# [OP1] A better system for patients to call/alert nurses and inform of their needs

By Ling Nee Ker, Asst Director, KTPH
And Echo Wang, Sr Executive, KTPH

OIC - Q&A session
20 Aug 2019
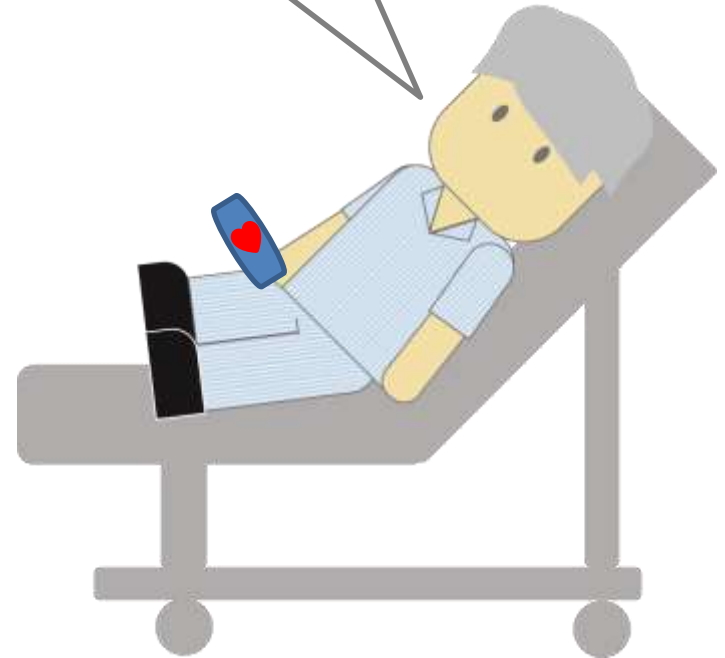
# As-Is (patient to staff communication)

**ROOM 2 BED 10**

What the patient wants?

Any Missy is coming to help me?

- Inadequate Information Leading to Unproductive Use of Time
- Shortcomings of a Wired Nursecall System

