

Quality Standards for the Hospital Management of Stroke in Vietnam

Budget Impact Analysis

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With funding support from the Rockefeller Foundation



Estimated Budget Impact of Implementing Quality Standards for the Hospital Management of Stroke in Vietnam

Overview

In July 2014, 15 Quality Standards (QS) relating the hospital management of stroke were launched by the Vietnamese Ministry of Health's Medical Services Administration. The QS were developed through a partnership between the Medical Services Administration (Ministry of Health), the Vietnam Health Economics Association (VHEA), and UK's NICE International, with funding support from the Rockefeller Foundation.

The budget impact analysis (BIA) contained in this document outlines estimates of the major budgetary implications of implementing the QS at Vietnamese hospitals, and has been produced to assist planning and implementation by policy makers at a central, provincial and district level, but also local hospital managers wishing to implement the QS in their own hospital.

Key cost drivers for hospitals associated with implementing the Quality Standards as interventional package have been identified and their expected annual cost has been calculated. The estimated saving associated with implementing the QS relate to expected reduction in inpatient length of stay. International experience and the evidence base that informed the development of the QS (in particular functioning stroke units) indicate that significant savings could be made to the cost of stroke care in Vietnam if these QS are implemented.

It is acknowledged that while substantial costs or savings may be achieved in particular areas by individual hospitals as a result of local circumstances, only major cost drivers have been identified. These have been generalised across three hospital types to reflect the current service provision of acute stroke care in Vietnam: type 1 (high concentration of stroke care), type 2 (medium concentration of stroke care), type 3 (low concentration of stroke care).

A key finding during the development of the QS is that there is significant variation in methods and levels of payment and the way that acute stroke is managed across different types of hospital facility in Vietnam. While this enhances the need for consistent, high-quality markers of care such as QS, it makes national aggregate estimates of the budget impact of QS implementation difficult. Some hospitals may find that implementation of the QS constitutes relatively little immediate on-going investment while other hospitals may require substantial investment and system re-design to comply with the Quality Standards. To assist in local planning, local hospital managers or district or provincial policy makers will be able to insert locally relevant estimates into the associated Excel-based analysis which accompanies this document to allow local estimates of the budget impact at the individual hospital level.

The estimates made in this BIA will be improved by planned primary level data collection in a sample of hospitals throughout 2015 and by local audit to be fed back to the Medical Services Administration.

Executive summary

- Stroke is a major contributor to premature death and disability in Vietnam. The Vietnamese population suffers 230,000 strokes annually, which accounts for up to 110,000 deaths and 1.7 million Disability Life-Years lost.
- The management of acute stroke in Vietnamese health facilities represents significant costs both to National Insurance and patients, and is estimated to be VND 1,026 billion (US\$48 million).
- The Quality Standards for the hospital management of acute stroke are 15 measurable and achievable statements describing high-quality stroke care. There are five cost main cost groupings (cost drivers) that result from implementing the QS as a package of care and which are included in this analysis: training, protocol development, administrative support, equipment, and medications.
- The implementation of Quality Standards for the hospital management of stroke will require an investment of VND 82.2 billion (US\$ 3.8 million) per year at full capacity. It is expected to result in gross savings of VND 117 billion (US\$5.5 million) (VND 35 billion net) each year across all acute care hospitals in Vietnam through a reduction in hospital length of stay.
- Largest net savings (VND23.5 billion, US\$1.1 million) are expected in high-concentration hospitals (high number of stroke admissions per facility) which account for an estimated 48% of admissions.
- Implementing the Quality Standards in low-concentration hospitals is estimated to result in a net cost of VND11.6 billion (US\$0.54million) as expected reductions in length of stay at these facilities may not offset implementation costs, however savings from improved care and referral processes at low-concentration hospitals may be realised in better outcomes and further savings in high-concentration hospitals.
- A significant proportion of expenditure associated with the implementation of the Quality Standards is increased use of medications for thrombolysis (alteplase). Meeting the thrombolysis quality standard is expected to increase the access of this drug to 3,300 additional patients annually at a cost of VND 38.5 billion (US\$1.8 million).
- Estimates included in this analysis are based on best available evidence and expert experience where available. Further clinical audit and research on the provision of stroke care in Vietnam is recommended to improve programme budgeting and planning and ultimately patient care.

