OVERVIEW

APA ITU STROKE?

DEFINISI

WHO

Suatu keadaan dimana ditemukan tanda-tanda klinis yang berkembang cepat berupa defisit neurologis fokal atau global, yang dapat memberat dan berlangsung selama 24 jam atau lebih dan atau dapat menyebabkan kematian, tanpa adanya penyebab lain yang jelas selain vaskuler
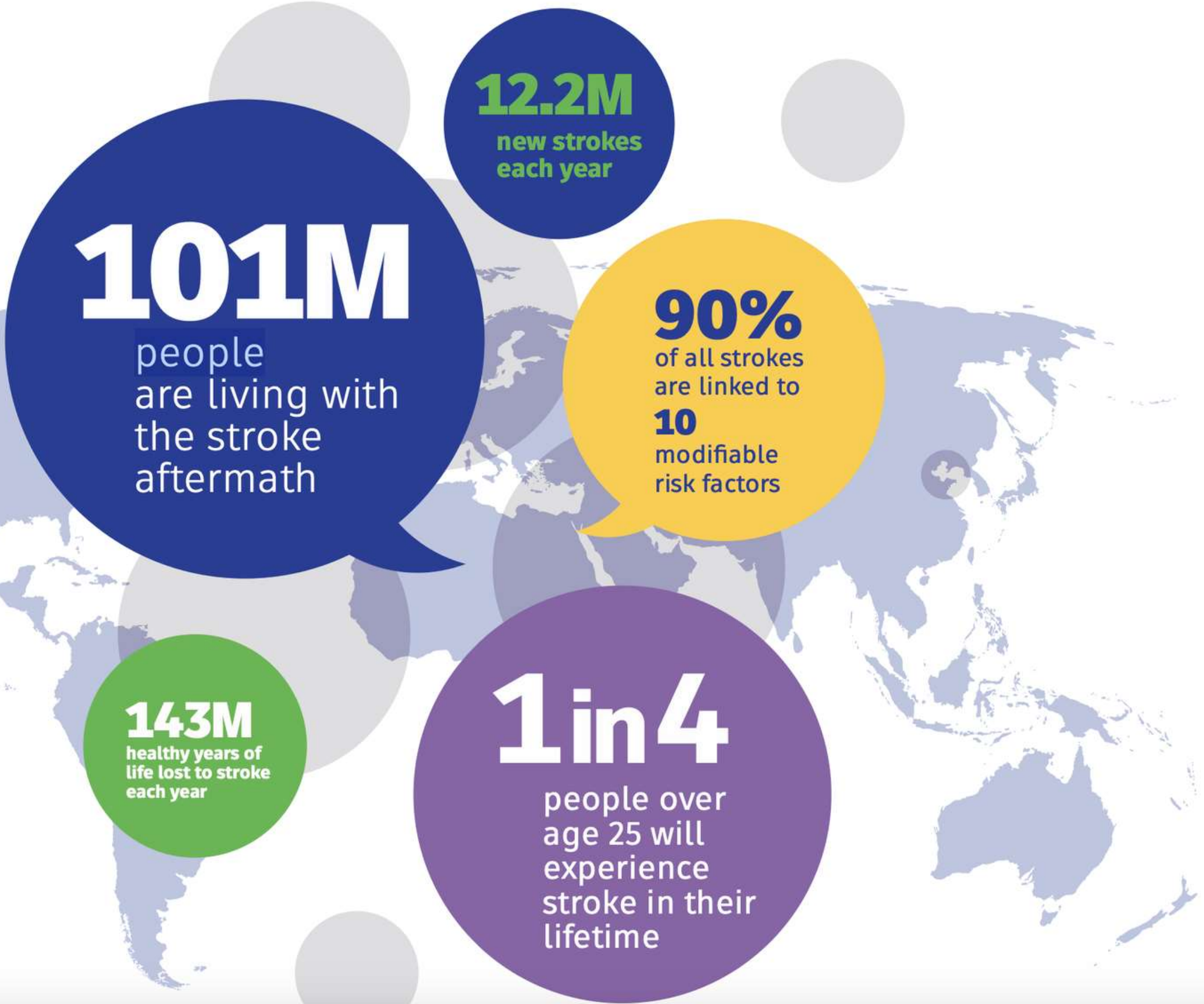
AHA/ASA

Sindrom defisit neurologis yang bersifat akut akibat jejas pada otak, medula spinalis, dan retina yang dapat dijelaskan dengan etiologi vaskuler

PNPK 2019

Manifestasi klinis akut akibat disfungsi neurologis pada otak, medula spinalis, dan retina baik sebagian atau menyeluruh yang menetap selama ≥ 24 jam atau menimbulkan kematian akibat gangguan pembuluh darah

EPIDEMIOLOGI

12.2M new strokes each year

101M people are living with the stroke aftermath

90% of all strokes are linked to **10** modifiable risk factors

143M healthy years of life lost to stroke each year

1 in 4 people over age 25 will experience stroke in their lifetime

Around the world, there are **12.2 MILLION** new strokes per year **ONE EVERY 3 SECONDS**

101 MILLION people worldwide are living with stroke aftermath **THIS NUMBER HAS ALMOST DOUBLED OVER THE LAST 30 YEARS**

54,7 M 1990

101.5 M 2019
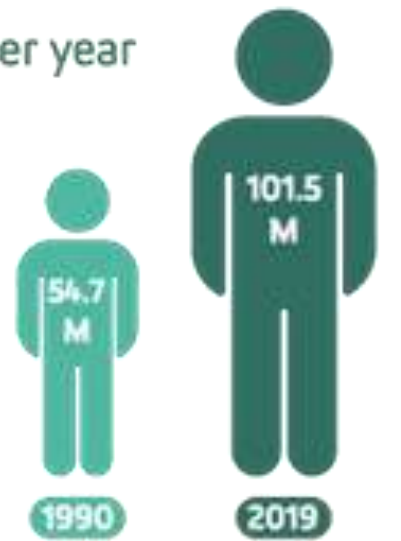
1 in 4 people will have a stroke in their lifetime **THIS NUMBER HAS INCREASED 50% OVER THE LAST 17 YEARS**

1999

2016

63%
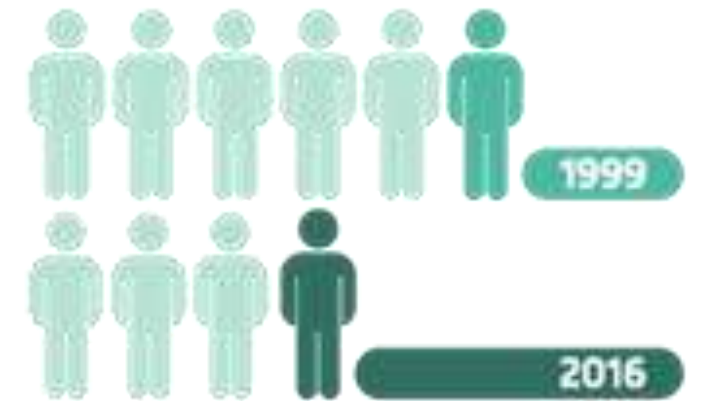
In 2019, **63%** of stroke happened in people younger than 70 years old.

