



Global Stroke
Guidelines and Action Plan:
A Road Map for Quality Stroke Care

**ACUTE INPATIENT
STROKE CARE**

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A ROAD MAP FOR QUALITY STROKE CARE

PURPOSE:

The WSO Roadmap to Delivering Quality Stroke Care is an implementation resource to accompany the WSO Global Stroke Services Guideline and Action Plan. This roadmap provides the framework for the implementation, monitoring and evaluation of stroke services globally.

It provides **standardization and consistency** for the selection of **evidence-based** recommendations, **approaches to implementations** in clinical practice, and the **calculation of performance measures** to create an environment of continuous quality improvement.

TARGET AUDIENCE:

The roadmap is intended to guide local healthcare officials and stroke care clinical groups in establishing stroke systems of care and implementing as many of the defined components as possible throughout the stroke continuum of care. The focus of the roadmap is on the processes of care and impacts on patient outcomes. It is recognized that not all regions will be able to provide all elements of quality stroke care; therefore the recommendations and performance indicators take into account what should be possible within three levels of service access.

It can be used by **local, regional, or country-level health authorities and service** providers as a foundation for their own evaluation frameworks for stroke.

Governments and funders should use these guidelines and action plan to review existing services, and identify service gaps. These groups could then prioritize gaps and look for solutions to improve access to services.

Clinicians and other healthcare workers should use these guidelines and roadmap to scrutinize local care delivery, access to care and ongoing support to achieve recovery goals.

This roadmap will also provide valuable guidance to stroke **programs under development**, to help ensure that all key elements defined here are considered from the beginning of development.

FORMAT:

The roadmap is **organized along the continuum of care** starting at the onset of a stroke event through the acute phase (emergency department and inpatient care), stroke rehabilitation, prevention of recurrent stroke and concludes with community reintegration and long term recovery.

Each section represents a part of the continuum and enables users to **review and assess the structural elements and services available** for stroke care; **core evidence-based best practice** recommendations related to processes of care that should be operational; and, a list of **key quality indicators to monitor levels** of care provided and impact on patient and economic outcomes.

HOW TO USE:

Users of this Roadmap should:

1. **Review** the sections relevant to their phase of stroke services;
2. **Complete an assessment** of current services and resources, current recommendations in place, and current data collection methods and access; then
3. **Develop an implementation plan** to ensure that these core elements are optimized and additional elements added to improve the stroke services they provide.

IMPLEMENTATION:

1. Hands-on hardcopy resource
2. **Electronic interactive app/resource** where users can enter what elements they have available from a master check list and the program identifies current level, recommendations and performance measures.

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ACUTE INPATIENT STROKE CARE

This section focuses the acute inpatient care period after the hyperacute stage is completed. This phase of care usually starts from about 24 hours after stroke onset through the first 5 to 7 days. In this phase the patient becomes medically stable and care goals shift to ongoing stroke assessment, determining etiology, management of persistent symptoms, initiating recovery, early rehabilitation, and prevention of acute complications. Acute stroke care ideally involves healthcare providers with expertise in stroke care, and takes place in a clinic or hospital stroke unit or ward, but may occur in other community settings, including the home, based on resource and facility availability.

Health Service Capacity for Stroke Care Checklists[^]



Please complete the following information to clearly identify the stroke services you are developing or assessing.

REGION:	ORGANIZATION COMPLETING CHECKLIST:	PRIMARY CONTACT PERSON:
SERVICE SCOPE:	GOALS OF THIS ASSESSMENT/COMMENTS: To be completed by local group	
<ul style="list-style-type: none"> <input type="radio"/> Provincial/State/National Assessment <input type="radio"/> Regional/Local assessment <input type="radio"/> Large urban hospital with advanced stroke services (comprehensive stroke services) <input type="radio"/> Community hospitals with access to some stroke services <input type="radio"/> Community with health clinic as only health services available <input type="radio"/> Rural community with a visiting health worker 		

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A. Stroke Services and Resource Availability



Please review each of these lists and tick all services and resources that you currently have in place and available for providing stroke care. Once completed, review your responses to determine which category of stroke services you most closely fit into.

