

## Project Title

**I-SCREEN-** Integrating Stroke Care tRansition through strokeE triagE screenING pathway

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## Organisation(s) Involved

Jurong Community Hospital & Ng Teng Fong General Hospital

## Healthcare Family Group(s) Involved in this Project

Medicine

## **Applicable Specialty or Discipline**

Rehabilitation & Physical Medicine

## **Project Period**

Start date: 01 May 2022

Completed date: 31 January 2023

## **Aim(s)**

Aim to improve the care transition from NTFGH to JCH/NTFGH Rehabilitation Medicine using 3 main changes.

- Standardise a triage pathway to better stratify stroke patients from acute setting, to allow timely right-siting of patients to rehabilitation facilities.
- Streamline referral process from acute hospital to rehabilitation centres by creating a common communication platform.
- Improve information transfer during care transitions from acute stroke unit to rehabilitation setting with a standardised transfer template.

## **Background**

See poster appended/ below

## **Methods**

See poster appended/ below

## **Results**

See poster appended/ below

## **Conclusion**

See poster appended/ below

**Project Category**

Care Continuum

Inpatient Care

**Keywords**

Stroke, Triage, Screening, Rehabilitation

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# I-SCREEN- INTEGRATING STROKE CARE TRANSITION THROUGH STROKE TRIAGE SCREENING PATHWAY

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QUALITY

## Define Problem, Set Aim

### Problem/Opportunity for Improvement

With an ageing population, Singapore needs accessible, appropriate and quality rehabilitation care to be part of the overall solution to better health and life. This will require us to address the following existing gaps and needs in Rehab care delivery for stroke patients:

- 1) There is currently no common approach to guide care planning based on the patients' rehab needs in acute stroke units. There are also inconsistent practices pertaining to the referral timing to rehabilitation centres, from patient's stroke presentation.
- 2) There is a need to streamline referral process and a need for an efficient common communication platform between acute stroke unit and rehabilitation centres, early in the patient's stroke recovery journey.
- 3) During care transitions from acute to rehabilitation setting, information transfer is variable and rehab providers may commonly need to seek additional clarification from acute team.
- 4) There is no harmonised patient-reported or clinical outcome measures that can be tracked to identify and respond to problems.

These issues result in varied practices on the ground and fragmented care for stroke patients.

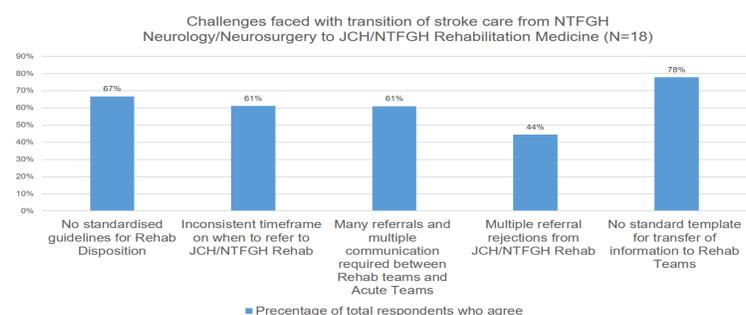
### Aim

This project targets stroke patients care journey from acute hospital to inpatient rehabilitation settings. It aims to:

- 1) Create a standardised guidelines to right site acute stroke patients to their required inpatient rehabilitation settings
- 2) Reduce the time required to transfer patients from acute hospital to inpatient rehabilitation settings
- 3) Improve the information transfer during care transitions from acute hospital to rehabilitation providers
- 4) Improve rehabilitation outcomes of patients through right siting.

### Project Scope

Ng Teng Fong Hospital (NTFGH) Stroke unit team to apply the Stroke Triage Pathway for all newly admitted acute NTFGH ischemic and haemorrhagic stroke patients for Day 2 Virtual Stroke Review.



## SOLUTION PLANNING & SCOPING

The project aims to improve the care transition from NTFGH to JCH/NTFGH Rehabilitation Medicine using 3 main changes:

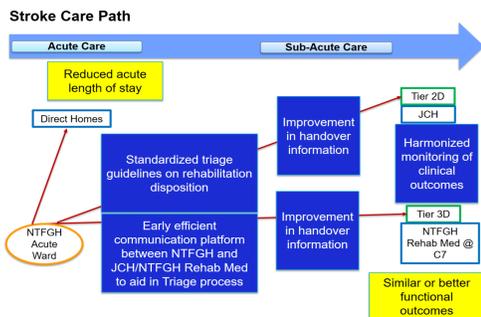
- 1) Standardise a triage pathway to better stratify stroke patients from acute setting, to allow timely right-siting of patients to rehabilitation facilities.
- 2) Streamline referral process from acute hospital to rehabilitation centres by creating a common communication platform.
- 3) Improve information transfer during care transitions from acute stroke unit to rehabilitation setting with a standardised transfer template.

### Secondary aims:

- 1) Acute LOS reduction for newly admitted acute NTFGH ischemic and haemorrhagic stroke patients.
- 2) Early right siting of patients to JCH/NTFGH Rehabilitation Medicine resulting in similar or better functional outcomes, measured by MBI.