STROKE IS NO LONGER A DISEASE OF THE ELDERLY

World Stroke Organization

Up to **80%** of strokes and heart attacks happen in people with **LOW OR MODERATE CVD ABSOLUTE RISK**

RISKESDAS 2007

Prevalensi stroke 8.3 per 1000

RISKESDAS 2013

PREVALENSI STROKE

NAIK 50%

menjadi 12.1 per 1000

RISKESDAS 2012-2014

67% STROKE ISKEMIK

33% Stroke hemoragik

Kemenkes RI. 2019. Kepmenkes RI No HK 01..07/Menkes/394/2019: PNPK Tata Laksana Stroke

Yudiarto F et al. 2014. Indonesia Stroke Registry. Neurology, 2014: 82(10 Supplement).

2019 Global Burden of Disease estimates for stroke burden (as measured by DALYs) attributable to risk factors*

World Stroke Organization

Metabolic risks (high systolic blood pressure (SBP), high body-mass index (BMI), high fasting plasma glucose (FPG), high total cholesterol, and low glomerular filtration rate) account for

71.0%

(64.6–77.1)
of stroke burden.

Behavioural factors (smoking, poor diet, and low physical activity) account for

47.0%

[41.3 to 54.4]
of stroke burden,
and environmental risks (air pollution and lead exposure)
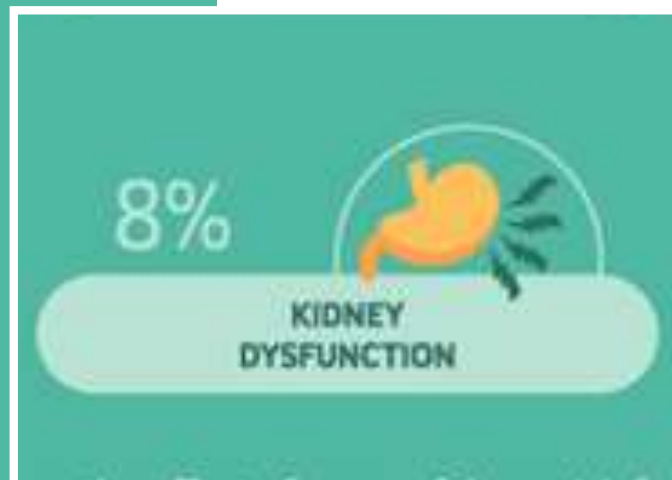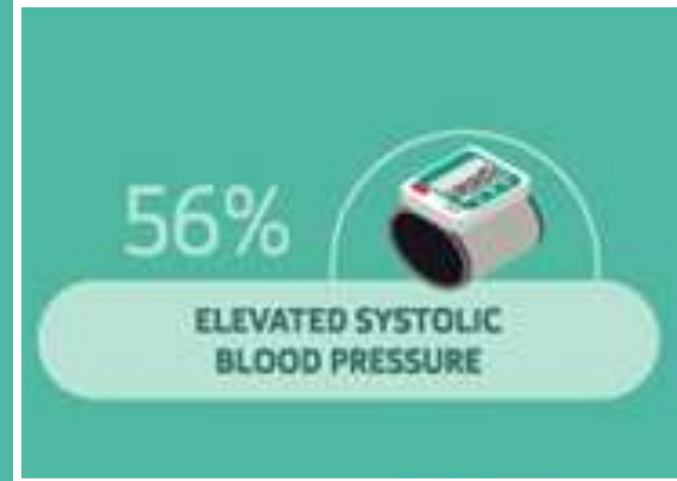
37.8%

[35.0 to 41.0].

Globally, high systolic blood pressure is the largest single risk for stroke
(contributing 79.6 million DALYs [67.7-90.8]; or 55.5% of total stroke DALYs [48.2-62.0]),
high body-mass index (BMI)
(34.9 million [22.3-48.6]; 24.4% [15.7-33.2]),
high fasting plasma glucose
(28.9 million [19.8-41.5]; 20.2% [13.8-29.1]),
ambient particulate matter (PM2.5) pollution
(28.7 million [23.4-33.4]; 20.1% [16.6-23.0]),
and smoking
(25.3 million [22.6-28.2]; 17.7% [16.4-19.0]).

All risk factors combined account for

87.0%

(84.2- 89.8)
of the global stroke burden

10 LEADING STROKE RISK FACTORS IN THE WORLD*

56% ELEVATED SYSTOLIC BLOOD PRESSURE

31% POOR DIET

20% HIGH FASTING GLUCOSE

24% HIGH BODY MASS INDEX

20% AIR POLLUTION

18% SMOKING

10% HIGH LDL CHOLESTEROL

8% KIDNEY DYSFUNCTION

6% ALCOHOL USE

2% LOW PHYSICAL ACTIVITY

World Stroke Organization

*The sum of stroke burden attributable to the risk factors exceeds 100% because the effect of many of these risk factors overlap and are mediated partly or wholly through another risk factors. Percentages show stroke-related disability-adjusted life years attributable to each risk factor.
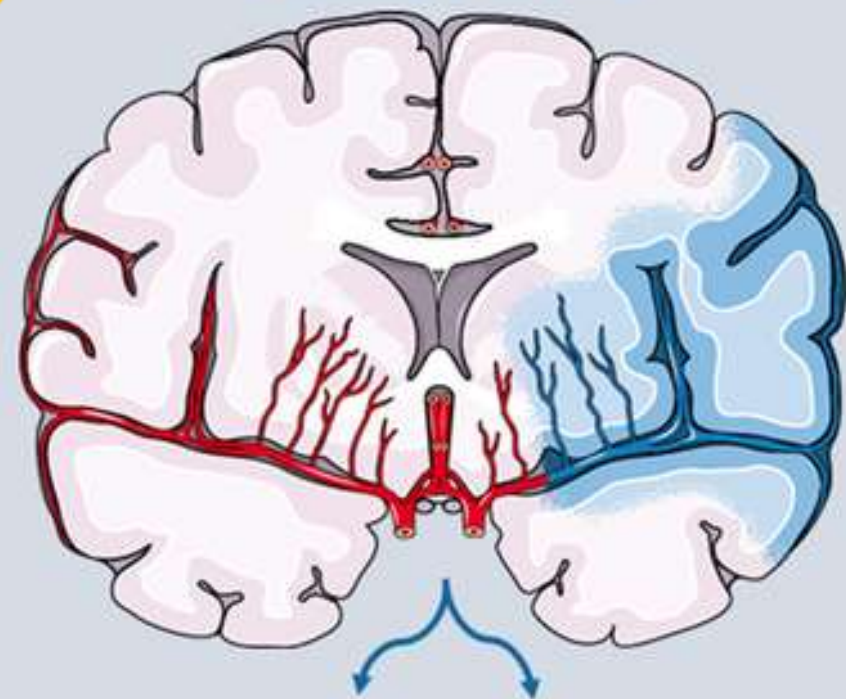
JENIS STROKE

