

# Streamlined Implantable Device Reporting and Tracking Workflow

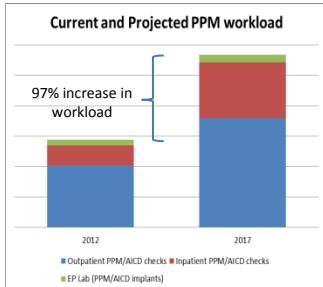
Ang You Ling, Chong Hui Min,  
Darly Antonio Raoet, Hazel Huang Jieying,  
Ho Su Yi, Joyce Ang Wei Ying, Lim Chien Fern,  
Siti Saleha Binte Isnin, Victor Effendie,  
Chiong Siau Chien, A/Prof Ching Chi Keong



**National Heart Centre Singapore**  
SingHealth

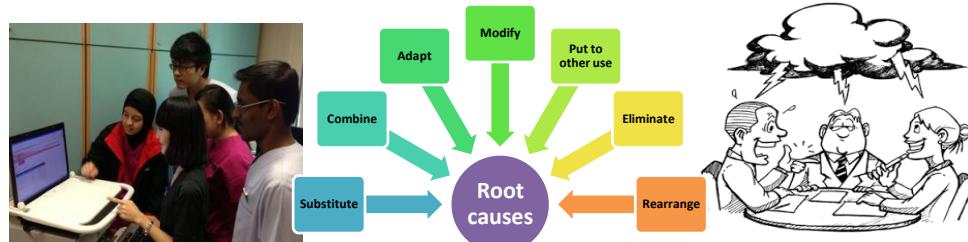
## BACKGROUND

Implantable Pacemaker / Implantable Cardioverter Defibrillator (PPM/ICD) device checks is one of our lab's business areas that is projected to grow rapidly over the next few years with our aging population. We projected a 97% increase in PPM/ICD device checks' workload by year 2017. **A more efficient Implantable Device reporting and tracking system is required to meet future demand.**

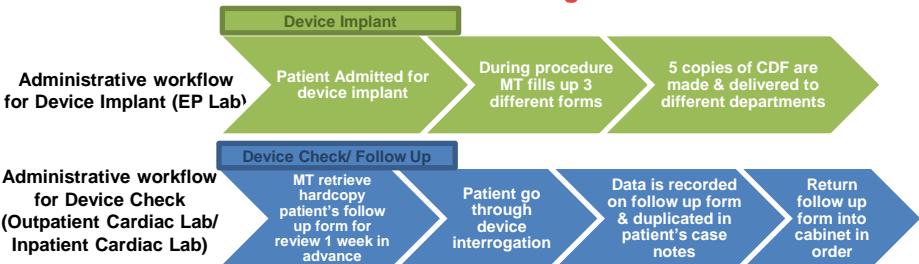


## METHODOLOGY

The **Plan-Do-Check-Act (PDCA)** problem solving methodology is used to analyse the problem. Innovative solutions were developed using tools such as SCAMPER technique to harvest new ideas and the creative solutions matrix and tree diagram were used to select the final solutions. Through team discussions and brainstorming sessions, the team decided to develop a **common reporting platform for device implantation and follow-up check** which can convert all hardcopy reports to softcopy and eventually archived into a common drive.



### PPM/ICD Device Documentation and Tracking Process :



### Project Goals

- ♥ Improve management of implant data for efficient follow-up
- ♥ Track all implantable devices in the event of a product recall
- ♥ Improve patient safety
- ♥ Improve staff and patient satisfaction



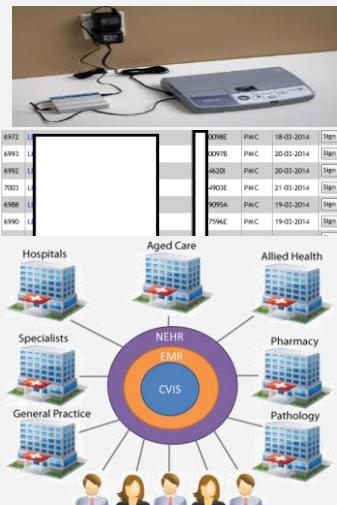
## RESULTS

- ♥ Total elimination of photocopying, filing & storing of hardcopy reports
- ♥ Total elimination of delays caused by lost of Cardiac Databank form (CDF) faxes
- ♥ Total elimination of handoffs of multiple hardcopy files
- ♥ Reduced delays caused by missing patient's information
- ♥ Reduced **66%** of total **backend processing time**
- ♥ Retrieval of **patient's device information** in less than **1 minute**
- ♥ Annual manhour savings of **\$19845** from elimination of excessive paper work
- ♥ Improved patient safety
- ♥ Improved staff and patient satisfaction



### Spin Offs

- ♥ Expanded Home Monitoring features into Device Implant & Check module
- ♥ Acknowledgement of Reports by Electrophysiologists – Improve patient safety
- ♥ Interface with Electronic Medical Record (EMR) and National Electronic Health Record (NEHR) to automate communication of patient's cardiac records intra-hospitals
- ♥ Especially beneficial for physicians to have timely diagnosis and life-saving treatment in cases of emergencies
- ♥ Changi General Hospital's Cardiac department can access to view & update Device Implant & Check records



### Impact on Stakeholders

#### Patients

- ♥ Receive timely clinical diagnosis and treatment
- ♥ Increase safety, effectiveness and better coordination/continuity of care

