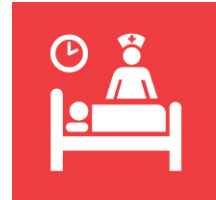


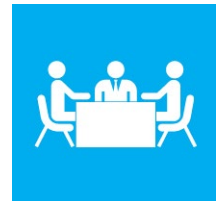
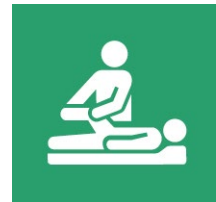
MODULE 2: ACUTE STROKE MANAGEMENT



Learning Objectives

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

- Understand the benefits of an organized stroke unit
- Identify the professionals within the acute team
- Explain the common post-stroke complications
- Identify other effects of stroke
- Understand the components of advanced care planning, including transitional and discharge planning



For the most up to date information please refer to the following Canadian Stroke Best Practice Guideline when completing this module:

[NEW Acute Stroke Management | Canadian Stroke Best Practices](#)

[Transitions and Community Participation Following Stroke | Canadian Stroke Best Practices](#)



2.1 Stroke Unit Care

Patients that are admitted to the hospital because of an acute stroke or transient ischemic attack should be treated in an interdisciplinary stroke unit. Always refer to the most up to date Canadian Stroke Best Practice Recommendations for stroke care guidelines.

Acute Inpatient Stroke Care

A stroke unit is a specialized, geographically defined hospital unit that is dedicated to the management of stroke patients.

- For facilities without a dedicated stroke unit, the facility must strive to focus on care on the priority elements identified for comprehensive stroke care delivery (including clustering patients, interprofessional team, access to early rehabilitation, stroke care protocols, case rounds, patient education).

The core interprofessional team within a stroke unit should consist of healthcare professionals with stroke expertise.

This may include but is not limited to:

- nursing, occupational therapy, physiotherapy, speech language pathology, social work, clinical nutrition, pharmacists, recreational therapists, discharge planners

As per the Canadian Stroke Best Practice Recommendations (2010) stroke unit care is characterized by a coordinated interprofessional team approach for preventing stroke complications, preventing stroke recurrence, accelerating mobilization, and providing early rehabilitation therapy. Stroke patients are more likely to return home and regain independence than those cared for on traditional hospital wards.

Specialized stroke unit care reduces the likelihood of death and disability by as much as 30% in men and women of any age with stroke (mild, moderate and severe).

A Guide to Implementing Stroke Unit Care, 2009, The Canadian Stroke Strategy.

Components of Acute Inpatient Stroke Care

Langhorne et al. (2002) described key components to effective care in stroke units. These components include:

- Comprehensive assessment of medical problems, impairments and disabilities
- Active physiological management (careful management of physiological abnormalities)
- Early mobilization and avoidance of bedrest
- Skilled nursing care
- Early setting of rehabilitation plans involving careers
- Early assessment and planning of discharge needs



The provision of good nursing care also involves addressing the risk for venous thromboembolism, temperature, mobilization, continence, nutrition, dysphagia screening and oral care for all hospitalized stroke patients.

Initiating Rehabilitation



Rehabilitation is initiated in the acute care setting to enable individuals with impairments and activity limitations to identify and begin working towards their optimal physical, mental, social, and functional levels.

A key component of stroke rehabilitation is the use of validated stroke assessment tools.

All people admitted to hospital with acute stroke should be assessed by rehab professionals as soon as possible after admission, preferably within the first 24–48 hours.

2.2 The Interprofessional Stroke Team: Acute Care

There are many roles on the interprofessional team that contribute to the stroke survivor's care. Each team member should understand the varied points of view held by other team members and trust them to deliver care that is appropriate to their respective disciplines (Cramm and Nieboer, 2011). It is important that team members understand their role on the interprofessional team, as well as the role of other team members.

Teams should also consider the "extended team" – those who come in contact with the stroke survivor and caregiver along their journey across the continuum of care and at various transition points. This ensures that the patient care plan is communicated across transition points.

Knowledge and insight of the interprofessional and extended teams will assist team members' decision-making in the stroke survivor's plan of care.

Roles on the Interprofessional Team

Occupational Therapist (OT): Responsible for the assessment of personal and domestic care activities; evaluation and treatment of functional impairments related to change in sensorimotor, cognitive and perceptual abilities; prescription of wheelchairs and bathroom appliances; home visits; patient and family education. Leisure and work-related activities are also a component of Occupational Therapy assessment and treatment.

Physiotherapist (PT): Responsible for the assessment and treatment of motor functioning, including motor control, strength and physical conditioning; balance, gait and mobility retraining; home and community visits; patient and family education regarding mobility and safety issues.

Speech and Language Pathologist (SLP): Responsible for the diagnosis and treatment of acquired communication disturbances; collaborative assessment and management of swallowing disorders; patient and family education.

Dietitian: Provides a myriad of services: assessment of nutritional status and requirements; collaborative assessments and

management of swallowing disorders, implementation of appropriate diet plans; risk factor modification; patient and family education.

Social Worker (SW): Provides services related to emotional and adjustment counseling for patients and families; assessment of patient, family and community resources required to facilitate discharge planning; referral to appropriate community agencies; patient and family education.

Pharmacist: Provides consultation for matters related to drug therapy; patient and family education.

Physician: An important member of the interdisciplinary team, the physician provides medical expertise and leadership in the diagnosis and management of the stroke patient and any of their related complications and/or co-morbidities. The physician makes decisions around care and as part of the team, determines readiness for discharge.

Recreation Therapist: Assists people with a variety of disabilities to develop and use leisure time to enhance health, independence, and quality of life.