# As-Is (staff to staff communication)

I need to call other colleague for help … but need to keep my hands clean

**Contact Precaution**

- Not convenient for nurses to reach for a handset during their work as hands are full managing patient.
- Infection control management prevent nurse from using a handset.
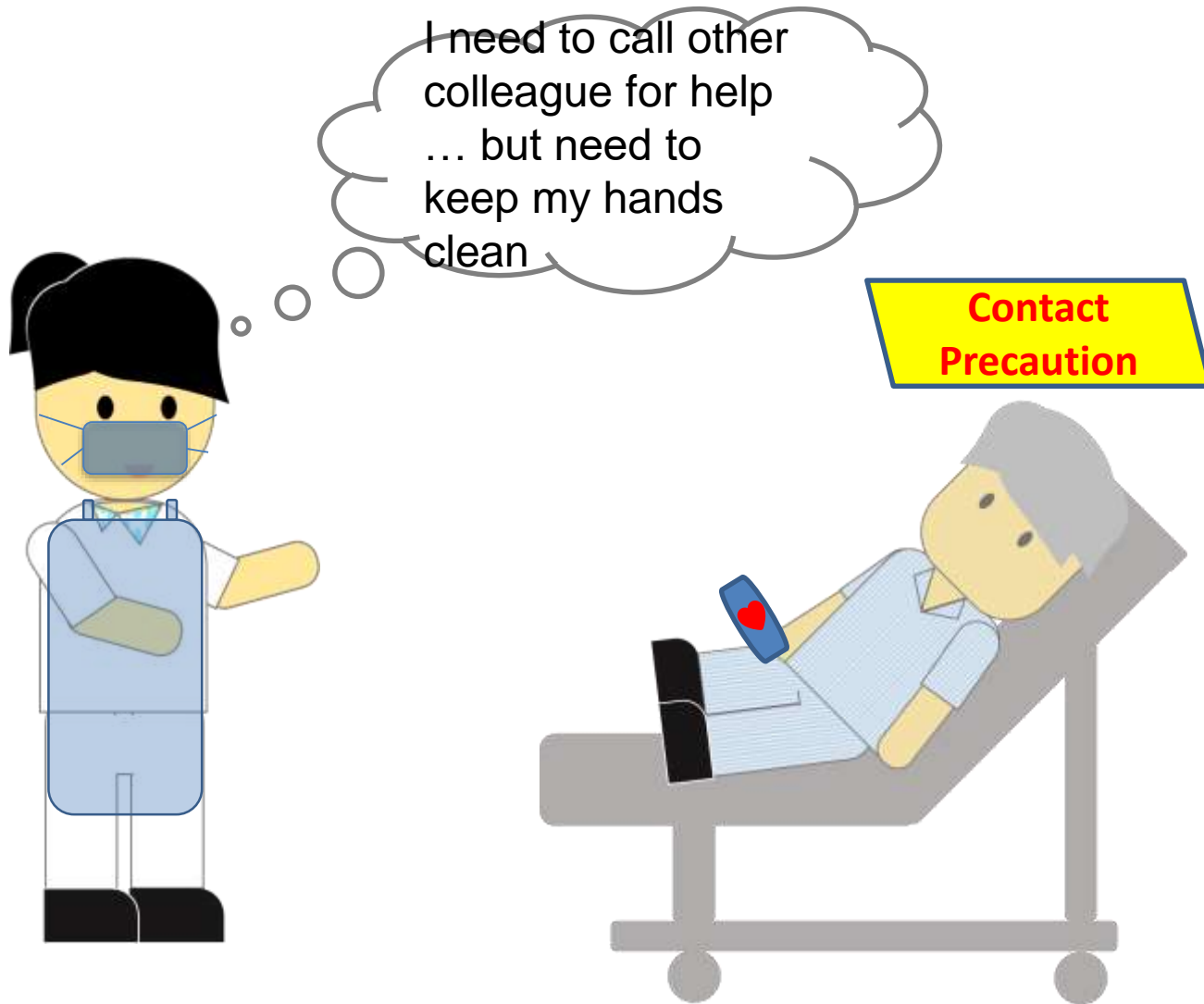
# What pain points we are having?

## Shortcomings of a Wired Nurse-call System

- Whether patient can reach?

- The wire long enough?

- Infection Control concerns

- ……

## Lack of an efficient intra-ward hands-free communication

- Nurse Station phone?

- Personal handphone?

- Wards Public Address(PA) syste...

- ……

# What we want to achieve?

- Patients are aware of call **status**

- Reduction in **unnecessary motion/work**

- **Prioritisation** of multiple simultaneous requests for patient safety

- **Effective allocation** of tasks to the right staff → Reduction in nurse intervention for non-nursing related requests

- Staff can initiate **hands-free communication** to ask for further support without unnecessary motion

*Google Home?  Alexa?  Siri? … for healthcare …*

# [OP2] A solution that can monitor patients' vital signs and movements in real-time
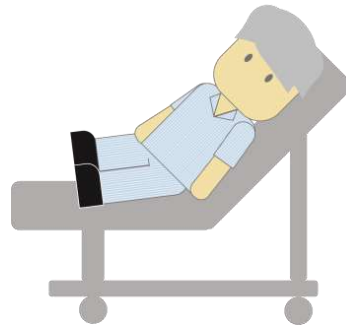
By Ling Nee Ker, Asst Director, KTPH

And Jack Lau, Sr Executive, KTPH

# What is Patient Monitoring

## Vital Signs

Blood Pressure
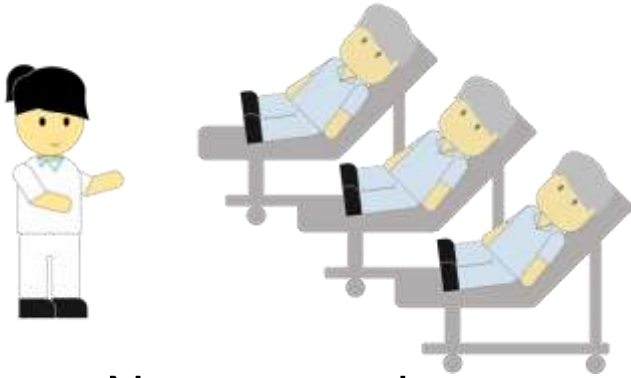Temperature
Respiratory Rate
Heart Rate
SPO2

## Patient Behaviour

Activity level
Restlessness
Bed Exit
Seizures and Fits

# As-Is

**1**

Nurses need to monitor many patients at once, round the clock.

