Radio Frequency Identification (RFID) Tracking Of Cardiac Patients In SGH Campus

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National Heart Centre Singapore — SingHealth
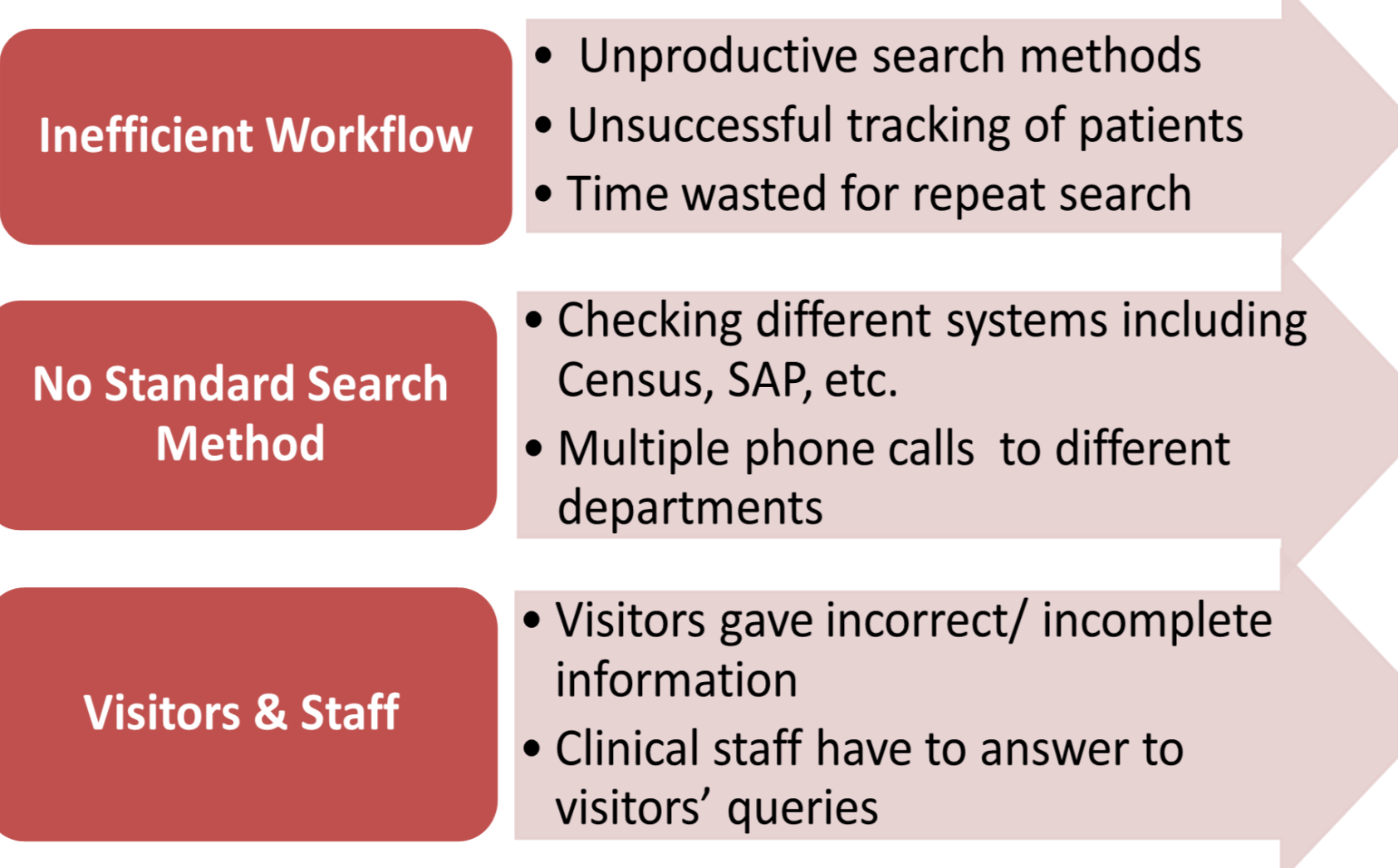
1 BACKGROUND

