Project Title

Trialing the Use of Smart Robot (TEMI) In ED to Improve Patient Experience

Project Lead and Members

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Organisation(s) Involved

Ng Teng Fong General Hospital

Healthcare Family Group(s) Involved in this Project

Medical, Nursing, Healthcare Administration

Applicable Specialty or Discipline

Operations, Quality Innovation & Improvement, Service Quality

Project Period

Start date: Apr 2023

Completed date: May 2023

Aims

To explore and trial the use of smart robot in ED for a period of 4 weeks to test 3 specific identified functions: 1. Video Calling 2. Patient Video Education and 3. Escorting Function to assess a robot's effectiveness in improving patient/NOK's experience and increasing manpower efficiency (reduce time spent by staff to perform the task).

Background

See poster attached/ below

Methods

See poster attached/ below

Results

See poster attached/ below

Lessons Learnt

See poster attached/ below

Conclusion

See poster attached/ below

Project Category

Care & Process Redesign

Value Based Care, Patient Satisfaction, Quality Improvement, Design Thinking

Technology, Digital Health

Keywords

TEMI Robot, Patient Experience

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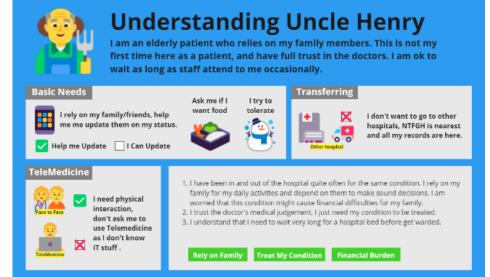# TRIALING THE USE OF SMART ROBOT (TEMI) IN ED TO IMPROVE PATIENT EXPERIENCE

⭐ **PATIENT EXPERIENCE**

SPONSORS: DR GARY CHOA, CLARICE WEE
MEMBERS: DR ESTHER TAN, JOYCE LOKE, JOANNE YEO, KHOO MAY LIN, KELVIN LEW, NG YAN JUN, NITHIANATHAN S/O SIGAMANI, PHYLLIS NG, SITI MAZIAH BINTE OMAR, EILEEN NG

Define Problem, Set Aim

Problem/Opportunity for Improvement

Our ED Patient Experience Workgroup, together with QII team, used Design Thinking methodology with the aim of improving ED patient experience. Patient Observations and Patient Interviews were conducted. Empathy maps were done up and personas were created from there.

The ED team brainstormed solutions during the ideation workshop and one possible idea that arose was to deploy smart robots to meet the needs of our personas and improve their patient experience. The intent of deploying smart robots was also to help nurses with tasks so that they can focus on providing clinical care.

Aim

To explore and trial the use of smart robot in ED for a period of 4-weeks to test 3 specific identified functions:
1. Video Calling 2. Patient Video Education and 3. Escorting Function- to assess a robot's effectiveness in improving patient/NOK's experience and increasing manpower efficiency (reduce time spent by staff to perform the task).

Identified Functions

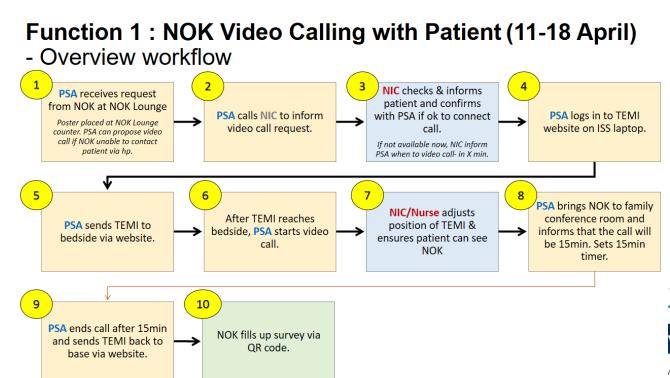| Video Calling	Patient Education	Escorting discharged P2 patients
• Less tech-savvy patients at P2 unable to connect with NOKs. • Next-of-Kin (NOK) are worried and anxious as they are unable to visit patients as P2 clinical area does not allow visitation. (esp. during long ED bed wait). • 64% of our PSAs surveyed frequently get scolded/ complained for not allowing NOK to see/ visit the patient	• Long time taken to educate patients on caring for their conditions (~5-20min depending on staff). • Education done through printed discharge advice. Patients may not be able to visualise.	• Nurses get derailed from nursing care activities by the need to bring discharged patients to pharmacy/payment counter within the ED so that they do not get lost. • As a result of nurses escorting patients, other patients under their care may be left unattended.

