Module 2: Stroke Rehabilitation Management

Learning Objectives

Upon completion of this module, nurses will be able to:

- Understand the rehabilitation philosophy
- Describe stroke unit care
- Outline composition and roles of the interprofessional stroke team
- Describe programming (intensity, practice, stimulating environment)
- Be aware of common assessment tools
- Describe the role of education
- Describe discharge planning/community reintegration
- Describe post-stroke complications

Please refer to the following content when reading this module:

1. Canadian Stroke Best Practice Recommendations, Rehabilitation
   http://www.strokebestpractices.ca/index.php/stroke-rehabilitation/
Rehabilitation Philosophy

According to the World Health Organization, rehabilitation is a process aimed at enabling people with disabilities to obtain and maintain their optimal physical, sensory, intellectual, psychological and social functional levels through the provision of the tools they need to attain independence and self-determination (World Health Organization, n.d.).

Individuals who have experienced a stroke may require rehabilitative care as a result of the deficits acquired from their stroke. It incorporates a broad range of interventions that address one or more of medical and/or clinical care needs, therapeutic needs, and/or psychosocial needs.

The outcome of rehabilitative care will include maintenance or sustaining of functionality, restoration of functionality and/or development of adaptive capacity (Rehabilitative Care Alliance, 2014).

Stroke Rehabilitation Unit Care

A geographically defined stroke unit and specialized team provide the best care according to research evidence (Lindsay, Suddes, Gubitza, Bayley, & Phillips, 2013b, p. 7).

The benefits of specialized stroke unit care are substantial. As compared to general rehabilitation units, coordinated and organized rehabilitation care in a stroke unit has been shown to reduce mortality and hospital length of stay and to increase functional independence and quality of life. (Hebert, D., et al., 2016)

According to the Canadian Stroke Best Practice Recommendations (Hebert, D., et al., 2016), there is strong and compelling evidence in favour of admitting patients with moderate and severe stroke to a geographically defined stroke rehabilitation unit staffed by an interprofessional team. Death and disability are reduced when post-acute stroke patients receive coordinated, interprofessional evaluation and intervention on a stroke rehabilitation unit. For every 100 patients receiving organized inpatient interprofessional rehabilitation, an extra five return home in an independent state (p. 8).

Specialized staff are properly equipped and trained to provide care on the individual stroke unit. The team collaborates closely and cohesively to provide optimal rehabilitation to all patients. Individuals who have suffered from a moderate to severe stroke who are prepared for rehab and have goals that are realistic and attainable should be allowed to participate in inpatient rehabilitation.

Canadian Rehabilitation Nursing Certification (CRNC)

Being certified by the Canadian Nurses Association in Rehabilitation Nursing shows a commitment to an advanced standard of professional competence and a comprehensive understanding of the nursing specialty. Approximately, 5-15% of the certification exam focuses on the care of a patient with stroke.

Key features of a stroke rehabilitation unit include:

- Designated staff with specialized expertise in stroke and rehabilitation
- Routine involvement of the caregivers in the rehabilitation process
- Coordinated care from an interprofessional team, including meetings at least once each week
- Information provided to patients and caregivers
- Regular programs of education and training

(Forrestal et al., n.d.)
Interprofessional Stroke Rehabilitation Team

Specialized rehabilitation teams should consist of Physicians (including a physiatrist or physician with expertise/core training in stroke rehabilitation), Nurses, Physiotherapists, Occupational Therapists, Speech-Language Pathologists, Social Workers, Recreation Therapists, Dietitians, Pharmacists and Psychologists.

It is the role of all interprofessional team members to capitalize on shared competencies to ensure that patients have consistent and optimal practice opportunities of their skills to help achieve rehabilitation goals.

Physiatrist

A Physician that specializes in rehabilitation and physical medicine, the Physiatrist monitors the patient’s participation and progress in the stroke rehabilitation program.

Most Responsible Physician (MRP)

Some sites may have a general or family Physician who monitors the patients’ general medical condition.

