



Patient Information on Acute Stroke Activation Programme (ASAP)

For enquiries and appointments,
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Consultation by Appointment

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What is Acute Stroke?

There are two types of acute stroke: ischaemic stroke due to interruption of blood flow to the brain, and haemorrhagic stroke due to bleeding into the brain. Ischaemic stroke is caused by a blood clot cutting off the blood supply to an area of the brain, depriving the brain tissue of oxygen and nutrients. As a result, the brain tissue suffers damage and eventually dies. The effect of acute stroke depends on the location and severity of brain tissue damage. Severe stroke may result in significant permanent disability or even death.

“Time is Brain” in Acute Stroke Management

During the initial phase of acute ischaemic stroke, not all brain tissue with interrupted blood supply becomes permanently damaged immediately. Some of the tissue can be salvaged if the blood supply can be restored within a critical time period. This time window for rescue is very short, and the earlier the blood supply can be restored, the better the outcome is. Reperfusion by thrombolytic therapy is a high-risk intervention and has to be conducted by a team of experienced professionals. For accurate diagnosis and prompt treatment, acute stroke management requires concerted efforts and seamless coordination of different disciplines and specialists.

ASAP at Hong Kong Sanatorium & Hospital

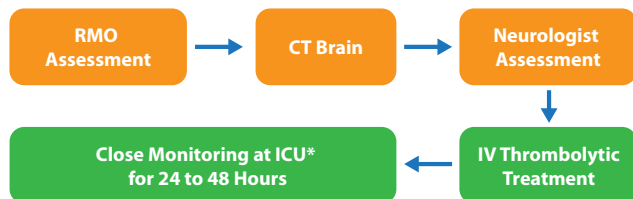
Launched in 2016, the Acute Stroke Activation Programme (ASAP) mainly caters for patients with acute ischaemic stroke presenting within 3 hours of the onset of stroke and provides them with intravenous thrombolytic therapy, i.e. administration of drugs via injection to dissolve blood clots in vessels and restore cerebral blood flow.

Adopted by ASAP since 2021, the RapidAI software, an AI-enhanced cerebrovascular imaging system, can determine the amount and percentage of salvageable brain tissue based on neurovascular magnetic resonance imaging (MRI) and perfusion scanning. Doctors can now determine the patient's eligibility for endovascular thrombectomy and provide more treatment options to patients who might have missed the golden 3-hour window after stroke onset.

Activation of ASAP for Arrival Within 3 Hours After Onset

In general, intravenous thrombolytic therapy is most effective if it can be commenced within 3 hours of the onset of stroke. Some patients may show improvement when treatment is commenced within 4.5 hours. Our Resident Medical Officer (RMO) at HKSH Family Medicine and Primary Care Centre will first conduct a priority assessment on the suspected stroke patient upon arrival at the 24-hour Outpatient Service.

If the preliminary diagnosis of acute stroke is established, priority CT brain scan will be performed on the patient to differentiate between haemorrhagic and ischaemic stroke. At the same time, an in-house neurologist will be called back to provide assessment.



*ICU admission is subject to the final decision of the attending neurologist.

What is Thrombolytic Therapy?

Thrombolysis is a treatment to break up and dissolve blood clots in blocked blood vessels. Alteplase (Actilyse) and Tenecteplase (Metalyse) are thrombolytic (or clot-dissolving) medicines that can be given intravenously to dissolve the blood clot and possibly restore the blood supply to the brain tissue affected by acute stroke, thereby improving the chance of recovery after acute stroke. After treatment, patients may receive further endovascular assessment with RapidAI software to evaluate treatment outcome and guide subsequent management.

Thrombolytic therapy is most effective if given within 4.5 hours from the onset of acute stroke symptoms. While on average only about 1 in 4 (26%) patients recover to full independence following an ischaemic stroke, the same outcome is achieved in another 1 in 8 patients (13%) after thrombolytic therapy.

What Are the Risks of Thrombolytic Therapy?

Haemorrhage (bleeding) in the brain or other parts of the body is the most significant risk of thrombolytic therapy. Approximately 1 in 15 (6%) patients treated with thrombolytic therapy develops bleeding in the brain that worsens neurological impairment, or even leads to death in 1% of patients. The same type of bleeding may also occur in the damaged brain tissue of ischaemic stroke patients not treated with thrombolytic therapy. Close monitoring and control of blood pressure are required during the first 24 hours after thrombolytic therapy. The stroke team will determine one's eligibility for thrombolytic therapy based on the clinical profile and brain scan findings. The treatment may not be considered for patients with certain medical conditions that increase the risk of bleeding in the brain or other organs, a past history of bleeding in the brain, or stroke beyond the recommended time window.

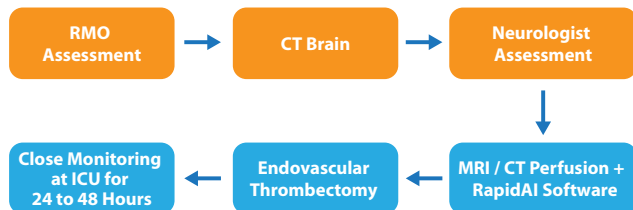
What Treatment Will I Receive If I Choose Not to Receive Thrombolytic Therapy?

