

Innovating Hyperacute Stroke Workflow with Smart App Application

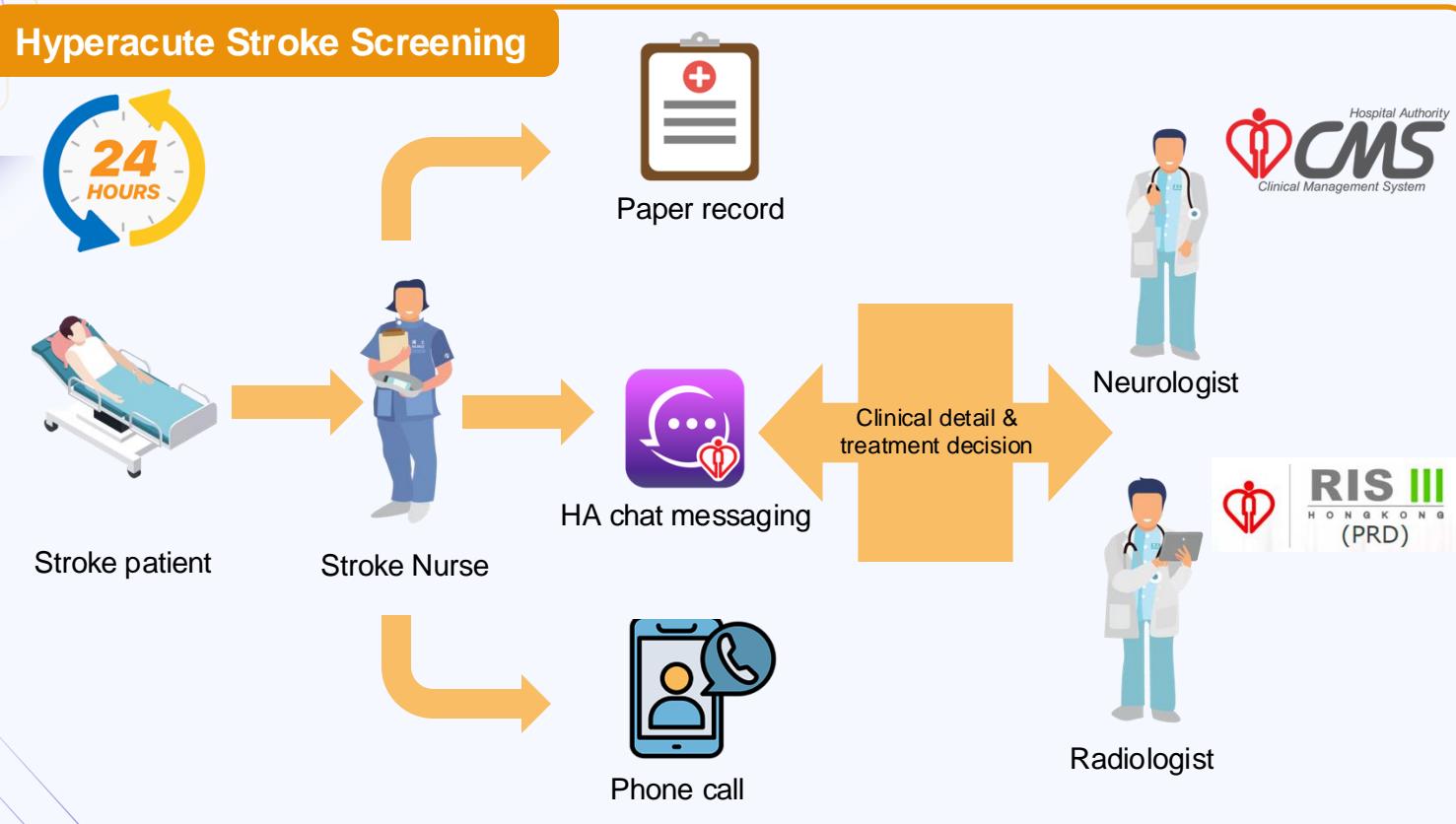
Mr. LEUNG Wai-man, Raymond

Associate Nurse Consultant (M&G/ Stroke)

