

An initiative of the Stroke Services Improvement (SSI) team in collaboration with all public hospitals in Singapore.

### Introduction

This information guide aims to provide a general understanding of stroke, what you may expect during your stay in the hospital and subsequent care after your discharge.

Your healthcare team will provide you with specific information on your condition and the plan of management. If you have any questions or wish to know more about your condition, please consult your stroke care team.

This information is also available online at http://healthhub.sg/strokehub

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### **Fact Sheets**

We acknowledged that you may have other questions about your condition or your role as a caregiver. Here is a list of fact sheets with more information. You may access them via the HealthHub website at http://healthhub.sg/strokehub

#### **Fact Sheets Content List**

#### Controlling Risk Factor of Stroke

- Hypertension
- Smoking and Stroke
- Atrial Fibrillation
- Cholesterol
- Diabetes
- Healthy Eating
- Alcohol

#### **Consequences of Stroke**

- Cognitive Issues
- Coping with Cognitive Issues
- Emotional Changes
- Coping with Emotional Changes
- Sexual Intimacy
- Spasticity
- Bladder and Bowel Problems

#### **Rehabilitation after Stroke**

- Physiotherapy
- Occupational Therapy
- Speech Therapy for Communication Difficulties
- Swallowing Difficulties

#### Social and Leisure Matters after Stroke

- Driving Eligibility
- Travelling
- Financial Assistance
- Returning to Work
- Sports, Exercise and Physical Activity

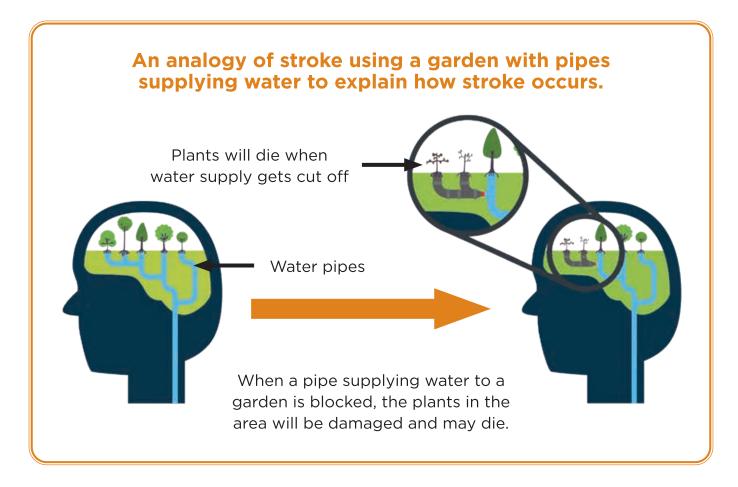
#### For My Carer

Caring for Your Loved One

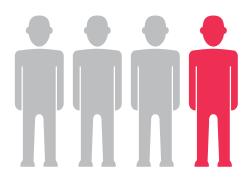
## About Stroke

#### WHAT IS STROKE?

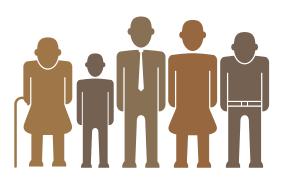
Normal brain function requires oxygen and nutrients which are supplied by blood through blood vessels. A stroke occurs when there is a disruption of blood flow to the brain. The area of the brain which is deprived of blood is thus damaged, resulting in signs and symptoms of stroke.



#### **HOW COMMON IS STROKE?**



1 in 4 people will suffer from a stroke in their lifetime



It can happen to anyone regardless of age, gender, ethnicity or socio- economic status

## Types of Stroke

There are 2 main types of stroke.

#### Ischaemic Stroke: 'blocked artery'

It is the most common type of stroke. This occurs when a blood clot is lodged in an artery and cuts off blood supply to the brain. It is usually caused by either:

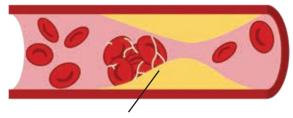




Blood clot

a blood clot from the heart is dislodged and travels to the brain

THROMBOSIS



Fatty Plaque

a blockage of a brain blood vessel due to narrowing from fatty plaque formation

#### Haemorrhagic Stroke: 'burst artery'

This occurs when there is a rupture of a blood vessel causing bleeding in the brain. It is usually caused by:

- High blood pressure
- Defects in the blood vessel wall such as cerebral aneurysms



Rupture to blood vessels; leakage of blood

Cerebral Aneursym

#### Transient Ischaemic Attack (TIA) - "mini-stroke"

- It happens when there is a temporary interruption of blood supply to the brain.
- Thus there is no permanent brain damage and the symptoms go away completely within a few minutes.