Minimum Healthcare Services	Essential Stroke Services (In addition to services listed under Minimal stroke services)	Advanced Stroke Services (In addition to services listed under Minimal and essential stroke services)
<ul style="list-style-type: none"> ○ Care provided in local communities without coordination across defined geographic regions ○ Very limited access to physicians Provide assessment skill development <ul style="list-style-type: none"> • Provide training in basic stroke risk factor assessment: blood pressure, atrial fibrillation (pulse check), exercise, alcohol, diet (with respect to circumstances) • Basic skills in risk factor management, medications, lifestyle management • Training in basic rehabilitation techniques, mobility and positioning that can be passed on to family • Basic training in swallow screens and dysphagia management; and in temperature management ○ Variable access to healthcare workers (nurses or lay workers) <ul style="list-style-type: none"> • Training in basic stroke risk factor assessment: blood pressure, atrial fibrillation (pulse check), exercise, alcohol, diet (with respect to circumstances) • Training in basic rehabilitation techniques, mobility and positioning that can be passed on to family • Basic training in swallow screens and dysphagia management; and in temperature management ○ No access to diagnostic services or hospital care ○ Limited access to the most basic lifestyle preventative advice ○ Access to internet <ul style="list-style-type: none"> • Access to mobile stroke education (such as WSA) • Access to mobile tools such as Stroke Riskometer 	<ul style="list-style-type: none"> ○ Access to basic diagnostic services <ul style="list-style-type: none"> • Laboratory blood test (CBC, electrolytes, urea, glucose, INR, PT) • Electrocardiogram (12 lead) • Computed Tomography (CT) scan brain and vasculature • Capability to do CT Angiography (CTA) • Echocardiography • Doppler ultrasound • Holter monitors ○ Access to nurses and nursing assessment with stroke training <ul style="list-style-type: none"> • Acute care settings • Advanced practice nurses • Nurse practitioner ○ Access to physicians with stroke expertise (although may not be stroke specialists) <ul style="list-style-type: none"> • General/Family/Primary care physicians • Neurologist • Neurosurgeon • Internist • Cardiologist • Geriatrician • Emergency Medicine • Physical and Rehabilitation Medicine • Intensivist • Access to stroke specialists through telestroke modalities, and teleradiology ○ Access to acute inpatient stroke care, where admitted stroke patients are cared for on: <ul style="list-style-type: none"> • Stroke Unit • Clustered model on same ward • Scattered throughout hospital ○ Access to stroke unit care (WSA Module): <ul style="list-style-type: none"> • Geographically defined unit dedicated to the care of stroke patients <ul style="list-style-type: none"> - Or, model of clustering stroke patients • Members of a interdisciplinary stroke team <ul style="list-style-type: none"> - Physicians with stroke expertise - Stroke Nurses 	<ul style="list-style-type: none"> ○ Access to advanced diagnostic services <ul style="list-style-type: none"> • Magnetic Resonance Imaging (MRI) • Capability to do MR Angiography • CT Perfusion scans • Prolonged ECG monitoring devices ○ Access to physicians with stroke expertise in acute stroke care, stroke prevention and/or stroke rehabilitation <ul style="list-style-type: none"> • Neurologist • Neurosurgeon • Internist • Neuroradiologist / interventionalist • Geriatrician • Intensivist • Cardiologist • Emergency Medicine • Physical and Rehabilitation Medicine • General/Family/Primary care physician • Program to develop and maintain core competencies in stroke care ○ Access to additional acute interdisciplinary stroke team members <ul style="list-style-type: none"> • Nurses • Nursing assistants • Pharmacist • Social worker/case manager • Palliative Care team • (See below for rehabilitation staff) ○ Fully coordinated stroke care provided across geographically discrete regions <ul style="list-style-type: none"> • Advanced stroke services rationalized to a smaller number of centres • Stroke pathways that define movement of stroke patients across region to higher and lower levels of services as required