Physiotherapist

- Assesses and treats motor function including motor control, strength, mobility, gait and balance
- Assists patient with mobility and movement
- Provides education to patient and his/her family with regards to transfers, exercises and walking using proper equipment

Occupational Therapist

- Assesses and treats functional impairments related to changes in motor control, cognition and perception
- Teaches activities or tasks of daily living, including self-care and domestic care activities
- Prescribes wheelchair and/or adaptive devices
- Conducts home assessments to aid with discharge needs

Speech-Language Pathologist

- Assesses and treats communication issues both written and verbal, including reading and auditory comprehension
- Assesses and treats swallowing difficulties, and makes recommendations regarding safe diet texture and consistency

Dietitian

- Assesses nutritional status and requirements, and implements appropriate diet plan
- Provides education to patients challenged with swallowing difficulties, poor appetite, weight loss, obesity and diabetes
Social Worker

- Assists the patient and family in understanding rehabilitation services
- Assesses emotional and mental health of the patient, which may include screening for depression
- Provides emotional and adjustment counseling
- Assesses patient, family and community resources required to facilitate discharge planning

Recreation Therapist

- Assesses leisure interests and abilities, encouraging the use of leisure time to contribute to recovery, and helps patient to return to meaningful activities that are within his/her capabilities and interests
- Educates patient and their family regarding community programs to assist reintegration

Psychologist

- Assesses cognition to see how patient can best learn new information
- Identifies areas of strength and weakness in terms of problem-solving and decision-making and makes recommendations to the team where applicable
- Assesses mental health and treats or makes recommendations as needed

Pharmacist

- Provides consultation for matters related to drug therapy, including patient and family education

Nurse

- Is a key team member as the only discipline present around the clock with the patient
- Facilitates and coordinates the plan of care and education plan for patients admitted to the stroke rehabilitation unit, ensuring an interprofessional approach to patient-centred care
- Plays a key role in medication administration and patient education, particularly around self-management of risk factors, bowel and bladder management

Programming

The Canadian Stroke Best Practice Recommendations state the following related to programming (Hebert et al., 2016):

- All patients with stroke should begin rehabilitation therapy within an active and complex stimulating environment as early as possible once medical stability is reached (section 3)
- The team should promote the practice of skills gained in therapy into the patient’s daily routine in a consistent manner (section 3)

Three factors are required to optimize rehabilitation:

- Increased intensity of therapy
- Practice of skills outside of therapy time
- Complex, stimulating environment
Rehabilitation intensity

Earlier access to and greater intensity of rehabilitation is linked with improved functional recovery and reduced length of stay. Evidence indicates that patients who received total therapy time less than three hours per day had significantly lower total functional gain than those treated for greater than three hours per day (Wang et al., 2012).

According to the *Quality Based Procedures: Clinical Handbook for Stroke (Health Quality Ontario, 2015)*, patients should receive at least three hours of direct task-specific therapy per day by the interprofessional stroke team for at least 6 days per week. All this is through an individualized treatment plan.

According to the Ontario Stroke Network (2014), rehabilitation intensity is defined as: The amount of time the patient spends in individual, goal-directed rehabilitation therapy. This therapy is focused on physical, functional, cognitive, perceptual and social goals to maximize the patient’s recovery over a seven day per week period. It is the time that a patient is engaged in active face to face treatment which is monitored or guided by a therapist.

Active stimulating environment

Contrary to best practices in stroke rehabilitation, research shows that hospitalized people with stroke in inpatient rehabilitation units spend most of their waking day inactive, alone and in their bedroom (West & Bernhardt, 2012). Enriched environments are defined as environments with access to greater sensory stimuli and more learning experiences.

Approaches to fostering an optimal rehabilitation environment include promotion of:

- A therapeutic environment (rather than clinical); a patient should not be limited to his/her room, looking at four walls or watching television
- Opportunities to practice and integrate skills learned as an integral part of daily routines
- Integrating individualized goals into the patient’s activities on the inpatient unit
- Activities that are energizing, refreshing and arouse the senses
Intentional rounding

Intentional rounding, sometimes known as “hourly rounding” or “comfort rounding”, is a practice that improves patient safety and experience, and reduces call bells. Research also shows it improves clinical outcomes, nursing efficiency, and staff satisfaction. Intentional rounding involves nurses carrying out regular checks on patients to ensure their fundamental care needs are met. Patients are checked every 1-2 hours for the 4 “P’s”:

**Positioning** - the nurse ensures the patient is comfortable and that tissue breakdown, pressure ulcers and falls are prevented. Pressure ulcer and falls risk assessment tools should be used as appropriate.

**Personal needs** - the nurse ensures all hygiene, comfort, toileting, dietary and hydration needs are met. Routine scheduled toileting prevents falls and improves bladder function.

**Pain** - the nurse ensures pain is assessed and treated, asking patients to describe their level of pain on a scale of 0 to 10 and helping in the appropriate ways.

**Possessions** - the nurse makes sure all necessary items are within easy reach (e.g., fresh water, Kleenex, TV remote control, telephone, and call bell) while considering individual needs and cognitive/perceptual function.