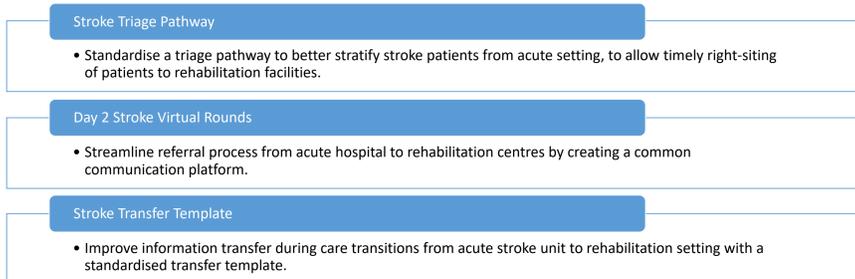
### Balancing measures:

- 1) JCH Rehabilitation LOS
- 2) U-turn rate from JCH to NTFGH
- 3) 30-day ED readmission rate for JCH discharges

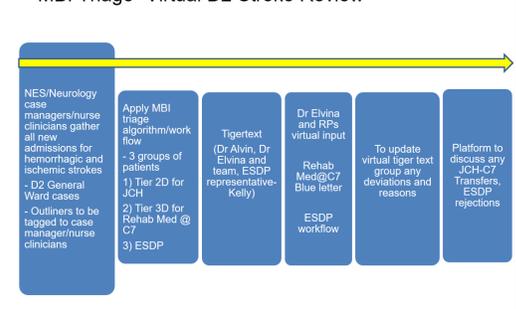


## Interventions

I-SCREEN aims to improve the care transition from NTFGH to JCH/NTFGH Rehabilitation Medicine using 3 main changes:



### MBI Triage- Virtual D2 Stroke Review



To facilitate handover of information to JCH, please kindly indicate the information below with JCH referral. Thank you.	
Mechanism of stroke	<input type="checkbox"/> Haemorrhagic <input type="checkbox"/> Ischemic <input type="checkbox"/> Small vessel disease <input type="checkbox"/> Large artery atherosclerosis <input type="checkbox"/> Cardio embolic <input type="checkbox"/> Stroke of other determined aetiology <input type="checkbox"/> Stroke of undetermined aetiology
BP targets and long-term BP target control	<input type="checkbox"/> <u>    </u> / <u>    </u> (date) <input type="checkbox"/> <u>    </u> / <u>    </u> (date)
Anticoagulation required	<input type="checkbox"/> Yes, if yes, please indicate type: _____ <input type="checkbox"/> No
Antiplatelet treatment and duration	<input type="checkbox"/> Yes, if yes, please indicate type of scan and date: _____ <input type="checkbox"/> No
Any interval scans required (e.g. CT brain)	<input type="checkbox"/> Yes, if yes, please indicate type: _____ <input type="checkbox"/> No
Acute Medical issues to follow up	<input type="checkbox"/> Yes, if yes, please indicate type: _____ <input type="checkbox"/> No
TCU plans	<input type="checkbox"/> stroke MDC <input type="checkbox"/> Others: _____
Family/Patient has been updated on JCH	<input type="checkbox"/> Yes <input type="checkbox"/> No
Follow-up investigations required at JCH	<input type="checkbox"/> Yes, if yes, please indicate: _____ <input type="checkbox"/> No

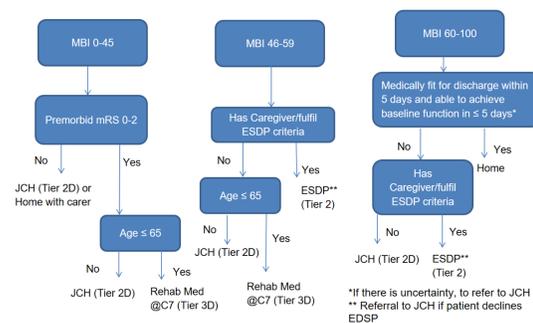
## Interventions (Continued)

### The Stroke Pathway Triage

Set of stratification guidelines in stroke rehab management to ensure the right-siting of acute stroke patients to the appropriate inpatient rehab setting based on their stroke impairments, whilst ensuring similar or improved functional abilities at discharge.

Aims to standardise the triage process using an objective tool and serve as a transition protocol for acute physicians for transfer of rehab care. It defines three bands of stroke severity, which is being used to recommend optimal rehab trajectories.

