

MANAGEMENT OF STROKE

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STROKE ACUTE CARE PATHWAY

DEFINITIONS

1.WHO

A NEUROLOGICAL DEFICIT OF

- **Sudden** onset
- With **focal** rather than global dysfunction
- In which, after adequate investigations, symptoms are **presumed to be of non-traumatic vascular origin**
- and last for **>24 hours**

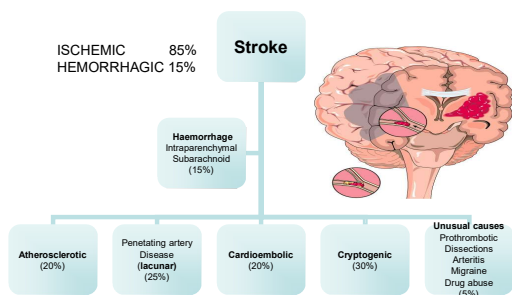
2. NINDS 2005

- When the blood supply to part of the brain is suddenly interrupted or when a blood vessel in the brain bursts

3.TIA-neurological deficit of vascular origin lasts from few minutes to hours and resolves within 24 hours

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TYPES OF STROKE



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STROKE	ACUTE CARE PATHWAY
WHY?	
❖ MAJOR GLOBAL PUBLIC HEALTH CONCERN	
❖ MAIN CAUSE OF DISABILITY IN ADULTS	
❖ SECOND COMMONEST CAUSE OF DEATH (WHO 2003)	
❖ FIFTY PERCENT ARE DEPENDENT DAILY ACTIVITIES	
❖ AMONG THE TOP 4 CAUSES OF DEATH IN ASEAN COUNTRIES	
❖ IN MALAYSIA, 4 TH COMMON CAUSE OF DEATH AFTER SEPTICAEMIA, HEART DISEASE AND CANCER	
❖ There are no study reports of either organized stroke care or analysis of outcome in stroke patients, from Malaysia	

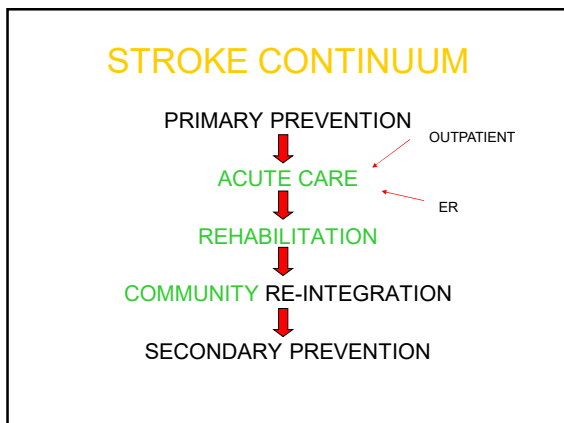
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STROKE	ACUTE CARE PATHWAY
CHANGING TRENDS....	
• Stroke is a preventable and treatable disease	
• More effective evidence based primary and secondary prevention strategies	
• Evidence of interventions that are effective soon after the onset of symptoms	
• Understanding of the care processes that contribute to a better outcome has improved	

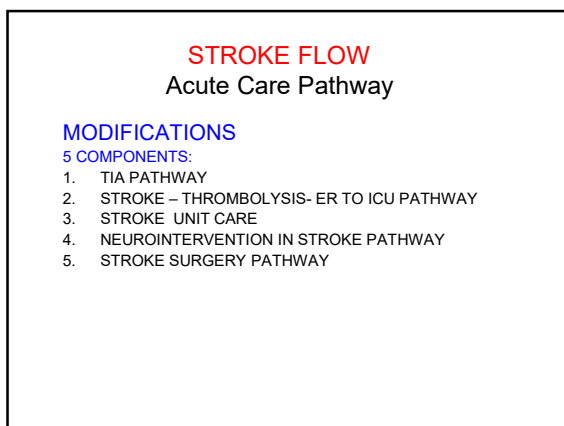
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EVIDENCE BASED PATHWAY	
• ISCHEMIC STROKE IN ADULTS	
• TRANSIENT ISCHEMIC ATTACKS-TIA	
• HEMORRHAGIC STROKE IN ADULTS	
• STROKE IN CHILDREN	
• ANEURYSMAL RUPTURE	
• AVM BLEED	

