NEUROLOGY				
NO	**INDICATOR**	**DIMENSION**	**STANDARD**	**SECONDARY DATA REPORTING FREQUENCY**
1a	Percentage of patients with waiting time of ≤ 60 minutes to see the doctor at the Neurology Outpatient Clinic **(Two or more registration areas involved)**	Timeliness	≥ 80%	Monthly
1b	Percentage of patients with waiting time of ≤ 90 minutes to see the doctor at the Neurology Outpatient Clinic **(Only one registration area involved)**	Timeliness	≥ 90%	Monthly
2	Percentage of Ischaemic Stroke (IS) patients receiving IV recombinant tissue plasminogen activator (IV rt-PA) therapy within (≤) 35 minutes of CT brain initiation. (From *CT brain initiation to needle time*)	Efficiency	≥ 65%	3 Monthly
3	Percentage of patients without confirmed ptosis after 4 weeks following administration of botulinum toxin injection for Blepharospasm	Safety	≥ 90%	3 Monthly
4	Percentage of Acute Ischaemic Stroke (AIS) inpatients obtained Neurology consultation within (≤) 24 hours of referral	Customer centeredness	≥ 85%	3 Monthly

*For indicator 1, each department to report either 1a **OR** 1b, and not both. (Refer technical specification)

Indicator 1

*Either indicator 1a **OR** 1b is to be reported, based on how many registration counters are involved.

- **Two or more registration areas are involved:** If registration of patient is first done at hospital's main outpatient / ACC complex registration counter with payment collection, following which the patient needs to re-register at the respective clinical department counter - Refer **Indicator 1a**.
- **Only one registration area is involved:** If registration of patient with payment collection is either done **ONLY** at clinical department counter **OR** it is done **ONLY** at hospital's main outpatient / ACC complex registration counter with no further re-registration required at the clinical department counter - Refer **Indicator 1b**.

Discipline	:	**Neurology**
Indicator 1a	:	**Percentage of patients with waiting time of ≤ 60 minutes to see the doctor at the Neurology Outpatient Clinic (Two or more registration areas involved)**
Dimension of Quality	:	Timeliness
Rationale	:	1. MOH aims for waiting time to see the doctor at outpatient services, to be less than 90 minutes, in line with patient-centred services. Waiting time is time patient first registers in the hospital till the time patient is seen by doctor. (Reference: Director-General of Health Malaysia Circular No. 6/2004) 2. The waiting time is based on patient's experience from the time the patient first registers at the first counter in the hospital till seen by doctor. In view of many counters being involved in some hospitals/ departments, some clinical departments have opted for monitoring of registration from department counter, as any process prior to that appears out of the clinical department's control. Thus, due to involvement of 2 or more counters within the hospital, for monitoring of clinical services KPI, the target of waiting time is for less than 60 minutes within the department. This is applicable only if patient is being registered at another counter within the same hospital (e.g. at hospital's main outpatient/ ACC complex registration counter) prior to the clinical department counter. 3. For hospitals to eliminate or reduce waiting time, it is important to balance between the demand for appointments and the supply of appointments. One needs to identify opportunities for improvement by strengthening the policy of outpatient services in hospital, apply Queuing Theory and having contingency plans.
Definition of Terms	:	**Two or more registration areas involved**: If registration of patient is first done at hospital's main outpatient/ ACC complex registration counter with payment collection, following which the patient needs to re-register at the respective clinical department counter: **Waiting time**: Time of registration counter at department counter or time of appointment given to patient (whichever is later) till the time the patient is first seen by the doctor, which is beginning of a consultation.
Criteria	:	**Inclusion**: 1. All outpatients of Neurology Outpatient Clinic. **Exclusion**: 1. Patients who come without an appointment ("walk-in" patients). 2. Patients that need to do procedures on the same day before seeing the doctors (e.g. blood taking or imaging). 3. Patients who state their preference to see only a specific doctor at the clinic.