Establish Measures

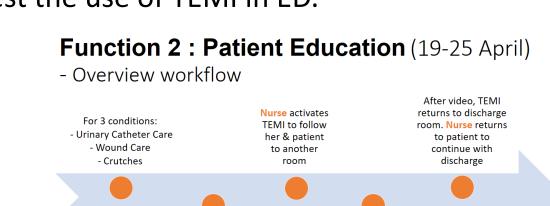| S/N	Function	Post-intervention Measures	Baseline Measures
1	Video Calling at P2	**Quantitative** 1. Number of video calls made on TEMI **Qualitative** 1. NOK survey post-video call & staff survey post-pilot.	This service is currently not provided. Hence, the baseline is **0**. If tap on manpower (PSA/Nurse) to facilitate video call, it can take up to **20min/call**.
2	Patient Video Education at P3 3 conditions: • Urinary catheter care • Use of crutches • Wound care	**Quantitative** 1. No. of times patient watch patient education video on TEMI 2. Time taken to facilitate the whole process **Qualitative** 1. Patient survey & staff survey post-pilot.	Done by nurse **verbally** using printed discharge advices. Survey shows that nurses take **5-10 min** to teach patient about any of the 3 identified conditions. **97%** of ED nurses surveyed thinks education video will help convey information better and in a standardised manner.
3	Escort stable ambulant discharged patients from P2 to Pharmacy/ Payment	**Quantitative** 1. No. of trips made by TEMI 2. No. of minutes saved **Qualitative** 1. Staff survey post-pilot.	Time taken by nurse to escort (based on time motion study): 2min 25s + 1min 30s = **4min 55s** Est. no. of stable ambulant patients discharged from P2 & accompanied by nurse: **~560/month**

Test & Implement Changes

Piloting the workflow with 4-week TEMI Robot Trial (11 April - 8 May 2023)

New workflows were developed to test out the use of TEMI for the identified use cases. The pilot focused on 1 function every week. PDSA cycles were run in shorter intervals during the course of the pilot. Workflows were revised to adapt to changes on ground and to better test the use of TEMI in ED.

Function 1 : NOK Video Calling with Patient (11-18 April) - Overview workflow

Function 2 : Patient Education (19-25 April) - Overview workflow

Function 3 : Escort stable ambulant discharged patient from P2 to Pharmacy/ Payment Counter (26 April- 2 May)

Poster displayed at NOK Lounge to publicise the trial to NOKs

Roll Calls and Hands-on Training Sessions organized for PSAs and Nurses

P2 patient following TEMI to discharge pharmacy

Outcomes

Video Call

8 NOK responses - 100% found service helpful. Of which, 2 patients were uncommunicative and on tubes.

Our learning: TEMI is not just for communication. Sometimes just being able to see the face of their loved ones brings comfort to them.

Positive feedback from NOKs

- Have been able to call the mother but still worried as **cannot see how she is doing and how is the bruise.**
- Patient uncommunicative/ cannot move. Video call mainly to see the mother.
- This service is very helpful (expressed repeatedly during our conversation). She is **happy can encourage her mother and can take photo of the screen to share with her siblings too.**
- **Grateful that the option exist so that she can still see the patient.** (Patient on tubes, non-communicative.)

Why do you need to use this?

- Pt has a traditional phone but the battery is flat. Patient has been here since Sunday and still waiting for bed (Wed).
- Pt's eye condition not very good so difficult to use hp as **he doesn't know how to press the button on his hp.**

How do you find this service?

- Definitely will prefer if can visit in person and have the physical touch but the video call is very good as an alternative to at least see how she is doing.
- Wife (78 yo) found the experience very good, can see and hear pt very clearly.