#### Medical Technologist (MTs)

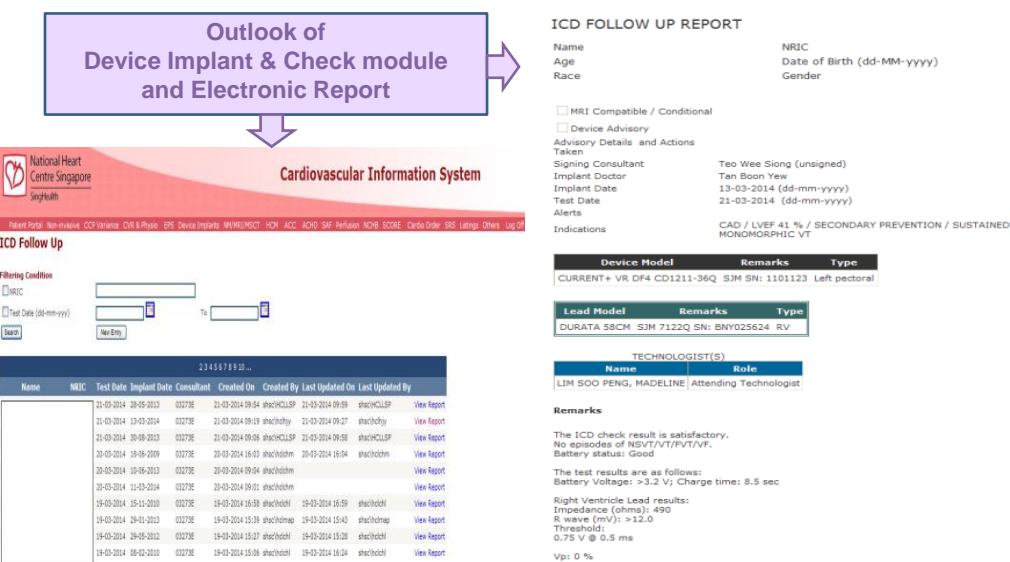
- ♥ Less administrative workload and able to focus on more cardiac diagnostic work

#### Doctors

- ♥ Convenient access to retrieve & approve device check reports
- ♥ Give timely and sound clinical diagnosis & treatment for patients

## SOLUTIONS

Device Implant & Check module was developed as a common reporting platform, which converts all hardcopy reports to softcopy, and archiving it into a common drive



**Outlook of Device Implant & Check module and Electronic Report**

**ICD FOLLOW UP REPORT**

Name, Age, Race, NRIC, Date of Birth (dd-MM-yyyy), Gender

Device Model, Remarks, Type

Lead Model, Remarks, Type

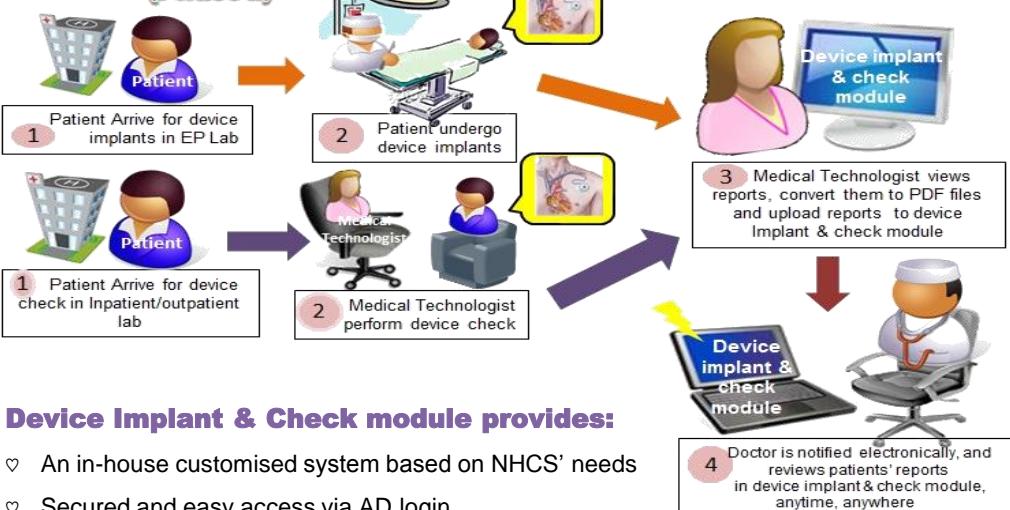
TECHNOLOGIST(S)

Remarks

The ICD check result is satisfactory. No episodes of NSVT/VT/PVT/VF. Battery status: Good

The test results are as follows:  
Battery Voltage: >3.2 V; Charge time: 8.5 sec  
Right Ventricle Lead results:  
Impedance (ohms): 490  
R wave (mV): >12.0  
Threshold: 0.75 V @ 0.5 ms  
Vp: 0 %  
RVB Impedance: 48

### PPM device implants/check Final Implementation (Phase II)



### Device Implant & Check module provides:

- ♥ An in-house customised system based on NHCS' needs
- ♥ Secured and easy access via AD login
- ♥ Digital online reporting platform, replacing manual / paper-based processes
- ♥ Easily retrieve patients' device & leads information, saving more time for doctors & MTs
- ♥ File attachments, allowing MTs to upload PDF copy of device check reports
- ♥ MTs a platform to enter home monitoring transmission results with in-office device checks
- ♥ MTs a view of scheduled home monitoring transmissions from different companies
- ♥ A quick view of Alerts to doctors and MTs, improving patient safety