In National Heart Centre wards, it is common for patient to be transported out of the ward for surgery, procedures or cardiac investigations daily. Enquiries on patients' location are made frequently by visitors. Staff will have to locate patients by calling other departments, or check through census book and various online system such as SAP, Citrix, Trendcare or BMS.
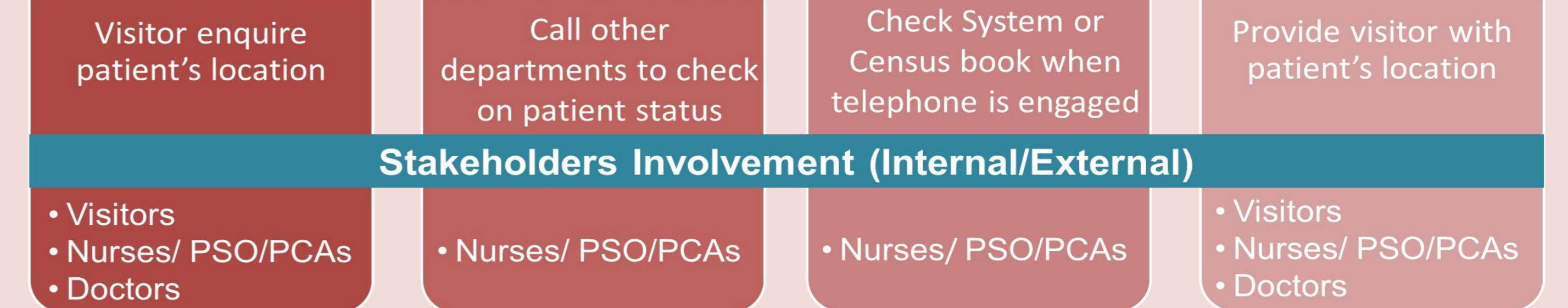
PREVIOUS SITUATION

A survey done in NHCS has showed that a staff takes an average of 4 minutes to locate one patient and there was an average of 45 to 60 enquiries per day.

Target:
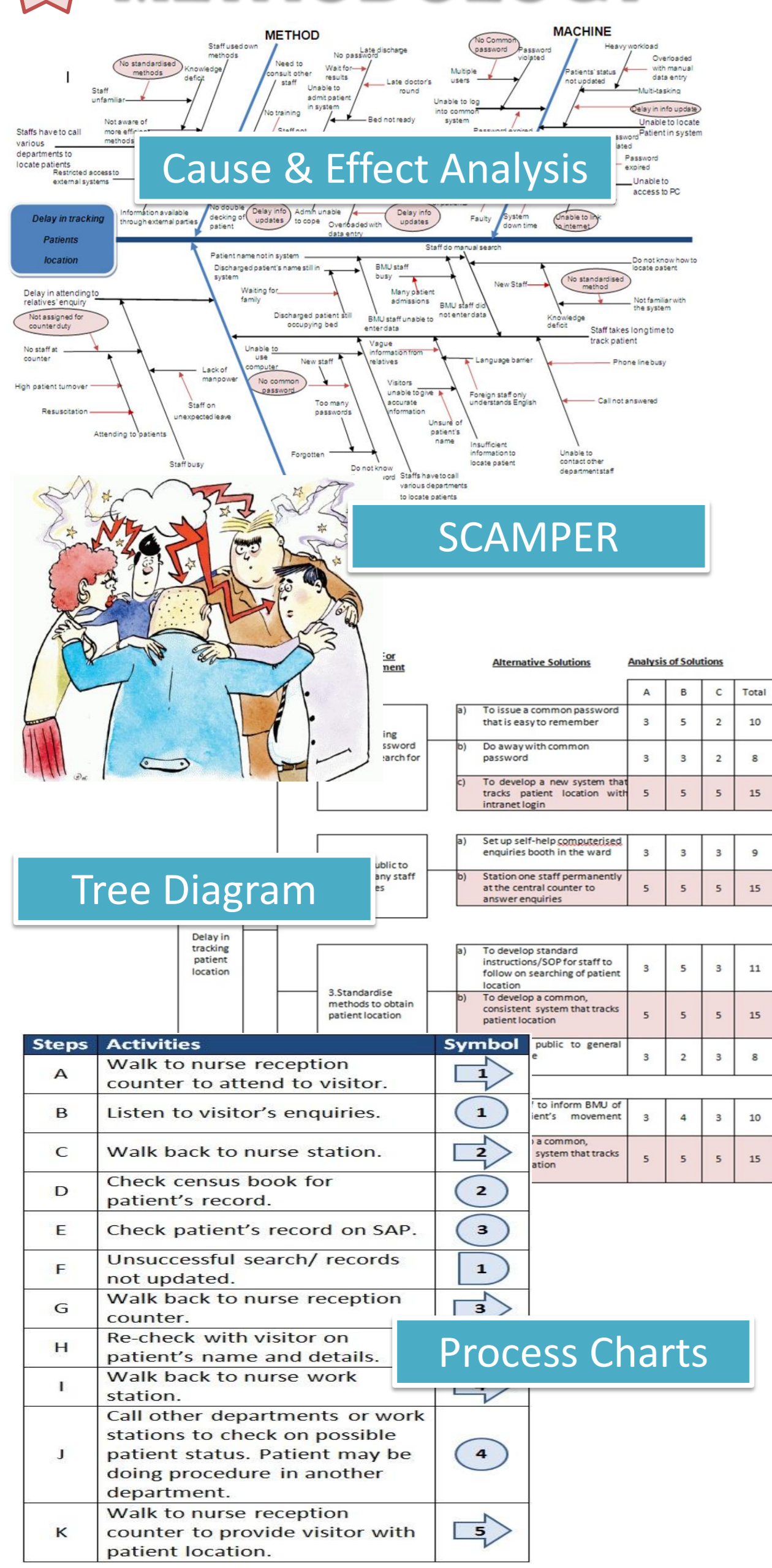**To locate 90% of Patients in 2 minutes**