### **About the Brain**

- The brain has 2 sides (right and left) and is divided into several areas that control different functions.
- The location of the brain damage will determine the signs and symptoms of stroke.

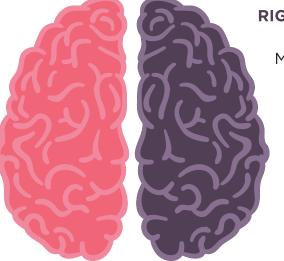
#### **LEFT BRAIN FUNCTIONS**

Movement and sensation of right side of body

Understanding and expressing language

Reading and writing

Vision on the right side



#### **RIGHT BRAIN FUNCTIONS**

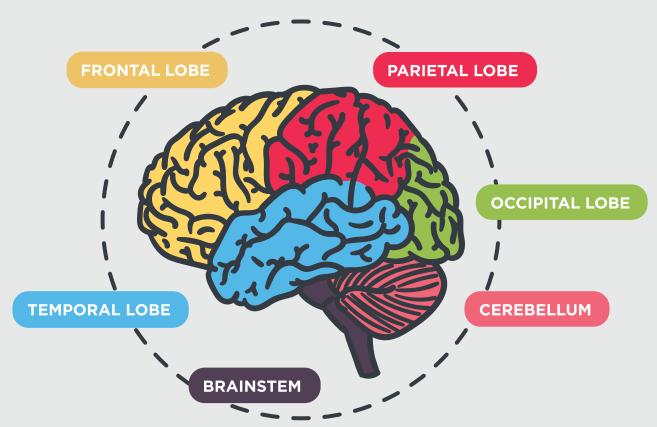
Movement and sensation of left side of body

Face and object recognition

Body awareness

Vision on the left side

Your doctors may describe the location of your stroke. Here is a diagram showing the different parts of the brain.



## Signs and Symptoms of Stroke

It is important to understand that every patient is affected by stroke differently. The signs and symptoms of stroke depend on the area of damage in the brain.

# PHYSICAL

#### Weakness

- You may experience weakness in one or both sides of the body. This weakness varies in severity.
- Weakness of the face muscle may result in facial drooping, drooling and speech difficulty.

#### **Incoordination of movements**

- You may experience difficulty in standing, walking or performing delicate tasks.
- \* Refer to Physiotherapy and Occupational Therapy fact sheets for more information.

#### COMMUNICATION



#### Slurring of speech ("Dysarthria")

 You may experience difficulty in articulating words. This may cause your speech to be unclear, slow or soft.

#### Language impairment ("Dysphasia")

- You may experience inability to understand or express words, phrases and sentences, in both verbal and written form.
- \* Refer to Speech Therapy for Communication Difficulties fact sheet for more information.



#### Numbness

- You may experience reduced or loss of sensation over one side or specific parts of your body.
- You may experience abnormal extra feeling over one side of your body such as tingling or electric sensation.



#### **Visual impairment**

• You may experience double vision or loss of vision in one side or area of your visual field.

#### **SWALLOWING**



#### Difficulty with swallowing ("Dysphagia")

- You may experience difficulty with drinking and eating. It can cause coughing and choking leading to an increase risk of lung infection.
- \* Refer to Swallowing Difficulties fact sheet for more information.

### What to Expect in the Hospital

Stroke patients usually require admission to a hospital for further investigation and treatment. Stroke Unit is a designated area in the hospital managed by a specialised multi-disciplinary stroke care team, where early treatment for stroke is provided.

#### STROKE CARE TEAM

The members of the stroke care team may include:



\* Refer to page 21, for you to note the names of your stroke care team members.

#### MONITORING

During your hospital stay, your condition will be monitored periodically. This may include regular checks of blood pressure and assessment of your stroke signs every few hours.

#### SCREENING

You will be assessed by various stroke care team members followed by an appropriate intervention or referral to a healthcare professional.