The nurse greets each patient, explains intentional rounding, completes the 4 “P’s” and answers any patient questions. They let the patient know a nurse will return within a specified time and then asks, “Is there anything else I can do for you before I leave?”

Triage for admission to inpatient rehabilitation

In acute care, a measure of stroke disability is completed on or by the third day after admission using the Alpha Functional Independence Measure® (AlphaFIM®). This tool generates a Projected FIM® Instrument score (see assessment section below for further details). Triage recommendations are as per the table:

<table>
<thead>
<tr>
<th>AlphaFIM® Score</th>
<th>Recommended Referral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild &gt; 80</td>
<td>Community-based rehabilitation</td>
</tr>
<tr>
<td>Moderate 40 to 80</td>
<td>Inpatient rehabilitation</td>
</tr>
<tr>
<td>Severe &lt; 40</td>
<td>Admit to inpatient rehabilitation, if eligible, OR consider an alternate program (e.g., restorative care/short-term complex medical) with regular assessment for admission to inpatient rehabilitation.</td>
</tr>
</tbody>
</table>

(Ontario Stroke Network, 2015, p.1)
The rehabilitation team assesses the patient’s stroke-related impairments and functional status within 24 to 48 hours of admission.

Integration of the assessment process within the rehabilitation team is essential in order to provide an optimal, efficient experience for the patient (e.g., eliminates repetitive history taking and duplication of testing).

Common Assessment Tools

The Canadian Stroke Best Practice Recommendations (Hebert et al., 2016) state that: Clinicians should use standardized, valid assessment tools to evaluate the patient’s stroke-related impairments, functional activity limitations, and role participation restrictions. Tools should be adapted for use in patients with communication differences or limitations due to aphasia (section 2.2).

Functional Independence Measure® (FIM®)

This measure provides a uniform system of measurement for disability based on the International Classification of Impairment, Disabilities and Handicaps. It measures the level of a patient’s disability and how much assistance is required for the individual to carry out activities of daily living. The FIM® consists of 18 items (13 motor tasks and 5 cognitive tasks) considered basic activities of daily living. When the patient is admitted to inpatient rehabilitation, completion of the FIM® is mandatory and all nurses must be certified. Nurses contribute significantly to the scoring as observers of function over a 24 hour period and have knowledge of pharmacological interventions that may affect the FIM® score.

Tasks are rated on a 7 point ordinal scale that ranges from total assistance (or complete dependence) to complete independence. Scores range from 18 (lowest) to 126 (highest), indicating level of function. Scores are rated at a minimum on admission and discharge.

Dimensions assessed include:

- Eating
- Grooming
- Bathing
- Upper body dressing
- Lower body dressing
- Toileting
- Bladder management
- Bowel management
- Bed to chair transfer
- Toilet transfer
- Shower transfer
- Locomotion (ambulatory or wheelchair-level)
- Stairs
- Cognitive comprehension
- Expression
- Social interaction
- Problem-solving
- Memory
The FIM® provides a measure of burden of care in hours that can be helpful in discussing care requirements with family.

The FIM® cognitive and motor scores, along with the patient’s age, generate a Rehabilitation Patient Group (RPG) that primarily reflects severity of disability. Each RPG has a target length of stay for inpatient rehabilitation ranging from 8 days for those with milder severity (RPG 1150) to 49 days for the most severe strokes (RPG 1100).

The following displays the target length of stay by RPG, according to the Quality-Based Procedures: Clinical Handbook For Stroke (Acute And Postacute) (Health Quality Ontario; Ministry of Health and Long-Term Care, 2015; page 97):

<table>
<thead>
<tr>
<th>Rehabilitation Patient Group (RPG)</th>
<th>Stroke QBP Target Length of Stay</th>
</tr>
</thead>
<tbody>
<tr>
<td>1100</td>
<td>48.9 days</td>
</tr>
<tr>
<td>1110</td>
<td>41.8 days</td>
</tr>
<tr>
<td>1120</td>
<td>35.8 days</td>
</tr>
<tr>
<td>1130</td>
<td>25.2 days</td>
</tr>
<tr>
<td>1140</td>
<td>14.7 days</td>
</tr>
<tr>
<td>1150</td>
<td>7.7 days</td>
</tr>
<tr>
<td>1160</td>
<td>0 days</td>
</tr>
</tbody>
</table>

Other Assessment Tools

AlphaFIM® is an abbreviated version (six items) of the FIM® Instrument created to assess function and disability in the acute care setting.