**2**

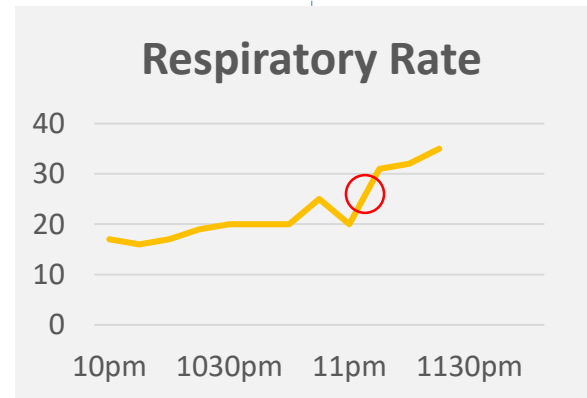Nurses' observations can sometimes be subjective, cannot always keep sight of patient.

**3**

Patient condition can change outside of monitoring intervals.

# To-Be

Contactless
Machine Learning,
 A.I. etc

**Sleep Movement**

**Body Temperature**
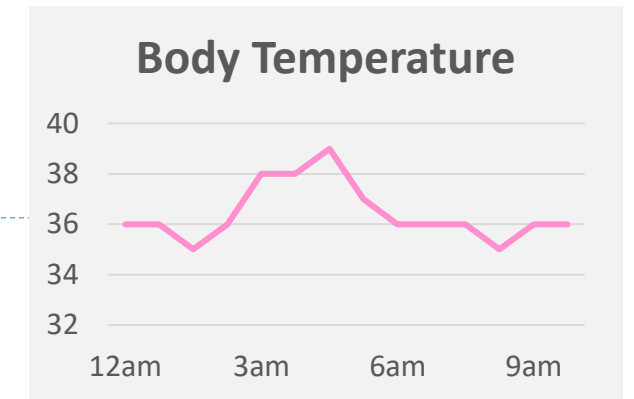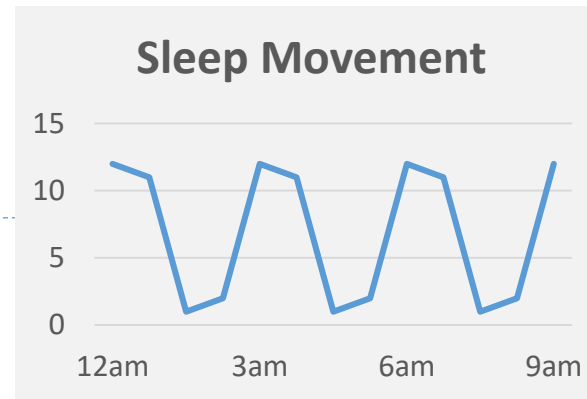
**Respiratory Rate**

**Patient Vital Signs & Behaviour**
- Respiratory Rate
- Body Temperature
- Bed Turning
- Activity Level
- Sleep movements
- Detecting if a fall-risk patient is attempting bed exit
- Detection of seizures and fits
- Monitoring of patients with psychological issues
- Suicidal precaution patients
- Alcohol withdrawal behaviours
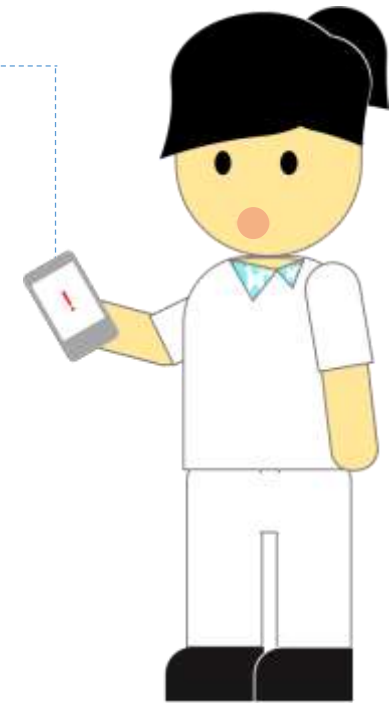
**[OP3]** A smart system to (1) integrate care information from various sources within inpatient setting, (2) analyse and interpret the information, and (3) send the information to the relevant care personnel and trigger the necessary action