Registered Nurse (RN)/ Registered Practical Nurse (RPN): Facilitates and coordinates the plan of care for all acute stroke and TIA patients admitted to the stroke unit, ensuring an interprofessional approach to client centered care. They demonstrate knowledge of the principles of evidence-based practice and support best practice stroke care by using appropriate assessment tools. Nurses consult with appropriate members of the care team in the management of the patient. They are actively involved in implementing an interprofessional educational plan to meet the stroke patient and family needs.

Stroke Navigator/Transition Coach: This role has been shown to have promising effects. Some of the functions of a *Stroke Navigator* include but are not limited to:

- Assistance with coordinating complex discharges
- Assessment and triage of patients to identify plans of care and facilitate timely access to the next level of care
- Clinical management to ensure the right patient receives the right service at the right time through the management of wait lists and coordination of admission and discharge
- Provision of recommendations regarding the level of care required in order for patients to achieve maximum outcomes
- Collaboration with the interprofessional team within the care setting and across transition points in order to facilitate communication and patient flow
- Education for the patient and family/caregiver in secondary prevention

2.3 Post-Stroke Complications

Potential Severe Complications

Complication	Cause	When Does It Occur?	Associated Factors	Signs and Symptoms	Usual Treatment
<p>Hemorrhagic Transformation (also called extension of stroke)</p> <ul style="list-style-type: none"> Bleeding within the infarcted region One of the most serious complications in the immediate post admission to acute care 	<ul style="list-style-type: none"> Initial vascular obstruction produces ischemia of the distal tissue Affected blood vessels and brain tissue are rendered fragile and injured When the occluding embolus either lyses spontaneously, or breaks apart and migrates distally, cerebral blood flow is restored to the “injured” ischemic arterioles and can result in increased vascularization/perfusion in what had previously been a bloodless field 	24–48 hours after original infarct	<ul style="list-style-type: none"> The bigger the infarct, the greater the possibility of collateral circulation Richness of collateral circulation Use of anticoagulant and interventional therapy with thrombolytic agents associated with a higher incidence of hemorrhagic transformation 	<p>Progressive cerebral deterioration including:</p> <ul style="list-style-type: none"> Headache/vomiting Depressed level of consciousness and neurological signs such as sluggish pupillary response Increased blood pressure Respiratory changes 	<ul style="list-style-type: none"> Assessment with CNS tool or NIHSS tool Notify <i>Physician</i> of neurological worsening CT to diagnose Control blood pressure Avoid use of anticoagulants Removal of clot surgically if possible
Cerebral Edema/Pressure	<ul style="list-style-type: none"> Increase in brain volume commonly occurs in the large Middle Cerebral Artery infarcts when profuse quantities of fluid collect in brain tissue due to cellular swelling 	Highest in the first 48–96 hours		<p>The earliest sign of an increase in intra-cerebral pressure is a change in the patient’s level of consciousness (neurological worsening). This can be subtle as:</p> <ul style="list-style-type: none"> Irritability Quietness Restlessness Change in personality/lethargy Headache/dizziness Confusion 	<ul style="list-style-type: none"> Monitor patient more frequently with neuro and vitals signs Ensure proper alignment of head and neck Head of bed elevated 30 degrees May require drainage of cerebral spinal fluid through an extraventricular drain Report changes (LOC, behaviour, headache, ocular/motor changes may be subtle Avoid clustering of activities/decrease stimulation Treat hyperthermia/hyperglycemia Use of Mannitol to reduce increased intracerebral pressure (does require close monitoring including renal function, urine output, fluid balance, electrolytes)
<p>Did you know...</p> <p>While frequency and type of complications vary with the severity of neurological and functional deficits, 60% of patients experience some type of complication post-stroke.</p>					

References: Heart and Stroke Foundation and Canadian Stroke Network (2007). Faast FAQs for stroke nurses. Black, Yau, Bisnare, O’Farrell, Mayer and Tymianski (2012) in Tymianski, Sarro, & Green (Eds.). Navigating Neuroscience Nursing: A Canadian Perspective – Adapted from Table 11 (p. 94).

Additional Potential Complications and Nursing Monitoring and Treatment for the Patient with Acute Ischemic Stroke

Complication	Clinical Points	Nursing Monitoring and Treatment
Hypertension or Hypotension	<ul style="list-style-type: none"> The blood pressure will rise in acute stroke in an attempt to perfuse the brain Hypotension and extreme hypertension are associated with worsened morbidity Normalizing a blood pressure in the acute phase may extend the stroke For patients who receive tPA there are specific blood pressure parameters for the first 24 hours If the patient has NOT been given tPA, there is no consensus on the treatment of elevated blood pressure, however extreme blood pressure elevation (SBP > 220 to DBP > 120 mmHG) may be treated to reduce the BP by 15% over the first 24 hours Antihypertensive may be held in first 24 hours post stroke, and restarted slowly to prevent hypotension 	<ul style="list-style-type: none"> Monitor blood pressure and be aware of the acceptable blood pressure parameters for individual patients Treat extreme hypertension as directed by <i>Physician</i> (e.g., IV hydralazine, nitroglycerin paste)
Cardiac Arrhythmias, Myocardial Infarction	<ul style="list-style-type: none"> Cardiac ischemia and arrhythmias are more common in acute stroke 	<ul style="list-style-type: none"> Monitor with continuous cardiac telemetry Notify <i>Physician</i> if arrhythmia or ischemia noted
Venous Thromboembolism	<ul style="list-style-type: none"> Patients who are not mobilizing independently, or who have other risk factors for venous thromboembolism (e.g., cancer, Hypercoagulable state) are at higher risk Enoxaparin found to be better than unfractionated heparin for DVT prophylaxis in acute ischemic stroke (Sherman, 2007) Thigh length elastic compression stockings do not significantly reduce DVT after ischemic stroke (The CLOTS trial collaboration, 2009) 	<ul style="list-style-type: none"> Mobilize early Ensure appropriate venous thromboembolism prophylaxis ordered and implemented consistently

Black, Yau, Bisnare, O'Farrell, Mayer and Tymianski (2012) in Tymianski, Sarro, & Green (Eds.). Navigating Neuroscience Nursing: A Canadian Perspective – Adapted from Table 11 (p. 94).