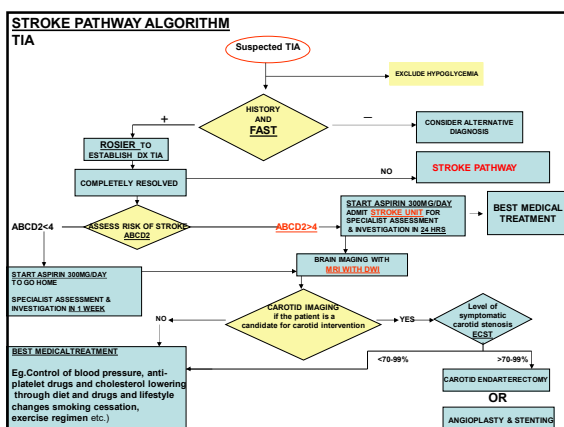
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TIA

Acute Care Pathway

• **Use the Face-Arm-Speech Test (FAST)**

Three simple checks can help you recognise whether someone has had a stroke or mini-stroke (transient ischemic attack – TIA).

F -Facial weakness: Can the person smile? Has their mouth or an eye drooped?

A -Arm weakness: Can the person raise both arms?

S -Speech problems: Can the person speak clearly and understand what you say?

T -Test all three signs.

REFERENCE : *NICE CLINICAL GUIDELINES- STROKE*
EVIDENCE LEVEL 1 B

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Recognition Of Stroke In ER (ROSIER)

	YES	NO
Has there been loss of consciousness or syncope?	-1	0
Has there been a seizure?	-1	0
Asymmetric facial weakness?	1	0
Asymmetric hand weakness?	1	0
Asymmetric leg weakness?	1	0
Speech disturbance?	1	0
Visual field disturbance?	1	0

Total score

If total score >0 stroke likely
if total score -2, -1 or 0 stroke unlikely
NB : EXCLUDE HYPOGLYCEMIA

REFERENCE : *NICE CLINICAL GUIDELINES- STROKE*
EVIDENCE LEVEL 1B

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TIA

ABCD2 Score

Symptom	Score
Age > 60 years	1 point
Blood pressure > 140/80	1 point
Clinical (neurological deficit)	2 points for hemiparesis 1 point for speech problem without weakness
Duration	2 points for >60 minutes 1 point for 10-60 min
Diabetes	1 point

Maximal score is 7.

REFERENCE : *Rothwell et al, Lancet. 2007;369:283-92*
EVIDENCE LEVEL 3

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TIA

- People who have had a suspected TIA who are at **lower risk** of stroke ABCD2 score of 3 or below: should have
 - aspirin (300 mg daily) started immediately
 - specialist assessment and investigation as soon as possible, but definitely within 1 week of onset of symptoms
 - measures for secondary prevention introduced as soon as the diagnosis is confirmed, including discussion of individual risk

NB: People who have had a TIA but who present late (more than 1 week after their last symptom has resolved) should be treated as though they are at **lower risk** of stroke.

REFERENCE : **NICE CLINICAL GUIDELINES- STROKE**

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TIA

- People who have had a suspected TIA who are at **high risk** of stroke
- TIAs with ABCD2 score ≥ 4 or above should have:
- aspirin (300 mg daily) started immediately
 - specialist assessment and investigation within 24 hours of onset of symptoms
 - measures for secondary prevention introduced as soon as the diagnosis is confirmed, including discussion of individual risk

• TIAs with a **score of 5 or greater** to be admitted for immediate Ix and Tx (within 24 h).

REFERENCE : **NICE CLINICAL GUIDELINES- STROKE**
EVIDENCE **LEVEL 3**

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Carotid Endarterectomy

Pooled Reanalysis of ECST and NASCET data
Almost 6000 patients

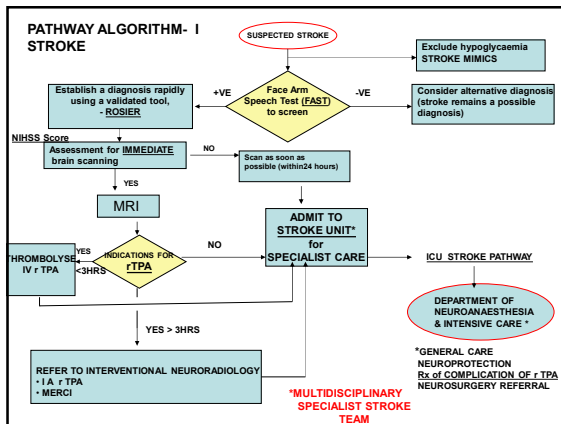
For patients with 50% or higher stenosis, the number of patients needed to undergo surgery (ie, number needed to treat) to prevent one ipsilateral stroke in 5 years was

- 9 for men versus 36 for women
- 5 for age 75 years or older versus 18 for younger than 65 years
- 5 for those randomized within 2 weeks after their last ischaemic event, versus 125 for patients randomized after more than 12 weeks.