<table>
<tr><td></td><td></td><td>Sampling:
Using an average of total patients seen in a month, 30% of the patients in each month need to be sampled for this indicator.
For example, in a case of 22 clinic days per month, 7 clinic days in a month need to be selected for data collection. Hospital/ department to ensure randomised sampling of data by ensuring each clinic day of the week is included to ensure proper representation of data.</td></tr>
<tr><td>Type of indicator</td><td>:</td><td>Rate-based process indicator</td></tr>
<tr><td>Numerator</td><td>:</td><td>Number of sampled patients with waiting time of ≤ 60 minutes to see the doctor at the Neurology Outpatient Clinic</td></tr>
<tr><td>Denominator</td><td>:</td><td>Total sample of patients seen by the doctor at the Neurology Outpatient Clinic</td></tr>
<tr><td>Formula</td><td>:</td><td>Numerator x 100 %
Denominator</td></tr>
<tr><td>Standard</td><td>:</td><td>≥ 80%</td></tr>
<tr><td>Data Collection & Verification</td><td>:</td><td>1. Where: Data will be collected in the Neurology Outpatient Clinic.
2. Who: Data will be collected by Officer/ Paramedic/ Nurse in-charge of the department/ unit.
3. How to collect: Data is suggested to be collected from patient's case notes/ appointment record book/ waiting time slip.
4. How frequent: Monthly data collection within department.
Validated summarised secondary data to be sent monthly to Quality Unit of the respective hospital for monitoring.
PVF to be sent 6 monthly to Quality Unit of hospital.
5. Who should verify:
<table>
<tr><td></td><td>Prepared by</td><td>Validated by</td></tr>
<tr><td>Primary Data</td><td>Officer/ Paramedic/ Nurse in-charge</td><td>Supervisor of the person who prepared the data</td></tr>
<tr><td>Secondary Data</td><td>Officer/ Paramedic/ Nurse in-charge</td><td>Head of Department/ Specialist in-charge</td></tr>
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PVF must be verified by Head of Department, Head of Quality Unit and Hospital Director.</td></tr>
<tr><td>Remarks</td><td>:</td><td></td></tr>
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Discipline	**:**	**Neurology**
Indicator 1b	:	**Percentage of patients with waiting time of ≤ 90 minutes to see the doctor at the Neurology Outpatient Clinic (Only one registration area involved)**
Dimension of Quality	:	Timeliness
Rationale	:	1. MOH aims for waiting time to see the doctor at outpatient services, to be less than 90 minutes, in line with patient-centred services. Waiting time is time patient first registers in the hospital till the time patient is seen by doctor. (Reference: Director-General of Health Malaysia Circular No. 6/2004) 2. The waiting time is based on patient's experience from the time the patient first registers at the first counter in the hospital till seen by doctor. In view of many counters being involved in some hospitals/ departments, some clinical departments have opted for monitoring of registration from department counter, as any process prior to that appears out of the clinical department's

		control. Thus, due to involvement of 2 or more counters within the hospital, for monitoring of clinical services KPI, the target of waiting time is for less than 60 minutes within the department. This is applicable only if patient is being registered at another counter within the same hospital (e.g. at hospital's main outpatient/ ACC complex registration counter) prior to the clinical department counter. 3. For hospitals to eliminate or reduce waiting time, it is important to balance between the demand for appointments and the supply of appointments. One needs to identify opportunities for improvement by strengthening the policy of outpatient services in hospital, apply Queuing Theory and having contingency plans.
Definition of Terms	:	<u>If registration of patient with payment collection is done ONLY AT CLINICAL DEPARTMENT COUNTER:</u> **Waiting time**: Time of registration counter at department counter or time of appointment given to patient (whichever is later) till the time the patient is first seen by the doctor, which is beginning of a consultation. <u>If the registration is done ONLY AT HOSPITAL'S MAIN OUTPATIENT / ACC COMPLEX REGISTRATION COUNTER, with no re-registration at the clinical department counter:</u> **Waiting time**: Time of registration counter at hospital's main outpatient / ACC complex registration counter or time of appointment given to patient (whichever is later) till the time the patient is first seen by the doctor, which is beginning of a consultation.
Criteria	:	**Inclusion**: 1. All outpatients of the Neurology Outpatient Clinic. **Exclusion**: 1. Patients who come without an appointment ("walk-in" patients). 2. Patients that need to do procedures on the same day before seeing the doctors (e.g. blood taking or imaging). 3. Patients who state their preference to see only a specific doctor at the clinic. **Sampling**: Using an average of total patients seen in a month, 30% of the patients in each month need to be sampled for this indicator. For example, in a case of 22 clinic days per month, 7 clinic days in a month need to be selected for data collection. Hospital/ department to ensure randomised sampling of data by ensuring each clinic day of the week is included to ensure proper representation of data.
Type of indicator	:	Rate-based process indicator
Numerator	:	Number of sampled patients with waiting time of ≤ 90 minutes to see the doctor at the Neurology Outpatient Clinic
Denominator	:	Total sample of patients seen by the doctor at the Neurology Outpatient Clinic
Formula	:	<u>Numerator</u> x 100 % Denominator
Standard	:	≥ 90%
Data Collection & Verification	:	1. **Where**: Data will be collected in the Neurology Outpatient Clinic. 2. **Who**: Data will be collected by Officer / Paramedic / Nurse in-charge of the