Berg Balance Scale is a clinical test of a person’s static and dynamic balance abilities.

Boston Naming Test is a widely used neuropsychological naming tool to measure confrontational word retrieval in individuals with aphasia or other language disturbance.

Braden Scale is for predicting pressure ulcer risk. This scale includes assessment of sensory perception, moisture, activity, mobility, nutrition, friction and shear.

Chedoke-McMaster Stroke Assessment (CMSA) is used to determine the presence and severity of common physical impairments. It has six dimensions which include the recovery stage of the arm, hand, leg, foot, postural control and shoulder pain.

Cognitive Linguistic Quick Test (CLQT) quickly identifies strengths and weaknesses in five cognitive domains (attention, memory, executive functions, language and visual-spatial skills) in adults with neurological impairment.

Hospital Anxiety and Depression Scale (HADS) is used to determine the level of anxiety and depression that an individual is experiencing.

Montreal Cognitive Assessment (MoCA) assesses cognitive domains. It assesses short-term memory, visuospatial abilities, and executive function. Attention, concentration and working memory are evaluated as well as orientation to time and place.
Mini-Mental State Examination (MMSE) is the most commonly used test for complaints of memory problems. The MMSE tests a number of different mental abilities, including a person's memory, attention and language. In addition there is a language modified MMSE for patients with language impairment.

Motor-Free Visual Perception Test (MVPT) assesses a person’s visual perceptual ability. It is especially useful for those who may have learning, motor or cognitive disabilities.

Oral Health Assessment Tool (OHAT) is a brief oral health status examination.

Patient Health Questionnaire - 9 (PHQ9) is a screening and diagnostic tool that can be used to identify features of depression in at-risk populations including stroke. The PHQ-2 is a shorter version of the PHQ-9 with two screening questions to assess the presence of a depressed mood and a loss of interest or pleasure in routine activities; a positive response indicates further testing is required.

Morse Fall Risk Assessment is used to assess a patient’s risk of falls based on prior fall history, diagnoses, mobility, and mentation.

STOPBANG Questionnaire is a screening tool for sleep apnea.

Timed Up and Go (TUG) is a simple test used to measure a person’s mobility and requires both static and dynamic balance. It measures the time taken to rise up from a chair, walk three meters, turn around, walk back to the chair and sit back down.

Ten Meter Walk Test assesses walking speed in meters per second over a short duration.

Western Aphasia Battery (WAB) is an instrument for assessing the language function of adults, in order to discern the presence, degree and type of aphasia.

Development of an Integrated Treatment Plan

Development of an integrated rehabilitation treatment plan to achieve goals that are reasonable for an inpatient stay, and a safe and successful discharge, is essential.

The Canadian Stroke Best Practice Recommendations (Hebert et al., 2016) state the following: Stroke unit teams should conduct at least one formal interprofessional meeting per week to discuss the progress and problems, rehabilitation goals, and discharge arrangements for patients on the unit. Individualized rehabilitation plans should be regularly updated based on review of patient status (section 2.2).

Education

Patient education

In regards to education, the Canadian Stroke Best Practice Recommendations (Lindsay & Gilmore, 2013a) state that patient education should promote self-efficacy through mastering self-management skills, including action planning, modeling behaviours, problem-solving and decision-making strategies, reinterpreting symptoms, identification of risks within current and ideal lifestyle, level of risk is the patient willing to accept to maintain or improve health status following stroke (e.g., decision-making regarding smoking, diet, blood pressure management).
• Key topics in self-management training should include exercise, symptom management techniques, risk factor management, nutrition, fatigue and sleep management, use of medications, managing emotions of fear, anger and depression, cognitive and memory changes, training in communication with health professionals and others, and health-related problem-solving and decision-making.

With the patient’s permission, family members and informal caregivers should be invited and encouraged to attend therapy sessions with the patient, and have their questions addressed. Family and informal caregivers should be taught proper patient care skills and provided with opportunities for demonstration and feedback to ensure safe care delivery for both the patient and informal caregiver (e.g., in transfers from bed to chair, feeding techniques, and positioning of the hemiplegic limb). (section 6.2.3)