Additional Potential Complications and Nursing Monitoring and Treatment Common to Most Patients with Acute Cerebrovascular Disorders

Complication	Clinical Points	Nursing Monitoring and Treatment
Hyperthermia	<ul style="list-style-type: none"> Fever can worsen patient outcome after stroke 	<ul style="list-style-type: none"> Monitor body temperature regularly If elevated > 37.5 Celsius, use treatments to reduce fever, consider underlying infection
Hypoglycemia or Hyperglycemia	<ul style="list-style-type: none"> Hypoglycemia and hyperglycemia can worsen patient outcome after stroke 	<ul style="list-style-type: none"> Monitor blood glucose Hypoglycemia should be corrected immediately Hyperglycemia should be treated (e.g., sliding scale insulin, patients previous diabetic regime)
Pneumonia	<ul style="list-style-type: none"> Patients with dysarthria and/or dysphagia, significant immobility, reduced level of consciousness, poor oral hygiene are at higher risk 	<ul style="list-style-type: none"> Chest auscultation, respiratory rate, and oxygen saturation monitoring and swallowing assessment Monitor for signs and symptoms of pneumonia such as increased oxygen needs, fever, change in sputum, increased respiratory rate
Seizure	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Monitor for focal or generalized seizure
Falls	<ul style="list-style-type: none"> Patients with weakness, neglect, and/or confusion are at risk of falls 	<ul style="list-style-type: none"> Ensure <i>appropriate</i> use of bed rails and restraints if needed Attempt a toileting routine, monitor for urinary retention (often falls secondary to attempts to walk to washroom)
Skin Breakdown	<ul style="list-style-type: none"> Patients who are immobile are at risk of skin breakdown 	<ul style="list-style-type: none"> Mobilize early, frequent position changes if immobile consider pressure relief mattress, promote early and appropriate nutrition
Pain	<ul style="list-style-type: none"> Pain is common May include musculoskeletal pain, neuropathic pain, and/or post-procedural pain 	<ul style="list-style-type: none"> Pain assessments should be performed regularly Patient repositioning is important for pain Pharmacological treatment should be administered as needed
Hemiplegic Shoulder	<ul style="list-style-type: none"> Subluxation of hemiplegic shoulder may result in a pain syndrome and/or soft tissue damage 	<ul style="list-style-type: none"> 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)

Complication	Clinical Points	Nursing Monitoring and Treatment
Nutritional Deficiency and Dysphagia	<ul style="list-style-type: none"> • 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 and have no overt signs • Consider NG feeding tube to ensure appropriate nutrition if there are ongoing swallowing concerns 	<ul style="list-style-type: none"> • Bedside swallowing assessment should be performed by nurse or <i>Speech- Language Pathologist</i> using a valid screening tool within 24 hours of admission. • Patients with dysphagia and eating a modified diet or receiving enteral feeding are at risk or aspiration pneumonia
Urinary Dysfunction (retention or incontinence)	<ul style="list-style-type: none"> • 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) 	<ul style="list-style-type: none"> • 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
Bowel Dysfunction	<ul style="list-style-type: none"> • Constipation and incontinence are common if patient is not able to mobilize independently • Enteral feeding may cause constipation or diarrhea 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Ensure an oral care routine, even if patient is NPO

Swallowing Disorder (Dysphagia)

Swallowing disorders are caused by damage to the brain.

A swallowing disorder (also called dysphagia) is a difficulty or discomfort in swallowing. This can make it difficult to eat and drink fluids. During both eating and drinking, an important part of the swallowing process is the closure of the airway (or wind pipe) as the fluid or ball of food (also known as a bolus) passes through the throat. This closure of the airway prevents the food from entering into the lungs. Swallowing difficulties can occur at any part along the swallowing process – from the point the food enters the mouth, to chewing and creation of the bolus of food, to the passage of the fluid or bolus of food into the stomach (Martino & Sharpe, n.d.).

Dysphagia can result in dehydration and malnutrition.



A patient who has not yet been screened for dysphagia cannot take anything by mouth, including medications.

What is the risk of dysphagia?

Approximately 22-65% of stroke patients experience dysphagia within the first days and weeks after a stroke. Swallowing disorders can persist for many months. Swallowing disorders require immediate attention; if ignored, they can cause serious complications or even death.

When is it most likely to occur?

Immediately after a stroke, resolving for most patients over time with rehabilitation.

What are the signs and symptoms?

- Coughing or choking before, during or after swallowing
- Not being able to swallow, not all food swallowed
- Pocketing food in mouth
- Difficulty chewing or swallowing
- Difficulty controlling food or fluid in the mouth

- Drooling
- A hoarse voice
- A gargling, wet sounding voice
- Bringing food back up, sometimes through the nose
- The sensation of food or drink catching in the mouth

(Swallowing Problems after Stroke, The Stroke Association, UK, 2012)

Dehydration & Malnutrition

What is the risk of dehydration and malnutrition?

Stroke patients are at an increased risk of dehydration and malnutrition if they experience changes in their ability to swallow (dysphagia).

Malnourished patients have longer lengths of stay, increased medical complications, and increased frequencies of dysphagia or enteral feeding. Malnutrition is also associated with poor patient outcomes (Bouziana & Ziomas, 2011).

