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Patient Information on Acute Stroke Activation Programme (ASAP)

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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 becomes damaged 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 the brain tissue with interrupted blood supply becomes permanently damaged immediately. Some of this tissue can be salvaged if the blood supply can be restored within a critical time period. This time window for rescue is very short; more importantly, the earlier the blood supply can be restored, the better the outcome. This reperfusion by thrombolytic therapy is a high risk intervention and has to be conducted by a team of experienced professionals. Acute stroke management requires concerted efforts and seamless coordination of different disciplines and specialists for accurate diagnosis and prompt treatment.

ASAP 1.0 and 2.0 Offered by 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 to provide them with intravenous thrombolytic therapy (i.e. administration of drugs via injection to dissolve blood clots in vessels to restore cerebral blood flow).

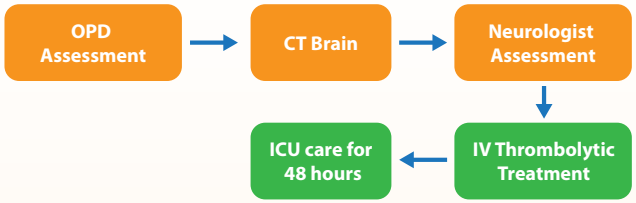
Built on the ASAP 1.0, the latest ASAP 2.0 is an enhanced programme for severe acute stroke patients in which RapidAI software, an AI-enhanced cerebrovascular imaging system, is adopted to determine the amount and percentage of salvageable brain tissues based on neurovascular magnetic resonance imaging (MRI) and perfusion scanning. Doctors can now determine the patient's eligibility for endovascular therapy (Intra-arterial thrombectomy/ IA thrombectomy) and bring hope for more treatment options to patients who might have missed the golden 3-hour window after stroke onset, making Hong Kong Sanatorium & Hospital the first local private hospital to provide 24/7 acute stroke service and IA thrombectomy for ischaemic stroke patients.

Activation of ASAP 1.0 for Arrival within 3 Hours after Onset

Upon the arrival of any suspected stroke patient to the 24-hour Outpatient Department (OPD), the Resident Medical Officer (RMO) will provide priority assessment to the patient.

If the preliminary diagnosis of acute stroke is established, ASAP 1.0 will be activated and priority CT brain scan will be performed on the patient to differentiate between haemorrhagic or ischaemic stroke, while an in-house neurologist will be called back to provide assessment.

In general, intravenous thrombolytic therapy is performed, and is most effective if it can be commenced within 3 hours of the onset of stroke. Some patients may show improvement if treatment is commenced within 4.5 hours.



What is Thrombolytic Therapy?

Thrombolysis means breaking up and dissolving of the blood clots within the blocked blood vessel. Alteplase (or rtPA) is a thrombolytic (or 'clot-dissolving') medicine given intravenously that can dissolve the blood clot and possibly restore the blood supply to the brain tissue affected by acute stroke. As a result, the chance of recovery after acute stroke is improved.

Thrombolytic therapy is most effective if given within 3 hours from the onset of acute stroke symptoms. While on the average only 1 in 4 (26%) patients recover to full independence following an ischaemic stroke, an additional 1 in 8 (13%) patients treated with thrombolytic therapy achieve recovery to full independence. Selected patients may also benefit from thrombolytic therapy if the treatment is given up to 4.5 hours from acute stroke onset.

What are the Risks of Thrombolytic Therapy?

Haemorrhage (bleeding) in the brain or other parts of the body is the most important risk of thrombolytic therapy. Approximately 1 in 15 (6%) patients treated with thrombolytic therapy develops bleeding in the brain, which may worsen the neurological impairment or even lead to death in 1%. This type of bleeding in the damaged brain tissue can also occur naturally after an ischaemic stroke even without thrombolytic therapy. Patients who have received thrombolytic therapy will require close monitoring and control of the blood pressure during the first 24 hours. Patients with certain medical conditions that increase the bleeding risk in the brain or other organs, past history of bleeding in the brain, or with stroke onset exceeding the recommended time window may not be suitable for thrombolytic therapy. The stroke team will determine a patient's eligibility for thrombolytic therapy based on the clinical profile and the findings on the brain scan.

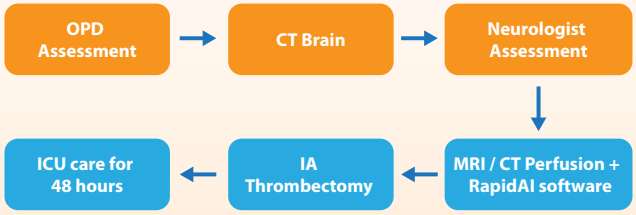
What Treatment will I Receive if I Choose Not to Receive Thrombolytic Therapy?