Family and caregiver education

‘Timing It Right’ is an education framework (Cameron & Gignac, 2008) that highlights family caregivers’ changing experiences and corresponding support needs across the care continuum.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Time</th>
<th>Setting</th>
<th>Caregiver Support Needs</th>
<th>Caregiver Outcomes</th>
</tr>
</thead>
</table>
| Diagnosis   | Illness onset         | Acute            | **Information:** diagnosis, prognosis, treatment options  
**Emotional:** someone to talk to  
**Training:** not required                                                                 | **Knowledge:** survival/prognosis  
Reduce emotional distress                                                                                 |
| Stabilization | Illness stabilized     | Acute and Rehab  | **Information:** cause, care needs  
**Emotional:** someone to talk to  
**Training:** initial training to assist with ADL and rehab therapies                                         | **Knowledge:** awareness about cause  
Confidence in supporting ADL                                                                 |
| Preparation | Before going home     | Acute or Rehab    | **Information:** access to community resources  
**Emotional:** uncertainty about future  
**Training:** practice with ADL skills and rehab therapies                                                   | **Knowledge:** community resources  
Confidence, self-efficacy in supporting ADL  
Perceived social support                                                                                   |
| Implementation | First few months at  | Home             | **Information:** managing care  
**Emotional:** coping, adapting  
**Training:** to manage care in the home                                                                        | Self-efficacy in managing care and use of community services  
Perceived social support                                                                                   |
| Adaptation  | After being home for some time | Home | **Information:** valued activities  
**Emotional:** relational changes  
**Training:** community reintegration                                                                          | Participation in valued activities  
Psychological well being                                                                                   |

(adapted from Cameron & Gignac, 2008)
Discharge Planning

As per the Canadian Stroke Best Practice Recommendations (Lindsay et al., 2013a), discharge planning should be initiated as soon as possible after the patient is admitted to each phase of care (e.g., emergency department, inpatient acute care, rehabilitation, complex continuing care, home care).

Discharge planning activities should include:

- Pre-discharge needs assessment of a patient’s physical needs, family capacity, patient and family psychosocial needs, case history information and decision-making needs.
- Home-visits for patients being discharged to the community to identify home modifications required for access and safety.
- Family meetings between the interdisciplinary team, patient, and family to set goals of care and expectations for discharge dates, and to identify potential transitional care needs and living setting.
- Caregiver training specific to the current and ongoing needs of the individual patient.
- Day, overnight and weekend passes (i.e., leave of absences - LOAs) to determine readiness for discharge, to identify potential barriers to discharge, and to address psychosocial, emotional, physical, and financial needs of patients and families.
- Post-discharge follow-up plan, including identification of, and communication with, key contacts and healthcare providers at the next stage of care, appointments, treatments and contact information to re-access healthcare services as required.

(Lindsay et al., 2013a, section 6.4)

Community reintegration

As per the Canadian Stroke Best Practice Recommendations (Lindsay et al., 2013a), patients and families should be provided with information, support and access to services throughout transitions to the community following a stroke to optimize the return to life roles and activities. Patients and families should be provided with information regarding peer support groups in their community, and initial connection with these groups should be encouraged where available (section 6.5).

Supporting Stroke Survivors in Community Re-Engagement: Components & Questions Trigger Tool

The purpose of using the trigger tool is to guide one’s practice in a reflective process and engage patients in their stroke recovery journey towards successful community re-engagement.

The following 8 components seek to maximize life participation, independence and meaning in a holistic manner:

- Health Management
- Life Roles
- Social Network
- Environment
- Communication
- Caregiver Support
- Mobility
- Financial Management

The healthline.ca is another resource that patients and providers can use to assist in discharge planning.
Leisure and vocation

As per the Canadian Stroke Best Practice Recommendations (Lindsay et al., 2013a, section 6.5):

- Patients should be provided with a list of community-based resources for engaging in aerobic and leisure activities in the community prior to discharge; they should be referred to relevant agencies as appropriate to provide support in re-engaging in leisure activities.
- Community-based therapy for individuals with stroke should include the development of problem-solving skills for overcoming the barriers to engagement in physical activity and leisure pursuits.

Self-medication program

A stroke survivor is given responsibility for the self-administration of medications, some of which will be taken chronically. The objective of this program is to teach the patient about his/her medications while still under supervision and ensure he/she is able to manage self-administration independently. A patient and their family are counselled throughout the program by nurses and a Pharmacist.

How does a rehabilitation philosophy differ from the medical model?

Can you think of a patient that you have cared for who may have benefitted more over the long-term from participating in his/her care while you assisted, guided and taught him/her, rather than having their self-care done for them?

Post-Stroke Complications

It is in the rehabilitation setting that a patient may start to experience different complications associated with stroke. These complications could include pain, seizures, depression, spasticity and deep vein thrombosis (DVT). It is important to know these complications and be able to understand what the patient is experiencing.