Benefit from surgery was greatest in men, patients aged 75 years or older, and those randomized within 2 weeks after their last ischemic event, and fell rapidly with increasing delay.

REFERENCE : **Lancet 2004;363:915-924**
EVIDENCE **LEVEL 1 ++**

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ACUTE CARE PATHWAY

- **STROKE UNIT**
- Organised inpatient (stroke unit) care for stroke
The Cochrane Database of Systematic Reviews
Organised inpatient (stroke unit) care for stroke:
- Organised stroke unit care is a form of care provided in hospital by nurses, doctors and therapists who specialise in looking after stroke patients and work as a co-ordinated team.
- This review of 31 trials, involving 6936 participants, showed that patients who receive this care are more likely to survive their stroke, return home and become independent in looking after themselves. A variety of different types of stroke unit have been developed.
- The best results appear to come from those which are based in a dedicated ward.

OUTCOME:
EVIDENCE LEVEL : 2+ A
RCT= 304 : 1+

LENGTH OF STAY:
COCHRANE REVIEW: 1++

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STROKE Acute Care Pathway
Administration of rTPA

'CLOT BUSTER'

Main eligibility criteria

FOR IV INFUSION

- Treatment given within 3hrs
- Intracranial bleeding excluded
- Age <80
- Early major infarction excluded (parenchyma hypo-attenuation or brain swelling >1/3rd MCA territory)
- NIHSS SCORE <22
- MRS ≥ 2
- BP < 185/110
- Not on warfarin or heparin, platelets and coagulation normal
- Treatment given by a specially trained physician
- Facilities for close monitoring

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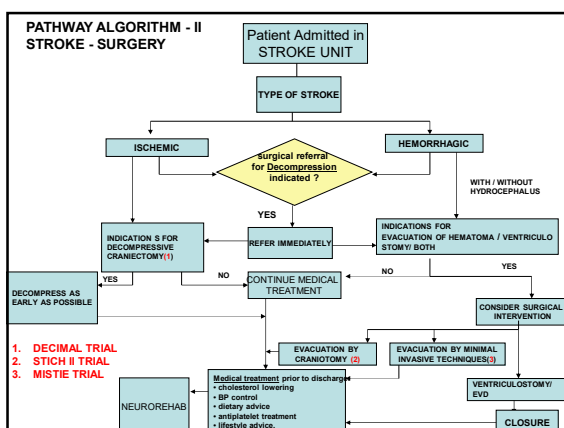
RECOMMENDATIONS: STROKE UNIT

- Every hospital should have a stroke unit
- A stroke should be managed by a multidisciplinary stroke team
- An efficient referral and rehabilitation system to be established for the success of a stroke unit
- Stroke units significantly reduce death, dependency, institutionalisation and length of hospital stay.

OUTCOME:
EVIDENCE LEVEL : 2+ A
RCT= 304 : 1+

LENGTH OF STAY:
COCHRANE REVIEW: 1++

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STROKE SURGERY HEMORRHAGIC

- A. Lobar hemorrhage
1. STICH Trial - Mendelow AD et al. Lancet 2005, RCT,
-No difference in outcome in stable patients
-Surgery Outcome better than conservative RX in progressive Neurological deterioration.
Evidence Level 1++
- B. Basal ganglia Hemorrhage
1. Endoscopy Evacuation better than conservative treatment,
Vol. > 50cc, age < 50 years
Evidence Level 1+
- C. Cerebellar Hemorrhage with obstructive hydrocephalus
Surgical Emergency

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Stroke Surgery

Surgical Treatment Of Intracerebral Hemorrhage

The International STICH Trial

- Spontaneous ICH < 72 hrs
- GCS > 5, Diameter > 2cm
- Age > 14 yrs R
- Craniotomy/Evacuation
- 500 patients
- Conservative Med Control
- 500 patients