Swallowing test to assess for dysphagia
 Risk of deep vein thrombosis due to immobility
 Current mobility and functional status
 Fall risk
 Risk for developing pressure sores



#### INVESTIGATION

You will undergo various tests which may include:



- Either Computerised tomography (CT) scan or Magnetic Resonance Imaging (MRI) scan
- This will help to identify the type, location and size of the stroke area.



• Ultrasound of the neck and brain blood vessels to assess the blood supply in the brain.





- To screen for new risk factor(s) or measurement control of existing risk factor(s).
- To measure your blood counts and check the function of your other organs such as kidneys and liver.



- Electrocardiogram (ECG) checks for any abnormal heart rhythm.
- Echocardiogram is an ultrasound to check for the presence of any clots or abnormal communications between the chambers of your heart.
- **Holter** monitors the heart rhythm with continuous ECG over 24 or 48 hours to detect any heart rhythm abnormalities.

#### **MEDICATIONS**

Your doctor will prescribe you with medications. This may be taken orally or given by injection. Do inform your stroke care team if you are taking any medication(s), over-the-counter drug(s) or traditional chinese medication (TCM). You are advised not to self-medicate without speaking to your doctor.

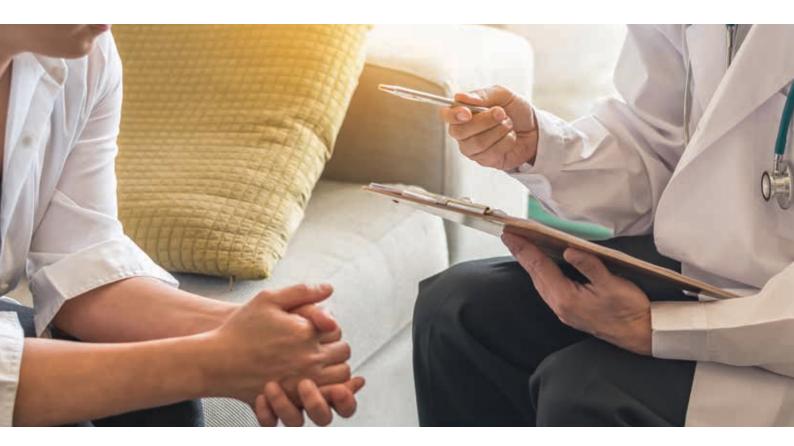
#### EARLY MOBILISATION

Your stroke care team will encourage early mobilisation once it is safe. This is to promote early recovery and prevention of complications. Your safety is our priority, always ask your stroke care team for assistance if needed.

#### SCREENING AND PREVENTION OF POST STROKE ACUTE COMPLICATIONS

You will be monitored closely for any post stroke acute complications during your hospital stay.





#### PLANNING FOR REHABILITATION

Your stroke care team will assess your current mobility function and find out about your social situation. Rehabilitation planning will be a team-based decision together with you and your family.

Your caregiver may be required to undergo caregiver training depending on your care requirement.

#### **DISCHARGE CARE PLAN**

Starting a discharge plan as soon as possible is important. If needed, the stroke care team will help to organise services and make contact with key providers before you leave the hospital.

Discharge planning may include:

- Written communication to your primary care doctor at the General Practitioner / Polyclinic.
- Referral to Agency of Integrated Care (AIC) to arrange for services at community hospitals, day rehabilitation centres, day care centres, home nursing, home medical programme and nursing homes.
- Recommendation of medical equipment, mobility equipment and home modifications.
- Coordination of outpatient medical clinic appointments after discharge.

## **Risk Factors Control**

After having a stroke or TIA, your risk of having another stroke or TIA is higher. About 1 in 5 people who have had stroke will suffer another stroke in 5 years. Poor control of risk factors will increase your chance of having another stroke.

It is important to reduce your risk by:

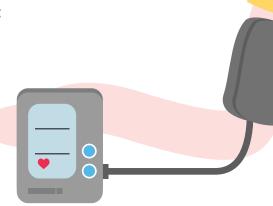
- knowing your risk factors for stroke
- controlling these risk factors

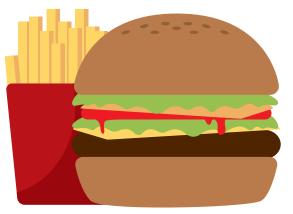
### WHAT ARE THE RISK FACTORS FOR STROKE? HOW CAN I CONTROL MY RISK FACTORS?