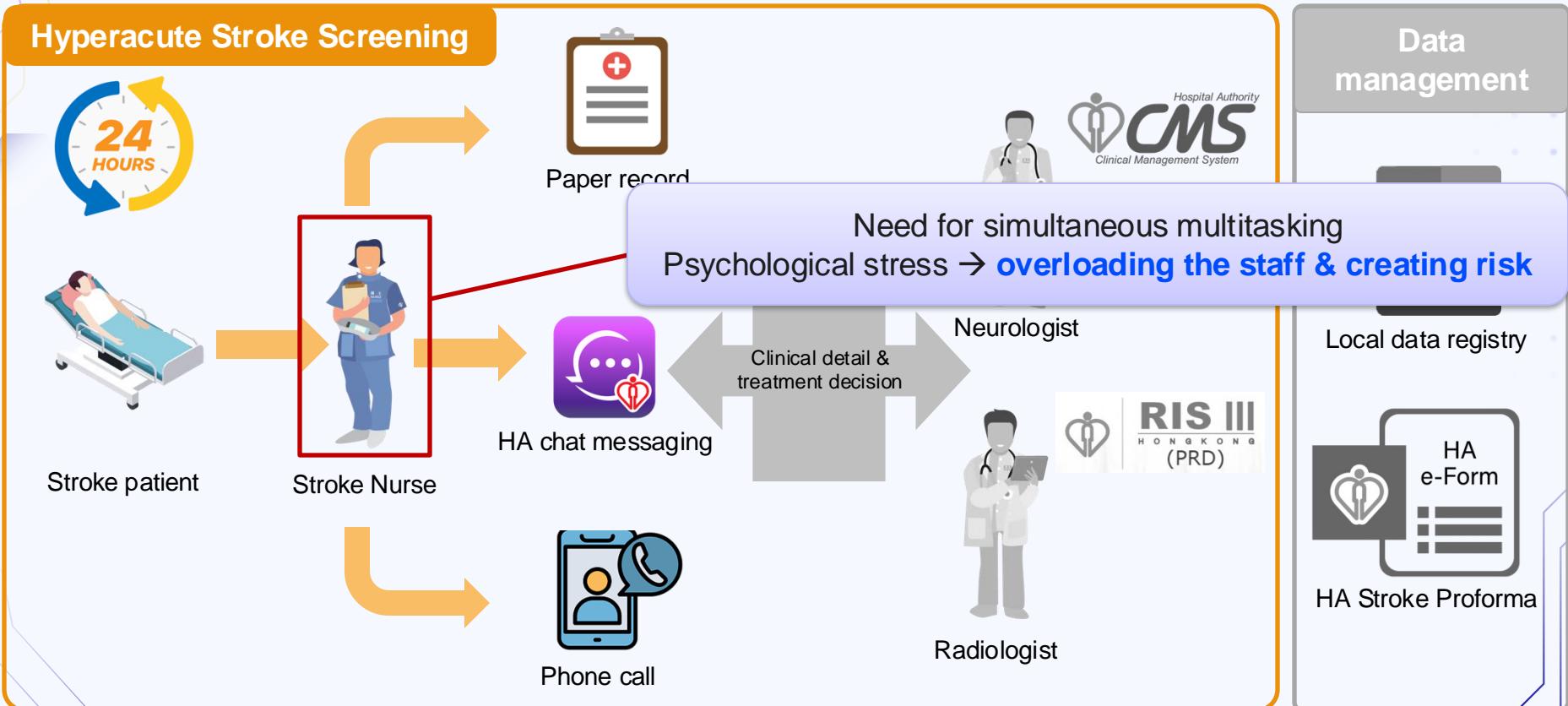
New Territories West Cluster / Tuen Mun Hospital



Current Stroke Workflow



Multi-tasking Stress

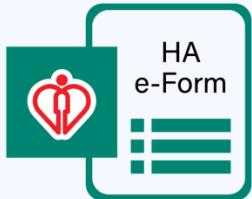


Data management issues

Data management

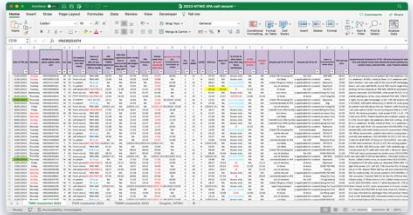


Local data registry



HA Stroke Proforma

Fragmented data system



Local tPA call log

Stroke Proforma

Thrombolysis Proforma

Variance in input format

e.g. date & time format
hh:mm
DD/MM/YY hh:mm
DD/MM hh:mm

Transcription error from paper record to electronic system



1.5 man-hour per day

Need of transcribing & verifying data to electronic record

Time for New Solution

中風中心 | 國家認證中風中心選址屯門醫院 院方：去年起已開始籌組

■ 港聞

發布時間：2025/01/20 00:00



分享：[f](#) [s](#) [e](#) [m](#) [d](#)

