neurosurgery, and Psychiatry* 74:18–21.

Makelbust, J. Sieggreen, M. (2000) *Pressure Ulcers: Guidelines for Prevention and Management*, 3rd ed. Pennsylvania: Springhouse.

Pasero, C., Reed, B.A., McCaffery, M. (1999) Pain in the elderly. In McCaffery, M. & Pasero, C., (eds.): *Pain: Clinical Manual for Nursing Practice*, 2nd ed. St. Louis, MO: Mosby, pp. 674–710.

St. Marie, B. (2002) *Core Curriculum for Pain Management Nursing*. Philadelphia, Pennsylvania: WB Saunders.

Thorn, S., RGN, BSc, DipN. (2000) Neurological rehabilitation nursing: A review of the research. *Journal of Advanced Nursing* 31(5):1029–1038.

Professional Nursing References

American Nurses Association	www.nursingworld.org
Association of Rehabilitation Nurses	www.rehabnurse.org
American Pain Society	www.ampainsoc.org
American Association of Critical Care Nurses	www.aacn.org
American Association of Neuroscience Nurses	www.aann.org
American Heart Association	www.aha.org
American Society of Pain Management Nurses	www.aspmn.org
Association of Rehabilitation Nurses	www.rehabnurse.org
National Institute of Nursing Research	www.ninr.nih.gov
National League for Nursing	www.nln.org