Summary table

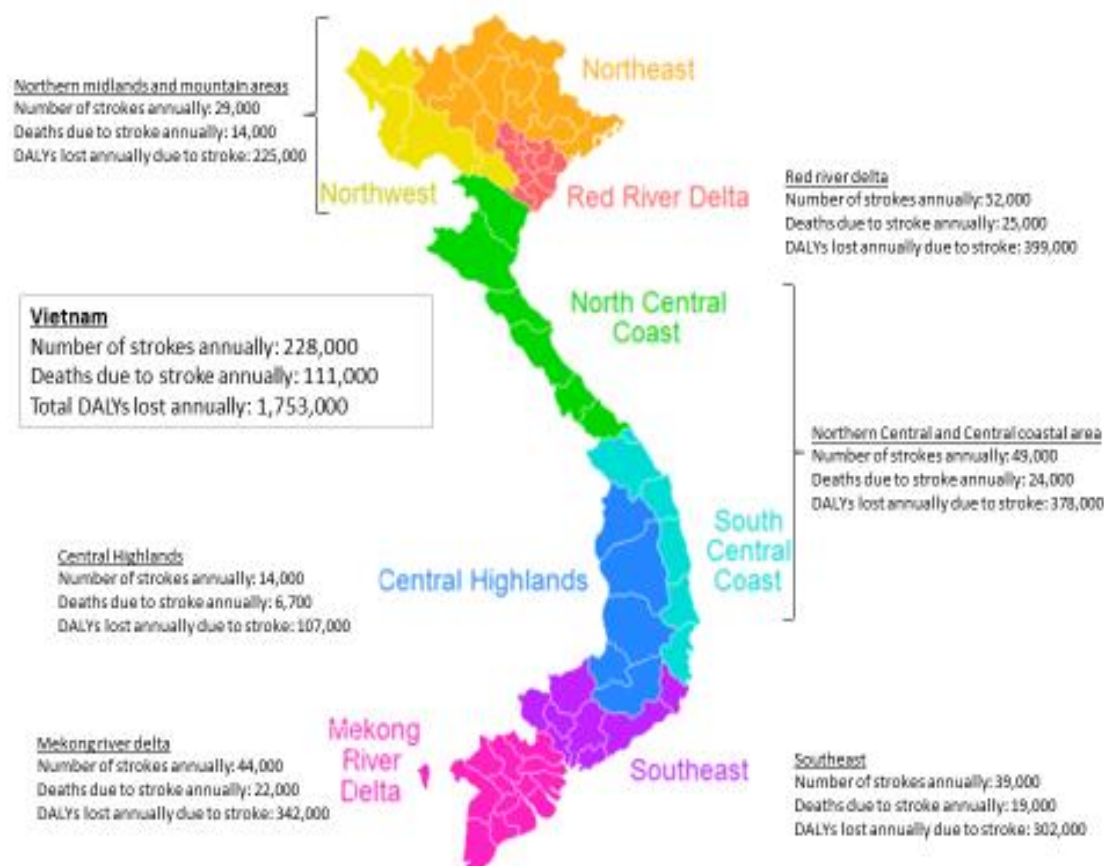
Hospital type	Type 1	Type 2	Type 3	Total
Cost drivers	<i>In VND (000,000) and US\$ (000,000)</i>			
Training	1,560	6,750	11,700	20,010
<i>US\$</i>	<i>0.07</i>	<i>0.32</i>	<i>0.55</i>	<i>0.94</i>
Equipment	40	299	461	1,163
<i>US\$</i>	<i>0.02</i>	<i>0.01</i>	<i>0.02</i>	<i>0.05</i>
Drugs	44,096	4,079	1,989	50,163
<i>US\$</i>	<i>2.06</i>	<i>0.19</i>	<i>0.09</i>	<i>2.35</i>
Protocol Development	570	3,500	3,900	7,970
<i>US\$</i>	<i>0.03</i>	<i>0.16</i>	<i>0.18</i>	<i>0.37</i>
Administrative support	1,185	988	770	2,943
<i>US\$</i>	<i>0.06</i>	<i>0.05</i>	<i>0.04</i>	<i>0.14</i>
Total costs	47,814	15,615	18,820	82,249
<i>US\$</i>	<i>2.24</i>	<i>0.73</i>	<i>0.88</i>	<i>3.85</i>
Savings				
LOS reduction	71,339	38,688	7,228	117,256
<i>US\$</i>	<i>3.34</i>	<i>1.81</i>	<i>0.34</i>	<i>5.49</i>
Estimated annual net impact	23,524	23,073	-11,591	35,006
<i>US\$</i>	<i>1.10</i>	<i>1.08</i>	<i>-0.54</i>	<i>1.64</i>

What is the current status of stroke care in Vietnam?

Stroke is one of the main causes of premature death and morbidity in Vietnam with an estimated annual prevalence of 135.07 ischemic strokes per 100,000 and 119.71 haemorrhagic strokes per 100,000 resulting in 228,000 annual strokes [REF GBD]. The high incidence is also associated with high mortality, with 111,000 deaths annually which represent 18% of all premature deaths in males and 23% of all premature deaths in females.

In addition to impact on mortality and morbidity, stroke also results in large costs to the Vietnamese healthcare system and to patients. The costs of acute (in-hospital) care for the management of stroke are estimated at VND 1,026 billion (US\$48 million) annually [REF].

