

Streamlined Implantable Device Reporting and Tracking Workflow

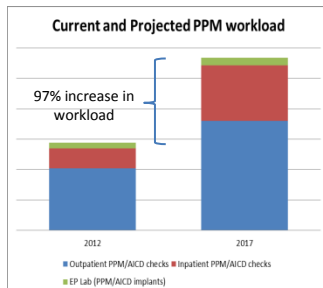
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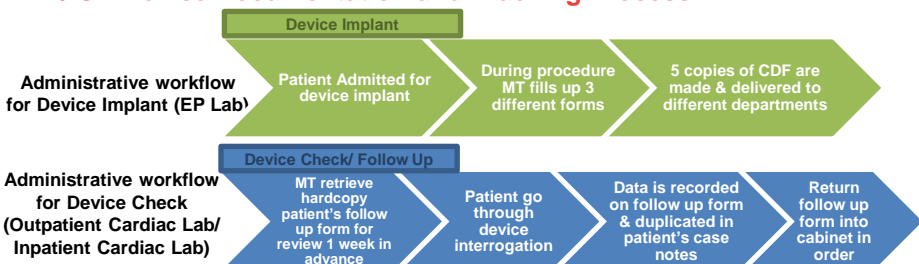
National Heart Centre Singapore
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BACKGROUND

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.**



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



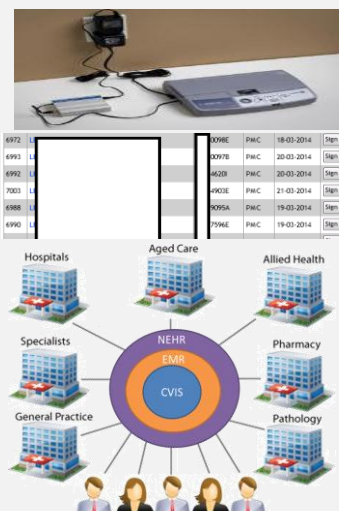
RESULTS

- ♥ 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

Doctors

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

Patients

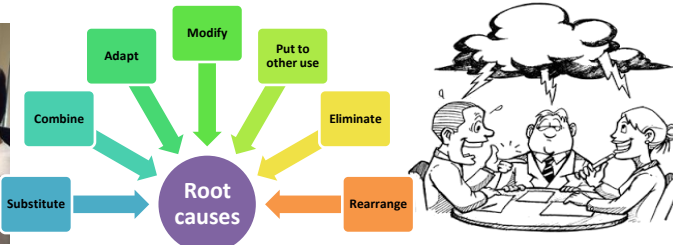
- ♥ Receive timely clinical diagnosis and treatment
- ♥ Increase safety, effectiveness and better coordination/continuity of care

Medical Technologist (MTs)

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

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.



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

☐ MRI Compatible / Conditional
☐ Device Advisory

Advisory Details and Actions Taken

Signing Consultant: Teo Wee Siong (unsigned)
Implant Doctor: Tan Boon Yew
Implant Date: 13-03-2014 (dd-mm-yyyy)
Test Date: 21-03-2014 (dd-mm-yyyy)

Alerts: CAD / LVEF 41 % / SECONDARY PREVENTION / SUSTAINED MONOMORPHIC VT

Device Model	Remarks	Type
CURRENT+ VR DF4 CD1211-36Q	SJM SN: 1101123	Left pectoral

Lead Model	Remarks	Type
DURATA SBGM SJM 7122Q SN: BNY025624	RV	

TECHNOLOGIST(S)

Name	Role
LIM SOO PENG, MADELINE	Attending Technologist

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
Vpi: 0 %
RVB Impedance: 48

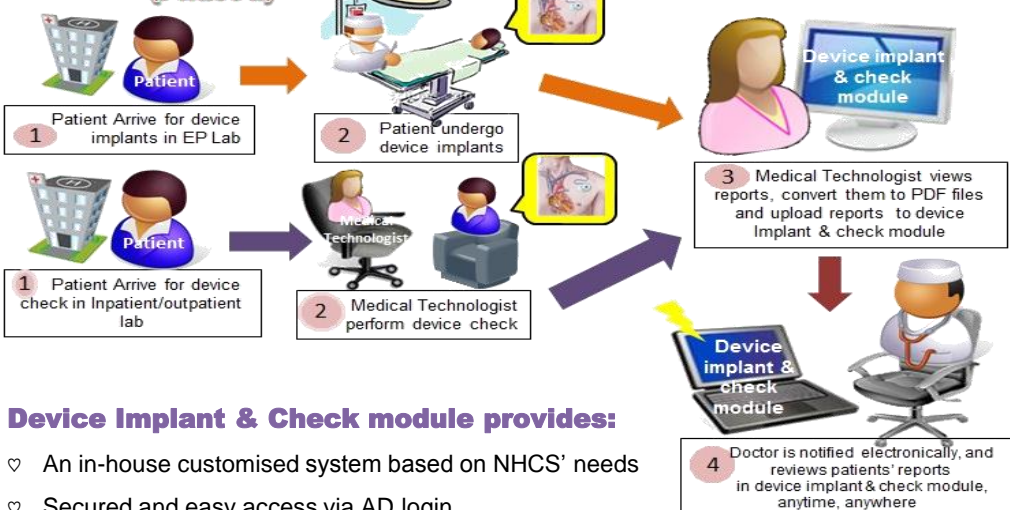
Cardiovascular Information System

ICD Follow Up

Filtering Condition: [] NRIC [] Test Date (dd-mm-yyyy) [] To []

Name	NRIC	Test Date	Implant Date	Consultant	Created On	Created By	Last Updated On	Last Updated By	View Report
21-03-2014	20-05-2013	022786	21-03-2014 09:54	ahacholsap	21-03-2014 09:59	ahacholsap	21-03-2014 09:59	ahacholsap	View Report
21-03-2014	13-03-2014	022786	21-03-2014 09:18	ahacholsap	21-03-2014 09:27	ahacholsap	21-03-2014 09:27	ahacholsap	View Report
21-03-2014	30-08-2013	022786	21-03-2014 09:56	ahacholsap	21-03-2014 09:59	ahacholsap	21-03-2014 09:59	ahacholsap	View Report
20-03-2014	18-06-2009	022786	20-03-2014 16:03	ahacholsap	20-03-2014 16:04	ahacholsap	20-03-2014 16:04	ahacholsap	View Report
20-03-2014	10-06-2013	022786	20-03-2014 09:54	ahacholsap	20-03-2014 09:54	ahacholsap	20-03-2014 09:54	ahacholsap	View Report
20-03-2014	11-03-2014	022786	20-03-2014 09:51	ahacholsap	20-03-2014 09:51	ahacholsap	20-03-2014 09:51	ahacholsap	View Report
19-03-2014	15-11-2013	022786	19-03-2014 16:58	ahacholsap	19-03-2014 16:59	ahacholsap	19-03-2014 16:59	ahacholsap	View Report
19-03-2014	29-01-2013	022786	19-03-2014 15:16	ahacholsap	19-03-2014 15:43	ahacholsap	19-03-2014 15:43	ahacholsap	View Report
19-03-2014	29-08-2012	022786	19-03-2014 15:27	ahacholsap	19-03-2014 15:28	ahacholsap	19-03-2014 15:28	ahacholsap	View Report
19-03-2014	08-02-2010	022786	19-03-2014 15:06	ahacholsap	19-03-2014 15:06	ahacholsap	19-03-2014 15:06	ahacholsap	View Report

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