<table>
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3. How to collect: Data is suggested to be collected from patient's case notes/ appointment record book/ waiting time slip.
4. How frequent: Monthly data collection within department.
Validated summarised secondary data to be sent monthly to Quality Unit of the respective hospital for monitoring.
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Discipline	:	**Neurology**
Indicator 2	:	**Percentage of Ischaemic Stroke (IS) patients receiving IV recombinant tissue plasminogen activator (IV rt-PA) therapy within (≤) 35 minutes of CT brain initiation. (From** *CT brain initiation to needle time*)
Dimension of Quality	:	Efficiency
Rationale	:	1. Intravenous rt-PA is proven by randomised control trials to reduce disability from Ischaemic Stroke at 90 days. 2. Delay in thrombolysing patients is associated with higher risk of in-hospital mortality and symptomatic intracranial bleed. **Table 5. ED-Based Care** Action — Time Door to physician — ≤10 minutes Door to stroke team — ≤15 minutes Door to CT initiation — ≤25 minutes Door to CT interpretation — ≤45 minutes Door to drug (≥80% compliance) — ≤60 minutes Door to stroke unit admission — ≤3 hours CT indicates computed tomography; and ED, emergency department. Source: Bock.[*] *35 minutes is obtained by subtracting the door to CT initiation time from door to needle time (25 minutes from 60 minutes).
Definition of Terms	:	**Ischaemic Stroke (IS):** It is defined as an episode of neurological dysfunction caused by focal infarction of the brain, spinal cord, or retina, in which central nervous system infarction was defined by pathological, imaging, or other

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<tr><td></td><td></td><td>objective evidence of ischemic injury in a defined vascular distribution or by symptoms that persisted ≥24 hours or until death with other (non-stroke) causes excluded.

Recombinant tissue plasminogen activator (rt-PA): It is a thrombolytic therapy used for IS. Intravenous rt-PA is used at a dosage of 0.9 mg/kg, maximum dose 90mg.

CT brain imaging time: It is the time a CT Brain is initiated.</td></tr>
<tr><td>Criteria</td><td>:</td><td>Inclusion:
1. All patients diagnosed with IS indicated for thrombolytic therapy within office hours (8am to 5pm).

Exclusion:
1. Patients of < 18 years of age.
2. Patients who have contraindications for thrombolytic therapy as per the 'AHA/ ASA 2018 guidelines for the Early Management of Patients with Acute Ischaemic Stroke'.
3. Documented reason for delay in initiating rt-PA e.g.:
• Unstable patient who needs urgent medical stabilisation, prior to CT brain (e.g. intubation for respiratory failure or airway protection).
• Patient who needs treatment of elevated blood pressure.
• Patients with fluctuating neurological examination.
• Initial refusal by patient or family members for thrombolysis therapy.
4. Patients who come after office hours (as many KKM centres are still single neurologist centres and have yet to open 24-hours' thrombolysis service).</td></tr>
<tr><td>Type of indicator</td><td>:</td><td>Rate based process indicator</td></tr>
<tr><td>Numerator</td><td>:</td><td>Number of patients with IS receiving IV rt-PA therapy within (≤) 35 minutes of CT brain initiation</td></tr>
<tr><td>Denominator</td><td>:</td><td>Total number of patients diagnosed with IS receiving IV rt-PA therapy</td></tr>
<tr><td>Formula</td><td>:</td><td>Numerator x 100%
Denominator</td></tr>
<tr><td>Standard</td><td>:</td><td>≥ 65%</td></tr>
<tr><td>Data Collection & Verification</td><td>:</td><td>1. Where: Data will be collected in Acute Stroke Ward/ Neurology Ward/ Acute cubicle of general medical, geriatric ward or ward where the post thrombolytic therapy patients are treated.
2. Who: Data will be collected by Officer/ Paramedic/ Nurse in-charge of the department/ unit.
3. How to collect: Data is suggested to be collected from patient's case notes/ procedure book/ IV rt-PA record book.
4. How frequent: 3 monthly data collection within department.
Validated summarised secondary data to be sent 3 monthly to Quality Unit of the respective hospital for monitoring.
PVF to be sent 6 monthly to Quality Unit of hospital.
5. Who should verify:
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Remarks	:	