Acute stroke care is currently highly concentrated in large centrally- or provincially- administered hospitals with an estimated 53% [REF] of patients suffering a stroke entering hospital. The figure below shows estimations of the distribution of stroke incidence by regions, based on national average incidence.



Source author calculations based on Global Burden of Disease 2010 estimates and Government of Vietnam national statistics

Limitations

This Budget Impact Analysis (BIA) aims to provide estimates of cost and saving implications as a result of implementing the stroke Quality Standards. Where possible, parameter estimates have been drawn from peer-reviewed publications or official government databases and information systems. In some instances, author judgement and extrapolation has been required.

It is likely that implementation of the QS could result in dynamic changes in patient flow.

No estimate of the health benefit of the quality standards as this is just implementation costs.

Types

Given the high degree of centralisation of stroke treatment in Vietnam, it was necessary to identify three “types” of acute care hospital for the purposes of this budget impact analysis which are detailed in table [NN] below. There is likely to be substantial variation within these groupings. The reported patient flow are central estimates based on available data.

Type One facilities are large centrally or provincially administered hospitals which admit many patients with stroke (more than 1,000 patients annually). An example of this hospital type (at the larger end of the scale) would be Bach Mai hospital in Ha Noi, which has 1,900 beds and admits in excess of 5,500 patients with stroke each year¹. It is estimated that there are approximately 30 Type One hospitals in Vietnam and for the purposes of this analysis, we assume that they aspire to implement all of the Quality Standards to the highest level (including gold level stroke units, rapid imaging, and thrombolysis).

Type Two hospitals have a smaller number of beds and are administered at a Provincial or in some instances at District level. Type Two hospitals will have a lower throughput of patients with stroke (approximately 100-200 annually) and it is estimated that there are approximately 250 in Vietnam. An example of Type Two hospital is Ha Dong Provincial hospital which has 600 beds and admits 100 patients with stroke annually². For the purposes of this analysis it is estimated that Type Two hospital aspire to implement the majority of the Quality Standards at Silver level stroke units and would not perform procedures such as thrombolysis.

Type Three hospitals are typically smaller, largely District-level administered and would usually refer the majority of acute stroke patients. Subsequently the patient case-mix in such facilities is expected to be of a lower complexity and in some instances represent referral from Type 1 or 2 hospitals after acute stroke care has been provided. Type 3 facilities collectively would still treat a substantial number of patients with stroke and therefore the majority of the Quality Standards remain relevant.

¹ Admitted 2,764 patients with ICD-10 code I-63 in period July-December 2013 [REF]

² Admitted 57 patients with ICD-10 code I-63 in period July-December 2013 [REF]

It is estimated that there are approximately 780 Type Three hospitals in Vietnam and for the purposes of this analysis it is assumed Type Three hospitals would aspire to achieve bronze level stroke units, would be a recipient of expertise dissemination initiatives and would not frequently conduct diagnostic imaging on patients with expected stroke. An example of Type Three hospital would be Thuong Tin District hospital which has 210 beds and admitted 18 patients with stroke between July-December 2013 or Ba Vi District hospital which has 244 beds and admitted just one patient with stroke in the same time period.

Table 1 below shows the hospital types classified for the purposes of this analysis.

Table 1: Hospital Types

Type	Estimated number in Vietnam	Concentration of stroke services per facility	Approximate number of stroke admissions*	Estimated proportion of total stroke admissions	QS aspirations (if not already doing)
Type I	30	High	1,000+	48%	Gold stroke units, thrombolysis, diagnostic imaging, hub for disseminating expertise
Type II	250	Medium	100 – 200	35%	Silver stroke units, diagnostic imaging,
Type III	780	Low	Less than 50	17%	Bronze stroke units, rapid referral, recipient of expertise dissemination

**annual admissions. Central estimates of annual admissions due to stroke as used in the analysis are n = 1,800 (Type 1), n = 160 (Type 2), and n = 25 (Type 3).*

Where will the Quality Standards be implemented?

Although hospitals have been classified into “types” for the purpose of this analysis and future implementation planning, the intention of the Quality Standard Committee is that the quality standards should be implemented to some degree in all health facilities in Vietnam where acute stroke is managed, from district level hospitals to specialist central hospitals, including private hospital facilities. Differences in the administrative and technical classes of hospital in Vietnam means that some hospitals will be more able to implement the quality standards rapidly and without major re-organisation or costs, while others may need substantial changes to clinical practice, organisational environment, and existing payment and activity regulation and policies.

The implementation of each of the quality standards in hospitals by administrative type and class shown in table QQ.