There are risk factors that you can control. These include:

#### **High Blood Pressure (Hypertension)**

- The most important known risk factor for stroke.
- Uncontrolled hypertension increases the risk of stroke by 4 times.





#### **High Cholesterol (Hyperlipidemia)**

- The main cause of high cholesterol is having a diet high in saturated fats (fats from animal foods).
- High cholesterol have about 2 times the risk of heart disease, a contributor to stroke risk.

#### **Diabetes**

 Uncontrolled diabetes over a long period of time can cause damage to your blood vessels and nerves. The risk of stroke is 1.5 times more in diabetic patients.



#### Smoking

- If you smoke 20 cigarettes a day, you are six times more likely to have a stroke compared to a non-smoker.
- \* Refer to Smoking and Stroke fact sheet for more information.



#### Irregular heart beat (Atrial fibrillation or AF)

- As a result of the irregular heart beating, the heart does not pump and empty the blood smoothly or completely. This increases the risk of clots forming in the heart and travelling to the brain.
- AF increases the risk of stroke by 5 times.
- \* Refer to Atrial Fibrillation fact sheet for more information.

#### **Unhealthy Lifestyle**

- Being inactive, having an unhealthy diet, obesity and excessive alcohol consumption can increase the risk of high blood pressure, high cholesterol, diabetes, heart disease and further strokes.
- \* Refer to Alcohol fact sheet for more information.

Some risk factors are not within our control. These include:

#### • Age

 Stroke affects people of all ages. The chance of having a stroke approximately doubles every 10 years of life after age 55.

#### Gender

• Men have a higher risk of stroke than women. The risk of stroke increases in women after menopause.

#### • Heredity Factors

- There are some genetic causes of stroke.
- Previous Stroke, Transient Ischaemic Attack (TIA) or Heart Attack
  - If you previously had a stroke, TIA or heart attack, you are at greater risk than someone who has not.

# **Treatments for reducing risk of another stroke**

There are strategies to help reduce the risk of another stroke.



#### **Anti-Platelet**

Eg. Clopidogrel, Aspirin, Dipyridamole

• An anti-platelet makes the blood 'less sticky' by preventing blood cells called platelets from sticking together to form a clot.

#### **Anti-Coagulant**

Eg. Warfarin, Novel-Oral Anti-coagulants (Rivaroxaban, Dabigatran and Apixaban)

- An anti-coagulation is a blood thinner that helps prevent formation of new blood clots and keeps existing blood clots from getting larger. They work by interfering with the function of certain blood clotting factors that are needed to form clots.
- It is usually prescribed to patients with atrial fibrillation (AF) and some other heart and blood disorders.

#### **Cholesterol Lowering Medicines**

Eg. Simvastatin, Atorvastatin, Rosuvastatin, Ezetimibe, Fenofibrate, Gemfibrozil

- There are medications to lower your cholesterol level.
- Statin medications helps to lower your risk of stroke and heart disease.

#### **Lifestyle Modification**

- Quit smoking
- Limit alcohol consumption
- Have healthy and well-balanced diet
- Exercise regularly
- Maintain healthy body weight
- Take your medications as prescribed by your doctor
- Attend medical appointments with your doctor as scheduled

### **How Stroke May Affect You?**

Stroke does not affect individuals in a similar way. Thus a stroke patient may not experience all the consequences of stroke.



- You may experience weakness on one side of your body or problems with coordination and balance. This may cause you to have difficulty moving around and carrying out daily routines such as feeding, showering, and dressing.
- \* Refer to Physiotherapy and Occupational Therapy fact sheets for more information.

#### NUTRITION



- You may have difficulty swallowing and may need to be on a special food consistency or nasogastric tube feeding. Supplements may be prescribed to meet your daily nutritional requirements.
- \* Refer to Swallowing Difficulties fact sheet for more information.