By Ms. Tan Tzuu Ling

Sr Nurse Manager, TTSH

# A Smart Patient Care Communication System for Safe & Timely Last Mile Care Delivery in the General Wards

**Pain points**

1. Every day, a nurse waste an average of 29 minutes searching for someone for information or something which can possibly be utilized for direct patient care. 30% of PSA time was interrupted by telephone calls and an average of 35 minutes per day searching for a nurse to answer the calls or gather information from the healthcare team.

2. Information and data that are being collected but may not be delivered and evaluated in a timely manner to the care team. With the positive development and introduction of new monitoring systems, there may be more alarm triggers and yet alarms come in various form factors, that may result in alarm fatigue for the staff. Care team is required to remember the colour of the visual alarm trigger and the audio alarm trigger or to make sense of the critical information generated. Often, the care team will be busy attending to matters either at the ward station or attending to a patient. During their activities, they may miss the critical information or alarm triggers.

**Scale of problem / Impact of solution**

1. More than 20% of the population

**What you need from external partners**

Company that can develop and deploy a Smart Patient Care Communication System for the general ward.

# [OP4] High functionality footwear for healthcare professionals

By Mr. Nurhisyam Bin Norhalim,

Radiographer, TTSH

**Description of problem**

1. Existing footwear are on extreme ends of the spectrum; comfortable crocs or steel-toed boots, Lightweight sneakers or cumbersome boots. HWs often pick comfort/style over safety.

2. Workplace accidents occur on a regular basis. Whether a heavy object is accidentally dropped onto the foot or a trolley running over toes. The fast-paced nature, heavy equipment used and long-shifts all exacerbate the problem.

## Pain points

1. Healthcare workers tend to value comfort over safety when it comes to footwear. They tend to discount safety (nurses clogs) for trendy cushioned sneakers or classy dress shoes.

2. Shoes in the market often offer only one or the other. Few offer both but end up appearing overbuilt or intimidating. There is no middle-ground.



## Scale of problem / Impact of solution

1. 221 reported Workplace Related Incidents resulting in injury to staff in 2018 according to IRIS statistics.

2. The problem affects each person working in the hospital and extends beyond.

## What you need from external partners

Company that can assist in development and manufacturing of working prototype and product.

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# [OP5] An improved reusable face visor which does not compromise audibility, meets infection control standards and at reduced cost

By Dr Holy Koh and

Ms Suryati Binte Mohd Isa (NHGP)

## An improved reusable face visor which does not compromise audibility, meets infection control standards and at reduced cost.

**Description of problem**

1) The initial quality improvement objective to reduce mask expenses has been achieved. However the solution is not yet ideal. This gives us room to innovate and improve more.

2) Currently, dentists and dental assistants use face visor with plastic fluid shield that covers the whole face to protect the care provider from aerosol/splashes. It is used with a surgical face mask when seeing patients for all dental procedures. The current surgical face mask with face visor is cheaper than the fluid-shield face mask with visor and offers greater protection as it surrounds the whole face. However, staff feedback that the face visor tends to press on the temples, causing headaches for some.

3) The adjustable drawstring at the back of the face visor is a potential area for germs to populate as it is hard to clean with alcohol swipes.

4) The long fluid shield also hit the patient's face if the staff bends too close to patient.

5) Staff has to speak louder as voice becomes muffled with the protection offered by the fluid shield and surgical face mask.

# An improved reusable face visor which does not compromise audibility, meets infection control standards and at reduced cost.