Quality Standard	Central Hospital		Provincial Hospital		District Hospital		Private
	Specialised	Level & II	Level I & II	Level III	Level I & II	Level III	
No in Vietnam	3	22	62	268	17	516	
QS1: Trained Staff	✓	✓	✓	✓	✓	✓	✓
QS2: Imaging	✓	✓	✓	✓	✗	✗	Hospital decision
QS3: TIA	✓	✓	✓	✓	Referral	Referral	Competency dependent
QS4: Stroke Units	Gold	Gold	Gold / Silver	Silver	Bronze	Bronze	Bronze at minimum
QS5: Dignity	✓	✓	✓	✓	✓	✓	✓
QS6: Thrombolysis	✓	✓	✓ / ✗	✗	✗	✗	Competency dependent
QS7: Early Mobilisation	✓	✓	✓	✓	✓	✓	✓
QS8: Swallowing and Nutrition	✓	✓	✓	✓	✓	✓	✓
QS9: Prevention (lifestyle advice)	✓	✓	✓	✓	✓	✓	✓
QS10: Secondary Prevention (medication)	✓	✓	✓	✓	✓	✓	✓
QS11: Telemedicine	Hub	Hub	✓	✓	✓	✓	✓
QS12: Disseminating Expertise	Hub	Hub	Hub / Recipient	Hub / Recipient	Recipient	Recipient	Hospital decision
QS13: Screening (emergency response)	✓	✓	✓	✓	✓	✓	✓
QS14: Public Awareness	✓	✓	✓	✓	✓	✓	✓
QS15: Monitoring Quality of Care	✓	✓	✓	✓	✓	✓	✓

Summary of estimate of budget impact

Training [other cost driver tables to be inserted]

A key element of this QS are ensuring that staff have sufficient training to effectively manage patients with stroke. Training costs can be variable depending on method of instruction, frequency of follow up and incentives and support put in place to ensure staff maintain key competencies. Table [QQ] below shows key training areas with estimates of number of people trained and estimated costs for the different hospital types. Training requirements will be different for staff depending on likely concentration of patients with stroke at the facility and functions (e.g. thrombolysis, imaging, rapid referral) that are likely to be conducted.

Type One hospitals n = 30

<i>Training subject area</i>	<i>To whom (staff type)</i>	<i>To meet which QS</i>	<i>Frequency of training/year</i>	<i>Number of staff requiring training per facility</i>	<i>Annual cost per facility</i>	<i>Total cost (all facilities Type I)</i>
<i>Appropriate management of stroke including routine care, maintaining dignity, early mobilisation, swallowing and nutrition, stroke unit functioning and multidisciplinary working</i>	Clinicians, nurses, allied health professionals	QS1; QS4 (Gold SU); QS5; QS7; QS8	2	25	11,000,000	330,000,000
<i>Diagnostic imaging</i>	Clinicians, Radiographers	QS2	2	10	5,000,000	150,000,000
<i>Management of TIA</i>	Clinicians, nurses, allied health professionals	QS1; QS3	2	25	11,000,000	330,000,000
<i>Thrombolysis</i>	Specialist clinicians	QS6	Specialist training programs			
<i>Multifacility working and expertise dissemination (hub)</i>	Clinicians, nurses, allied health professionals	QS11; QS12	1	25	6,000,000	180,000,000
<i>Screening for stroke</i>	Emergency contact healthcare professionals	QS13	2	10	5,000,000	150,000,000
<i>Clinical audit (monitoring care)</i>	Clinicians, nurses, allied health professionals, administrative staff	QS15	1	30	7,000,000	210,000,000
<i>Protocol implementation</i>	Clinicians, nurses, allied health professionals, administrative staff	All	1	30	7,000,000	210,000,000
			Total	40	52,000,000	1,560,000,000
				Total cost (US\$)	2,433	72,992

Part II – Individual Quality Standards

This section describes each of the 15 quality standards, listing key cost drivers and limitations in assessing budget impact for this analysis.

Clinical-level quality standards

1. People with stroke and people with transient ischaemic attack (TIA) receive hospital care from appropriately trained healthcare professionals.

Quality measure – structure

- Evidence of locally agreed protocols to ensure that staff in the relevant hospital departments (such as emergency department, stroke unit, ICU, neurology) are appropriately trained to deliver care for people with a suspected or confirmed diagnosis of stroke or TIA

Quality measure – process

Numerator: The number of people who have received care from appropriately trained staff.

Denominator: The number of people with stroke or TIA admitted to the hospital.

Which hospitals would implement this Quality Standard?

	Central Hospital		Provincial Hospital		District Hospital		Private
	Specialised	Level I & II	Level I & II	Level III	Level I & II	Level III	
	✓	✓	✓	✓	✓	✓	✓

Cost drivers

There are two cost drivers for this QS:

- Ensuring that staffing levels are at an adequate level relative to number of patients admitted with stroke or TIA.
- Ensuring that all staff are appropriately trained.

Expected budget impact:

The budget impact of maintaining adequate staffing levels will be dependent upon expected throughput of patients at individual sites. Adequate staffing levels can be interpreted as sufficient to meet the requirements of the Quality Standards regardless of time of admission. centres are likelyhas not been calculated as i

2. Patients with suspected stroke receive brain imaging within 1 hour of arrival at the hospital if they meet any of the indications for immediate imaging, or within 24 hours if they do not meet any indication for immediate imaging.