The risk of malnutrition rises with increasing length of stay.

Patients must be screened for dysphagia to ensure the food they are consuming is swallowed into the stomach instead of being re-directed to the lungs, causing pneumonia. Dysphagia screening using a validated tool should be completed within 24 hours to ensure a stroke patient is safe to consume food and medications by mouth. Until then, for safety reasons, patients should **not** be fed or receive medications orally.

Poor oral care/oral hygiene also contributes to dehydration and malnutrition. Dysphagia and oral care will be discussed in more depth in *Module 6: Swallowing, Feeding, and Oral Care*.

What patients are most at risk?

Patients with dysphagia and those with severe stroke have a higher risk of dehydration and malnutrition (Crary, M.A., et al, 2012).

Elderly patients have a general decreased sensation of thirst which also contributes to potential dehydration.

When stroke patients are placed on a 'thickened fluids' regimen, there is an increased challenge of ensuring adequate hydration is met. This often happens because patients refuse or reduce their consumption due to dislike of the consistency or different taste.

Other factors contributing to malnutrition include level of consciousness, the presence of nausea or vomiting, the presence of post-stroke depression, poor oral hygiene/care, decreased mobility, and weakness in the face and upper extremity.

When is it most likely to occur?

For patients without pre-existing dehydration or malnutrition, the risk increases at the time of the stroke.

Signs of dehydration:

- Dry mouth/tongue
- Constipation
- Hypotension
- Concentrated urine
- Weight loss
- Disorientation
- Sunken eyes

The **consequences of dehydration** are serious and affect prognosis, overall health, and therefore, quality of life:

- Lethargy
- Pressure ulcers
- More falls
- Bowel obstruction
- Kidney stones
- Poor oral health
- Urinary tract infections
- Skin breakdown
- Renal failure

Signs of malnutrition:

- Weight loss
- Loss of muscle tissue
- Complaints of dizziness
- Increased falls
- Patient unable to keep warm
- Constipation or diarrhea
- Eating less than usual

Consequences of malnutrition:

- Recurrent infections
- Pressure sores/skin breakdown
- Dry skin
- Injury from falls

The *Registered Dietitian* on your team should be involved for further management of dehydration and nutrition.

Simple ways to help prevent dehydration or malnutrition:

- Have appropriate liquids available to the patient at all times (thin or pre-thickened fluids)
- Encourage fluid at meals – take a sip between bites
- Offer beverages with snacks
- Encourage plenty of fluids with medications
- Follow up with the Speech-Language Pathologist to monitor for any texture upgrades that are appropriate for patients on thickened fluids
- Consult the Occupational Therapist for strategies and/or adapted eating utensils and dishes to support patients with weak upper body or visual perceptual changes



Consult with the *Physician, Dietitian, Speech-Language Pathologist, and Occupational Therapist* if you suspect a patient is dehydrated or malnourished.

Seizures

What is the risk of seizure post-stroke?

Approximately 10% of stroke patients experience a seizure after a stroke. In at least half of these, seizures do not recur.

The risk of seizure increases according to the size of the stroke – the larger the stroke, the greater the risk of seizure (Teasell, Robert, et al., 2013)

When is it most likely to occur?

85% of seizures occur within 72 hours of a stroke (UWO Evidence Based Neurology Group, 2003)

What patients are most at risk?

Patients with intracerebral and subarachnoid hemorrhages are at higher risk of seizure (Gilmore, et al., 2010). Residual motor and sensory deficits make it difficult to detect early symptoms of seizure.

What are the usual interventions?

- The standard diagnostic tool is EEG, which can demonstrate abnormal focal electric discharge in 30-50% cases after a seizure.
- Anticonvulsants (anti-seizure medication or anticonvulsant drugs/ACDs) are generally started in a patient with a typical clinical presentation with or without EEG correlation. New onset seizures occurring at the time of an acute stroke, either immediately before or within 24 hrs of the stroke onset, should be treated using an appropriate short-acting medication (e.g., lorazepam IV) if they are not self-limiting (Casaubon, Suddes, 2013). A single, self-limiting seizure occurring at onset, or within 24 hrs after an acute stroke, or also known as an “immediate” post-stroke seizure should not be treated with long-term anticonvulsant medication (Casaubon, Suddes, 2013).
- Patients who have an immediate post-stroke seizure should be monitored for recurrence of seizure activity. This could be carried out during routine monitoring of vital signs and neuro status (Casaubon, Suddes, 2013).
- Patients will need to be re-examined by the Ministry of Transportation to determine driving abilities.

Deep Venous Thromboembolism (DVT)

The concern with a DVT is that it can result in **pulmonary embolism** (PE) development, a blood clot that obstructs blood flow in the pulmonary artery or any of its branches, which can be fatal. A high percentage of PE occurs without signs.

What is the risk of post-stroke venous thromboembolism?

Approximately 20–50% of hospitalized stroke patients will develop venous thromboembolism, depending on the presence of current or pre-existing risk factors.

What patients are most at risk?

- Patients unable to move one or both of their lower limbs
- Patients who are unable to mobilize independently
- Patients with a history of venous thromboembolism
- Patients who are dehydrated
- Patients with co-morbidities (i.e. malignant disease, etc.)

DVT signs:

- Asymmetrical pain, tenderness
- Swelling
- Discolouration

The gold standard diagnostic test is ultrasound.

Those at high risk for development of DVT should be considered for prophylaxis with low molecular weight heparin (with appropriate prophylactic dose per agent).

Anti-thrombotics and anti-coagulants should **be avoided for at least 48 hours** after onset of intracerebral hemorrhage for patients at risk of venous thromboembolism.