**Fluid shield face mask with visor**
(Cost: $$)

**Face visor with plastic fluid shield** covers the whole face and protects user from aerosol. It is used together with **surgical face mask**. (Cost: $)

Transparent plastic shield as visor protection

Face visor with plastic fluid shield

Surgical face mask

Press on temples and may cause headache

Muffled voice

May hit patient's face if bends too close

Adjustable drawstring may harbour bacteria

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## Problem statement / Title
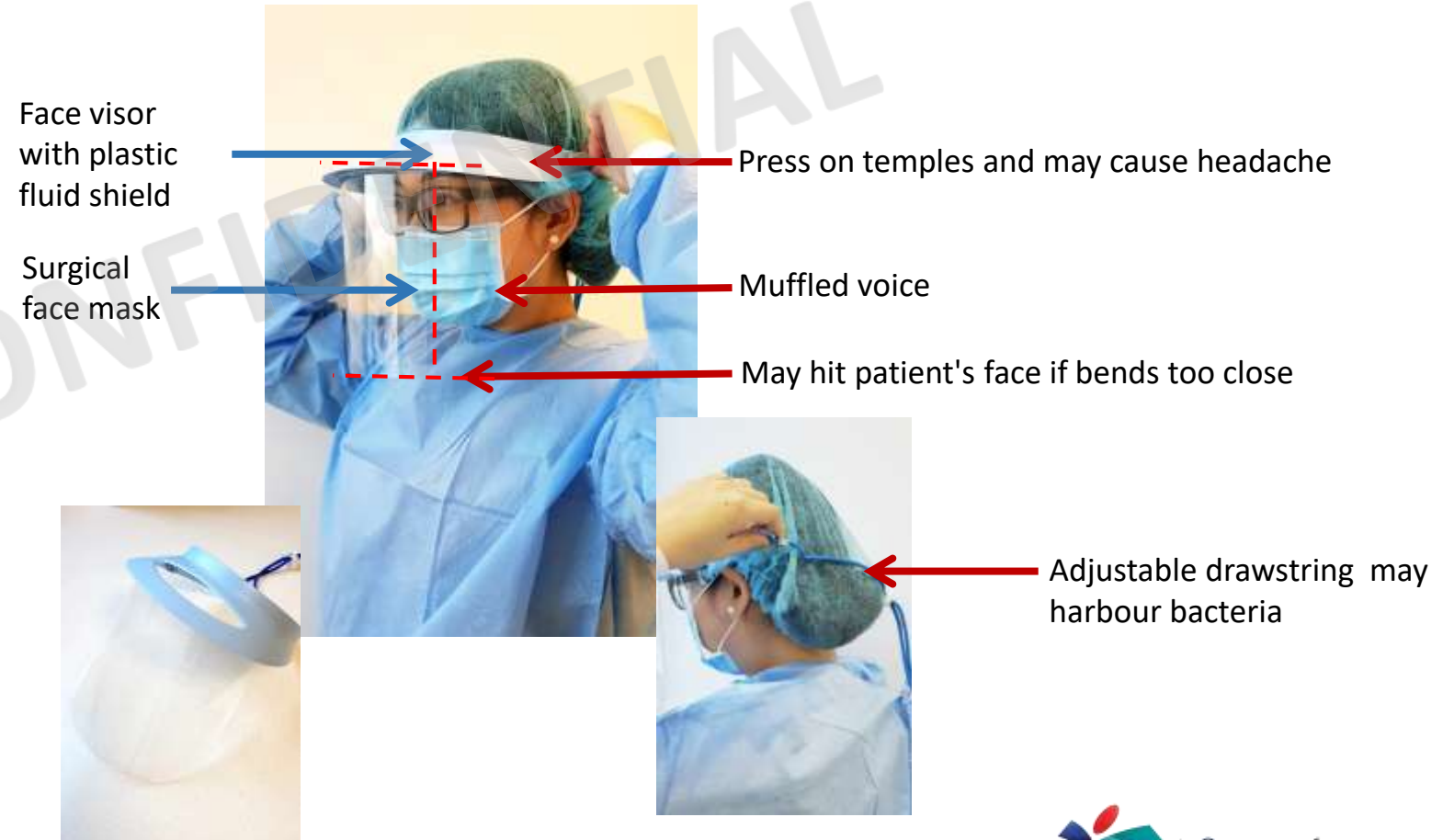**An improved reusable face visor which does not compromise audibility, meets infection control standards and at reduced cost.**