Design

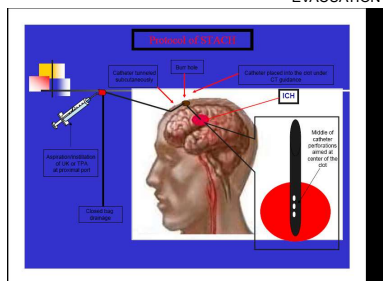
- 83 Centers
- Goal: 1000 patients
- Inclusion: Supratentorial hemorrhage only, uncertainty on need to operate
- Exclusions: severe pre-ICH disability or systemic disease, IVH, BGH
- Outcome: GOS, BI, RS at 6 months
- Funding: UK Stroke Association, UK Medical Research Council
- Coordinating Center: Dept Neurosurgery, Newcastle upon Tyne, UK

David Mendelow, MD
The Lancet Feb 2005

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UROKINASE OR TPA INSTILLATION AND ASPIRATION

THROMBOLYSIS WITH UK / TPA AND MINIMAL INVASIVE EVACUATION- PHASE II



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STROKE SURGERY ISCHEMIC

People with middle cerebral artery (MCA) infarction who meet all of the criteria below should be considered for decompressive hemicraniectomy.

- They should be referred within 24 hours of onset of symptoms and treated within a maximum of 48 hours:
- aged 60 years or under
- clinical deficits suggestive of infarction in the territory of the MCA with a score on the National Institute of Health Stroke Scale (NIHSS) of above 15
- decrease in the level of consciousness to give a score of 1 or more on item 1a of the NIHSS
- signs on MRI of an infarct of at least 50% of the MCA territory, with or without additional
- infarction in the territory of the anterior or posterior cerebral artery on the same side, or
- infarct volume greater than 145 cm³ as shown on diffusion-weighted MRI.

- DECIMAL TRIAL- RCT - Stroke. 2007;38:2506.)
- EVIDENCE LEVEL 1+

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DECIMAL TRIAL-RESULT

Decompressive Craniectomy in Malignant MCA infarction

- Thirty-eight patients from 7 stroke centers had been enrolled in the DECIMAL trial when it was prematurely stopped on recommendation from the data safety monitoring committee. On the basis of interim data, the data safety monitoring committee recommended first, to stop the trial, mainly because of slow recruitment and a high difference in mortality between the 2 groups, and
- second, to organize a pooled analysis of the individual data from DECIMAL and the 2 other ongoing European randomized trials of decompressive craniectomy in malignant MCA infarction (DESTINY and HAMLET).

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STROKE PATHWAYS

RESOURCES:

1. National clinical guidelines for stroke
Clinical Effectiveness & Evaluation Unit
ROYAL COLLEGE OF PHYSICIANS
2. STROKE
National clinical guideline for diagnosis
and initial management of acute stroke and
transient ischaemic attack
ROYAL COLLEGE OF PHYSICIANS
3. Stroke:
Diagnosis and initial management of acute stroke and transient ischaemic attack (TIA)
National Institute of clinical Excellence and Health clinical guideline (NICE)

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LEVELS OF EVIDENCE

I	Evidence obtained from at least one properly randomized controlled trial
II – 1	Evidence obtained from well-designed controlled trials without randomization
II – 2	Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one centre or research group
II – 3	Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of the introduction of penicillin treatment in the 1940s) could also be regarded as this type of evidence
III	Opinions of respected authorities, based on clinical experience, descriptive studies and case reports; or reports of expert committees

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GRADES OF RECOMMENDATIONS

A	At least one meta analysis, systematic review, or randomized controlled trial (RCT), or evidence rated as good and directly applicable to the target population
B	Evidence from well conducted clinical trials, directly applicable to the target population, and demonstrating overall consistency of results; or evidence extrapolated from meta analysis, systematic review or RCT
C	Evidence from expert committee reports, or opinions and/or clinical experiences of respected authorities; indicates absence of directly applicable clinical studies of good quality

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LEVELS OF EVIDENCE- PRIMARY RISK FACTORS