熱門 [緬甸地震](#) [啟德七標2025](#) [DSE2025](#) [啟德體育園](#) [超市大搜查](#) [結業潮](#) [金像獎2025](#) [名校專區](#) [會員有獎](#)



▲ 屯門醫院新手術大樓。(醫管局圖片)

“
中国卒中
急救APP

- | 优秀的卒中救治
流程管理工具
- | 基于移动信息的
院前院内一体化
协同救治、分级
诊疗示范工程



Developing localized version
of smart stroke app

Timeline of Development



Dec 2024

Clinical application
and ongoing
improvement



May 2024

2 rounds of user
acceptance tests



March 2024

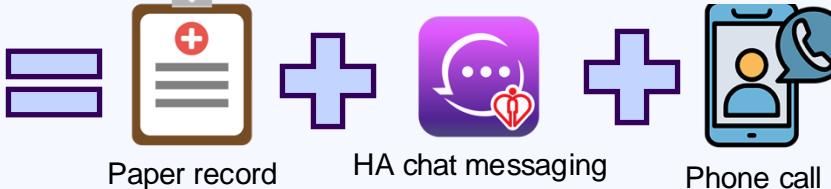
Design blueprint
of SSR



Early 2024

Formation of inter-
disciplinary
development
workgroup

Goal for Our Stroke App



1 App for All

From Pre-hospital to Post treatment



Smart time Capture

Reduce hurdle in manual recording



Automate Database

Facilitate service review analysis

One App for All



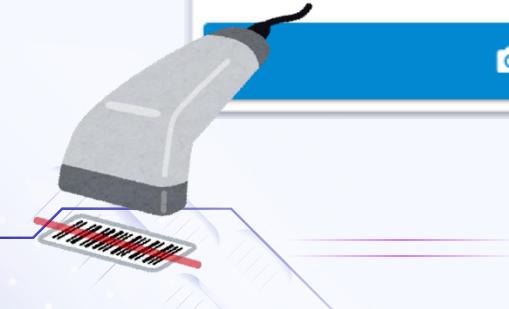
AED Nurses

One-click
activation of stroke
Green Channel

≡ Smart Stroke Registry (PRD)

HKID / AE No. / HN No.

SCAN



TMH Stroke Alert
28 Members

Fri, 14 Feb

NTWC Smart Stroke Registry
*** [AED Initiate Case] ***

Rank / Hospital: tmhaedmo/TMH
Site of Stroke call: TMH AED
Pre-hospital notification: Yes
* Pre-Case ID: SSR0000782
HKID: [REDACTED]
Sex / Age: M/81

Case Acknowledge
9:54 AM

NTWC Smart Stroke Registry
*** [AED Initiate Case] ***
Case Acknowledge
9:55 AM ✓

One App for All



AED Nurses



Stroke Team

Smart Stroke Registry (UAT)

By Activation: 00:02:00 By Onset: 00:02:07

Activation Triage ▶ IA Disposal

TMH IA Screening HKID A1234563

Age 54 Gender M Weight Body Weight (kg)

Start Procedure Act. by [event]

IA Screening

ACKNOWLEDGED

Neurologic: Radiologist: Raymond LEUNG, NTWC/TMH ANC(M&G)

CTB Show ICH No

CTB REQ. CTA REQ. CTB DONE CTA DONE

1ST MO ARRIVAL

RADILOGIST REPLY NOT FOR IA LVO DETECTED, FOR IA

RECEIVED HA-CHAT REPLY "NOT FOR IA", WAITING FOR THE "REASON".

NOT FOR IA LVO DETECTED, FOR IA

[UAT] NTWC IA Thrombectomy
57 Members

Mon, 20 Jan

NTWC Smart Stroke Registry

*** [Triage Screening IV+IA] ***

Rank / Hospital: Raymond LEUNG, NTWC/TMH ANC(M&G)/TMH

Site of Stroke call: TMH AED

Pre-hospital notification: Yes

* Pre-Case ID: SSR0000387

HKID: [REDACTED]