ISKEMIK   VS   HEMORAGIK

87%

A blood clot block the blood flow | A blood vessel rupture and bleeds

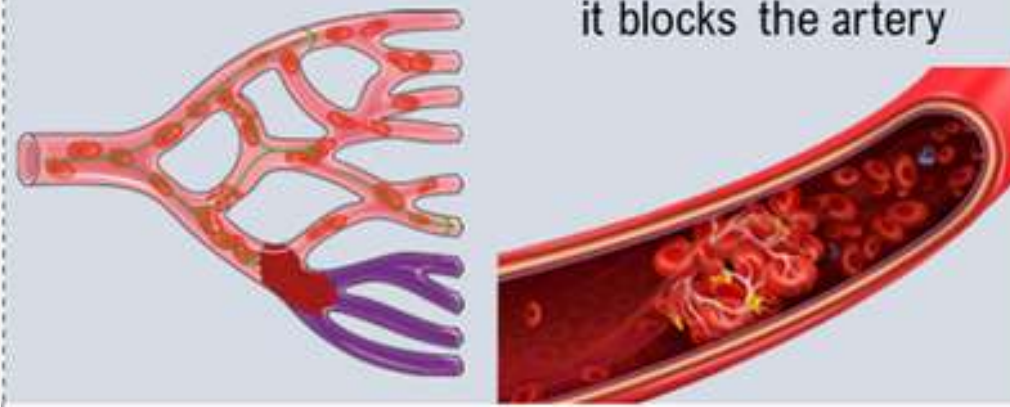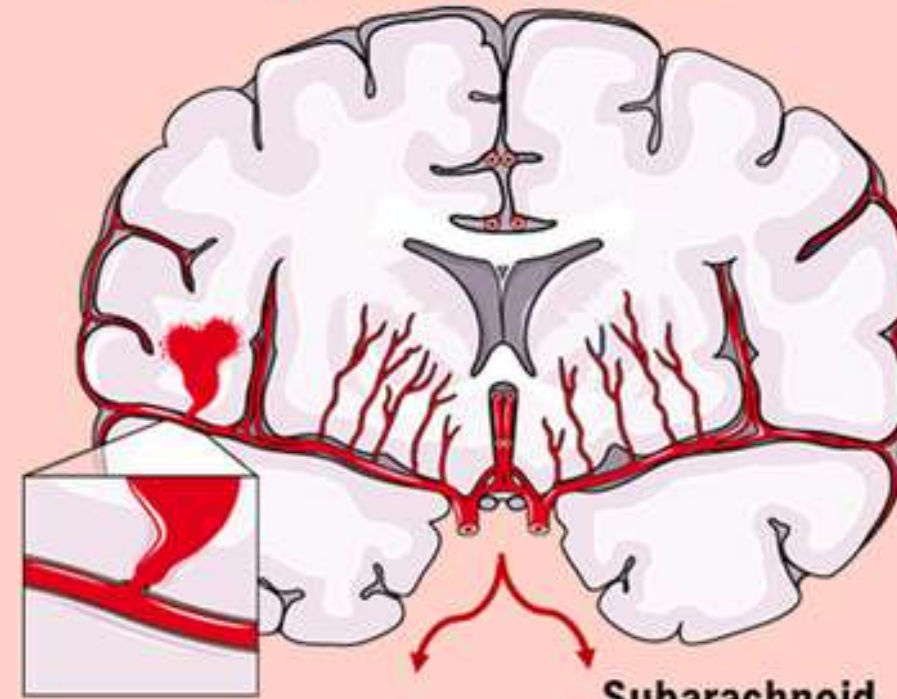**Ischemic Stroke** | **Hemorrhagic Stroke**

Thrombotic
A blood clot forms locally in the brain consequently blocking the blood flow

Embolic
A blood clot formed in the body travels through the bloodstream until it reaches the brain, where it blocks the artery
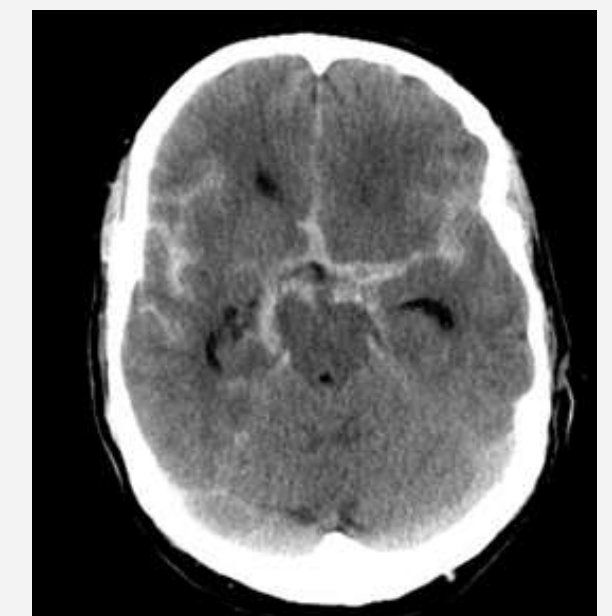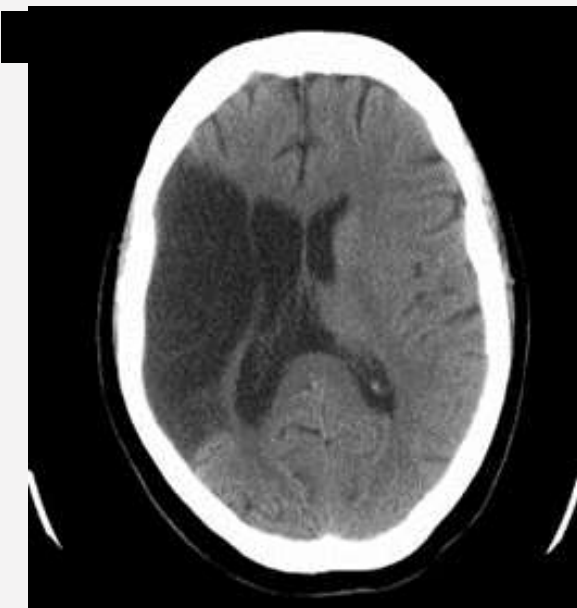
Intracerebral Hemorrhage (ICH)
The bleeding occurs within the brain