Pain post-stroke

Pain post-stroke can be experienced by a patient for different reasons. Pain is any sensation in the body that causes suffering or discomfort.

Literature identifies that 23.9% of stroke survivors experience pain in the first week post-stroke and 53.3% of the survivors report pain as a post-stroke complication they experienced in the first three months and this was exclusive of shoulder pain. Post-stroke pain remains prevalent and survivors should be assessed using a validated tool for pain throughout the continuum of care (acute, rehabilitation and home) for the presence of chronic musculoskeletal and central post-stroke pain. (Registered Nurses’ Association of Ontario [RNAO], 2011, p. 17)
Central post-stroke pain

- This type of pain is a neurologic condition caused by damage to the brain and/or spinal cord. The character of this pain may vary in different patients and can sometimes affect a large area or be restricted to a smaller more specific area.
- The pain is usually described as constant with a moderate to severe intensity, and can often be made worse by touch, movement, temperature changes and emotions. The sensation of this pain may be described as burning, aching “pins and needles”, tingling or shooting types of pain.
- There is usually no visible tissue damage noted in the area where the patient experiences the pain.
- This type of pain can be difficult to treat. Pain medications can sometimes ease some of the pain but not completely relieve the pain. Sometimes tricyclic antidepressants such as nortriptyline or anticonvulsants such as neurontin (gabapentin) can be useful in managing this type of pain.

(National Institute of Neurological Disorders, 2011)

Complex regional pain syndrome (shoulder hand syndrome)

- Complex regional pain syndrome (CRPS) is a chronic pain condition most often affecting one of the limbs (arms, legs, hands, or feet), usually after an injury or trauma to that limb. CRPS is believed to be caused by damage to, or malfunction of, the peripheral and central nervous systems. CRPS is characterized by prolonged or excessive pain and mild or dramatic changes in skin colour, temperature and/or swelling in the affected area.
- The key symptom is prolonged pain that may be constant and, in some people, extremely uncomfortable or severe. The pain may feel like a burning or “pins and needles” and may spread to include the entire arm or leg.
- There is often increased sensitivity in the affected area, such that even light touch or contact is painful (called allodynia). People with CRPS also experience constant or intermittent changes in temperature, skin colour, and swelling of the affected limb.

(National Institute of Neurological Disorders and Stroke, 2015)

Spasticity and high tone

Spasticity is classically defined as a velocity dependent increase of tonic stretch reflexes (muscle tone) with exaggerated tendon jerks. It can be observed in typical patterns of flexion and adduction in the upper extremity (closed fist, bent elbow) and extension and adduction in the lower extremity (straight leg with foot pointed down and in). One study reported that 39% of patients with a first-ever stroke were spastic twelve months after their stroke. Spasticity can be painful, interfere with functional recovery and hinder rehabilitation efforts (Teasell, Hussein, & Viana, 2014).

Seizures post-stroke

The incidence of seizures following ischemic or hemorrhagic stroke is noted to be highly variable, ranging from a low of 7.7% to a high of 42.8% (Teasell et al., 2014). At least two studies suggest a higher incidence of post-stroke seizures (15-17%) in patients in rehabilitation.

Seizures usually occur during the first 1 to 2 weeks following stroke. Hemorrhagic stroke patients have been found to have an almost two-fold risk of developing a seizure following stroke compared to patients with an ischemic lesion (Teasell et al., 2014).
Falls

Many studies identify increased risk of injurious falls (e.g., hip fractures) in stroke survivors. The RNAO (2002) guidelines on *Prevention of Falls and Fall Injury in the Older Adult* identifies screening for fall risk is supported in research and is important in the identification of fall–prone patients.

Variables known as predictors of falls for persons with stroke include paralysis, history of previous falls, use of psychotropic medicines, visual impairment, urinary incontinence, functional disability, poor balance, depression and cognitive impairment (Nakagawa et al., 2008 and Eng et al. 2008).

Due to visuospatial neglect, proprioceptive impairments and attention deficits, persons with right-sided stroke are at increased risk of falling compared to persons with left-sided lesions (Eng et al. 2008). Systematic reviews identified persons with stroke are at risk for fragility fractures due to immobility, vitamin D deficiency, gender and time since stroke (Eng et al. 2008).

Deep venous thrombosis (DVT) and pulmonary embolus (PE)

Following stroke, the main risk factor for DVT is immobilization resulting in stasis of venous blood. Hypercoagulability may also contribute in certain subsets of stroke patients.