Quality measure – structure

- Evidence of equipment for brain imaging, e.g. a cranial tomography (CT) scanner.
- Evidence of locally agreed protocols to prioritise any patients with acute stroke to receive imaging within 1 hour of arrival at the hospital if they meet indications for immediate imaging, or within 24 hours if they do not meet such indications.
- Availability of appropriately trained staff to perform imaging within the specified times 24 hours a day and 7 days a week.
- Availability of appropriately trained staff, either locally or via an electronic link, to interpret the findings of brain imaging within the specified times 24 hours a day and 7 days a week.
- Evidence of locally agreed protocols to identify patients with acute stroke and to refer them to another hospital with facilities for timely brain imaging, where these are not locally available.

Quality measure – process

a)

Numerator: The number of patients who have had brain imaging within 1 hour of arrival at the hospital.

Denominator: The number of patients with acute stroke who meet any indication for immediate imaging admitted to the hospital.

b)

Numerator: The number of patients who have had brain imaging within 24 hours of arrival at the hospital.

Denominator: The number of patients with acute stroke who do not meet any indication for immediate imaging admitted to the hospital.

Which hospitals would implement this Quality Standard?

Central Hospital		Provincial Hospital		District Hospital		Private
Specialised	Level & II	Level I & II	Level III	Level I & II	Level III	
✓	✓	✓	✓	✗	✗	Hospital decision

3. People with TIA (whose symptoms have fully resolved) are considered as medical emergencies, assessed and treated by a healthcare professional with expertise in neurovascular disease within 24 hours, and started on aspirin treatment immediately.

Quality measure – structure

- Evidence of locally agreed protocols for the assessment and treatment of TIA as medical emergencies within 24 hours, and not necessarily as inpatients
- Availability of staff with expertise in neurovascular disease
- Availability of aspirin

Quality measure – process

a)

Numerator: The number of patients treated as medical emergencies, and assessed and treated by a healthcare professional with expertise in neurovascular disease within 24 hours of arrival at the hospital.

Denominator: The number of patients with TIA admitted to the hospital.

b)

Numerator: The number of patients started on aspirin treatment immediately.

Denominator: The number of patients with TIA admitted to the hospital who do not have contraindications to aspirin.

Which hospitals would implement this Quality Standard?

Central Hospital		Provincial Hospital		District Hospital		Private
Specialised	Level I & II	Level I & II	Level III	Level I & II	Level III	
✓	✓	✓	✓	Referral	Referral	Competency dependent

4. Patients with suspected stroke are assessed and managed in a specialist stroke unit that meets at least Bronze criteria, by a doctor with specialist expertise in stroke and other appropriately trained staff within 24 hours of admission to hospital, and by all relevant members of the multidisciplinary rehabilitation team within 72 hours, with documented multidisciplinary goals agreed within 5 days.

Quality measure – structure

- Evidence of a designated ward, part of a ward, or geographically identified unit for stroke patients
- Evidence of locally agreed protocols to assess and manage stroke patients in a specialist stroke unit within 24 hours of arrival at the hospital
- Availability of a multidisciplinary team with appropriately trained staff to perform the specified assessment and management
- Evidence that patient rehabilitation plans are discussed at a multidisciplinary meeting including a doctor, a nurse and a therapist, within 5 days of arrival at the hospital.

Quality measure – process

a)

Numerator: The number of patients assessed and managed in a specialist stroke unit that meets at least Bronze criteria by a doctor with specialist expertise in stroke and other appropriately trained staff within 24 hours of admission to the hospital.

Denominator: The number of patients with suspected stroke admitted to the hospital.

b)

Numerator: The number of patients assessed and managed by all relevant members of the multidisciplinary rehabilitation team within 72 hours of admission to the hospital.

Denominator: The number of patients with stroke admitted to the hospital.

c)

Numerator: The number of patients with documented multidisciplinary goals agreed within 5 days of admission to the hospital.

Denominator: The number of patients with stroke admitted to the hospital

Definitions

Appropriate assessment should include assessments of: mobility, continence, memory, mood, communication, risk of developing pressure sores, nutrition, hydration, and blood pressure.

Appropriately trained staff will have stroke management experience and training, and be able to conduct the above listed assessments. Timely diagnosis and intervention is crucial for acute stroke, and being seen by a stroke consultant or associate specialist within 24 hours of admission is significantly associated with reduced mortality (Bray et al., 2013)

Specialist stroke units are an evidence-based and internationally recognised method of providing timely and effective care to stroke patients in the acute phase. As of 2014, there are 21 stroke units across Vietnam, almost entirely in Hanoi and Ho Chi Minh City (Prof Le Van Thanh presentation to QS Committee, 2014). Establishing stroke units do not necessarily require new specialist staff to be recruited, but does require existing resources to be reorganised.