Subarachnoid Hemorrhage (SAH)
The bleeding occurs in the subarachnoid space
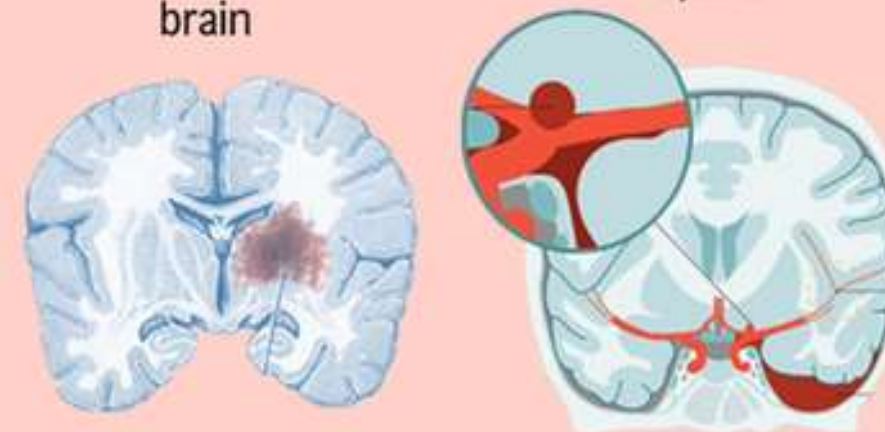
STROKE ISKEMIK

TROMBOSIS   VS   EMBOLI
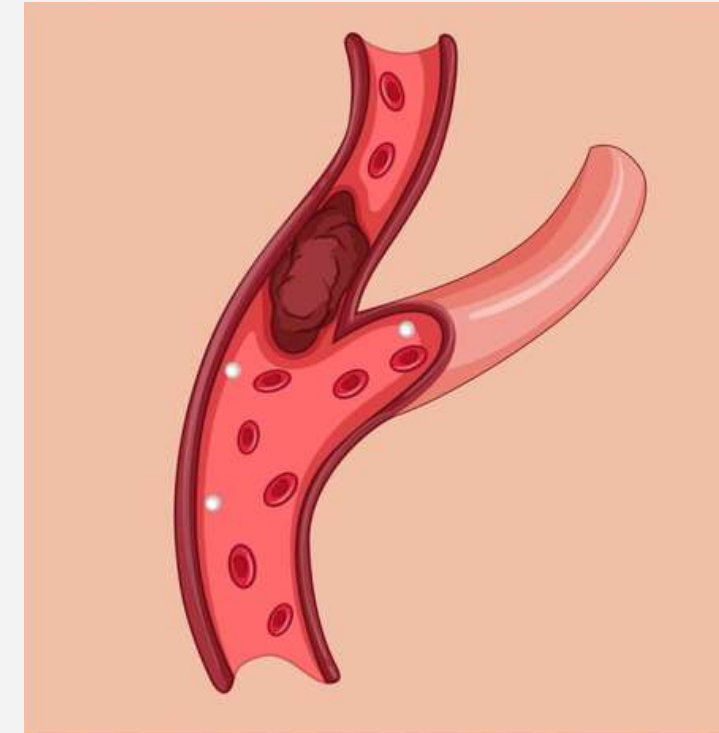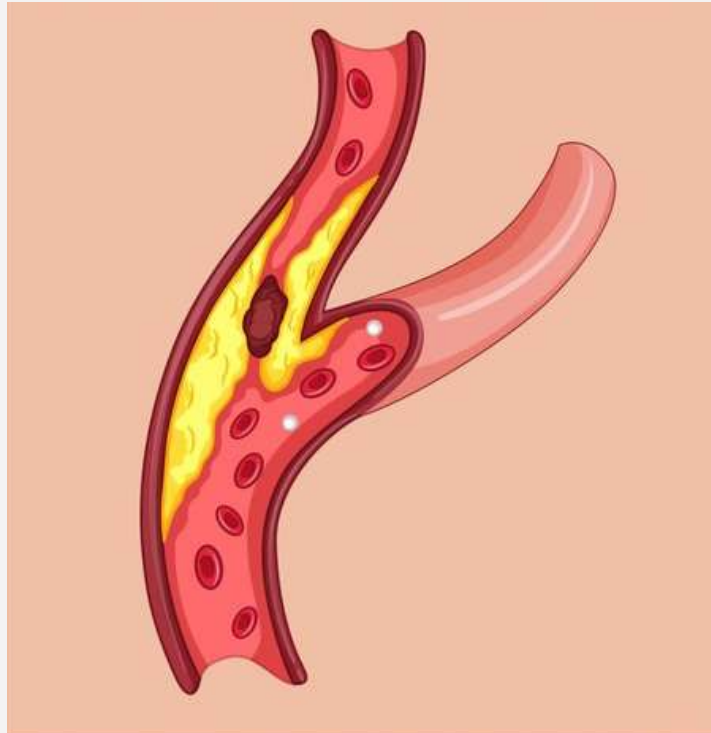
- 15% Kardioemboli pada stroke diakibatkan oleh atrial fibrilasi
- STROKE KRIPTOGENIK