#### COGNITION



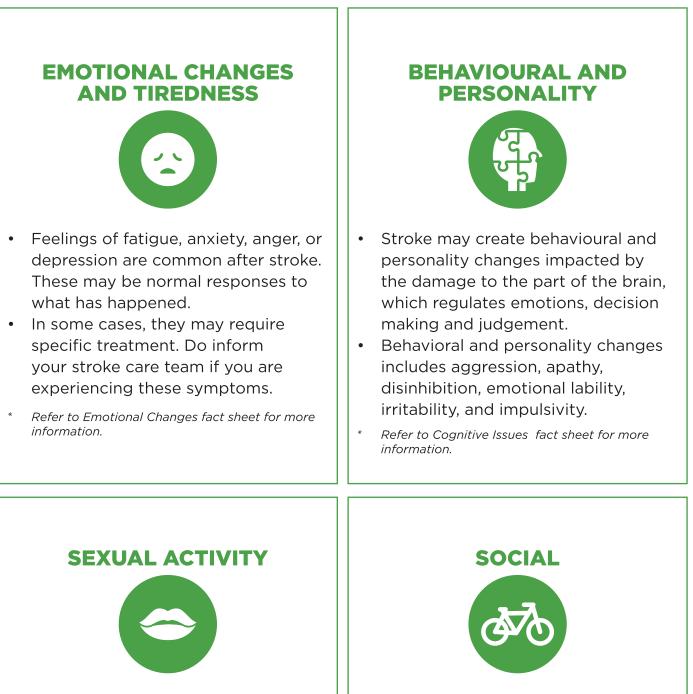
- As a result of stroke, you may have poor memory attention or difficulty with thinking and reasoning. These difficulties may affect your ability to perform certain tasks and make decisions.
- \* Refer to Cognitive Issues fact sheet for more information.

#### CONTINENCE



- You may experience difficulty controlling your bladder or bowel movements. This may be due to the damage in the area of the brain, or a decrease in mobility.
- \* Refer to Bladder and Bowel Issues fact sheet for more information.

### **How Stroke May Affect You?**



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- You may feel worried about engaging in physical intimacy or have a physical impairment that affects intimacy.
- \* Refer to Sexual Intimacy fact sheet for more information.

The consequences of stroke may

usual social activities.

fact sheets for more information.

restrict your ability to engage your

Refer to Social and Leisure Matters after Stroke

### **Complications after Stroke**

After having a stroke, you may suffer from some complications. The stroke care team will take actions early to prevent complications if possible and to detect and treat them early should they occur. Here are some examples of common complications.

#### CONTRACTURES

It usually occurs when the limbs becomes fixed in a certain position due to irreversible contraction and fibrosis of the muscles.

#### **PRESSURE SORES**

. . . . .

The constant pressure over certain body parts from reduced mobility may cause the skin over that area to break down.

#### MUSCLE SPASTICITY

Muscle spasticity after stroke may cause your muscle to become tensed and contract abnormally leading to pain.

#### SEIZURES

Damaged brain cells from stroke may lead to abnormal electrical activity in the brain causing convulsions.

#### INFECTION

Swallowing impairment can sometimes result in food or fluids entering the lungs leading to pneumonia.

Poor hygiene of genital area may also cause urinary tractinfection.

#### DEEP VEIN THROMBOSIS (DVT)

Formation of blood clots in veins of the legs may occur because of reduced mobility after stroke.

#### SHOULDER SUBLUXATION

It happens when there is a lack of support of an arm due to weakness. Hanging of the affected arm leads to pulling of the arm from the shoulder at the joint.

### **Rehabilitation after Stroke**

Rehabilitation benefits most patients after a stroke. It starts early after stroke occurs. You and your family members should be actively involved in your rehabilitation processes.



Rehabilitation aims to:

- ✓ Improve your ability to perform usual functions
- ✓ Decrease post- stroke complications

#### Where do I go for rehabilitation?

There are 2 general pathways for rehabilitation after stroke.

- 1. Outpatient Rehabilitation
  - You return home from the hospital and go to a centre a few times a week for therapy.
- 2. Inpatient Rehabilitation Centre
  - You are transferred to a specialised rehabilitation unit or community hospital with daily therapy sessions for continued inpatient stay and ongoing medical and nursing care.
- <sup>\*</sup> Refer to Rehabilitation after Stroke fact sheets for more information.

# Where to get more help after stroke?

We acknowledge that it is not easy journey for a stroke survivor or a carer of stroke survivor. These are some available resources you can refer to. Alternatively, you may approach the medical social worker in the hospital or polyclinic for more information.