Inefficient Workflow	• Unproductive search methods • Unsuccessful tracking of patients • Time wasted for repeat search
No Standard Search Method	• Checking different systems including Census, SAP, etc. • Multiple phone calls to different departments
Visitors & Staff	• Visitors gave incorrect/ incomplete information • Clinical staff have to answer to visitors' queries

PREVIOUS ENQUIRY PROCESS & STAKEHOLDERS INVOLVEMENT

Visitor enquire patient's location	Call other departments to check on patient status	Check System or Census book when telephone is engaged	Provide visitor with patient's location

Stakeholders Involvement (Internal/External)

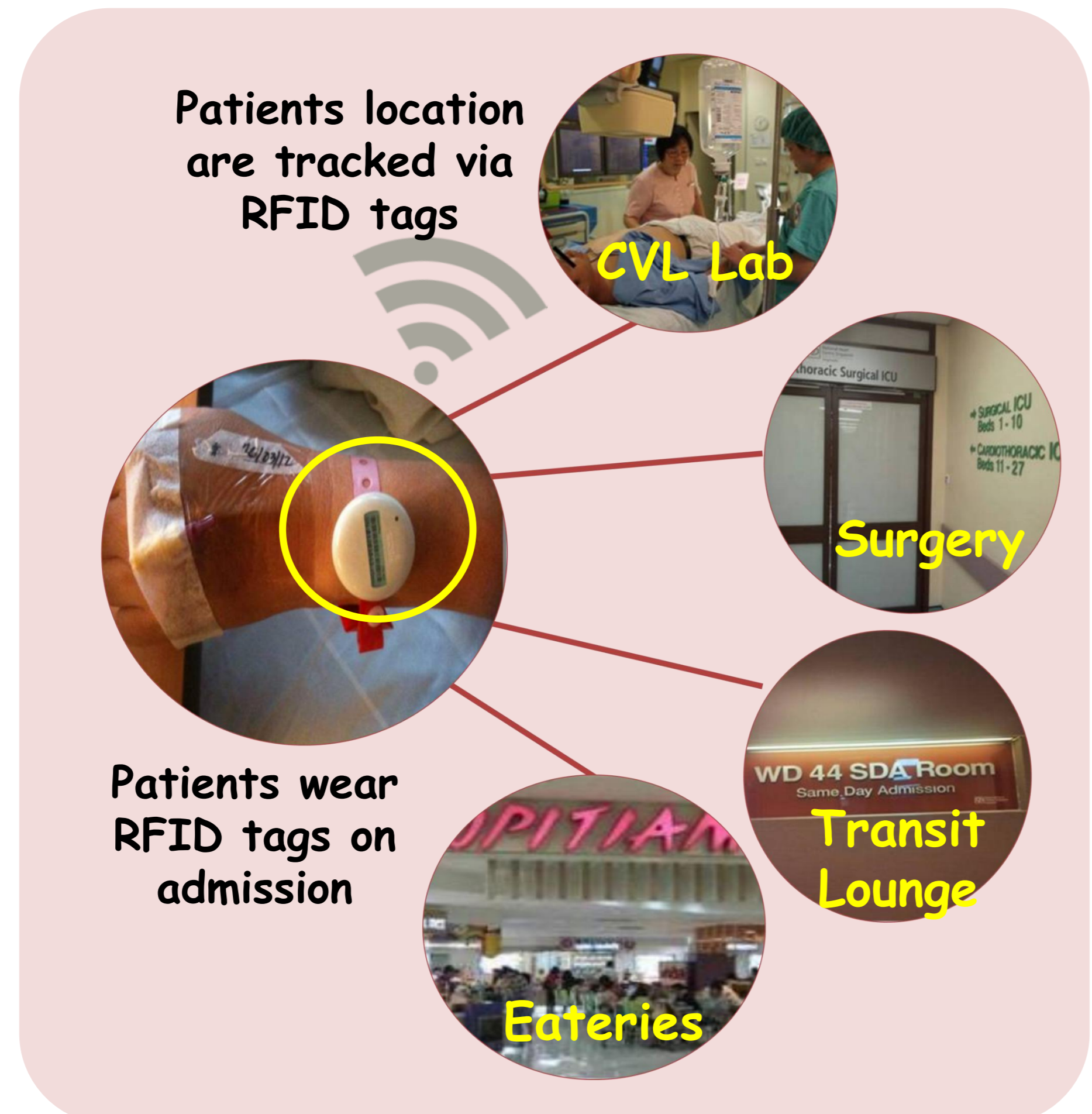| • Visitors • Nurses/ PSO/PCAs • Doctors	• Nurses/ PSO/PCAs	• Nurses/ PSO/PCAs	• Visitors • Nurses/ PSO/PCAs • Doctors