- Transient ischemic attack (TIA): klinis stroke transien kurang dari 24 jam

KLASIFIKASI STROKE

GEJALA DAN TANDA STROKE

World Stroke Organization

B E F A S T

- Loss of balance
- Eyesight changes
- Facial droop
- Arm weakness
- Speech difficulty
- Time to call 911
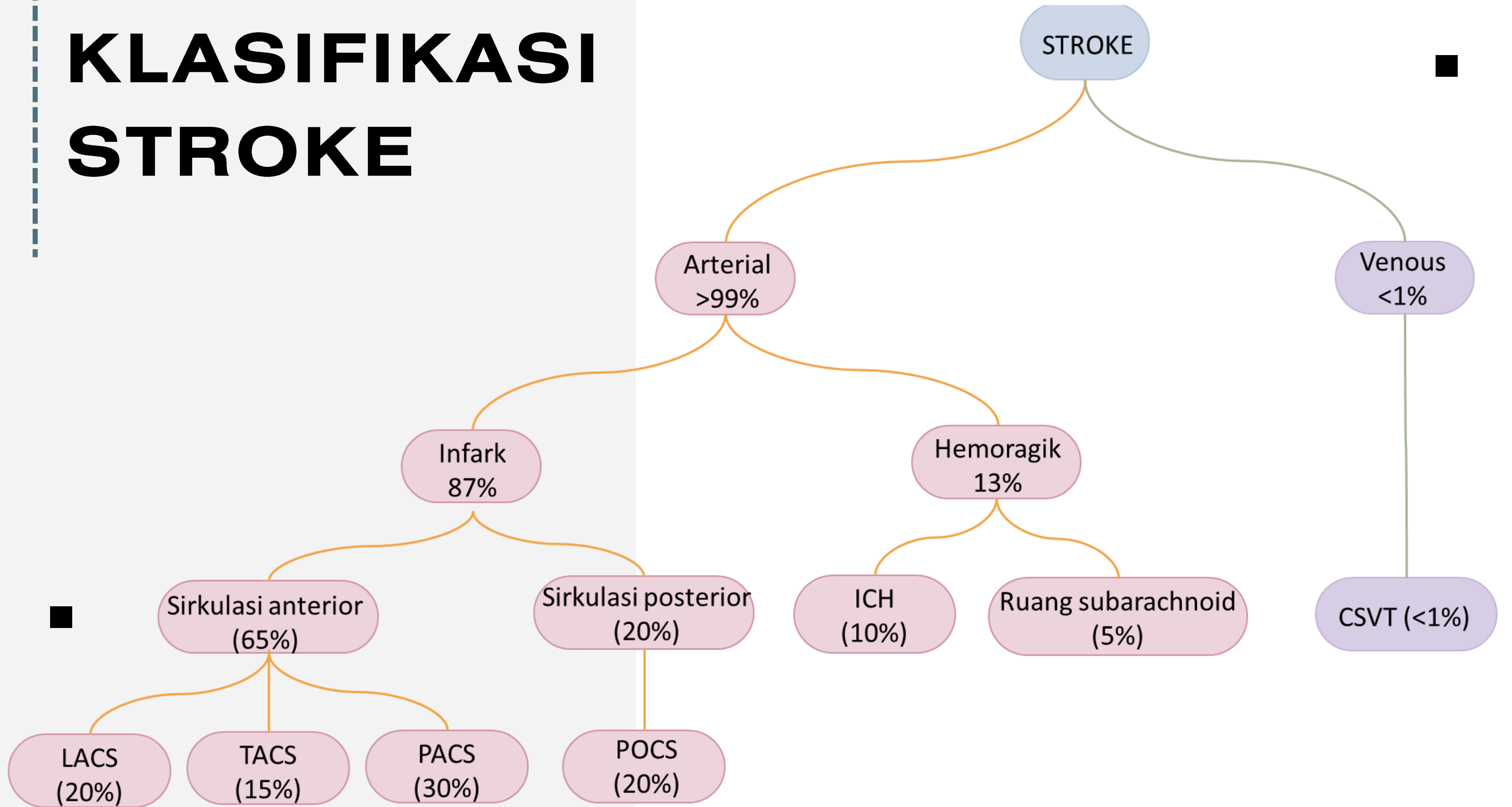
- Kelumpuhan anggota gerak separuh sisi
- Gangguan sensibilitas separuh sisi
- Perubahan status mental mendadak
- Afasia
- Wajah merot
- Bicara pelo

- Gangguan penglihatan (hemianopia atau monookuler)
- Diplopia
- Ataksia
- Vertigo
- Pingsan
- Disfagia

STROKE HEMORAGIK

■

| Assessment type	Comments
History	
Time of symptom onset (or time patient was last normal)	
Symptoms	Headache
	Thunderclap: Aneurysm, RCVS, some instances of CVST
	Slower onset: Mass lesion, some instances of CVST, ischemic stroke with hemorrhagic transformation
	Focal neurologic deficits
	Seizures
	Decreased level of consciousness
Vascular risk factors	Ischemic stroke
	Prior ICH
	Hypertension (Section 9.1.2)
	Hyperlipidemia
	Diabetes
	Metabolic syndrome
	Imaging biomarkers (eg, cerebral microbleeds; Section 9.1.1)
Medications	Antithrombotics:
	Anticoagulants (Section 5.2.1), thrombolytics, antiplatelet agents (Section 5.2.2), NSAIDs (9.1.4), dose and time of last ingestion
	Vasoconstrictive agents (associated with RCVS):
	Triptans, SSRIs (Section 8.2), decongestants, stimulants, phentermine, sympathomimetic drugs
	Antihypertensives (as a marker of chronic hypertension)
	Estrogen-containing oral contraceptives (hemorrhage attributable to CVST)
Cognitive impairment or dementia	Associated with (but not specific for) amyloid angiopathy
Substance use (Section 9.1.5)	Smoking
	Alcohol use
	Marijuana (associated with RCVS)
	Sympathomimetic drugs (amphetamines, methamphetamines, cocaine)
Liver disease, uremia, malignancy, and hematologic disorders	May be associated with coagulopathy