Primary Prevention

Factors	Recommendation	Level of evidence	Grade
Hypertension	Treat medically if BP > 140mmHg systolic and/or >90mmHg diastolic.	I	A
	Lifestyle changes if BP between 130-139 mmHg systolic and/or 80-89mmHg diastolic.	I	A
	Target BP for diabetics is <130mmHg systolic and <80mmHg diastolic.	I	A
	Hypertension should be treated in the very elderly (age > 70 yrs) to reduce risk of stroke.	I	A
Diabetes mellitus	Strict blood pressure control is important in diabetics.	I	A
Hyperlipidaemia	Maintain tight glycaemic control.		
	High risk group: keep LDL < 2.6mmol/l.	I	B
	1 or more risk factors: keep LDL < 3.4mmol/l.		
	No risk factor: keep LDL < 4.2mmol/l.		
Smoking	Cessation of smoking.	III	C
Aspirin therapy	100mg aspirin every other day may be useful in women above the age of 65.	II-1	B
Post menopausal Hormone Replacement therapy	Oestrogen based HRT is not recommended for primary stroke prevention.	I	A
Alcohol	Avoid heavy alcohol consumption.	II-2	B

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LEVELS OF EVIDENCE- PHARMACOTHERAPY

Aspirin	Start aspirin within 48 hours of stroke onset	I	A
	Use of aspirin within 24 hours of r-tPA is not recommended	II-1	A
Anticoagulants	The use of heparins (unfractionated heparin, low molecular weight heparin or heparinoids) is not routinely recommended as it does not reduce the mortality in patients with acute ischaemic stroke.	I	A
Neuroprotective Agents	A large number of clinical trials testing a variety of neuroprotective agents have been completed. These trials have thus far produced negative results.	I	A
	To date, no agent with neuroprotective effects can be recommended for the treatment of patient with acute ischaemic stroke at this time.	I	A

Anticoagulation following Acute Cardioembolic Stroke

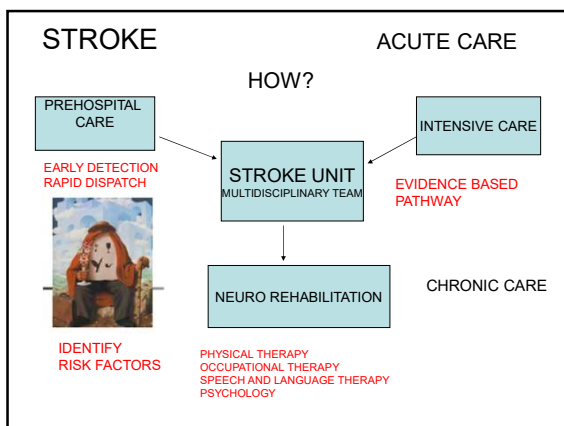
Treatment	Recommendations	Level of Evidence	Grade
Aspirin	All patients should be commenced on aspirin within 48 hours of ischaemic stroke.	I	A
Warfarin	Adjusted-dose warfarin may be commenced within 2-4 days after the patient is both neurologically and medically stable.	II-2	C
Heparin (unfractionated)	Adjusted-dose unfractionated heparin may be started concurrently for patients at very high risk of embolism.	III	C
Anticoagulation	Anticoagulation may be delayed for 1-2 weeks if there has been substantial haemorrhage.	III	C
	Urgent routine anticoagulation with the goal of improving neurological outcomes or preventing early recurrent stroke is not recommended.	I	A
	Urgent anticoagulation is not recommended for treatment of patients with moderate-to-large cerebral infarcts because of a high risk of intracranial bleeding complications.	I	A

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LEVELS OF EVIDENCE

	Treatment	Recommendations	Level of evidence	Grade
Neurosurgery	Carotid Endarterectomy (CEA)	Indicated for most patients with stenosis of 70-99% after a recent ischaemic event in centres with complication rates of less than 6%	I	A
		Earlier intervention (within 2 weeks) is more beneficial.	II-1	B
		May be indicated for patients with stenosis of 50-69% after a recent ischaemic event in centres with complication rates of less than 6%	III	C
		CEA is not recommended for patients with stenosis of less than 50%	I	A
		Patients should remain on antithrombotic therapy before and after surgery	II-2	B
Interventional Neuroradiology	Carotid angioplasty & stenting (CAS)	CAS represents a feasible alternative to carotid endarterectomy for secondary stroke prevention when surgery is undesirable, technically difficult or inaccessible.	II-2	B
		Distal protection devices should be used during the procedure and anti-platelet agents such as clopidogrel be initiated.	I	A
		The long-term safety and efficacy of CAS is not known	III	C
	Intracranial	Role of AS in intra-cranial stenoses, asymptomatic	II-2	C

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Thank you for your attention

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