The use of anti-embolic stockings alone for post-stroke venous thromboembolism prophylaxis is not recommended (Canadian Best Practice Recommendations for Stroke Care, 2013).

Prevention is key!

Early mobilization and adequate hydration should be encouraged with all acute stroke patients to help prevent venous thromboembolism. Ideally within 24 hours, unless contraindicated.

(2013 Canadian Best Practice Recommendations for Stroke Care)

2.4 Other Effects of Stroke

Emotional Lability

Damage to the brain can cause changes to the parts of the brain that control emotions or behaviour. In the case of emotional lability, the injury is in the parts of the brain responsible for the awareness of emotions (self or others') and the ability to control (including inhibit) the way emotions are expressed. (Understanding Emotional Lability, National Stroke Foundation, 2012).

Emotional lability presents as rapidly changing, inappropriate, or prolonged emotional responses to a given situation which may even be expressed in ways that are different from the person's actual emotional state. This may be characterized by outbursts of anger, laughter, or crying. These behaviours can be confusing, embarrassing, and difficult for the patient to understand (Understanding Emotional Lability, National Stroke Foundation, 2012)

What are the usual triggers?

- Excessive fatigue/tiredness
- Stress/worry/anxiety
- High levels of sensory stimulation
- Time pressures, pressure to perform, or pressure to speak (i.e. on phone)
- Experiencing strong emotions or discussing emotional topics (i.e. relationships, a significant loss)
- Demands from others
- Very sad or funny situations

What are the usual recommendations?

- Have a break. Take time away from the trigger/situation to settle the emotions.



- Use cognitive strategies. Try relaxation techniques, distraction, or cognitive-behavioural techniques as supported by a *Social Worker* or *Psychologist*

- Ignore it. Try to ignore the behaviour as much as possible to prevent adding extra pressure on the patient.
- Change the topic or task.
- Plan ahead.
- Try supportive counselling.

(Understanding Emotional Lability, National Stroke Foundation, 2012)

It is important to explain to the family and the patient that this is a common effect of the stroke and to be supportive. Sometimes, directing their attention away from the triggering topic can change the emotional response.

Did you know ...

There is an increased risk for the onset of emotional lability within the first 6 weeks of stroke (Robinson, 1997).

Post-Stroke Depression (PSD)

Depression affects every aspect of a person's life, including one's body, emotions, thoughts and mood. It is much more complex than simply "feeling blue" and is characterized by a persistent and pervasive feeling of sadness or hopelessness.

Depression is often accompanied by a change in sleep patterns, weight gain or loss, and a change in appetite. Other effects are flat affect, increased sensitivity to pain and discomfort, and lack of self-care.

Depression is serious. It is associated with increased rate of mortality, and is a major barrier to full physical and mental recovery from stroke.

PSD may limit the energy needed to fully participate in rehab and activities of daily living (ADLs). It may also increase the severity of cognitive impairment, irritability, and the appearance of personality changes.

It is important to differentiate depression from emotionally lability. Labile patients may be more tearful with visitors but be able to fill their time when they are alone. Labile patients remain motivated to participate in therapies, set goals and try to achieve them. Patients who are depressed may find it difficult to independently achieve these levels of motivation.

What is the risk of post-stroke depression?

Depression, the most common emotional disorder, may affect up to 40% of all patients with stroke. Stroke survivors are most likely to suffer from depression within the first six months post-stroke.

Which patients are most at risk?

- Patients with a history of depression or psychiatric illness
- Female gender
- Functional impairment
- Cognitive impairment
- Social isolation

(Salter, K. et al, www.ebrsr.com)

All patients with stroke should be screened for depression using a validated tool. Screening should take place at all transition points and whenever clinical presentation indicates. Refer to *Module 10: Stroke and Depression* for more information about post-stroke depression.

Spasticity

Spasticity is involuntary muscle tightness and stiffness that can occur after a stroke. It is characterized by exaggerated deep tendon reflexes that interfere with muscular activity, gait, movement, self-care, or speech.

What does it look like in the stroke patient?

Spasticity can vary from mild muscle stiffness to severe and uncontrollable muscle spasm and contracture. It can be very painful, especially if a joint is pulled into abnormal positions.

Once established, the chronically shortened muscle may develop physical changes like shortening and contracture that further contribute to muscle stiffness.

How can spasticity be treated?

- Therapeutic positioning as recommended by Physiotherapist and Occupational Therapist
- Regular stretching exercises prescribed by Physiotherapy
- Use of prescribed muscle relaxants
- Serial casting for contractures to allow tendons to stretch
- Use of a local blocking agent that will deliberately impair the transmission between nerve and muscles when the brain sends these abnormal messages of contraction (botulinum toxin).
- Consider referral to a spasticity clinic.



Consult with the *Physiotherapist* and *Occupational Therapist* on strategies to help manage spasticity.

Pain

Pain is common after a stroke; it is essential to assess and treat any pain that a patient experiences on an ongoing basis. Pain interferes with a person's participation in rehabilitation and recovery (Gould, Barnes, Talavera, Foy, & Cailliet, 2013).

The pain assessment begins by asking the patient if he or she is experiencing any pain.

The pain experienced by a patient may be a result of the stroke or of pre-existing conditions. If the pain is due to pre-existing conditions, then it should be assessed and treated as appropriate.

The three most common types of pain resulting from the stroke are hemiplegic shoulder pain, complex regional pain syndrome, and central post-stroke pain.