TATA LAKSANA STROKE ISKEMIK

TERAPI GOLD STANDARD STROKE ISKEMIK AKUT

Tergantung dari waktu reperfusi dari jaringan serebral yang iskemik
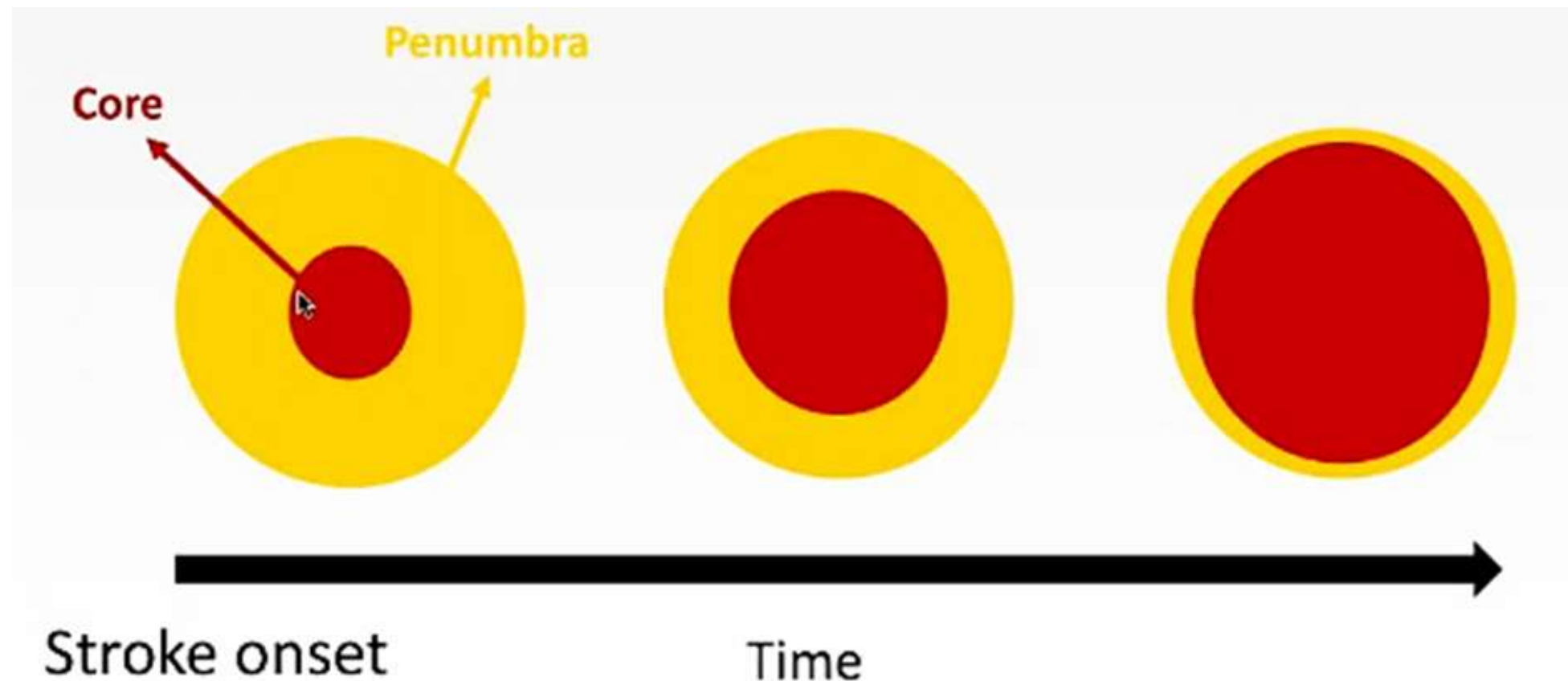
Area otak yang rusak dibagi menjadi inti iskemik (jaringan otak yang pasti mati) dan penumbra (area yang belum mati dan dapat diselamatkan). Semakin lama otak tidak mendapatkan oksigen, Semakin luas kerusakan otak. Seiring berjalannya waktu, luas area otak yang rusak bertambah, sehingga mendapatkan pengobatan segera akan meningkatkan pemulihan.

SO TIME IS BRAIN & SAVE THE PENUMBRA

Manajemen Pasien Curiga Stroke Akut di Faskes Primer

Prinsip: TIME IS BRAIN

**Pasien harus tiba dan mendapat tata laksana di RS dalam kurun waktu < 2jam → Rujuk Segera
Mengetahui daftar RS yang dapat melakukan terapi Trombolisis (rTPA) dan EVT**

| Pasien datang ke Faskes Primer | → | *Early stroke symptoms recognition* oleh Dokter Faskes Primer | → | Persiapan & pelaporan rujukan ke RS terdekat dengan fasilitas rTPA & aktivasi Code Stroke prahospital | → | Persiapan tim Code Stroke di RS Rujukan | → | Pasien tiba di IGD RS Rujukan: Intervensi |
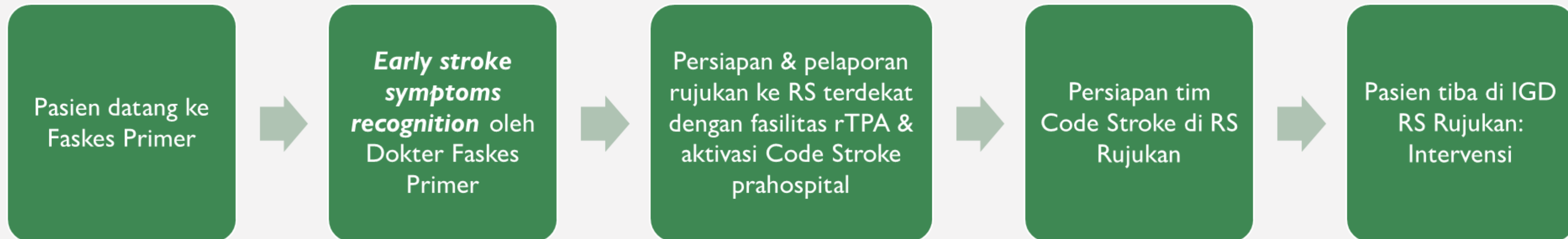
< 2 jam

Adult Suspected Stroke

1 Identify signs and symptoms of possible stroke
Activate Emergency Response

2 Critical EMS assessments and actions
- Support ABCs; give **oxygen** if needed
- Perform prehospital stroke assessment (Table 1)
- Establish time of symptom onset (last normal)
- Triage to stroke center
- Alert hospital
- Check glucose if possible

3 Immediate general assessment and stabilization
- Assess ABCs, vital signs
- Provide **oxygen** if hypoxemic
- Obtain IV access and perform laboratory assessments
- Check glucose; treat if indicated
- Perform neurologic screening assessment
- Activate stroke team
- Order emergent CT scan or MRI of brain
- Obtain 12-lead ECG

NINDS TIME GOALS

ED Arrival 10 min

ED Arrival 25 min

ED Arrival 45 min

ED Arrival 60 min

Stroke Admission 3 hours

4 Immediate neurologic assessment by stroke team or designee
- Review patient history
- Establish time of symptom onset or last known normal
- Perform neurologic examination (NIH Stroke Scale or Canadian Neurological Scale)

5 *Does CT scan show hemorrhage?*

No Hemorrhage / **Hemorrhage**

6 Probable acute ischemic stroke; consider fibrinolytic therapy
- Check for fibrinolytic exclusions (Tables 4 and 5)
- Repeat neurologic exam: are deficits rapidly improving to normal?