#### **GOVERNMENT SUPPORTED AGENCIES**

#### COMMUNITY CARE SERVICES



AIC seeks to create a vibrant care community enabling people to live well and age gracefully. AIC coordinates and facilitates efforts in care integration to achieve the best care outcomes for our clients.

#### Website: www.aic.sg • Hotline: 1800-650-6060



SG Enable is an agency dedicated to enabling persons with disabilities.

Website: www.sgenable.sg • Hotline: 1800-8585-885

FAMILY SERVICE CENTRES Family Service Centres (FSCs) are based in the community to provide help and support to individuals and families in need. They are staffed by social service professionals.

**Website:** www.msf.gov.sg/dfcs/familyservice/default.aspx

#### FINANCIAL ASSISTANCE

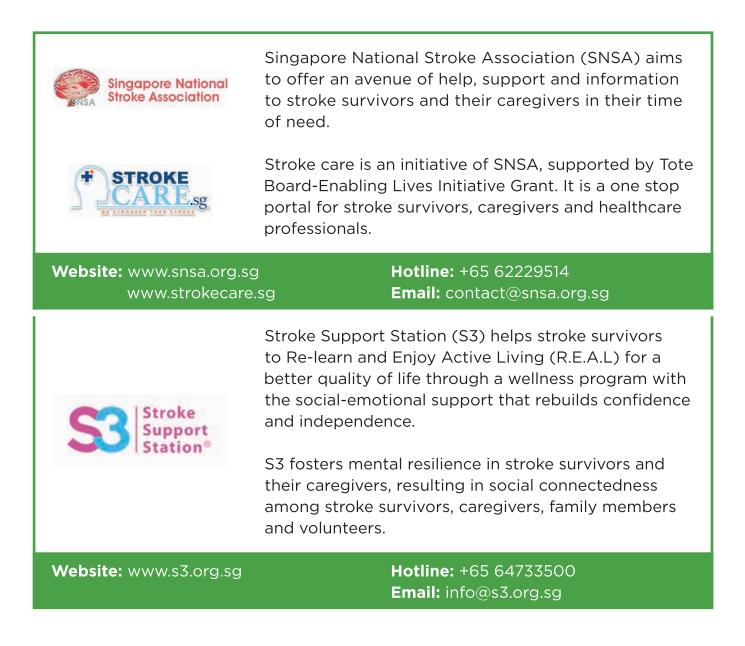


ComCare provides social assistance for low-income individuals and families. ComCare assistance is available at the Social Service Offices (SSOs). ComCare programmes are funded by the Community Care Endowment Fund (ComCare Fund).

Website: www.msf.gov.sg • Hotline: 1800-222-0000

#### SOCIAL ENTERPRISE AGENCIES

There are various resources available from social enterprise in Singapore.

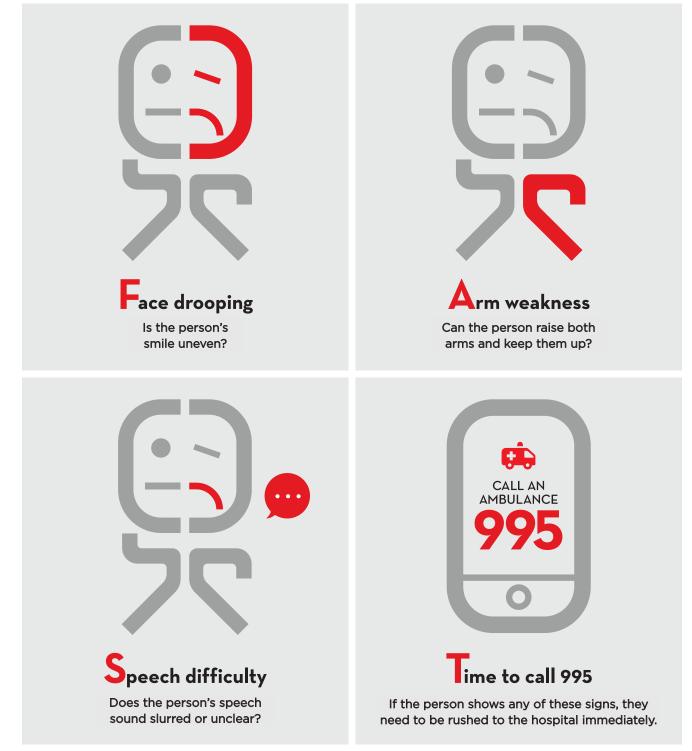


## To spot a Stroke, think F.A.S.T

#### WHY SHOULD I KNOW THIS?

Once you have had a stroke, your risk of another stroke is higher than the rest of the population. You may witness a stroke in a family member, friend or a stranger. Time is of the essence in treating a stroke. Learn to spot its warning signs and know what actions to take.