### Stroke Pathway Triage - Version 6



## Results

- 1) The Stroke Triage Pathway and D2 Stroke Virtual Rounds allowed for efficient and early triage of patients to determine required rehabilitation disposition. Average acute LOS at NTFGH has shown a reduction from 10.47 to 8.17 days for patients requiring rehabilitation at JCH and NTFGH Rehabilitation. (Table 3)
- 2) There is reduction in average referrals needed for every patient accepted to JCH and reduction in JCH referral rejection rate. There is an increase in percentage of patients accepted on 1st JCH referral from 47.4% (baseline) to 87% for period of 19th November-31st December 2022 and from 47.7% (baseline) to 68.8% in January 2023. (Table 3)
- 3) Percentage of JCH admissions increased from 69.9% to 88.9%, out of total admissions to NTFGH Rehabilitation and JCH.
- 4) Mean MBI Gain for JCH patients has shown an improving trend from 17.14 at baseline to 19 in January 2023. MBI efficiency has improved from 0.182 at baseline to 0.1875 in January 2023. There was a MBI efficiency dip from 18th October-18th November 2022 and 19th November to 31st December 2022 period. This could have been attributed by an increase in JCH rehabilitation LOS during these periods. (Table 5)
- 5) In terms of balancing measures, there was a slight increment in U turn rates from 0.182 at baseline to 0.188 in January 2023. However, it has been noted that 30-day ED readmission rates have improved from 0.114 at baseline to 0.063 in January 2023. (Table 6)

Table 2: Baseline data of mean age, mean initial MBI, premorbid mRS.

	Pre-implementation Data 1st May-31st Aug 2022 (N=275)	17th Oct -17th Nov 2022 (N=27)	18th Nov -31st Dec 2022 (N=31)	1st Jan- 31st Jan 2023 (N=24)
Mean Age	66	67	72	74
Mean initial MBI	69	53	49	48
Premorbid mRS	0-2 (221=83.1%)	0-2 (25= 92.6%)	0-2 (29= 96.7%)	0-2 (21= 87.5%)
No of patients (%)	>2 (45=16.9%)	>2 (2= 7.4%)	>2 (1=3.3)	>2 (3=12.5)
*missing data			*1 missing data	

Table 3: Average acute hospital length of stay, average JCH referrals per patient accepted, average JCH referral rejection per patient accepted and percentage of patients accepted on 1st JCH referral.

	Pre-implementation 1st May-31st August 2022 (N=38, 6 missing data - passed away)	18th October- 18th November 2022 (N=16, 1 missing - passed away)	19th November 2022- 31st December 2022 (N=23, 3 missing - passed away)	1st-31st Jan 2023 (N=16)
Average Acute hospital length of stay (days)	10.47	9.88	7.90	8.19
Average JCH Referrals per patient accepted	1.63	1.33	1.15	1.31
Average JCH Referral rejection per patient accepted	0.632	0.40	0.15	0.3125
Percentage of patients accepted on 1st JCH referral (%)	47.4%	56.3%	87%	68.8%

Table 5: Mean MBI Gain and MBI Efficiency for JCH admissions

	Pre-implementation 1st May-31st August 2022 (N=44, 9 missing data)	18th October- 18th November 2022 (N=16, 1 missing)	19th November 2022- 31st December 2022 (N=23, 2 missing data)	1st-31st Jan 2023 (N=16)
Mean MBI Gain	17.14	17.95	19.2	19
MBI Efficiency (Mean MBI Gain/Rehabilitation Length of Stay)	0.633	0.488	0.605	0.745

Table 6: Average Rehabilitation Length of stay at JCH, JCH U turn rate to NTFGH and 30 day ED readmission rate for JCH discharges

	Pre-implementation 1st May-31st August 2022 (N=38)	18th October- 18th November 2022 (n=16)	19th November 2022- 31st December 2022 (N=23, 3 missing data - passed away)	1st-31st Jan 2023 (N=16)
Average Rehabilitation length of stay (days)	27.1	36.75	31.75	25.50
U turn rate to NTFGH (per patient admitted to JCH)	0.182	0.125	0.304	0.188
30-day ED readmission rate (per patient discharged)	0.114	0.188	0.087	0.063

## Spread Changes & How I-SCREEN has benefitted patients

In this project, the changes to care-redesign and how they have helped include:

- The Stroke Pathway Triage as a set of stratification guidelines in stroke rehab management to ensure the right-siting of acute stroke patients to the appropriate inpatient rehab setting, based on their stroke impairments and rehabilitation needs.
- Day 2 Stroke Virtual Review. A common virtual communication platform using the hospital secured communication tool- Tigertext. This tool has allowed for effective and early communication between NTFGH Neurology/Neurosurgical team and JCH/NTFGH Rehabilitation teams.
- Stroke transfer template (Table 1) used by NTFGH Neurology and Neurosurgery to document key information required in the care handover from NTFGH to JCH. This has allowed for effective communication of relevant information required by JCH.

### Actual benefits to patient include:

- Standardised stratification guidelines resulting in early right siting of acute stroke patients, possibly associated with better functional outcomes as evident by MBI gain scores.
- Reduction in acute LOS and possibly patients' acute hospital cost savings.
- Better transfer of handover information using the Stroke transfer template for continuation of patient care from NTFGH to JCH

### Spread changes

The proposed innovation has been adopted in NTFGH and JCH. The monitoring of the innovation will be a period of 3 years from pilot launch on 17th November 2022, alongside the One Rehab Stroke pilot. Hopefully the strategies suggested can be implemented in other public healthcare institutions managing stroke patients.

