2.2 Stroke and its Effects

There are many considerations that are crucial to promoting safety and optimizing recovery when working with people who have had a stroke. The TACLS Quick Reference Guides were developed from the TACLS resource and can be used as quick reference to help *support healthcare providers* and informal caregivers who may not typically work with and care for people who have had a stroke.

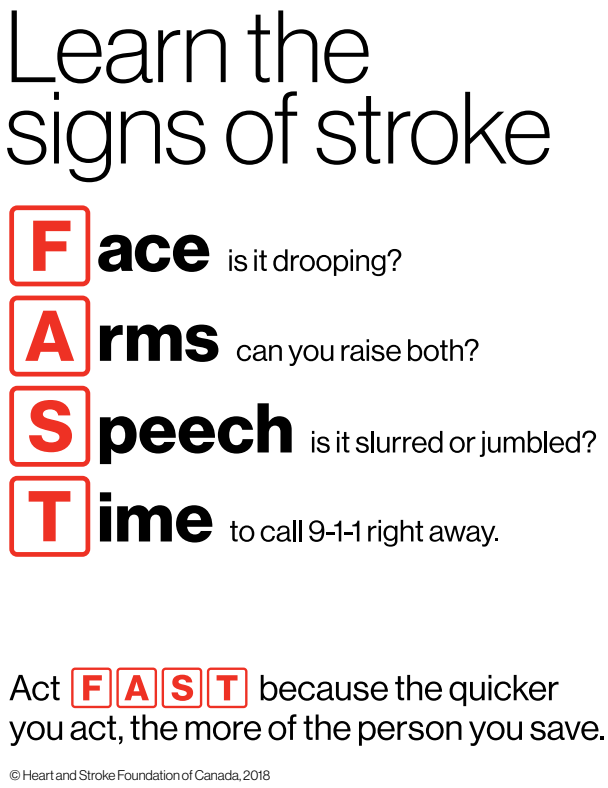
> We recommend reviewing the full **TACLS resource** for more complete information: **strokebestpractices.ca/resources/professional-resources/tacls**

What is a stroke

- A stroke happens when blood flow in an artery is interrupted either because the artery:
  - Becomes blocked – **ischemic stroke**.
  - Breaks open or leaks under pressure due to weakened walls – **hemorrhagic stroke**.
- As a result, some brain cells in the affected areas do not get the oxygen and nutrients they need. Neurons (brain cells) will start to die within minutes if blood flow is not restored. When the brain cells die, the area of the brain affected cannot function as it did before.
- **Transient ischemic attack (TIA)** (often called a 'mini-stroke') is a diagnosis that refers to a brief episode of neurological dysfunction caused by focal brain, spinal cord, or retinal ischemia, with clinical symptoms and without imaging evidence of infarction. TIA and minor acute ischemic stroke fall along a continuum. TIA symptoms fully resolve within 24 hours (usually within one hour). If any symptoms persist beyond 24 hours, then this would be considered a stroke, not a transient ischemic attack.
  - A TIA event is significant as it can be a warning of a future stroke event. Everyone should respond to an acute TIA as a potential emergency.
  - Symptoms of a TIA are similar to signs of a stroke. A person should seek immediate medical assessment, treatment and follow-up if they experience stroke signs/symptoms.
- **Ischemic stroke** is caused by a blockage or clot in an artery in the brain (about 85% of strokes).
  - The blockage can be caused when a substance called plaque builds up on the inside wall of an artery. The blockage or clot restricts blood flow to an area in the brain.
  - A blood clot can also form in another part of the body and travel to the brain.
- **Hemorrhagic stroke** occurs when a blood vessel in the brain breaks open (about 15% of strokes). The interrupted blood flow causes damage to the brain.
  - High blood pressure makes arteries weak over time, and is a major cause of hemorrhagic stroke. Weak spots in the arteries called aneurysms can stretch too far and eventually break open or start to leak.
- **Other causes of stroke** and additional factors that may increase the risk of stroke include:
  - Some people have abnormally formed blood vessels from birth called an arteriovenous malformation that can eventually break.
  - In rare cases, certain blood disorders, a tumor, an infection, illness, some medications or substance use, or brain trauma and/or swelling due to injury.

Signs of stroke

- It is important to act FAST (Face, Arms, Speech, Time) because the sooner the person gets to the hospital, the better their chance of receiving intervention that could help reverse or reduce the effects of stroke.
- Many medical interventions for stroke are time sensitive. Emergency Medical Services (EMS) will know which hospitals provide these medical interventions.
- Visit the Heart & Stroke YouTube Chanel for a **video on recognizing the FAST signs of stroke**.
- There are other signs of stroke that are less common including: vision changes, sudden severe headache, numbness, problems with balance.



If you or someone with you experiences any of these signs, call 9-1-1 or your local emergency number immediately.