If you are assessed to be 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, stabilisation of your blood pressure, and nursing care and physiotherapy to prevent complications and enhance the outcome of rehabilitation. The package charges will not be applicable to you.

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

For severe stroke patients whose conditions do not improve after receiving intravenous thrombolytic therapy, or who have arrived at the hospital after the desirable time limit for administering intravenous thrombolytic therapy, ASAP 2.0 will be activated. They will be arranged to undergo MRI or CT perfusion scanning on the brain and cerebral blood vessels to determine if there is large vessel blockage. With the RapidAI software, the amount and ratio of salvageable to irreversibly damaged brain tissues can be assessed and calculated to determine whether they are suitable for IA thrombectomy.

Timely treatment is vital to ensuring the chance of survival and satisfactory recovery of acute stroke patients. The AI system will play a significant role in saving time as the report can be generated at about 10 minutes and it will enable neurologists and neurosurgeons to decide on the best treatment option for the patients including the feasibility of IA thrombectomy in the most effective and efficient manner. Hence, treatment options for acute stroke patients can be extended beyond the 3-hour time limit.



What is IA Thrombectomy?

IA thrombectomy is a type of minimally invasive surgery that can be used for treatment of acute ischaemic stroke patients with large vessel occlusion.

During the procedure, the neurosurgeon will guide the instrument through the patients' arteries to the blockage and remove the blood clot to reestablish blood flow to the affected part of the brain. IA thrombectomy is best performed within 6 hours of the onset of severe stroke. Researches have shown good functional outcome in ischaemic stroke patients receiving IA thrombectomy within 16 hours or 24 hours if they meet certain criteria with the use of perfusion scanning and AI system.

What are the Risks of IA Thrombectomy?

There are certain risks for IA thrombectomy such as blood vessel damage. The attending doctors must carefully assess the patients' eligibility for this procedure with guidance by the data generated by the AI system. Under ASAP 2.0, patients who have undergone IA thrombectomy will be transferred to the Intensive Care Unit (ICU) for treatment and close monitoring of their blood pressure and vital signs for the next 48 hours.

What is the Role of Neurosurgery in Acute Stroke Management?

Joint management with the neurosurgeon will be 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 1.0 and 2.0

Hong Kong Sanatorium & Hospital has the following packages for patients with acute ischaemic stroke who undergo assessment for eligibility and receives thrombolytic therapy.

ASAP 1.0 Acute Stroke Intravenous Thrombolytic Treatment Package Budget Estimate

Package Component	Charge for ICU Semi-private room	Charge for ICU Private room
Diagnostic and Assessment	HK$17,800	
Intravenous Thrombolytic Therapy	HK$85,500	HK$110,800

ASAP 2.0 Acute Stroke Endovascular Thrombectomy Package Budget Estimate

Package Component	Charge for ICU Semi-private room	Charge for ICU Private room
Diagnostic and Assessment	HK$17,800	
Endovascular Assessment	HK$43,460	HK$45,450
Acute Stroke Endovascular Thrombectomy Package	HK$456,100	HK$497,600

Treatment Packages Include:

- ICU care for up to 48 hours
- Standard nursing care and procedures for up to 48 hours
- Neurologist attendance of the first two days (if applicable, neurosurgeon attendance inclusive)
- MRI stroke package
- Echocardiogram
- X-ray Examination: Chest
- Standard blood tests for stroke risk assessment (fasting glucose, lipid profile)
- Medication cost of Alteplase (thrombolytic) and operation cost of mechanical endovascular thrombectomy
- Physiotherapy for first two days

Items Not Included in the Above Packages:

- Surgical procedure or interventions of other medical condition (the approximate charge for neurosurgery in the setting of other acute stroke interventions ranges from HK$120,000 to $370,000 in General Ward, depending on the complexity of the operation. This charge includes operation fee, anaesthetist fee, surgeon's fee, but excluding room charges, doctor's ward round and other hospital charges)
- Other doctor fees for other medical condition
- Additional investigations including laboratory tests, blood transfusion, MRI, CT, ultrasound, X-ray other than those included in the package
- Other medication(s)
- Other emergency treatment and use of special equipment in the ICU
- Own choice of meals and overnight companion bed (companion bed only available in private room)

Remarks about Package Charges

- Prices are subject to change without prior notice
- Once a package is opted, withdrawal from the package is not allowed
- In case of any dispute, the Chinese version shall prevail
- 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 the your/ the patient's doctor

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