- 50–75% of dense hemiplegics develop DVT, 9–15% have PE, and 1–2% are fatal in the absence of prophylaxis.
- Incidence of DVTs may be as high as 45% (many are asymptomatic) in acute phase but falls to less than 10% in subacute rehabilitation.
- Peak onset of DVT is 2nd to 7th day post-stroke.
- When DVT causes symptoms, over 80% involve the popliteal or more proximal veins; symptomatic DVTs are rarely isolated distal (calf) DVTs.
- Non-extending distal DVT rarely causes PE; proximal (knee or above) DVT often causes PE.
- Odds of DVT are 17.6 times greater if bedridden or wheelchair-bound.

(Teasell et al., 2014)

Post-stroke fatigue

Post-stroke fatigue (PSF) has been identified as an increasing problem for stroke survivors in the first year post-stroke and was judged by between 23% and 59.5% of stroke patients to be one of their worst symptoms (Ponchel et al. 2015). About 30-70% of survivors suffer from fatigue.

The Fatigue Assessment Scale (Smith et al. 2008) has been validated and can be used to measure fatigue in stroke survivors (RNAO, 2005).

Changes to cognitive processing and the presence of aphasia appear to be related to PSF (greater mental effort is required to compensate for these impairments), but inflammatory and physical deconditioning factors may be related as well (Ponchel et al. 2015). In the literature, between 29% and 34% of fatigued patients are depressed. Nonetheless, fatigue was observed in 14–50% of non-depressed patients and 30% of fatigued patients did not have any anxious or depressive symptoms (Ponchel et al. 2015).

*RNAO Nursing Best Practice Guideline Screening for Delirium, Dementia and Depression in Older Adults* (rev. 2010, Appendix I, J, K, L) identifies tools that can be considered for use by the nurse and interprofessional team to assess for depression.
Other complications addressed within other modules:

- Post-stroke depression: Refer to Module 10 Mood and Behaviour Changes
- Hemiplegic shoulder pain: Refer to Module 9 Positioning, Transfers and Ambulation
- Dysphagia and aspiration: Refer to Module 5 Swallowing, Nutrition and Oral Care
- Urinary tract infection: Refer to Module 4 Continence

Assessments for Complications Post-Stroke

Nurses in all practice settings should assess (where feasible, using a validated tool) the stroke survivor’s risk for and/or presence of any of the following complications of stroke:

- Fall risk
- Fractures secondary to falls
- Bone loss secondary to immobility
- Fatigue
- Painful hemiparetic shoulder
- Pneumonia secondary to immobility and dysphagia
- Pressure ulcers
- Spasticity/contractures
- Urinary tract infection
- Venous thromboembolism

(RNAO, 2005, p. 14)

Falls

A number of falls risk screening tools are available to identify patients with risk factors who should undergo further comprehensive assessment by the interprofessional team in order to implement targeted falls prevention strategies in the individualized plan of care.

Please refer to the hospital’s policies for the tool used at a specific organization (e.g., Morse Falls Risk Assessment). Findings of any assessment should be used to initiate prevention strategies to prevent the physical and emotional consequences of falls.

Orthostatic hypotension, defined as a drop in systolic blood pressure of 20 mm Hg or more when a person assumes a standing position, is associated with falls and should be considered.
Pain

Nurses in all practice settings should assess and monitor on an ongoing basis the patient’s pain severity, quality, and impact on function using a validated tool (e.g., Wong-Baker Faces Pain Rating Scale, Numeric Rating Scale, the Verbal Analogue Scale or the Verbal Rating Scale)(RNAO, 2005, p. 17).

The choice of the most appropriate scale should be based on the patient’s cognitive function and language, and the same scale should be used each time pain is assessed. In the stroke population, it may be necessary to use an observer behaviour checklist if consistency cannot be obtained with a self-report scale. Refer to the RNAO Nursing Best Practice Guideline Assessment and Management of Pain (RNAO, 2013) for a comprehensive description of pain assessment and management (RNAO, 2005, p. 40).