Discipline	:	**Neurology**
Indicator 3	:	**Percentage of patients without confirmed ptosis after 4 weeks following administration of botulinum toxin injection for Blepharospasm**
Dimension of Quality	:	Safety
Rationale	:	1. Botulinum toxin therapy is the treatment of choice for Blepharospasm (BPS). It is the first-line treatment for BPS with a response rate of more than 90%. Although the use of botulinum toxin injection is generally safe, inappropriate administration comes with potential adverse effects such as ptosis, dry eye, diplopia etc. 2. Ptosis following administration of botulinum toxin is preventable. It causes severe vision impairment with psychological stress to patient. Unfortunately, there is no antidote or reversal therapy for this complication.
Definition of Terms	:	**Ptosis:** Ptosis is present when the upper eyelid is less than 2 mm from mid-pupil. (Reference: Small RG et al., 1989. The measurement and definition of ptosis.) **Blepharospasm (BPS):** It is a focal movement disorder producing bilateral involuntary eyelid closure with a severity ranging from increased blinking frequency to functional blindness.
Criteria	:	**Inclusion:** 1. All patients with BPS who received botulinum toxin injection. **Exclusion:** 1. Patients with pre-existing ptosis or any other physical abnormality involving the eyelid or around the eye.
Type of indicator	:	Rate-based outcome indicator
Numerator	:	Number of patients without confirmed ptosis after 4 weeks following botulinum toxin injection for BPS
Denominator	:	Total number of patients receiving botulinum toxin injections for BPS
Formula	:	$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$
Standard	:	≥ 90%
Data Collection & Verification	:	1. **Where**: Data will be collected in the Neurology Outpatient Clinic. 2. **Who**: Data will be collected by Officer/ Paramedic/ Nurse in-charge of the department/ unit. 3. **How to collect**: Data is suggested to be collected from patient's case notes/ procedure book. 4. **How frequent**: 3 monthly data collection within department. Validated summarised secondary data to be sent 3 monthly to Quality Unit of the respective hospital for monitoring. PVF to be sent 6 monthly to Quality Unit of hospital. 5. **Who should verify**:

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Remarks	:	

Discipline	**:**	**Neurology**
Indicator 4	:	**Percentage of Acute Ischaemic Stroke (AIS) inpatients obtained Neurology consultation within (≤) 24 hours of referral**
Dimension of Quality	:	Customer centeredness
Rationale	:	1. Stroke is the most common causes of physical disability in adults. 2. Strokes can be either ischaemic or haemorrhagic. The ischaemic (75%) is more common than haemorrhagic (25%). 3. Many cases of stroke are admitted to the general medical ward. Early referral to neurology team will ensure initiation of appropriate management and prevention of stroke complications. The management involves multidisciplinary departments/units. The long-term management includes secondary stroke prevention and rehabilitation process. The length of hospital stay (LOS) could reflect the effectiveness of stroke management. 4. Early neurological attention in acute stroke is related to better functional outcome and shorter hospitalization. Reference: Davalos A, Castillo J, and Martinez EV. Delay in Neurological Attention and Stroke Outcome. Stroke. 1995; 26: 2233-2237.
Definition of Terms	:	**Acute Ischaemic Stroke (AIS)**: It occurred when the blood supply to certain part of the brain is blocked usually because of atherosclerosis which usually located at the arterial branches. Other cause is a thromboembolic phenomenon usually from cardiac (cardioembolic stroke). The CT-scan brain shoes hypodense (black) area in the brain. **Neurology consultation:** Time taken from the time patient was referred to Neurology team to the time patient was seen by the team (at least seen by the medical officer from Neurology team and discussed verbally or via phone consultation).
Criteria	:	**Inclusion:** 1. Acute onset Ischaemic Stroke patients admitted for further management and referred for Neurology consultation. **Exclusion:** 1. Transient Ischaemic Attack (TIA). 2. Haemorrhagic Stroke which includes Intracerebral Haemorrhage (ICH) and Subarachnoid Haemorrhage (SAH). 3. Traumatic head injury. 4. Stroke syndrome other than vascular causes such as Cerebral Tumour.

<table>
<tr><td></td><td></td><td>5. Patients who died within (≤) 24 hours after referral.</td></tr>
<tr><td>Type of indicator</td><td>:</td><td>Rate-based process indicator</td></tr>
<tr><td>Numerator</td><td>:</td><td>Number of Acute Ischaemic Stroke (AIS) inpatients obtained Neurology consultation within (≤) 24 hours of referral</td></tr>
<tr><td>Denominator</td><td>:</td><td>Total number of Acute Ischaemic Stroke (AIS) inpatients referred to Neurology team</td></tr>
<tr><td>Formula</td><td>:</td><td>Numerator x 100%
Denominator</td></tr>
<tr><td>Standard</td><td>:</td><td>≥ 85%</td></tr>
<tr><td>Data Collection & Verification</td><td>:</td><td>1. Where: Data will be collected in Acute Stroke Ward/ Neurology Ward/ Acute cubicle of general medical and other wards that cater for the above conditions.
2. Who: Data will be collected by Officer/ Paramedic/ Nurse in-charge of the department / unit.
3. How to collect: Data is suggested to be collected from patient's case notes/ referral record book.
4. How frequent: Monthly data collection within department.
Validated summarised secondary data to be sent 3 monthly to Quality Unit of the respective hospital for monitoring.
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<tr><td>Remarks</td><td>:</td><td>*This indicator is also being monitored as an Outcome Based Budgeting (OBB) indicator.</td></tr>
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