Specialist stroke units are classified using the following criteria:

Bronze

- A designated ward or part of a ward set aside for stroke patients
- At least one nurse with stroke management experience and training will be on duty at all times
- Access to a doctor with expertise in stroke/neurology at least during normal working hours
- Agreed management protocols for common problems, based on available evidence.

Silver

As for Bronze, plus:

- Access to brain imaging during normal working hours
- Access to a physiotherapist with neurological/stroke training during normal working hours
- Access to a speech therapist with neurological training during normal working hours
- Has a coordinated multidisciplinary team that meets at least once a week for the interchange of information about individual patients
- Educational programmes and information are provided for staff, patients and carers

Gold

As for Silver, plus:

- A geographically identified unit
- Staff has specialist expertise in stroke and rehabilitation
- Provision of imaging and laboratory services
- Access to rehabilitation specialist staff

- All nurses caring for the stroke patients are experienced and competent in the management of acute stroke covering neurological, general medical and rehabilitation aspects
- Medical staff are specially trained in the delivery of acute medical care to stroke patients, including the diagnostic and administrative procedures needed for safe, effective delivery of thrombolysis available 24 hours, 7 days a week
- Organised as a single team of staff with specialist knowledge and experience of stroke and neurological rehabilitation including:
 - consultant physician(s)
 - nurses
 - physiotherapists
 - occupational therapists
 - speech and language therapists
 - dietitians
 - psychologists
 - social workers
- Easy access to services providing: pharmacy; orthotics; orthoptists; specialist seating; patient information, advice and support; and assistive devices.
- Have an education programme for all staff providing the stroke service and offer training for junior professionals in the specialty of stroke.

Which hospitals would implement this Quality Standard?

Central Hospital		Provincial Hospital		District Hospital		Private
Specialised	Level I & II	Level I & II	Level III	Level I & II	Level III	
Gold	Gold	Gold	Silver	Bronze	Bronze	Bronze at minimum

5. Patients with stroke are treated with dignity and respect, including their hygiene maintained, provided pressure area care and privacy.

Quality measure – structure

- Evidence of locally agreed protocols to ensure that patients' hygiene is maintained and pressure area care provided;
- Evidence of locally agreed protocols to allow sufficient physical space around the patient for mobilisation, and to ensure curtains are closed when providing medical or personal care to patients.

Quality measure – process

a)

Numerator: The number of patients with their hygiene maintained.

Denominator: The number of patients with stroke admitted to the hospital.

b)

Numerator: The number of patients provided pressure area care.

Denominator: The number of patients with stroke admitted to the hospital.

c)

Numerator: The number of patients with a curtain around their bed.

Denominator: The number of patients with stroke admitted to the hospital.

Which hospitals would implement this Quality Standard?

Central Hospital		Provincial Hospital		District Hospital		Private
Specialised	Level & II	Level I & II	Level III	Level I & II	Level III	
✓	✓	✓	✓	✓	✓	✓

6. Patients with suspected stroke arriving at a hospital with facilities to provide thrombolysis are admitted directly to a specialist stroke unit and assessed for thrombolysis, receiving it within 4.5 hours of stroke onset if clinically indicated.

Quality measure – structure

- Evidence of a stroke unit meeting Gold criteria
- Evidence of equipment for brain imaging, e.g. a cranial tomography (CT) scanner.
- Evidence of locally agreed protocols to prioritise any patients with acute stroke to receive imaging within 1 hour of arrival at the hospital and for the results to be interpreted as soon as possible
- Availability of appropriately trained staff to perform imaging within 1 hour of arrival at the hospital and to interpret the results as soon as possible, 24 hours a day and 7 days a week
- Evidence of locally agreed protocols to ensure that patients with suspected stroke are assessed for and given thrombolysis if clinically indicated
- Availability of thrombolytic medications
- Availability of appropriately trained and experienced staff to perform thrombolysis, including knowledge of contraindications, and specialist monitoring

Quality measure – process

a)

Numerator: The number of patients admitted directly to a specialist stroke unit and assessed for thrombolysis.

Denominator: The number of patients with suspected stroke arriving at a hospital with facilities to provide thrombolysis.

b)

Numerator: The number of patients who receive thrombolysis within 4.5 hours of stroke onset.

Denominator: The number of patients with suspected stroke assessed to require thrombolysis.

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Definitions

Hospitals with adequate facilities to provide thrombolysis must have a stroke unit meeting hospital has a stroke unit meeting Gold criteria, and provide specialist monitoring of patients including the monitoring of blood pressure every 2 hours.

Alteplase, the preferred thrombolytic drug, is clinically indicated where acute ischaemic stroke has been confirmed via brain imaging (and intracranial haemorrhage has been excluded), and time of

stroke onset is known and within 4.5 hours. Treatment should be started as soon as possible, given that the likelihood of benefit decreases while the risk of harm increases with time:

Which hospitals would implement this Quality Standard?