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Minimum Healthcare Services	Essential Stroke Services (In addition to services listed under Minimal stroke services)	Advanced Stroke Services (In addition to services listed under Minimal and essential stroke services)
	<ul style="list-style-type: none"> - <i>Nursing assistants</i> - <i>Pharmacist</i> - <i>Social worker/case manager</i> - <i>Palliative Care team</i> - <i>Physiotherapist</i> - <i>Occupational Therapist</i> - <i>Speech-Language Pathologist</i> • Protocols for rapid evaluation and diagnosis of stroke patients • Protocols to guide acute stroke care based on best practice guidelines <ul style="list-style-type: none"> - <i>Medical and nursing assessments:</i> - <i>Past history</i> - <i>Swallow screen</i> - <i>Nutrition, hydration</i> - <i>Functional status, mobility, DVT risk</i> - <i>Level of dependency</i> - <i>Skin Integrity</i> - <i>Bladder and bowel continence</i> - <i>Temperature</i> • Interdisciplinary meetings weekly to discuss patient progress against treatment goals; update management plans • Early access to rehabilitation therapies – including cross training of skills to nurses, nursing assistants and family members • Patient and family education, skills training, and involvement in care planning • Discharge planning <ul style="list-style-type: none"> ○ Access to stroke rehabilitation services <ul style="list-style-type: none"> • Early functional assessments, goal setting and individualized rehab plans developed ○ Access to stroke prevention therapies such as aspirin, lifestyle change recommendations, blood pressure management ○ Limited coordinated stroke care provided across geographically discrete regions ○ Stroke training programs for all levels of healthcare providers 	<ul style="list-style-type: none"> ○ Coordinated referral system Provide telestroke consultations to smaller and more rural; centres <ul style="list-style-type: none"> • Ambulance bypass agreements in place • Repatriation agreements in place to transfer patients back to home communities • Access to protocols for care of stroke patients: swallow assessment, food and fluids. Positioning, mobilization, continence, complications (fever, DVT, skin breakdown) • Printed stroke patient educational materials ○ Stroke training programs for all levels of healthcare providers ○ Data collection strategy and mechanisms <ul style="list-style-type: none"> • Acute inpatient stroke registry • Acute inpatient stroke database (local or regional) • Stroke prevention registry • Stroke prevention database • Stroke rehabilitation registry • Stroke rehabilitation database (local or regional)

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B. Core Stroke Care Recommendations



For each best practice recommendation, indicate with a tick whether the described practice is in place as a routine part of care; in development for implementation; not implemented, meaning the service/resource may be available but it is not currently part of stroke care within your services; or, the service/resource/equipment is not available within your facilities, therefore not possible to implement.