Sex / Age: M/54

Found onset time: -

Last seen normal: -

Stroke onset time: 2025-01-20 10:34:34

Premorbid mRS: 0

GCS: E4 V5 M6

NIHSS: 11

Right side(U/ L): 5/5

Left side(U/ L): 5/5

V / A / N: Vision, Aphasia, Neglect

Any Chest/Back Pain: No

Any Fall: No

Any Head Injury: No

Booked CT brain + CTA

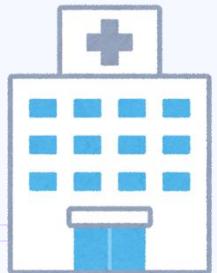
Case acknowledge by Radiologist

10:43 AM

One App for All



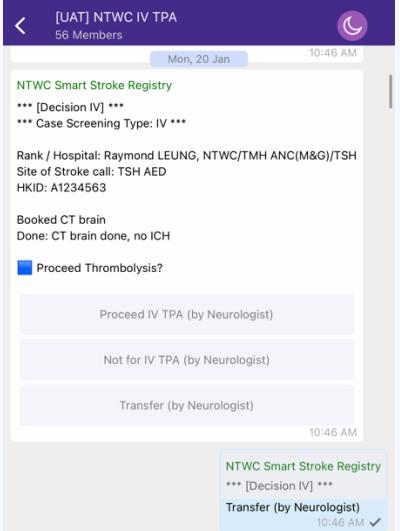
AED Nurses



Stroke Team



Neurologist / Neuro-interventionist



Confirm treatment decision on HA Chat

One App for NTWC



屯 門 醫 院
TUEN MUN HOSPITAL



博 爱 醫 院
Pok Oi Hospital



天 水 圓 醫 院
TIN SHUI WAI HOSPITAL

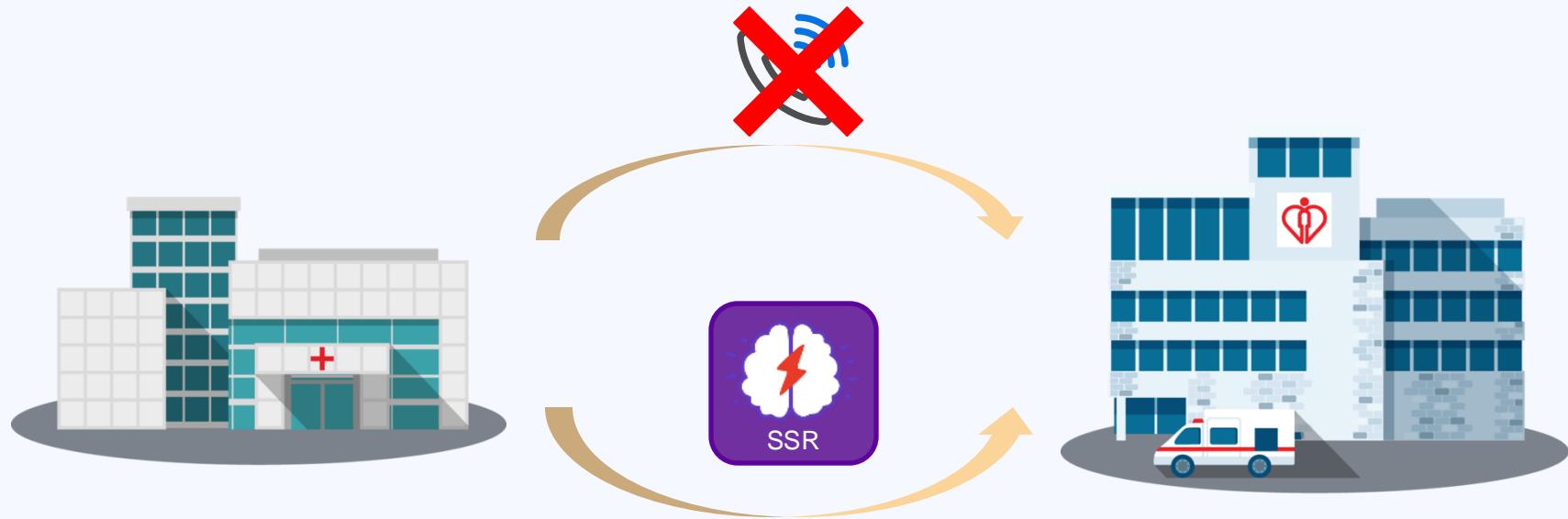


Centralizing data registry
for cluster management

Unified cluster workflow

Facilitating **interhospital**
communication

Inter-hospital Transfer Support



All transfer details recorded and alerted whole team
Saved up to 2-3 phone calls per cases

Seamless Database Entry



- ✓ All predefined timestamps captured
- ✓ Database building at same time for clinical management
- ✓ Well formatted data for immediate analysis

Stroke Nurse

Stroke Case

Only Admin can delete "Non-Init" case.