#### Think F.A.S.T



## Stroke Care Team

A group of healthcare professionals who will work with you to treat the different aspects of stroke care.

The stroke care team will work with you and your family members while you are in the hospital and when you go home. It can be helpful to write the names and contact details of your stroke team members.

Stroke Care Team Memeber	Name of your healthcare professional and contact details
Hospital:	
Doctor:	
Polyclinic/ General practitioner clinic:	
Nurses:	
Occupational therapist:	
Physiotherapist:	
Speech therapist:	
Pharmacist	
Dietitian:	
Medical social worker:	
Neuropsychologist:	
Others:	

### **Appointment Tracker**

Appointment	Date / Time	Doctor's Name	Location	Clinic Contact

### DISCHARGE CHECKLIST ∅

To help you with recovery after stroke, it is important to speak to your healthcare team and your caregiver about what you can expect. Use the checklist below to help you and make sure your questions are answered.

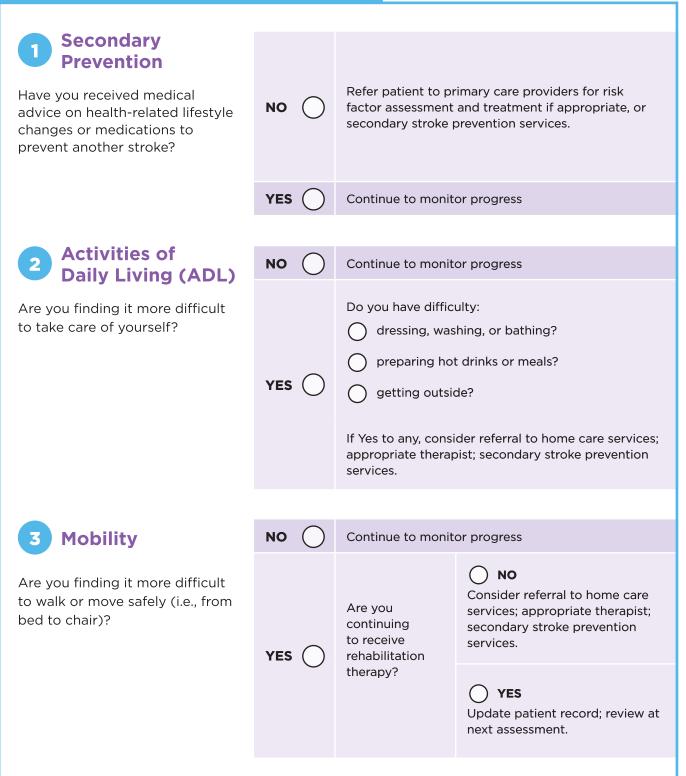
1	What is my diagnc	osis?	0	emic Stroke norrhagic Stroke
2	What are my risk for (you may tick more			
	O Hypertension	High Choles	terol 🔵 Dia	betes
	Smoking	C Excessive Al	$\bigcirc$	ial Fibrillation / her Heart condition
	Others:			
3		do I need to take	? What are the	by for and how often e the medication list
	below?		ip me complet	
	Name of medicine	What is it for?	How often?	Instruction