Health System and Stroke Recognition Core Evidence-Based Recommendations	Applicable Level of Health Services Capacity for Stroke Care			Supporting Evidence	Self Assessment
	Minimum	Essential	Advanced		
Acute Inpatient Care (First days after stroke)					
1.a Patients with an acute stroke should be admitted to hospital.		☑	☑	Evidence level: A	<input type="checkbox"/> In place <input type="checkbox"/> In development <input type="checkbox"/> Not implemented <input type="checkbox"/> Not available
1.b Patients with minor stroke or transient ischemic attack should be urgently assessed and prevention management commenced, (within 48 hours of stroke symptom onset) either in hospital or treated in a specialized outpatient clinic .		☑	☑	Evidence level: B	<input type="checkbox"/> In place <input type="checkbox"/> In development <input type="checkbox"/> Not implemented <input type="checkbox"/> Not available
2. Patients admitted to hospital with an acute stroke or transient ischemic attack should be treated by an interdisciplinary stroke team, consisting of at least a physician with training in stroke care, a nurse, rehabilitation specialist (such as a physiotherapist, occupational therapist, speech language pathologist).		☑	☑	Evidence level: A	<input type="checkbox"/> In place <input type="checkbox"/> In development <input type="checkbox"/> Not implemented <input type="checkbox"/> Not available
3. Patients admitted to hospital with an acute stroke or transient ischemic attack should be treated on an inpatient stroke unit, which is a specialized, geographically defined hospital unit dedicated to the management of stroke patients and staffed by an interdisciplinary stroke team (see Recommendation #2 above).		☑	☑	Evidence level: A	<input type="checkbox"/> In place <input type="checkbox"/> In development <input type="checkbox"/> Not implemented <input type="checkbox"/> Not available
4. Management strategies should be implemented for all stroke patients to prevent complications (e.g., fever, infection, pneumonia, hypoglycemia, deep vein thrombosis, skin ulcers, and recurrent stroke).	☑	☑	☑	Evidence level: A	<input type="checkbox"/> In place <input type="checkbox"/> In development <input type="checkbox"/> Not implemented <input type="checkbox"/> Not available

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Health System and Stroke Recognition Core Evidence-Based Recommendations	Applicable Level of Health Services Capacity for Stroke Care			Supporting Evidence	Self Assessment
	Minimum	Essential	Advanced		
Acute Inpatient Care (First days after stroke)					
5. Patients with devastating stroke should be provided palliative care and appropriate end of life care where medical treatment is considered to be futile.	✔	✔	✔	Evidence level: B	<input type="checkbox"/> In place <input type="checkbox"/> In development <input type="checkbox"/> Not implemented <input type="checkbox"/> Not available
6. Patients with suspected embolic stroke or lack of clear stroke mechanism (e.g., normal neurovascular imaging, no signs of large vessel disease) should have extended cardiac monitoring.		✔	✔	Evidence level: B	<input type="checkbox"/> In place <input type="checkbox"/> In development <input type="checkbox"/> Not implemented <input type="checkbox"/> Not available
7.a All stroke patients should be assessed for their risk of developing venous thromboembolism		✔	✔	Evidence level: C	<input type="checkbox"/> In place <input type="checkbox"/> In development <input type="checkbox"/> Not implemented <input type="checkbox"/> Not available
7.b Patients at high risk of venous thromboembolism should be started on venous thromboembolism prophylaxis immediately if there is no contraindication.		✔	✔	Evidence level: A	<input type="checkbox"/> In place <input type="checkbox"/> In development <input type="checkbox"/> Not implemented <input type="checkbox"/> Not available
8.a Frequent, out-of-bed activity in the very early time frame (within 24 hours of stroke onset) is not recommended. Mobilization may be reasonable for some patients with acute stroke in the very early time frame and clinical judgment should be used.	✔	✔	✔	Evidence level: B Evidence level: C	<input type="checkbox"/> In place <input type="checkbox"/> In development <input type="checkbox"/> Not implemented <input type="checkbox"/> Not available
8.b All patients admitted to hospital with acute stroke should start to be mobilized early (between 24 hours and 48 hours of stroke onset) if there are no contraindications <i>(Contraindications to early mobilization include, but are not restricted to, patients who have had an arterial puncture for an interventional procedure, unstable medical conditions, low oxygen saturation, and lower limb fracture or injury.)</i>	✔	✔	✔	Evidence level: B	<input type="checkbox"/> In place <input type="checkbox"/> In development <input type="checkbox"/> Not implemented <input type="checkbox"/> Not available