If you are considered not eligible for or choose not to receive thrombolytic therapy, you will receive the standard treatment for acute stroke including antithrombotic therapy, cholesterol-lowering therapy, blood pressure stabilisation, nursing care and physiotherapy to prevent complications and enhance the outcome of rehabilitation. The package charges are not applicable in this case.

For Arrival After 3 Hours of Onset or No Improvement After Intravenous Thrombolytic Therapy

When severe stroke patients show no improvement after intravenous thrombolytic therapy or arrive at the hospital after the desirable time limit, MRI or CT perfusion scanning will be performed on the brain and cerebral blood vessels to confirm large vessel blockage. To determine if one is suitable for endovascular thrombectomy, the amount and ratio of the salvageable and irreversibly damaged brain tissue can now be assessed and calculated using the RapidAI software.

Timely treatment is vital to ensure survival and satisfactory recovery of acute stroke patients. The AI system plays a significant role in saving time as the report can be generated in about 10 minutes, thereby enabling neurologists and neurosurgeons to decide on the best treatment option for individual patients most effectively, efficiently and beyond the 4.5-hour time limit, e.g. the feasibility of endovascular thrombectomy.



What is Endovascular Thrombectomy?

Endovascular thrombectomy is a minimally invasive surgery for acute ischaemic stroke patients with large vessel occlusion.

During the procedure, the neurosurgeon will try to reestablish blood flow to the affected part of the brain by using catheters to reach the blocked brain vessels and remove the blood clot. Endovascular thrombectomy is best performed within 6 hours of the onset of severe stroke. Research has shown good functional outcome in ischaemic stroke patients who meet certain criteria and receive endovascular thrombectomy within 16 or 24 hours after onset based on the perfusion scans and AI analysis.

What are the Risks of Endovascular Thrombectomy?

Endovascular thrombectomy has certain risks, such as blood vessel damage. The attending doctors will carefully assess the patients' eligibility for this procedure based on the AI-generated data. Patients are transferred to Intensive Care Unit (ICU) after endovascular thrombectomy, and are closely monitored for blood pressure and vital signs in the next 24 to 48 hours.

What Are the Other Roles of Neurosurgery in Acute Stroke Management?

Joint management with a neurosurgeon is required in the following clinical settings:

- Haemorrhagic stroke, including subarachnoid haemorrhage
- Haemorrhagic transformation of ischaemic stroke, including those occurring after thrombolytic therapy
- Large areas of damaged brain tissue in ischaemic stroke causing brain swelling and impairment in conscious level

Charges for ASAP Packages

Hong Kong Sanatorium & Hospital offers service packages to acute ischaemic stroke patients with eligibility assessment and therapy.

Acute Stroke Diagnostic and Assessment Package

Package Component	Charge for Semi-private Room	Charge for Private Room
Diagnostic and Assessment	HK\$22,100	

*ICU admission is subject to the final decision of the attending neurologist.

Acute Stroke Treatment Package

Package Component	Charge for ICU Semi-private Room	Charge for ICU Private Room
Intravenous Thrombolytic Therapy Package	HK\$71,000	HK\$98,000

The Acute Stroke Diagnostic and Assessment Package Includes:

- RMO and Neurologist consultation and assessment
- Nursing care and monitoring at the 24-hour Outpatient Service and before admission
- Urgent blood tests for assessment of acute ischaemic stroke (CBC, PT, APTT, LFT, RFT, C-reaction protein, ESR, HbA1c, random glucose)
- Urgent non-contrast CT brain scan
- ECG

The Acute Stroke Thrombolytic Therapy Package Includes:

- ICU care for up to 48 hours
- Standard nursing care and procedures for up to 48 hours
- Attendance of a neurologist for the first two days
- Standard blood tests for stroke risk assessment (fasting glucose, lipid profile)
- Medication cost of Alteplase or Tenecteplase (thrombolytic)

Items Not Included in the Above Packages:

- Endovascular thrombectomy and surgical procedures or interventions of other medical conditions (the approximate charge for neurosurgery in the setting of acute stroke interventions ranges from HK\$140,000 to HK\$650,000 in General Ward, and varies with operation complexity. The above charge includes operation fee, anaesthetist's fee, surgeon's fee but not room charges, doctor's ward round and other hospital charges)
- Other doctor's fees for other medical conditions
- Additional investigations other than those included in the packages, such as laboratory tests, blood transfusion, MRI, CT, ultrasound, X-ray examinations
- Other medications
- Other emergency treatments and use of special equipment in ICU
- Self-selected meals and overnight companion bed (companion bed only available in private rooms)

Remarks About Package Charges

- Early withdrawal is not entertained
- The Chinese version shall prevail in case of dispute
- The possible risks and complications as mentioned above are not exhaustive
- Rare and other unforeseeable complications may occasionally occur, and the risks may vary from person to person
- Should you have any enquiries, please consult your/ the patient's doctor

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