- Watch for signs that may indicate that the stroke survivor is in pain
- Acknowledge the patient’s pain
- Note the location and area of the pain, look for any signs of trauma or breakdown
- Ask the patient to describe the pain
- Complete a detailed pain assessment with a validated tool

DVT

If at least three from the list below are positive, there is an 85% likelihood of DVT:

- Active cancer
- Paralysis, paresis or recent plaster immobilization of lower extremity
- Recently bedridden for more than 3 days or major surgery within 4 weeks
- Localized tenderness along the distribution of the deep venous system
- Entire leg swollen
- Calf swelling is three centimetres greater than the asymptomatic side
- Pitting edema confined to the symptomatic leg
- Dilated superficial veins (non-varicose)

(Teasell et al., 2014)
## Treatments for complications post-stroke

<table>
<thead>
<tr>
<th>Complication</th>
<th>Clinical points</th>
<th>Nursing monitoring and treatment</th>
</tr>
</thead>
</table>
| **Pneumonia**              | • Patients with dysarthria and/or dysphagia, significant immobility, reduced level of consciousness, poor oral hygiene are at higher risk | • Chest auscultation, respiratory rate, oxygen saturation monitoring and swallowing assessment  
• Monitor for signs and symptoms of pneumonia such as increased oxygen needs, fever, change in sputum and increased respiratory rate |
| **Seizure**                | • Prophylactic antiepileptics are not recommended  
• Consider seizures in patients with a depressed or fluctuating mental status out of keeping with the degree of brain injury | • Monitor for focal or generalized seizure                                                          |
| **Falls**                  | • Patients with weakness, neglect, and/or lack of insight are at risk of falls    | • Ensure appropriate safety measures and interventions in place  
• Attempt a toileting routine and monitor for urinary retention (often falls secondary to attempts to walk to washroom) |
| **Skin breakdown**         | • Patients who are immobile are at risk of skin breakdown                         | • Mobilize early, frequent position changes  
• If immobile consider pressure relief mattress, ensure wheelchair cushion and other strategies consistently used  
• Promote appropriate nutrition and hydration                                                      |
| **Pain**                   | • Pain is common  
• May include musculoskeletal pain or neuropathic pain                                 | • Pain assessments should be performed regularly  
• Patient repositioning is important for pain  
• Give pain meds as ordered as needed especially before patient is going to therapy  
• Reassess effectiveness of the pain medications given and report back to Physician as needed |
<p>| <strong>Hemiplegic shoulder</strong>    | • Subluxation of hemiplegic shoulder may result in a pain syndrome and/or soft tissue damage | • Ensure proper positioning of hemiplegic arm to maintain neutral position (e.g., use pillows in bed, a lap tray in chair, and a sling with standing) |</p>
<table>
<thead>
<tr>
<th>Complication</th>
<th>Clinical points</th>
<th>Nursing monitoring and treatment</th>
</tr>
</thead>
</table>
| Nutritional Deficiency and Dysphagia             | • If symptoms of aspiration present (e.g., coughing after eating/drinking, etc.), keep patient NPO, use IV hydration, and find alternate routes for medications  
• Some patients may be silent aspirators with no overt signs  
• Consider NG feeding tube to ensure appropriate nutrition if there are ongoing swallowing concerns                                                                                             | • Bedside swallowing screen assessment should be performed by Speech Language Pathologist or nurse using a valid screening tool if needed to confirm the diet plan  
• Patients with dysphagia and eating a modified diet or receiving enteral feeding are at risk or aspiration pneumonia |
| Urinary dysfunction (retention or incontinence)   | • Urinary dysfunction after stroke is common  
• Patients with urinary incontinence may have overflow incontinence with large residual urine volumes left in the bladder  
• Use of indwelling catheters should be avoided (unless required for close fluid balance monitoring)                                                                 | • If patient is incontinent: do post-void bladder ultrasound volume assessments to assess for urinary retention  
• If patient is not voiding: do bladder ultrasound to determine appropriate time to perform intermittent catheterization  
• Consider an underlying urinary tract infection if there is complete retention  
• Implement a bladder retraining program |
| Bowel dysfunction                                | • Constipation and incontinence are common if patient is not able to mobilize independently  
• Enteral feeding may cause constipation or diarrhea                                                                                                                                                                                                                                                                                                                                                           | • Implement bowel management program  
• If patient has diarrhea, ensure elixir medication is not being given (e.g., Tylenol elixir should be changed to tablets)                                                                                                                                                                                                                 |
| Poor oral hygiene                                | • Patients with difficulty performing activities of daily living may have difficulty performing oral care  
• Results in bacterial colonization in the mouth and higher risk of aspiration pneumonia                                                                                                                                                                                                                                                                                                                          | • Ensure an oral care routine, even if patient is NPO                                                                                                                                                                                                                                                             |

(Green, Sarro, & Tymianski, 2012, p. 95)

Think about how one of the above listed complications might impact the hospital stay for one of your patients and change the course of their recovery. How is the role of the nurse critical in identifying and preventing this complication?

What are you passionate or excited about in your role as a stroke rehabilitation nurse?
References