Early treatment for ischemic stroke (clot)

- **Intravenous (IV) thrombolysis (a clot-busting drug)** **may** be recommended by physicians to help re-open blocked arteries.
  - The decision will depend on the type of stroke, amount of time since symptoms started, the results of the brain scan (e.g., CT or MRI) and other factors. IV thrombolysis can reduce the severity of a stroke, may reverse some of the effects and improve recovery.
  - IV thrombolysis must be given as soon as possible and within 4.5 hours after the symptoms began. This is why it's important to get to the hospital as quickly as possible once stroke symptoms are suspected. The longer the delay, the smaller the possible benefit.
- **Endovascular thrombectomy (EVT)** **may** be recommended by physicians if the clot is located in one of the large blood vessels of the brain.
  - Guided by X-ray imaging, a thin tube is threaded through blood vessels to the clot in the brain. The blood clot is then removed to restore blood flow in the brain. EVT helps to reduce impairment and is now considered the gold standard for treatment of patients with major ischemic strokes.
  - EVT is recommended for eligible patients within 6 hours of stroke onset, or up to 24 hours in select patients. The faster the blood flow can be restored, the greater their chance of an optimal outcome.

Early treatment for hemorrhagic stroke (bleed)

- Hemorrhagic stroke can be very serious and cannot be treated with intravenous thrombolysis or EVT. It typically requires a longer recovery time than an ischemic stroke. A neurosurgeon will determine if surgery is needed to control the bleeding in the brain, to fix the damaged artery and/or to lower the pressure in the brain.

Stroke risk factors

Three categories of risk factors that can increase a person's risk of having a stroke:

- **Medical risk factors:** some medical conditions can increase a person's risk of having a stroke (e.g., high blood pressure, high cholesterol, diabetes, atrial fibrillation, carotid stenosis, pre-eclampsia, sleep apnea, vascular cognitive impairment, heart conditions, cancer and other medical conditions).
- **Modifiable risk factors:** many risk factors can be managed through lifestyle changes, treatment and medication. These are sometimes called lifestyle risk factors (e.g., diet, not enough or lack of exercise and physical activity, weight management, smoking and vaping, heavy or binge drinking, unmanaged stress, use of recreational drugs such as cocaine or amphetamine, oral contraceptives (birth control) or hormone replacement therapy).
- **Non-modifiable risk factors:** there are other factors associated with a higher risk of stroke that are out of the person's control, they include:
  - Age (the older you are, the higher the risk)
  - Sex (risk of heart disease and stroke increases after menopause)
  - Family history of heart disease, stroke or TIA (parents or siblings)
  - Previous stroke or TIA
  - Indigenous heritage
  - South Asian or African descent
  - Social determinants of health

How you can help

- Review the TACLS PDF to learn strategies to support and reduce modifiable risk factors. Share resources (e.g., visit the Heart & Stroke – **Risk and Prevention**, **Are You At Risk**, **Patient and Caregiver Resources**, **Secondary Prevention Infographic**).
- It is important that a person is aware of their risk factors and takes measures to reduce their risk.
- Be aware of a person's risk factors and understand their goals for managing them. Reinforce recommendations that have been made by the team and report any concerns that you have. Ensure medications are taken as prescribed.
- Help the person set realistic goals, address barriers and track their progress. Provide support and encouragement.

Impairments and limitations

- **Impairments** are problems in body function or structure, such as significant deviation or loss*. These can be consequences or effects to a structure or organ of the body caused by the stroke (e.g., paralysis).
- **Limitations** involve the interaction between a person's impairments and/or health conditions and the environment** (e.g., person with paralysis may be unable to dress independently without assistance).
- Effects of stroke and extent of impairment depend on several factors including size and location of the blockage or bleed, amount of time the brain had restricted blood flow or accumulation of blood, amount of time between onset and medical intervention and/or extent of recovery.
- One side of the brain typically affects the opposite side of the body and impairments will usually occur on the opposite side to where the stroke happened.
- Some possible effects/impairments of a stroke include paralysis, weakness, sensory loss, balance impairment, vision changes, visual perceptual impairments, neglect or inattention, communication impairments, post-stroke fatigue, incontinence, changes in vital functions, changes in personality and mood, and/or cognitive difficulties.
- Remember, everyone's recovery journey is different. It may happen quickly or take months, years or be a lifelong journey. Recovery may not follow a consistent and/or continuous pattern.
- Rehabilitation needs to be considered for every person who has had a stroke or TIA. It is a key component of stroke care and should begin as soon after stroke as possible.

References:

1. Canadian Stroke Best Practice Recommendations: **www.strokebestpractices.ca**, **Acute Stroke Management**, 6th Edition, Section 1 and **Secondary Prevention of Stroke**, 7th edition, Sections 1,2, 3 & 4, **Rehabilitation and Recovery Following Stroke**
2. Taking Action for Optimal Community and Long-Term Stroke Care (TACLS), – Stroke and Its Effects
3. *ICF **www.who.int/classifications/icf/icfbeginnersguide.pdf**
4. **Modified from the WHO definition of disability **www.who.int/health-topics/disability**

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