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Health System and Stroke Recognition Core Evidence-Based Recommendations	Applicable Level of Health Services Capacity for Stroke Care			Supporting Evidence	Self Assessment
	Minimum	Essential	Advanced		
Acute Inpatient Care (First days after stroke)					
8.c Family members should be trained to assist with mobilization.	✔	✔	✔	Evidence level: C	<input type="checkbox"/> In place <input type="checkbox"/> In development <input type="checkbox"/> Not implemented <input type="checkbox"/> Not available
9.a Temperature should be monitored and initiate temperature-reducing care measures such as antipyretics and tepid baths when increased temperature	✔	✔	✔	Evidence level: B	<input type="checkbox"/> In place <input type="checkbox"/> In development <input type="checkbox"/> Not implemented <input type="checkbox"/> Not available
9.b For temperature greater than 37.5° Celsius, increase frequency of monitoring, investigate possible infection such as pneumonia or urinary tract infection and initiate antipyretic and antimicrobial therapy as required.	✔	✔	✔	Evidence level: A	<input type="checkbox"/> In place <input type="checkbox"/> In development <input type="checkbox"/> Not implemented <input type="checkbox"/> Not available
10. The use of indwelling catheters should be avoided due to the risk of urinary tract infection	✔	✔	✔	Evidence level: B	<input type="checkbox"/> In place <input type="checkbox"/> In development <input type="checkbox"/> Not implemented <input type="checkbox"/> Not available
11. All stroke patients should be screened for urinary incontinence and retention (with or without overflow), fecal incontinence, and constipation	✔	✔	✔	Evidence level: C	<input type="checkbox"/> In place <input type="checkbox"/> In development <input type="checkbox"/> Not implemented <input type="checkbox"/> Not available
12. The swallowing, nutritional and hydration status of stroke patients should be screened as early as possible (using validated screening tools where possible).	✔	✔	✔	Evidence level: B	<input type="checkbox"/> In place <input type="checkbox"/> In development <input type="checkbox"/> Not implemented <input type="checkbox"/> Not available
13. Family members should be trained on proper feeding techniques for stroke patients with swallowing difficulties.	✔	✔	✔	Evidence level: C	<input type="checkbox"/> In place <input type="checkbox"/> In development <input type="checkbox"/> Not implemented <input type="checkbox"/> Not available

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Health System and Stroke Recognition Core Evidence-Based Recommendations	Applicable Level of Health Services Capacity for Stroke Care			Supporting Evidence	Self Assessment
	Minimum	Essential	Advanced		
Acute Inpatient Care (First days after stroke)					
14. Abnormal results from the initial or ongoing swallowing screens should prompt referral to a speech-language pathologist, occupational therapist, and/or dietician for more detailed assessment and management		✔	✔	Evidence level: C	<input type="checkbox"/> In place <input type="checkbox"/> In development <input type="checkbox"/> Not implemented <input type="checkbox"/> Not available
15. 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)	✔	✔	✔	Evidence level: B	<input type="checkbox"/> In place <input type="checkbox"/> In development <input type="checkbox"/> Not implemented <input type="checkbox"/> Not available

Which recommendations are your highest priorities to implement?

What are your next steps to start development and implementation of these best practices?

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C. Key Stroke Quality Indicators



For each quality indicator, please note whether data is being actively and routinely collected; or, data collection processes are in development for the indicator; or, data may be available but it is not currently being collected; or, data for this indicator is not available at all so not able to collect or report it. Please tick the most appropriate box for each indicator.