7 Consult neurologist or neurosurgeon; consider transfer if not available

8 *Patient remains candidate for fibrinolytic therapy?*

Not a Candidate

9 Administer **aspirin**

Candidate

10 Review risks/benefits with patient and family. If acceptable:
- Give **rtPA**
- No anticoagulants or antiplatelet treatment for 24 hours

11
- Begin stroke or hemorrhage pathway
- Admit to stroke unit or intensive care unit

12
- Begin post-rtPA stroke pathway
- Aggressively monitor:
  – BP per protocol (Tables 2 and 3)
  – For neurologic deterioration
- Emergent admission to stroke unit or intensive care unit

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ALGORITMA PASIEN STROKE AKUT

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MANAJEMEN HIPERTENSI PADA STROKE ISKEMIK AKUT

Table 2. Potential Approaches to Arterial Hypertension in Acute Ischemic Stroke Patients Who Are Potential Candidates for Acute Reperfusion Therapy

Patient otherwise eligible for acute reperfusion therapy except that blood pressure is >185/110 mm Hg

- Labetalol 10–20 mg IV over 1–2 minutes, may repeat ×1, or
- Nicardipine IV 5 mg/hr, titrate up by 2.5 mg/hr every 5–15 minutes, maximum 15 mg/hr; when desired blood pressure reached, lower to 3 mg/hr, or
- Other agents (hydralazine, enalaprilat, etc) may be considered when appropriate

If blood pressure is not maintained at or below 185/110 mm Hg, do not administer rtPA

Management of blood pressure during and after rtPA or other acute reperfusion therapy:

- Monitor blood pressure every 15 minutes for 2 hours from the start of rtPA therapy; then every 30 minutes for 6 hours; and then every hour for 16 hours

If systolic BP 180–230 mm Hg or diastolic BP 105–120 mm Hg

- Labetalol 10 mg IV followed by continuous IV infusion 2–8 mg/min, or
- Nicardipine IV 5 mg/h, titrate up to desired effect by 2.5 mg/hr every 5–15 minutes, maximum 15 mg/h

If blood pressure not controlled or diastolic BP >140 mm Hg, consider sodium nitroprusside

Table 3. Approach to Arterial Hypertension in Acute Ischemic Stroke Patients Who Are *Not* Potential Candidates for Acute Reperfusion Therapy

Consider lowering blood pressure in patients with acute ischemic stroke if systolic blood pressure >220 mm Hg or diastolic blood pressure >120 mm Hg

Consider blood pressure reduction as indicated for other concomitant organ system injury

- Acute myocardial infarction
- Congestive heart failure
- Acute aortic dissection

A reasonable target is to lower blood pressure by 15% to 25% within the first day

PREVENSI STROKE SEKUNDER

Antiplatelet/antikoagulan

Manajemen hipertensi

Changing lifestyle

Mengendalikan faktor risiko vaskular

PREVENSI STROKE SEKUNDER (1)

Recommendations for Intracranial Large Artery Atherosclerosis
Referenced studies that support recommendations are summarized in online Data Supplements 20–27.

COR	LOE	Recommendations
		Antithrombotic Therapy
1	B-R	1. In patients with a stroke or TIA caused by 50% to 99% stenosis of a major intracranial artery, aspirin 325 mg/d is recommended in preference to warfarin to reduce the risk of recurrent ischemic stroke and vascular death.[335,336]
2a	B-NR	2. In patients with recent stroke or TIA (within 30 days) attributable to severe stenosis (70%–99%) of a major intracranial artery, the addition of clopidogrel 75 mg/d to aspirin for up to 90 days is reasonable to further reduce recurrent stroke risk.[336–339]
		Risk Factor Management
1	B-NR	6. In patients with a stroke or TIA attributable to 50% to 99% stenosis of a major intracranial artery, maintenance of SBP below 140 mmHg, high-intensity statin therapy, and at least moderate physical activity are recommended to prevent recurrent stroke and vascular events.[110,210,337,345–349]

Recommendations for Extracranial Carotid Stenosis
Referenced studies that support recommendations are summarized in online Data Supplement 28.

COR	LOE	Recommendations
1	A	1. In patients with a TIA or nondisabling ischemic stroke within the past 6 months and ipsilateral severe (70%–99%) carotid artery stenosis, carotid endarterectomy (CEA) is recommended to reduce the risk of future stroke, provided that perioperative morbidity and mortality risk is estimated to be <6%.[369]
1	A	2. In patients with ischemic stroke or TIA and symptomatic extracranial carotid stenosis who are scheduled for carotid artery stenting (CAS) or CEA, procedures should be performed by operators with established periprocedural stroke and mortality rates of <6% to reduce the risk of surgical adverse events.[370]
1	A	3. In patients with carotid artery stenosis and a TIA or stroke, intensive medical therapy, with antiplatelet therapy, lipid-lowering therapy, and treatment of hypertension, is recommended to reduce stroke risk.[210]
1	B-R	4. In patients with recent TIA or ischemic stroke and ipsilateral moderate (50%–69%) carotid stenosis as documented by catheter-based imaging or noninvasive imaging, CEA is recommended to reduce the risk of future stroke, depending on patient-specific factors such as age, sex, and comorbidities, if the perioperative morbidity and mortality risk is estimated to be <6%.[369]

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PREVENSI STROKE SEKUNDER (2)

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Recommendations for Extracranial Vertebral Artery Stenosis
Referenced studies that support recommendations are summarized in online Data Supplement 28.

COR	LOE	Recommendations
1	A	1. In patients with recently symptomatic extracranial vertebral artery stenosis, intensive medical therapy (antiplatelet therapy, lipid lowering, BP control) is recommended to reduce stroke risk.[378]
2b	B-R	2. In patients with ischemic stroke or TIA and extracranial vertebral artery stenosis who are having symptoms despite optimal medical treatment, the usefulness of stenting is not well established.[378]
2b	C-EO	3. In patients with ischemic stroke or TIA and extracranial vertebral artery stenosis who are having symptoms despite optimal medical treatment, the usefulness of open surgical procedures, including vertebral endarterectomy and vertebral artery transposition, is not well established.

Recommendation for Small Vessel Stroke
Referenced studies that support the recommendation are summarized in online Data Supplement 31.

COR	LOE	Recommendation
2b	B-R	1. In patients with ischemic stroke related to small vessel disease, the usefulness of cilostazol for secondary stroke prevention is uncertain.[382,384,408–410]

Recommendations for Aortic Arch Atherosclerosis
Referenced studies that support recommendations are summarized in online Data Supplement 29.

COR	LOE	Recommendations
1	B-R	1. In patients with a stroke or TIA and evidence of an aortic arch atheroma, intensive lipid management to an LDL cholesterol target <70 mg/dL is recommended to prevent recurrent stroke.[210]
1	C-LD	2. In patients with a stroke or TIA and evidence of an aortic arch atheroma, antiplatelet therapy is recommended to prevent recurrent stroke.[380–385]

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PREVENSI STROKE SEKUNDER (3)

Recommendations for Hypertension

Referenced studies that support recommendations are summarized in online Data Supplements 11 and 12.