Hemiplegic Shoulder Pain

- Occurs in up to 70% of stroke survivors
- Onset commonly within the first 2-3 weeks post-stroke but can begin earlier
- Contributing factors could include shoulder subluxation, contractures, complex regional pain syndrome (CRPS – see below), soft tissue damage from the stretching of the joint capsule, and spastic muscle imbalance
- Cause believed to be multi-factorial with different factors contributing at different stages of recovery
- Recovery is related to the severity of the stroke and the amount of time before voluntary movement returns
- Treatment includes rehabilitation and vigilant positioning and care of the arm

(Gould, Barnes, Talavera, Foy, & Cailliet, 2013)

Did you know ...
1 in 2 stroke survivors
will have pain.
7 in 10 stroke survivors
have untreated pain.
Heart and Stroke Foundation,
Tips and Tools, 2010

What are the recommendations for hemiplegic arm care?

Careful handling and positioning of the hemiplegic arm will help prevent the onset of hemiplegic shoulder pain and reduce the risk of complex regional pain syndrome (see below).

Quick Tips:

- **SUPPORT** the arm at all times
- **NEVER** pull on the arm during turning or transfers
- **NEVER** passively move the arm beyond 90 degrees

More information on the proper handling and management of the hemiplegic arm can be found in *Module 7: Mobility, Positioning, and Transfers*.

Complex Regional Pain Syndrome (CRPS)

- A chronic pain condition affecting one of the limbs or part of a single limb (i.e. hand, foot)
- Believed to result from an injury to or malfunction of the central or peripheral nervous system
- Pathophysiology is uncertain but involves the autonomic nervous system (i.e. sympathetic) and inflammation
- Characterized by prolonged or excessive pain and mild or dramatic changes in skin color, temperature, and/or swelling in the affected area (National Institute of Neurological Disorders and Stroke Care, 2013, p. 1)
- Recovery is slow, and severe cases may result in long term symptoms and disability
- Early diagnosis ensures the best chance of recovery
- Treatment includes pharmacological, psychological, and rehabilitative; physiotherapy is essential

To avoid injury, ensure the arm is always supported and **never raise the arm beyond 90 degrees.**

Always consult the **Physiotherapist** if you are uncertain of how to handle the hemiplegic arm. He or she will have information and tips for you to use.

Central Post-Stroke Pain (CPSP)

- Central nervous system damage from the stroke causes the brain to incorrectly interpret sensations as painful
- Normal touch can be perceived as painful but 'normally' painful sensations, such as a pinprick, may cause no pain
- Burning, prickling, or stabbing pain may be felt by the stroke survivor
- Pain is exacerbated by movement, emotional stress, or cold
- May start at any time: days, weeks or months post-stroke
- Also called thalamic pain syndrome after the part of the brain that may have been damaged
- Treatment approaches are pharmacological, psychological, and rehabilitative

Continence

All stroke patients should be screened for urinary incontinence and retention (with or without overflow), fecal incontinence, and constipation.

- Stroke patients with urinary incontinence should be assessed by trained personnel using a structured functional assessment.
- A bladder training program should be implemented in patients who are incontinent of urine.
- A bowel management program should be implemented in stroke patients with persistent constipation or bowel incontinence.



The following factors can all impact continence (bladder and bowel). Therefore, a comprehensive assessment of incontinence includes:

- Incontinence history
- Fluid intake
- Medical history
- Medications
- Functional ability
- Nutrition
- Mobility
- Activity level
- Cognition
- Level of consciousness
- Environmental factors
- Communication
- Post residual volume (assessed using portable ultrasound)
- Urine culture
- Rectal examination

What is the risk of post-stroke urinary incontinence?

- 15% of stroke survivors will have incontinence at 1-year post stroke.
- Urinary incontinence within 24 hours of a stroke is a predictor of functional disability.

Which patients are most at risk?

Women have higher rates of post-stroke incontinence than men (Canadian Best Practice Recommendations for Stroke Care, 2013).

Patients who have suffered a frontal lobe stroke will have:

- Voluntary control of the external sphincter but uninhibited bladder contraction
- Strong urges to void with short/no warning
- Persistent frequency, nocturia, urge incontinence

Patients who have suffered a hemispheric stroke will have:

- Urinary incontinence secondary to immobility and dependency on others rather than direct effects from the stroke

Strategies for urinary incontinence:

- Ensure adequate fluid intake (1500-2000 mLs)
- Assess post void residuals (normal is 50-100 mLs)
- Review medications
- Introduce a regular toileting routine
- Encourage bladder retraining (timed and prompted toileting on a consistent schedule)
- Pelvic muscle exercises – Kegel's (as taught by specialized RN or rehabilitation staff)
- Double voiding, Crede maneuver and intermittent catheterization (overflow incontinence)
- Limit use of dietary bladder irritants
- If needed, appropriate intermittent catheterization schedule should be established based on the amount of post-void residual volume
- A urology consultation may be needed

(Faaast FAQs for Stroke Nurses, pages 38, 39, HSFO, 2007)

- **Indwelling Catheter use should be avoided** due to the risk of urinary tract infection.
- If an indwelling catheter is used:
 - Its use should be assessed daily and it should be removed as soon as possible.

All stroke patients should be screened for urinary incontinence and retention (with or without overflow), fecal incontinence and constipation.

What is the risk of post-stroke bowel incontinence?

- Bowel incontinence occurs in 30% of stroke patients
- 97% of patients with bowel incontinence regain control within one year
- All stroke patients should be screened for bowel incontinence

Which patients are most at risk?

Patients with:

- Altered consciousness
- Cognitive deficits
- Impaired communication
- Neurogenic bowel without sensation or control

What is the usual treatment?

A bowel management program should be implemented in stroke patients with persistent constipation or bowel incontinence.