### Pain points
1) Wearing the surgical face mask with face visor muffles the voice. Staff ended up having to speak louder which adds a strain to their vocal cords. Patients may also hear instructions wrongly due to unclear instructions which may then lead to poorer clinical outcome or complaints due to miscommunication. Dental assistants may get the wrong instruction due to the muffled voice too.

2) Staff has difficulty cleaning the adjustable drawstring thus it may harbour bacteria when not cleaned properly.

3) The surgical face mask with face visor causes headache for some. Affected staffs have switched back to using the face mask with visor which is less environmentally friendly (as it is thrown away after every use) and more costly.

### Scale of problem / Impact of solution
Estimated scale of problem:
1) Less than 1 % of the global population
2) Less than $1 million

Impact of solution:
1) Cost saving
2) Less wastage, environmentally friendly.
3) Comfort fit and protection for clinicians.
4) Reduce miscommunication.

### What you need from external partners
1) Explore the possibility of adding a soft padding (of an easily cleanable material) where the face visor touches the temples.
2) Shorten the length of fluid shield.
3) Explore adding a one-way valve so that sound waves can pass through easily while still protecting the staff.
4) Replace adjustable drawstring with material that can be disinfected with 70% alcohol wipes.

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# [OP6] An efficient way to manage the inventory and dispensing of vaccines within the polyclinic

By Dr Valerie Teo, Family Physician Consultant, NHGP;
Mr. Richard Low, Asst Director of Nursing, NHGP;
Ms. Magdalene Tay, Sr Executive, NHGP

## Pain points

Currently, vaccines are stored in a vaccine refrigerator connected to a temperature monitoring logger and backup power supply.

Current system is bulky and occupies a lot of space inside a service room.

The whole process of dispensing, rotating and managing vaccine inventory are all manual processes.

## Scale of problem / Impact of solution

1. Nurses have to manually pick vaccines and there is a risk of picking the wrong vaccine for the patient. An automated dispensing system will be able to mitigate this risk.
2. Manual picking of vaccines may not be based on earliest expiry date first, which may result in wastage and write offs. It will be ideal to have a system that can dispense vaccines nearest to expiry first.
3. Cold chain is affected whenever the fridge is open. A door-less design with a closed system can better maintain cold chain.
4. Current uninterrupted power supply system has only 2 hours of backup power supply. A system with a longer duration of backup power will provide more time to implement contingency plans if necessary.

## What you need from external partners

A partner to develop for an automated **All In One** vaccine dispensing system that improves vaccines workflow, enhances patient safety and improves productivity.

## Current Half Height Vaccine Fridge

## Current Full Height Vaccine Fridge



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**Aim**

Develop a purpose-built vaccine management system with the following features:

1. Vaccine dispensing system that allow nurses to focus more on patient care and less on non-clinical tasks.
2. Automated vaccine picking and dispensing ensures correct vaccine is picked for the correct patient every time.
3. Touch screen interface for quick and accurate access to entire vaccine stock.
4. Secure and organized closed vaccine management system.
5. Automatic stock rotation and dispenses vaccines closest to expiry first.
6. Guaranteed temperature management that protects against temperature excursions.
7. Digital temperature loggers with 24/7 temperature monitoring.
8. Real time inventory monitoring and reporting.
9. Built-in backup power that provides at least 9 hours of coverage in the event of power failure.

# [OP7] An efficient way to administer referrals to evenly distribute appointments to primary healthcare institutions and shorten patients waiting time for specialist consult

By Phil Wong, Sr Executive, NSC

**Description of problem**

The current healthcare referring framework is largely depending from the workflows from primary care and the public healthcare institutions (PHIs). There are many factors involved during the visit in primary care which may lead to an uneven distribution of appointments and waiting time. In addition, manpower is required from both primary care and PHIs to handle all these referrals.

