For enquiries and appointments,
please contact us

HKSH Clinical Neuroscience Centre

HKSH Neurology Centre
HKSH Neurosurgery Centre
HKSH Neurophysiology Service

Happy Valley
Hong Kong Sanatorium & Hospital
3/F, Central Block
2 Village Road, Happy Valley, Hong Kong
(852) 2835 7689 (852) 2892 7569
neurology@hksh-hospital.com
www.hksh-hospital.com

Consultation by Appointment

For enquiry, please contact
24-hour Outpatient Service
Hong Kong Sanatorium & Hospital
(852) 2835 8602

NC.005I.H/E-17-082025

www.hksh.com

Patient Information on Acute Stroke Activation Programme (ASAP)

HKSH Clinical Neuroscience Centre

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 tissues with interrupted blood supply becomes permanently damaged immediately. Some of the tissues 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 1.0 and 2.0 of Hong Kong Sanatorium & Hospital

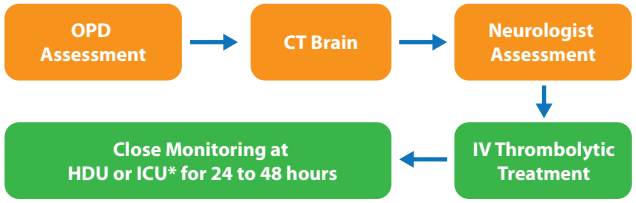
Launched in 2016, ASAP 1.0 mainly caters for patients with acute ischaemic stroke presenting within 3 hours of the onset of stroke and provides them with intravenous thrombolytic therapy, i.e. administration of drugs via injection to dissolve blood clots in vessels and restore cerebral blood flow.

Built on the ASAP 1.0, the latest ASAP 2.0 is an enhanced programme for severe acute stroke patients. It adopts RapidAI software, an AI-enhanced cerebrovascular imaging system, to determine the amount and percentage of salvageable brain tissues based on neurovascular magnetic resonance imaging (MRI) and perfusion scanning. Doctors can now determine the patient's eligibility for endovascular therapy (Intra-arterial thrombectomy/ IA thrombectomy) and provide more treatment options to patients who might have missed the golden 3-hour window after stroke onset.

Activation of ASAP 1.0 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) will first conduct a priority assessment on the suspected stroke patient upon arrival at the 24-hour Outpatient Department (OPD).

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 (or rtPA) is a thrombolytic (or 'clot-dissolving') medicine 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.

Thrombolytic therapy is most effective if given within 4.5 hours from the onset of acute stroke symptoms. While on average only 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.

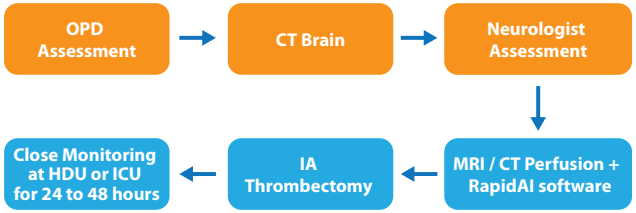
What Treatment will I Receive if I Choose Not to Receive Thrombolytic Therapy?

If you are considered not eligible for or choose not to receive thrombolytic therapy, you will receive the standard treatment for acute stroke including antiplatelet 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.

Activation of ASAP 2.0 for Arrival after 3 Hours of Onset or No Improvement after Intravenous Thrombolytic Therapy

ASAP 2.0 will be activated 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 IA thrombectomy, the amount and ratio of the salvageable and irreversibly damaged brain tissues 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 IA thrombectomy.



What is IA Thrombectomy?

IA 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. IA 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 IA thrombectomy within 16 or 24 hours after onset based on the perfusion scans and AI analysis.

What are the Risks of IA Thrombectomy?

IA thrombectomy has certain risks, such as blood vessel damage. The attending doctors must carefully assess the patients' eligibility for this procedure based on the AI-generated data. Under ASAP 2.0, patients are transferred to the High Dependency Unit (HDU) or Intensive Care Unit (ICU) after IA 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$20,600	
Endovascular Assessment	HK$56,830	HK$59,140

*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$101,610	HK$132,500
Acute Stroke Endovascular Thrombectomy Package	HK$535,000	HK$588,400

The Acute Stroke Diagnostic and Assessment Package Includes:

- RMO and Neurologist consultation and assessment
- Nursing care and monitoring at the OPD and before admission
- Urgent blood tests for assessment of acute ischemic 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:

- High Dependency Unit or 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 (including attendance of a neurosurgeon if applicable)
- MRI stroke package
- CT Stroke & Brain Perfusion with Rapid AI stroke imaging software
- Echocardiogram
- X-ray chest examination
- Standard blood tests for stroke risk assessment (fasting glucose, lipid profile)
- Medication cost of Alteplase (thrombolytic) and operation cost of mechanical endovascular thrombectomy
- Neurosurgeon operation fee and anaesthetist fee
- Physiotherapy for the first two days

Items Not Included in the Above Packages:

- Surgical procedures or interventions of other medical condition (the approximate charge for neurosurgery in the setting of other acute stroke interventions ranges from HK$130,000 to $400,000 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 High Dependency Unit or 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

For enquiry, please contact

24-hour Outpatient Service
Hong Kong Sanatorium & Hospital
Tel: (852) 2835 8602