Strategies for establishing a bowel program:

- Encourage appropriate fluids, diet, and activity
- Choose an appropriate rectal stimulant (refer to bowel protocols at your facility)
- Provide rectal stimulation initially to trigger defecation daily
- Select optimal scheduling and positioning
- Select appropriate assistive techniques and devices (the *Occupational Therapist* may be able to help with this)
- Evaluate medications that promote or inhibit bowel function

Visual and Perceptual Deficits

Visual deficits refer to the changes in what a person sees, whereas perceptual deficits impact the brain's ability to interpret and make sense of the visual information received in the brain. Visual deficits are due to primary sensory impairments whereas perceptual deficits are not. A person can have a visual deficit and/or a perceptual deficit depending on the location and size of the brain damage.

Several common deficits will be mentioned here due to their impact on safety. More information on the perceptual challenges following a stroke will be covered in *Module 9: Cognition, Perception, and Behaviour*.

What is the risk of visual deficits or perceptual deficits?

Up to two thirds of stroke survivors will experience visual or perceptual deficits. These can improve with time, recovery and rehabilitation but can persist. (Visual Problems after Stroke, Stroke Association, UK, 2012)

Visual Impairments:

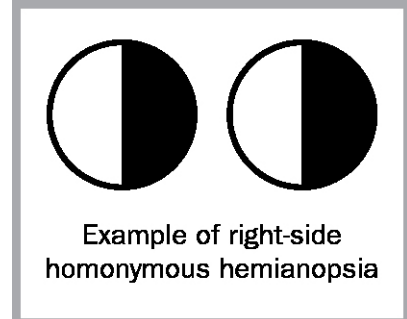
Homonymous hemianopsia
loss of half of the visual field on the same side

Diplopia
double vision

Decreased visual acuity
occurs from aging, diabetes, cataracts,
not wearing their glasses

Nystagmus
constant eye movement, resulting in the patient
seeing objects constantly shaking

Impaired eye movements
interference with a person's ability to move eyes from one object to another or follow a moving object, impacting safe mobility and reading



Visual field testing, the NIHSS (*National Institutes of Health Stroke Assessment Scale*) will help determine if the stroke patient presents with several of these conditions, including homonymous hemianopsia, impaired eye movements, and a form of unilateral neglect (visual neglect). It will not identify all potential visual or perceptual impairments. The *Occupational Therapist* and *Physician* can help identify visual and perceptual deficits.



Tip: Observe an experienced colleague perform visual field testing on a stroke patient to appreciate the exact method with which to assess impairments accurately.

Which patients are most at risk for visual impairments?

Those with strokes in the occipital lobe, parietal lobe, optic nerve, retina, or parts of the brain that control the movements of the eyes and lens are at highest risk.

Perceptual Impairments:

Unilateral Neglect

Numerous perceptual impairments can result from a stroke.

Unilateral neglect is one of the most common. It refers to a patient's lack of awareness of, or inability to orient or respond to information existing contra-lateral to the side of brain damage, including information from both the body and/or environment. It is not due to primary sensory deficit.

Right-sided hemispheric lesions in the parietal lobe can result in varying degrees of neglect. Moderate to severe neglect can significantly affect one's independence. The stroke survivor with unilateral neglect may:

- forget to dress/bath or groom the affected side of the body
- lose things in room, bed, etc.
- forget to turn water taps off
- not locate all food on tray or plate
- be unable perceive all the written words on a page, affecting his or her ability to read
- require assistance with mobility, as they may not attend to obstacles on left side which then increases the risk of falls and injury

Implications of neglect include:

- longer length of stay in inpatient rehabilitation
- higher risk of functional worsening at one year follow-up
- less independence at home after discharge

The *Occupational Therapist* on your team can complete detailed assessments and provide information and strategies to assist with your stroke patient who has visual and visual-perceptual deficits.



Perceptual deficits that may not be noticeable in the hospital can create safety problems in the home. All patients should be screened for cognition and perceptual deficits by an *Occupational Therapist* and, if language challenges are present, by a *Speech-Language Pathologist*.

Skin Breakdown

Prevention of pressure ulcer development is crucial. The *Braden Scale for Predicting Pressure Sore Risk* is a commonly utilized tool. The areas assessed include friction/shear, nutrition, sensation, moisture, activity, and mobility. Individuals with a score of 18 or less are considered to be at risk of developing pressure ulcers. A progressively lower score indicates an increasingly higher risk of skin breakdown.

Prevention:

1. adequate nutrition
2. adequate hydration
3. early mobilization
4. turning and positioning

Risk of Fall

Post-stroke falls are very common due to a variety of factors. These include, but are not limited to, balance changes, weakness, sensory impairment, unilateral neglect and other perceptual impairments, impulsivity, and a lack of insight into deficits.

A coordinated plan must be in place for the team to follow for fall risk reduction in the acute stroke patient.

Post-Stroke Fatigue

Fatigue is common after a stroke; about 39–72% of stroke survivors suffer from fatigue. Varying levels of fatigue affect functional abilities. For example, a stroke patient may require more assistance with transfers later in the day or after a therapy session. Activities of daily living (ADLs) take longer and they require more effort than before the stroke. Therefore, a stroke patient may become fatigued from what used to be a simple task. It is very important to schedule rest periods throughout each day.

Post-stroke fatigue can be worsened by both physical AND cognitive exertion.

Communication Disorders

Depending on the location of the stroke, a stroke survivor's communication may be affected. It could include the stroke

patient's ability to understand, find the right words, get the words out, speak clearly, read, or write.

What is the risk of communication disorders?

At least 25% of those suffering a stroke have some form of communication disorder (National Institute of Neurological Disorders and Stroke, 2011).

Which patients are most at risk?

Language centers are in the left cerebral hemisphere for right-handed individuals and many left-handed individuals. Stroke survivors who have an infarct in the left side of their brain are at most risk for developing aphasia (see below).

Difficulties with motor control and motor planning, as experienced in dysarthria and apraxia, result from damage to other areas of the brain.