1)  Uneven distribution of appointments to various PHIs due to factors such as the patients' preference, waiting time and proximity.

2)  Huge waiting time difference among institutions

3)  Repetitive labour-intensive tasks are require to perform the current referring framework from both primary care and specialist outpatient clinics (the receiving end)
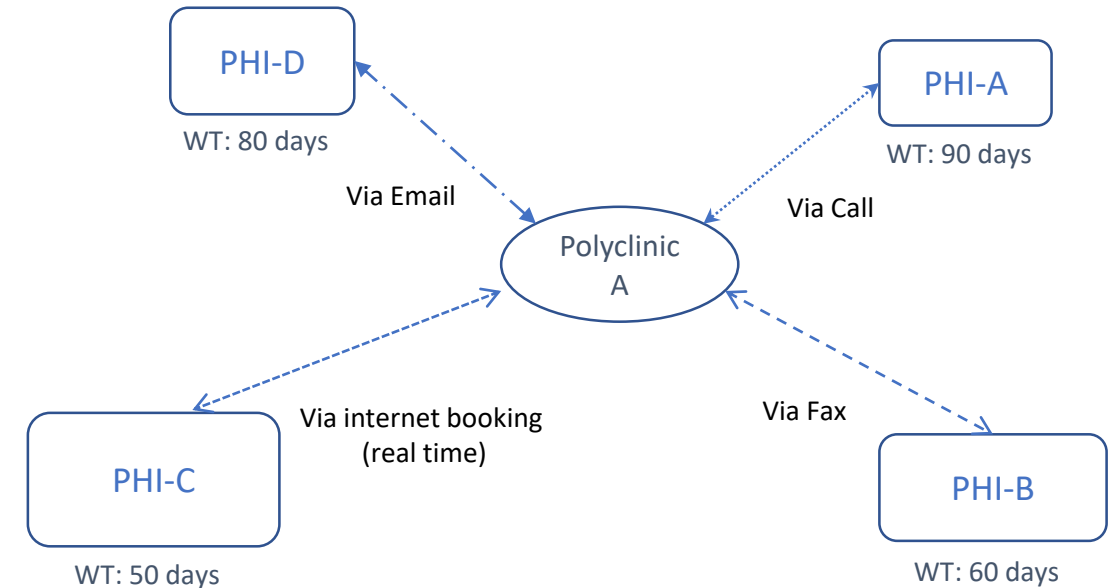
# An efficient way to administer referrals to evenly distribute appointments to primary healthcare institutions and shorten patients waiting time for specialist consult

## Pain points

1. The current referring framework is mainly depending on human intervention whereby the primary care have to send in an referral request to the Specialist Outpatient Clinics (SOC) via different channels such as fax, internet booking or call. The SOC whom received the referrals have to search for appointment, book and send it back to the primary care.
2. For those SOC without internet booking (real-time transaction), there will be turnaround time for the primary care to get back to the patient on the appointment details.
3. The patient may compare the waiting time across several PHIs before deciding which PHIs to be referred to, which the primary care have to amend the referral letters
4. Long turn around time due to factors in #1, #2 & #3
5. Waiting time is not standardize across all the PHIs which some patients can wait up to 90 days to see a specialist consult

## Scale of problem / Impact of solution

1. Appointment waiting time median will be the standardize across all PHIs
2. Reduce 10% headcount from the contact centre (in NSC context)
3. On a monthly basis, NSC received about 3200 dermatology referrals from primary care, PHIs, CHAS GP and others.



PHI-D
WT: 80 days

PHI-A
WT: 90 days

Via Email

Via Call

Polyclinic A

Via internet booking (real time)

Via Fax

PHI-C
WT: 50 days

PHI-B
WT: 60 days

## What you need from external partners

Company that can develop a system to receive referrals and evenly distribute via automation to all the SOC in PHIs. There should not need human intervention after the request entry has been entered into the system. The system should be capable to perform auto searching, comparing of WT across different PHIs , perform booking based on the shortest WT and send notification to the patients.

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