COR	LOE	Recommendations
1	A	1. In patients with hypertension who experience a stroke or TIA, treatment with a thiazide diuretic, angiotensin-converting enzyme inhibitor, or angiotensin II receptor blockers is useful for lowering BP and reducing recurrent stroke risk.[185–189]
1	B-R	2. In patients with hypertension who experience a stroke or TIA, an office BP goal of <130/80 mm Hg is recommended for most patients to reduce the risk of recurrent stroke and vascular events.[185,190–194]
1	B-NR	3. In patients with hypertension who experience a stroke or TIA, individualized drug regimens that take into account patient comorbidities, agent pharmacological class, and patient preference are recommended to maximize drug efficacy.[188,189,195,196]
2a	B-R	4. In patients with no history of hypertension who experience a stroke or TIA and have an average office BP of ≥130/80 mm Hg, antihypertensive medication treatment can be beneficial to reduce the risk of recurrent stroke, ICH, and other vascular events.[190,191,193,197]

Statin Therapy for Preventing Recurrent Stroke in Patients with Ischemic Stroke: A Systematic Review and Meta-Analysis of Randomized Controlled Trials and Observational Cohort Studies

Yue Yin,[a] Li Zhang,[a,*] Iain Marshall,[a] Charles Wolfe,[a,b,c] and Yanzhong Wang[a,b,c]

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Results: We retrieved 559 papers in searches, of which 11 RCTs and 12 observational cohort studies were included. Both RCTs and observational studies found that statins reduced the odds of stroke of any type in those with an initial ischemic stroke (11 RCTs: OR = 0.87, 95% CI [0.77,0.97]; p = 0.02; 12 cohort studies: OR = 0.80, 95% CI [0.66, 0.96]; p = 0.02). Both RCTs and observational studies found that recurrence of ischemic stroke was reduced by statins (6 RCTs: OR = 0.81, 95% CI [0.70, 0.93]; p = 0.002; 3 observational studies: OR = 0.67, 95% CI [0.61, 0.75]; p < 0.00001). Data from 7 RCTs and 8 cohort studies did not find a significant difference in hemorrhagic stroke but could not rule out a substantial increase or reduction (7 RCTs: OR = 1.15, 95% CI [0.62, 2.13]; p = 0.66; 8 cohort studies: OR = 0.93, 95% CI [0.71, 1.21]; p = 0.59).

Conclusions: In people who have experienced an ischemic stroke, statins reduce the risk of recurrent stroke of any type medicated through a reduction of ischemic stroke. We found no increase in the risk of hemorrhagic stroke.

PREVENSI STROKE SEKUNDER (POST STROKE HEMORAGIK)

Recommendations for Prognostication of Future ICH Risk
Referenced studies that support recommendations are summarized in Data Supplement 75.

COR	LOE	Recommendation
2a	B-NR	1. In patients with spontaneous ICH in whom the risk for recurrent ICH may facilitate prognostication or management decisions, it is reasonable to incorporate the following risk factors for ICH recurrence into decision-making: (a) lobar location of the initial ICH; (b) older age; (c) presence, number, and lobar location of microbleeds on MRI; (d) presence of disseminated cortical superficial siderosis on MRI; (e) poorly controlled hypertension; (f) Asian or Black race; and (g) presence of apolipoprotein E ε2 or ε4 alleles.[562–571]

Recommendations for BP Management
Referenced studies that support recommendations are summarized in Data Supplements 75 and 76.

COR	LOE	Recommendations
1	B-R	1. In patients with spontaneous ICH, BP control is recommended to prevent hemorrhage recurrence.[563,581]
2a	B-NR	2. In patients with spontaneous ICH, it is reasonable to lower BP to an SBP of 130 mm Hg and diastolic BP (DBP) of 80 mm Hg for long-term management to prevent hemorrhage recurrence.[581,582]

Recommendations for Management of Antithrombotic Agents
Referenced studies that support recommendations are summarized in Data Supplements 77 through 79.

COR	LOE	Recommendations
2a	C-LD	1. In patients with spontaneous ICH and conditions placing them at high risk of thromboembolic events, for example, a mechanical valve or LVAD, early resumption of anticoagulation to prevent thromboembolic complications is reasonable.[586,587]
2b	B-R	2. In patients with spontaneous ICH with an indication for antiplatelet therapy, resumption of antiplatelet therapy may be reasonable for the prevention of thromboembolic events based on consideration of benefit and risk.[588,589]
2b	B-NR	3. In patients with nonvalvular atrial fibrillation (AF) and spontaneous ICH, the resumption of anticoagulation to prevent thromboembolic events and reduce all-cause mortality may be considered based on weighing benefit and risk.[590–595]
2b	C-LD	4. In patients with AF and spontaneous ICH in whom the decision is made to restart anticoagulation, initiation of anticoagulation ≈7 to 8 weeks after ICH may be considered after weighing specific patient characteristics to optimize the balance of risks and benefits.[596,597]
2b	C-LD	5. In patients with AF and spontaneous ICH deemed ineligible for anticoagulation, left atrial appendage closure may be considered to reduce the risk of thromboembolic events.[598–602]

Recommendations for Management of Other Medications
Referenced studies that support recommendations are summarized in Data Supplements 80 and 81.

COR	LOE	Recommendations
2b	B-NR	1. In patients with spontaneous ICH and an established indication for statin pharmacotherapy, the risks and benefits of statin therapy on ICH outcomes and recurrence relative to overall prevention of cardiovascular events are uncertain.[605–609]
3: Harm	B-NR	2. In patients with spontaneous ICH, regular long-term use of nonsteroidal anti-inflammatory drugs (NSAIDs) is potentially harmful because of the increased risk of ICH.[610,611]

Recommendations for Lifestyle Modifications/Patient and Caregiver Education
Referenced studies that support recommendations are summarized in Data Supplement 82.

COR	LOE	Recommendations
Lifestyle modification		
2a	C-LD	1. In patients with spontaneous ICH, lifestyle modification is reasonable to reduce BP.[632]
2a	C-LD	2. In patients with spontaneous ICH, avoiding heavy alcohol consumption is reasonable to reduce hypertension and risk of ICH recurrence.[633–635]
2b	C-LD	3. In patients with spontaneous ICH, lifestyle modification, including supervised training and counseling, may be reasonable to improve functional recovery.[636,637]
Patient and caregiver education		
2a	C-LD	4. In patients with spontaneous ICH, psychosocial education for the caregiver can be beneficial to increase patients' activity level and participation and/or quality of life.[638]
2a	C-LD	5. In patients with spontaneous ICH, practical support and training for the caregiver are reasonable to improve patients' standing balance.[639]

TAKE HOME MESSAGE

STROKE ADALAH KEGAWATAN NEUROLOGIS

PENGENALAN SEGERA GEJALA STROKE: SANGAT PENTING

SEGERA RUJUK (< 2JAM) KE RS TERDEKAT DENGAN FASILITAS TROMBOLISIS

PENANGANAN STROKE ADALAH TANGGUNG JAWAB BERSAMA

THANK YOU

02 OKTOBER, 2024