Central Hospital		Provincial Hospital		District Hospital		Private
Specialised	Level & II	Level I & II	Level III	Level I & II	Level III	
✓	✓	✓	✗	✗	✗	Competancy dependent

7. Patients with acute stroke (ischemic and haemorrhagic) are mobilised and helped to sit up as soon as they are awake, unless medically unstable; and supported to stand and walk as soon as possible.

Quality measure – structure

- Evidence of locally agreed protocols for early mobilisation.
- Availability of appropriately trained staff to support early mobilisation.
- Availability of sufficient floor space around each patient.
- Availability of a chair beside each bed in order to practice sitting.
- Availability of other appropriate equipment for early mobilisation, including walking sticks and frames.
- Evidence of locally agreed protocols to provide basic practical training for family carers to assist in early mobilisation.

Quality measure – process

a)

Numerator: The number of patients who are mobilised and practice sitting.

Denominator: The number of patients with acute stroke admitted to hospital who are awake and not medically unstable.

b)

Numerator: The number of patients who are supported to stand and walk .

Denominator: The number of patients with acute stroke admitted to hospital are who are able to stand and walk, and not medically unstable.

Which hospitals would implement this Quality Standard?

Central Hospital		Provincial Hospital		District Hospital		Private
Specialised	Level & II	Level I & II	Level III	Level I & II	Level III	
✓	✓	✓	✓	✓	✓	✓

8. Patients with acute stroke have their swallowing screened by a specially trained healthcare professional within 4 hours of admission to the hospital, before being given any oral food, fluid or medication, and have an ongoing management plan for the provision of adequate nutrition.

Quality measure – structure

- Evidence of locally agreed protocols for swallowing screening and nutritional management
- Availability of specially trained staff to perform swallowing checks
- Availability of specially trained staff to administer nutrition management plans

Quality measure – process

a)

Numerator: The number of patients who have their swallowing screened by a specially trained healthcare professional within 4 hours of admission to hospital, before being given any oral food, fluid or medication.

Denominator: The number of patients with acute stroke admitted to hospital.

b)

Numerator: The number of patients with an ongoing management plan for the provision of adequate nutrition.

Denominator: The number of patients with acute stroke admitted to hospital.

Which hospitals would implement this Quality Standard?

Central Hospital		Provincial Hospital		District Hospital		Private
Specialised	Level I & II	Level I & II	Level III	Level I & II	Level III	
✓	✓	✓	✓	✓	✓	✓

9. People at high risk of stroke, including those who have already had a TIA or stroke, are assessed for and given information about lifestyle risk factors (exercise, smoking, diet, weight and alcohol); these people, and their carers where possible, given accessible information, advice and support in possible strategies to modify lifestyle and risk factors.

Quality measure – structure

- Evidence of locally agreed protocols for the provision of information, advice and support to reduce lifestyle risk factors for stroke
- Evidence of accessible written information, such as leaflets, for the general public

Quality measure – process

a)

Numerator: The number of people whom are assessed for lifestyle risk factors (exercise, smoking, diet, weight and alcohol).

Denominator: The number of people at high risk of stroke.

b)

Numerator: The number of people whom or whose carers are given accessible information, advice and support in possible strategies to modify their lifestyle risk factors (exercise, smoking diet, weight and alcohol).

Denominator: The number of people at high risk of stroke.

Which hospitals would implement this Quality Standard?

Central Hospital		Provincial Hospital		District Hospital		Private
Specialised	Level & II	Level I & II	Level III	Level I & II	Level III	
✓	✓	✓	✓	✓	✓	✓

10. Patients after stroke are offered appropriate medication to reduce risk of future strokes.

Quality measure – structure

- Evidence of locally agreed protocols to offer appropriate medication for secondary prevention of stroke, in line with international guidance.
- Availability of appropriate medication.

Quality measure – process

Numerator: The number of patients given appropriate medication to reduce risk of future strokes.

Denominator: The number of patients who have had stroke.

Which hospitals would implement this Quality Standard?

Central Hospital		Provincial Hospital		District Hospital		Private
Specialised	Level & II	Level I & II	Level III	Level I & II	Level III	
✓	✓	✓	✓	✓	✓	✓

Service-level quality standards

11. A telemedicine service in a specialist stroke unit that does not have a local specialist stroke physician has: a video link that enables a specialist stroke physician to observe a clinical examination, discuss the case with a trained assessing clinician, and see and talk to the patient and carer directly; and a link that enables a specialist stroke physician to review radiological investigations remotely.

Quality measure – structure

- Evidence of joint working agreements and protocols with specialist stroke unit in another hospital that does have a local specialist stroke physician
- Availability of video-conferencing facilities at the location of clinical examination, including adequate broadband Internet connection and equipment
- Availability of facilities to capture and transmit radiological images electronically (e.g. via email) for timely remote reviews

Quality measure – process

Numerator: Hospital has a telemedicine service with a video link to a specialist stroke physician for observing clinical examinations, discussing cases with a trained assessing clinician, and seeing and talking to patients and carers directly; and a link for reviewing radiological investigations remotely.