What do communication disorders look like in the stroke patient?

Dysarthria

- Difficulty producing clear speech
- Weakness or reduced coordination of muscles needed for speech
- Slurred speech
- Hoarseness/breathiness
- 'Mumbling' quality to the voice
- Changes in vocal quality (nasal/stuffy sounding)
- Slow rate of speech

Apraxia

- Difficulty planning the movements for speech; the person knows what they want to say, but the brain has difficulty programming the muscle movements necessary to producing the correct sounds.

Cognitive-communication impairments

Difficulty with:

- Organizing thoughts
- Concentrating
- Remembering
- Understanding non-verbal communication or humor, or sarcasm
- Word retrieval

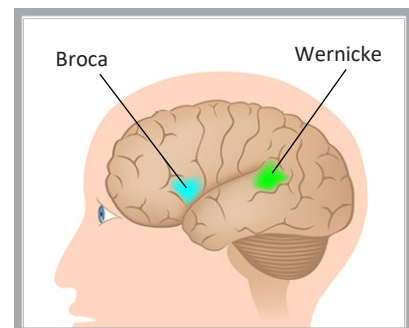
Aphasia

- Language impairment resulting from damage to the language-relevant areas of the frontal, temporal and parietal lobes of the brain
- Does not affect intelligence, but “Sadly, aphasia can mask a person’s intelligence and ability to communicate feelings, thoughts and emotions” (The Aphasia Institute, 2014).
- Resulting language dysfunctions are roughly classified as expressive (Broca’s aphasia) or receptive (Wernicke’s aphasia):

An individual with **Broca’s aphasia** has a partial or total inability to speak or produce spontaneous speech. He or she may have difficulty expressing thoughts and intentions and which may be ‘non-fluent’ in nature. The stroke can also affect written communication.

An individual with **Wernicke’s aphasia** has a partial or total inability to understand spoken and sometimes written language. Expression of language may be ‘fluent’ in nature but not easily understood.

The symptoms of **global aphasia** are those of severe Broca’s aphasia and Wernicke’s aphasia combined. There is an almost total reduction of all aspects of spoken and written language, in expression *and* comprehension (adapted from Ben-Yakov & Korner-Bitensky, 2011).



How can you help to communicate with an aphasic patient?

- Use short sentences, simple grammar, common vocabulary
- Speak S-L-O-W-L-Y
- Use normal tone and loudness
- Repeat and/or rephrase
- Give the stroke survivor plenty of time to process what you have said
- Use facial expressions, gestures, and visual cues
- Ask if the stroke survivor understands you
- Write down key words, draw pictures
- Ask “yes/no” questions
- Ask “closed ended” questions (i.e. orange or apple juice?)
- Ask the stroke survivor to write down what they said OR they can point to their answer on a piece of paper with “YES /NO ?”



The *Speech-Language Pathologist* on your team can provide you with more resources to for better communication with your stroke patient. Consult them for strategies to support the stroke survivor.

2.5 Advanced Care Planning and Transition Management

The stroke patient and family/caregiver should be approached by the interdisciplinary stroke team while receiving acute stroke care to participate in advance care planning (ACP). ACP allows for patient specific values, preferences, understanding, prognosis, treatments and future care goals to be considered.

Advance care planning may include identifying a substitute decision-maker to be applied in future if the need arises to make healthcare decisions or provide consent on behalf of the patient. Advance care planning discussions should be documented and reassessed regularly.

The stroke survivor and family/caregiver should be prepared for the transition that aligns with their situation, as well as their goals, wishes and abilities. During transitions, it is important to provide information, education, training, emotional support and referrals to the next level of service the patient may require.

Discharge Planning for patients leaving the acute unit should commence as soon as possible after the patient is admitted to each transition point along the continuum of care (e.g., emergency, acute care, rehabilitation, complex continuing care, home care, long term care).

Effective discharge planning should include:

- Patient and/or family/caregiver and interprofessional team meetings
- Discharge and transition care plans to engage in goal-setting, and discuss transitional care needs
- A pre-discharge needs assessment of the patient's physical needs, cognitive/perceptual needs, caregiver capacity, and psychosocial needs of the patient, family/caregiver
- General education for all patients with stroke or at risk of stroke, and their families and caregivers
- Caregiver training
- Post discharge follow up arrangements
- Liaison with community providers and link to resources
- Review of patient and caregiver psychosocial and support needs

(2013 Canadian Best Practice Recommendations for Stroke Care)

For education to be effective, patients and their family/caregivers should be assessed for their ability to take in and comprehend the information, and their readiness to learn (Sneath, 2009). It is important to appropriately time the information and education shared, based on the patient's stage of readiness and care needs (e.g., patient health status and needs, and mutual goals set with the patient (Bench & Day, 2010)). Giving too much information all at once to patients is not effective.

All information and education should be consistently conveyed and reinforced in both verbal and written formats and done by all interprofessional team members involved in the client's care transition.

For patients who have suffered a catastrophic stroke or a stroke in the setting of significant pre-existing comorbidity, a palliative approach to care may be considered.

As per the 2022 Acute Stroke Management, Canadians Stroke Best Practice Recommendations, decisions to initiate, withdraw, or forgo life-prolonging treatments after stroke, including artificial nutrition and hydration, should be made in discussion with the patient, family, and informal caregivers as appropriate, considering the best interests of the person, and including whenever possible their prior expressed wishes, either in an advanced care plan or through discussions.

In addition, each member of the healthcare team should understand their roles and responsibilities as defined by their respective provincial or territorial college or professional organization regarding discussions about medical assistance in dying (MAiD). It is important to be familiar with site specific processes and resources surrounding MAiD.

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