POTENTIAL IMPACT ON STAKEHOLDERS

- Provide timely update on patient location to patient's family & friends
- Improve communication & satisfaction level
- Reduce time and effort spent by staff on tracking cardiac patients' location
- Attention can be channeled to better patient care and clinical work.

2 METHODOLOGY

- Cause & Effect Analysis
- SCAMPER
- Tree Diagram
- Process Charts

Steps	Activities	Symbol
A	Walk to nurse reception counter to attend to visitor.	
B	Listen to visitor's enquiries.	1
C	Walk back to nurse station.	1
D	Check census book for patient's record.	2
E	Check patient's record on SAP.	3
F	Unsuccessful search/ records not updated.	1
G	Walk back to nurse reception counter.	2
H	Re-check with visitor on patient's name and details.	3
I	Walk back to nurse work station.	4
J	Call other departments or work stations to check on possible patient status. Patient may be doing procedure in another department.	4
K	Walk to nurse reception counter to provide visitor with patient location.	5

3 SOLUTIONS & IMPLEMENTATION

- ✓ Collaborated with IT department to develop a RFID Patient Location Tracking System
- ✓ Quick & convenient web-based access for staff via intranet log on

Patients location are tracked via RFID tags

- CVL Lab
- Surgery
- Transit Lounge
- Eateries

Patients wear RFID tags on admission

PHASE I: RFID SYSTEM PROTOTYPING

- ✓ Mock up system set up in a 66-bedded NHCS ward
- ✓ Station PSO at counter to attend to all visitor's enquiry
- ✓ PSO logs on Patient Location Tracking System to track patient's location