Denominator: Hospital with a specialist stroke unit meeting all Level 1 (“Bronze”) criteria except having a local specialist stroke physician.

Which hospitals would implement this Quality Standard?

Central Hospital		Provincial Hospital		District Hospital		Private
Specialised	Level & II	Level I & II	Level III	Level I & II	Level III	
Hub	Hub	✓	✓	✓	✓	✓

12. Central hospitals with expert training facilities in stroke care lead in disseminating expertise to provincial hospitals via regular joint meetings; and provincial hospitals lead in disseminating expertise to other hospitals within the province via regular joint meetings..

Quality measure – structure

- Evidence of joint working agreements and protocols between central hospitals with expert training facilities and provincial hospitals, and between provincial hospitals and other hospitals within the province, to disseminate expertise via regular meetings, e.g. weekly or monthly case reviews, training workshops, clinical placements, etc.
- Evidence of regular joint meetings, e.g. meeting agendas, attendance lists, summaries and reports, workshop training materials.

Quality measure – process

a)

Numerator: Hospital has a programme of regular joint meetings to disseminate expertise to provincial hospitals.

Denominator: Central hospital with expert training facilities in stroke care.

b)

Numerator: Hospital has a programme of regular joint meetings to disseminates expertise to other hospitals within the province.

Denominator: Provincial hospital.

c)

Number of joint meetings per month

d)

Numerator: Number of staff that have taken part in training events.

Denominator: Number of staff in the hospital who are involved in the assessment and management of stroke patients.

Which hospitals would implement this Quality Standard?

Central Hospital		Provincial Hospital		District Hospital		Private
Specialised	Level & II	Level I & II	Level III	Level I & II	Level III	
Hub	Hub	Hub / Recipient	Hub / Recipient	Recipient	Recipient	Hospital decision

13. Emergency contact healthcare professionals can screen for stroke and TIA using a validated tool, and respond to these as emergencies.

Quality measure – structure

- Evidence of a professional education campaign for emergency contact healthcare professionals outside of the hospital setting
- Evidence of a professional education campaign for emergency and outpatient healthcare professionals in the hospital

Quality measure – process

a)

Numerator: Hospital has in place a professional education campaign for emergency contact healthcare professionals to screen for stroke and TIA using a validated tool, and responding to these as emergencies.

Denominator: Any hospital.

b)

Government has established professional training standards for emergency contact healthcare professionals to screen for stroke and TIA using a validated tool, and responding to these as emergencies.

Definitions

Emergency contact healthcare professionals are all staff inside and outside a hospital that can potentially be the first point of contact for people presenting with stroke or TIA, including: 115 ambulance call centre staff, paramedics, Commune Health Station clinicians, family physicians, hospital emergency department clinicians, outpatient department clinicians.

Validated screening tools for stroke and TIA include the Face-Arm-Speech-Test (FAST).

Which hospitals would implement this Quality Standard?

Central Hospital		Provincial Hospital		District Hospital		Private
Specialised	Level & II	Level I & II	Level III	Level I & II	Level III	
✓	✓	✓	✓	✓	✓	✓

14. Members of the public can identify the main symptoms of stroke and TIA, and respond to these as emergencies.

Quality measure – structure

- Evidence of posters displayed and accessible written material made available in public areas of the hospital, e.g. emergency and outpatient departments
- The presence of mass-media public education campaigns, conducted within the framework of a formal evaluation

Quality measure – process

a)

Numerator: Hospital has a public education campaign in place.

Denominator: Any hospital.

b)

Government has established mass-media public education campaigns within the framework of a formal evaluation.

Definitions

Educational material around recognising the main symptoms of TIA and stroke should be based around validated diagnostic tools, such as the Face-Arm-Speech-Test (FAST).

Which hospitals would implement this Quality Standard?

Central Hospital		Provincial Hospital		District Hospital		Private
Specialised	Level I & II	Level I & II	Level III	Level I & II	Level III	
✓	✓	✓	✓	✓	✓	✓

15. Patients with stroke have their quality of care monitored, and systems are in place to address problems that are identified.

Quality measure – structure

- Evidence of locally agreed protocols to monitor quality, and to identify and address problems (e.g. regular review meetings).
- Evidence of audit standards (including specific measures and indicators) based on the Quality Standards for Stroke
- Evidence of data collection tools for audit standards

Quality measure – process

Numerator: The number of patients with stroke who have their quality of care monitored.

Denominator: The number of patients with stroke admitted to the hospital.

Which hospitals would implement this Quality Standard?

Central Hospital		Provincial Hospital		District Hospital		Private
Specialised	Level & II	Level I & II	Level III	Level I & II	Level III	
✓	✓	✓	✓	✓	✓	✓