Rows per page: 50 rows ▾ 1-50 of 719 | < < 1-50 of 719 > >|

Actions	Hospital	HKID	AE / HN No. / Pre-Case Id	Status	Progress	IV Only	IA Only
				Finished	Disposal		
				Finished	Disposal		
				Finished	Disposal		
				Finished	Disposal		

[DOWNLOAD RAW DATA](#)

ALL	TMH	POH	TSH				
Date of TPA call	Weekday	HN (No AE number, please update when av)	AE number of case	Sex	Age	Pre Hospital Notification (For AED Cases)	Source of referral (the 1st site - TMH/POH/TSH/ AED or ward)
16/12/2024	Monday			F	70	NA	TMH AED
16/12/2024	Monday			F	86	NA	POH SCAG in-pt
16/12/2024	Monday			M	75	NA	TSH AED
16/12/2024	Monday			M	86	NA	POH AED
16/12/2024	Monday			F	59	NA	TSH AED
17/12/2024	Tuesday			M	74	NA	POH AED
17/12/2024	Tuesday			M	74	NA	POH SN in-pt
17/12/2024	Tuesday			M	72	NA	TMH AED
17/12/2024	Tuesday			F	86	NA	TSH 6A in-pt
17/12/2024	Tuesday			F	73	NA	POH AED
17/12/2024	Tuesday			F	73	NA	POH AED/TMH AED

Facilitate Interventional Reporting



Radiologist

- ✓ Clinical details input to SSR
- ✓ Database & intervention reporting in one-go

Smart Stroke Registry (SSR)

By Registration: 01:27:27 By Onset: 03:40:27

IA-Peri

TMH HKID E4032229

Age: 73 Gender: M F Body Weight (kg):

Header from PRD: Header for PRD

IA Peri-Procedure

Groin Puncture Time: NOW CLEAR 2024-12-17 15:46

Time of 1st DSA: NOW CLEAR 2024-12-19 17:45

Time of 1st recanalization: NOW CLEAR 2024-12-17 16:20

DSA Site of occlusion: Left MCA M1 Left MCA Proximal M2

ASITNR collateral grade: 1

ASITNR collateral grade: 1

Other DSA finding: TANDEM LESION INTRACRANIAL STENOSIS PROCEDURE COMPLICATION N/A

mTICI score: 0 1 2A 2B 2C 3

Number of thrombectomy pass: 1

1st pass: Technique of thrombectomy: STENT RETRIEVER DIRECT ASPIRATION COMBINED TECHNIQUE N/A

Plain CT brain:
 - ASPECTS: 6
 - Presence of haemorrhage:
 CT angiogram of brain and neck:
 - Site of large vessel occlusion: Yes (Left MCA M1, Left MCA Proximal M2)

Other significant findings:
 Local anaesthesia
 IV-tPA before the endovascular procedure: N/A

CT brain perfusion:
 - CBF<30% volume: 0.0 mL
 - Tmax>6.0s volume: 82.0 mL
 - Mismatch volume: N/A
 - Mismatch ratio: Infinite

ASITNR collateral grade: 1

Total number of thrombectomy passes: 1
 1st pass: Combined technique
 Other intervention: N/A
 Final mTICI score: 3
 Associated tandem lesion: No

Associated intracranial atherosclerotic disease: No

Angiosuite entry time: 15:46
 Femoral puncture time: 15:46
 1st DSA run time: 17:45
 1st persistent mTICI 2b (or above) reperfusion time: 16:20
 Intra-arterial blood pressure: 182/95 mmHg (highest); 124/86 mmHg (lowest)



RIS III
HONG KONG
(PRD)

Impacts of SSR Implementation



>800

Clinical cases
handled via SSR

~7.5

Nursing man-hours
saved per week

>100

Reperfusion treatments
ordered

Road to Broader Horizon



*Leveraging experience of SSR to benefit **ALL** stroke patients in HA*

Acknowledgement

The project can be successfully implemented with the support of the following parties

- TMH Neuroscience Centre Management Committee
- NTWC Comprehensive Stroke Management Coordinating Subcommittee
- NTWC Information Technology Service
- HA HOIT
- Dr. Michael FU, TMH Consultant Neurologist
- Dr. Jimmy SIU, TMH Consultant Radiologist
- Dr. Kelvin TSOI, TMH Associate Consultant Neurologist
- Dr. Justin LAM, TMH Associate Consultant Radiologist
- NTWC Neurologists, Radiologists, and Stroke Nurses



Thank You!