	Video Call	Patient Education	Escorting to Pharmacy/Payment
No. of Cases	8 (in 5.5 days)	16 (in 7 days)	11 (in 7 days)
Time Taken	**Without TEMI**		
	20 min for PSA/Nurse	5-10 min for Nurse	4 min 55s for Nurse
	With TEMI		
	8 mins for PSA □ 7 min to coordinate with nurse & patient □ 1 min to setup • 11 min video call • 5 min for TEMI to return	6.8 mins (video) + **5-10 min for Nurse** to explain again	**<1min for Nurse** 7min by Temi
Staff Survey Outcomes Do you think we should provide this service in ED?	**PSAs (39 responses)** Yes: **72%** *Out of those who tried during pilot* → Yes: **92%** **Nurses (57 responses)** Yes: **69%** *Out of those who tried during pilot* → Yes: **100%** Feedback from PSAs: • It was easy to use TEMI. Good that TEMI can go back home itself. If we use Ipad, it will get missing. • We usually have to ask NOKs to go home to wait when they approach us for updates or to speak/see their family members. They are less angry with video call.	**Nurses (57 responses)** Yes: **71%** *Out of those who tried during pilot* → Yes: **89%** Feedback from P3 nurses: • P3 is too fast paced for TEMI. Will break the flow of discharge if need to maneuver and robot and show a video. • Need to explain again after video as the videos are not multi-lingual. • Videos are informative and good. • Patients can use their mobile device to scan the QR codes instead of using robot.	**Nurses (57 responses)** Yes: **74%** *Out of those who tried during pilot* → Yes: **100%** The cases during the pilot was much lower than estimated. During the week of pilot, ED had very high workload, nurses were quite overwhelmed and were less inclined to test the robot (as it deviates from usual workflow). They feel that walking patient to pharmacy themselves was much faster. Patient safety was quoted as a concern as nurses was not comfortable letting robot escort the discharged patient.
Decision by ED Patient Experience Workgroup	• Largely positive feedback by PSAs towards Video Call function • Positive feedback from NOKs (100%) • Decision to purchase 1 unit of TEMI robot for this function.	• Instead of using TEMI robot, ED decides to explore video education via QR codes at P3. • The videos are now being improved on and expanded to other languages.	• ED identified a few areas to place additional signage. To assure nurses that stable ambulant patients can go to pharmacy/payment independently. • Tap on the TEMI robot to be purchased for Video Call as an alternative.

Spread Changes, Learning Points

What are/were the strategies to spread change after implementation?

The team has put up workplan to purchase 1 unit of TEMI robot to operationalize the Video Call service permanently. To spread the change, after video call from ED NOK Lounge is rolled out permanently, the team will explore allowing NOKs to have a video call with patient from the comforts of their own homes/any location next.

Our pilot findings were shared at the PECSC platform. We are also very open to sharing learning points and NOK feedback with other patient care areas. This includes the strengths and limitations of what TEMI can provide. This can help to enhance their learning so that they can optimize the capabilities of TEMI during any pilots/trials.

What are the key learnings from this project?

1. Not 1 size fit all solution
During our ideation, robots/ technology are often quoted as a solution to our current pain points or a means to improve efficiency. However, the context of using these tools needs to be critically assessed. When developing functions of TEMI to test, we realised that there are many other considerations unique to ED, e.g. space constraints in ED, emotionally charged patients, infection control guidelines. It is also challenging for TEMI to cater to all patient types, e.g. contact precaution cases or patients with dementia which will still require staff to intervene or to be alongside them.

2. Human Intervention is still required
The team has to balance configuring TEMI as an independent solution versus some level of staff intervention to fully optimize the potential of the robot.

3. Change Management is key
As this is something new, how we influence our end-users is key. Time has to be invested in communication/ demo sessions so that our ED team knows that TEMI is here to help them and it is important for all of us to learn how to adapt, adopt and co-exist with these new technological solutions.

4. Find the Right Timing
At the initial stage, we opined that introducing TEMI when ED is extremely busy could help us to gauge if the robot can alleviate the burden of the team during bad days and test if the robot could navigate the crowded ED safely. On hindsight, it may be better to introduce a new technology when ED is less hectic so that staff are more adventurous and eager towards trying new technologies/ workflows which deviate from their usual habits.

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