	nat physical, emotional, behavior and communication challenges buld I expect? How do I work to overcome the challenges?
Sho	ould I contact a stroke or caregiver support group in the community
 Wh	nen, where and what are my medical follow-up checks?
	no should I contact if I have any queries about my hospital admission?
~~~	
ition	al notes:

# POST STROKE

Not sure what to update your doctor during your medical follow up for stroke? Here is a checklist developed by the Global Stroke Community Advisory Panel [2012], endorsed by the World Stroke Organization, adapted by the Heart and Stroke Foundation Canadian Stroke Best Practice Recommendations development team [2014].





4 Spasticity	NO 🔘	Continue to monit	or progress	
Do you have increasing stiffness in your arms, hand, or legs?	YES ()	Is this interfering with activities of daily living?	<ul> <li>NO</li> <li>Update patient record; review at next assessment.</li> <li>YES</li> <li>Consider referral to rehabilitation service; secondary stroke prevention services; physician with experience in post-stroke spasticity (e.g., physiatrist, neurologist).</li> </ul>	
5 Pain	NO ()	Continue to monit	or progress	
Do you have any new pain?	YES 🔵		equate evaluation by a healthcare ertise in pain management.	
6 Incontinence	NO ()	Continue to monit	or progress	
Are you having more problems controlling your bladder or bowels?	YES 🔿	Consider referral to healthcare provider with experience in incontinence; secondary stroke prevention services.		
7 Communication		Continue to monit	or progress	
Are you finding it more difficult to communicate?	YES 🔵	Consider referral to speech language pathologist; rehabilitation service; secondary stroke prevention services.		
8 Mood	NO 🔘	Continue to monit	or progress	
Do you feel more anxious or depressed?	YES 🔵	Consider referral to healthcare provider (e.g., psychologist, neuropsychologist, psychiatrist) with experience in post-stroke mood changes; secondar stroke prevention services.		

9 Cognition	NO ()	Continue to monit	or progress	
Are you finding it more difficult to think, concentrate, or remember things?	YES 🔵	Is this interfering with your ability to participate in activities?	<ul> <li>NO</li> <li>Update patient record; review at next assessment.</li> <li>YES</li> <li>Consider referral to healthcare provider with experience in post- stroke cognition changes; secondary stroke prevention service; rehabilitation service; memory clinic</li> </ul>	
	0			
<b>10</b> Life After Stroke		Continue to monit	or progress	
Are you finding it more difficult to carry out leisure activities, hobbies, work, or engage in sexual activity?	YES 🔵	Consider referral to stroke support organization support group; leisure, vocational, or recreational therapist.		
Personal Relationships	NO 🔘	Continue to monit	or progress	
Have your personal relationships (with family, friends, or others) become more difficult or strained?	YES 🔵	and family m	erral to stroke support organization; rovider (e.g., psychologist, herapist) with experience in family and stroke.	
12 Fatigue	NO ()	Continue to monit	or progress	
Are you experiencing fatigue that is interfering with your ability to do your exercises or other activities?	YES 🔿	<ul> <li>Discuss fatigue with Primary Care provider.</li> <li>Consider referral to home care services for education and counselling.</li> </ul>		
Other	NO ()	Continue to monit	or progress	
Challenges Do you have other challenges or concerns related to your stroke that are interfering with your recovery or causing you distress?	YES ()	<ul> <li>Schedule next primary care visit with patient and family member(s) to discuss challenges concerns.</li> <li>Consider referral to healthcare provider; strosupport organization.</li> </ul>		

### MY BLOOD PRESSURE DIARY

This is a sample template for you to record your blood pressure (BP). Keeping records of your BP is useful for you and your doctor in managing your hypertension. Do check with your doctor on the frequency of monitoring.

#### MY TARGET BP

Depending on your condition, you may have a different blood pressure target. Consult your doctor for your targeted blood pressure range.

Date	Time (AM)	Blood Pressure	Pulse	Time (PM)	Blood Pressure	Pulse
		/			1	
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		/			/	
		/			1	
		/			/	

# MY BLOOD TEST

This is a sample template for you to keep track of your blood test record. Keeping records of your blood test is useful for you in managing your risk factor.

Depending on your condition, you may have a different target range. Consult your doctor for your targeted blood test range.

Test	Date	Date	Date	Date	Date
LDL					
MY TARGET					
Fasting Glucose					
MY TARGET					
HbA1c					
MY TARGET					
Comments					

# MY BLOOD CLOTTING RATIO

This is a sample template for you to keep track of your INR results if you are on warfarin. Keeping records of your INR result is useful for your doctor and pharmacist in titrating the dosage of warfarin you should take.

M	Y TARGI	ET	

INR THERAPEUTIC TARGET

Date	INR Value	Warfarin Dose (mg)	Comments





#### **Stroke Services Improvement**

#### www.healthhub.sg/strokehub

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