PHASE II: RFID TV & EXPANSION

- ✓ RFID Patient's location is directly displayed on plasma TV installed in the waiting area and Same Day Admission Transit Lounge
- ✓ Visitors are updated by on patient's real time location via TV terminals
- ✓ Visitors do not need to approach staff all the time
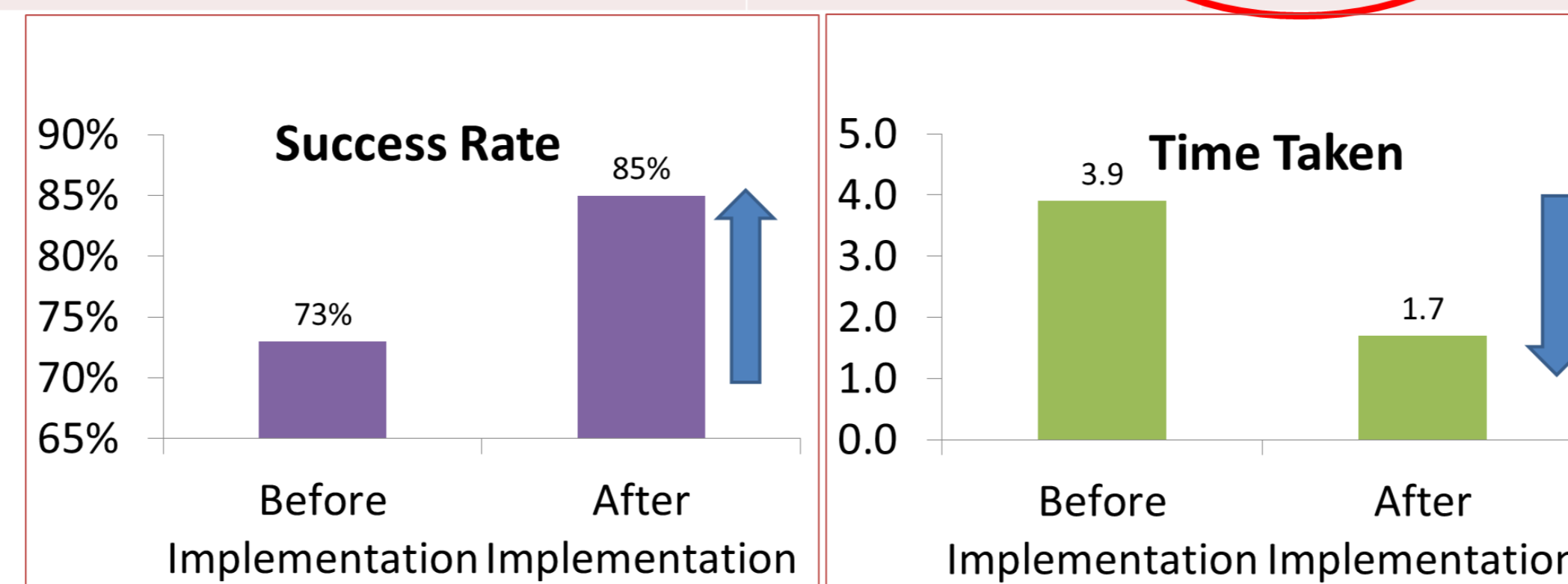- ✓ PSO is able to assist nurses in performing clerical duties

Ward 44 / 47B / 56 Patient Location Tracking (Production) (Page 3 of 5)

Patient No.	Ward/Bed	Current Location
LIM L***2996J	W44B1701	W44
LIM Y***6...		
LOH N***1...		

47B / 56 Patient Location Tracking (Page 10 of 1?)

Patient No.	Ward/Bed	Current Location
NG KO***6752D		KOPI
NG PA***8912F		W44
NG QN***9614F		MOT
NG SE***4339I		W44
NGAN ***5608B	W561104	W56
OH BO***5463H		W56
OH YA***3315B	W44A2608	W56
ONG A***2580A	W561202	W56
ONG C***6592H		W44

- **RFID TV at ward Visitor Lounge**
- **CPU at Nurse Counter to launch RFID system**
- **RFID TV at ward SDA Transit Lounge**

4 RESULTS

- ✓ Average time taken to locate patients **was reduced by 2.2 minutes.**
- ✓ **56% improvement** after using the RFID tracking system

Achieved 85% success rate of tracking patient within 1.7 minutes

BEFORE PROCESS

Steps	Activities	Symbol
A	Walk to nurse reception counter to attend to visitor.	1
B	Listen to visitor's enquiries.	1
C	Walk back to nurse station.	2
D	Check census book for patient's record.	3
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Searching process Streamlined!

AFTER PROCESS

Steps	Activities	Symbol
A	Walk to nurse reception counter to attend to visitor.	1
B	Listen to visitor's enquiries.	1
C	Walk back to nurse station.	2
D	Log on intranet to check RFID for patient's location.	2
K	Walk to nurse reception counter to provide visitor with patient location.	5

TANGIBLE BENEFITS

Results	Before Implementation	After Implementation
Time Taken to Locate patient	3.9 min	1.7 min
Successful Tracking rate	73%	85%

Success Rate — Before Implementation 73%, After Implementation 85%

Time Taken — Before Implementation 3.9, After Implementation 1.7

SPIN OFFS

RFID Patient Location Tracking System is Implemented in other wards in NHCS in March 2013 & June 2013

...Manpower savings of $52,000 for 9 stations per year!

OTHER BENEFITS

Innovation	• RFID Location data is readily available in hospital Bed Management system • Ease of Implementation • Cost Effective
Award & Recognition	• Best Poster in Healthcare Quality Forum 2012 • Awarded GOLD in Team Excellence Symposium Mar 2013

New NHCS Building...Digital Hospital

RFID Patient Location Tracking System will be Implemented at **Short Stay Unit** and **Operating Theatre** in the new NHCS Building.

ACKNOWLEDGEMENT

1. Ho Ai Lian (Director, Nursing)
2. Tay Ai Liu (Acting Assistant Deputy Director, Nursing)
3. Foo Lee Lian (Acting Senior Nurse Manager, Nursing)