Performance Measures	Numerator	Denominator	Self Assessment
Acute Inpatient Care (First days after stroke)			
1. Proportions of presenting stroke patients admitted to acute inpatient hospital	Number of presentations to a health care facility who are admitted to inpatient unit.	Total presentations to a health care facility for stroke or TIA.	<input type="checkbox"/> Data collected <input type="checkbox"/> In development <input type="checkbox"/> Data not collected <input type="checkbox"/> Data not available
2. Proportion of TIA patients with access to rapid assessment services.	Number of presentations to a health care facility who receive a rapid assessment for TIA within 48 hours of stroke symptom onset.	Total presentations to a health care facility for TIA.	<input type="checkbox"/> Data collected <input type="checkbox"/> In development <input type="checkbox"/> Data not collected <input type="checkbox"/> Data not available
3. Proportion of stroke and TIA patients who are admitted to an acute stroke unit.	Number of stroke and TIA patients admitted to hospital and treated on a specialized acute stroke unit at any time during their hospital stay	All stroke and TIA patients admitted to an inpatient acute care facility.	<input type="checkbox"/> Data collected <input type="checkbox"/> In development <input type="checkbox"/> Data not collected <input type="checkbox"/> Data not available
4. Time from stroke onset until first mobilization.	Hours/days from stroke onset to first mobilization after arrival to hospital	All stroke and TIA patients admitted to an inpatient acute care facility.	<input type="checkbox"/> Data collected <input type="checkbox"/> In development <input type="checkbox"/> Data not collected <input type="checkbox"/> Data not available
5. Distribution of discharge locations for stroke and TIA patients discharged alive from acute care.	Number of stroke patients discharged to home or place of residence, inpatient rehabilitation, long term care, or other location following inpatient admission for stroke	All stroke and TIA patients admitted to an inpatient acute care facility, And discharged alive	<input type="checkbox"/> Data collected <input type="checkbox"/> In development <input type="checkbox"/> Data not collected <input type="checkbox"/> Data not available
6. Percentage of stroke inpatients with a documented swallowing screen completed.	Number of stroke patients admitted to hospital who have documentation in their chart of a completed swallow screen.	All stroke and TIA patients admitted to an inpatient acute care hospital.	<input type="checkbox"/> Data collected <input type="checkbox"/> In development <input type="checkbox"/> Data not collected <input type="checkbox"/> Data not available

What indicators are priority for us?

Who will collect the data?

How will the data be collected (electronically, on paper, etc)?

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How will the data be analyzed? When? How often?

Who will receive the results?

The Roadmap to implementation of the WSO Global Stroke Guidelines and Action Plan includes several modules that together address the full continuum of stroke care. The following modules are available for you to use as part of stroke service planning, self-assessment and implementation. Each Roadmap module includes the relevant service and resource checklist, applicable stroke best practice recommendations and important key quality indicators. Some modules in the Roadmap include additional elements and expanded information to those in the published WSO Global Stroke Care Guidelines and Action Plan to be of further practical use for all sites.

Users of these tools are encouraged to review all modules of the Roadmap.



The following modules are available as part of the WSO Roadmap for Quality Stroke Care:

Introduction and Overview

1. Stroke System Development

2. Prehospital and Emergency Care

→ 3. Acute Inpatient Stroke Care

4. Secondary Stroke Prevention

5. Stroke Rehabilitation

6. Community Reintegration and Long Term Recovery

World Stroke Organization - Clinical Practice Guideline

<http://www.world-stroke.org>

Clinical Practice Guideline Guidelines recommended by the WSO Guidelines and Quality subcommittee.

WSO International Stroke Guidelines 2012; American Academy of Neurology guideline publication.

Evidence-based Guideline: Prevention of stroke in nonvalvular atrial fibrillation. Summary of Evidence-based Guideline for CLINICIANS. Summary of Evidence-based Guideline for PATIENTS and their FAMILIES

More information: <https://www.aan.com/Guidelines/Home/ByTopic?topicId=20>

Heart and Stroke Foundation resource for healthcare providers. Taking Action for Optimal Community and Long-Term Stroke Care (TACLS). French version: Agir en vue de soins optimaux communautaires et de longue durée de l'AVC.

About the World Stroke Organization

OUR VISION: A LIFE FREE OF STROKE.

OUR MISSION:

The World Stroke Organization's mission is to reduce the global impact of stroke through prevention, treatment and long-term care. We work to reduce the impact of stroke on individuals, their families, and their communities. Our members campaign together to increase awareness of stroke risk and to improve treatment and care. We believe that reducing the global burden of stroke makes the world a healthier place for everyone.

Corporate partners

The World Stroke Campaign has been made possible through the generous financial contribution of its corporate partners.

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