Project Title

Cytogenetics Bone Marrow Section–Automating specimen requisition & set-up documentation

Project Lead and Members

Project lead: Fiona Liaw Pui San

Project members: Chan Wai Ching, S Rajeswari D/O Shanmugam, Jane Haw Ching Yee, Alvin Lim Soon Tiong, Lim Tse Hui1, Lim Ping, Mary Tan , Lau Lai Ching, Lee Geok Yee, Tien Sim Leng

Organisation(s) Involved

Singapore General Hospital

Healthcare Family Group(s) Involved in this Project

Allied Health, Healthcare Administration

Applicable Specialty or Discipline

Healthcare Administrator

Project Period

Start date: Not applicable

Completed date: Not applicable

Aims

To reduce the time spent on specimen requisition and set-up documentation by 30% in the Cytogenetics Bone Marrow Section within 6 months

Background

- This Laboratory offers various diagnostic tests, such as conventional karyotyping of bone marrow (BM) specimens for patients with haematological malignancies.

- Specimen requisition is laborious, involving repetitive copying and pasting of information in the Meditech Laboratory Information System.
- This information is handwritten multiple times on the batch worksheet and the logbook, resulting in tedious data entry effort.
- We have therefore undertaken a project to streamline the work processes through digitization of information to achieve improved efficiency.
- This project aligns with SGH's quality priorities for enhanced efficiency by making full use of resources to improve processes and outcomes.

Methods

See poster appended/below

Results

See poster appended/below

Conclusion

- The project's result is aligned with SGH's quality priorities for efficient use of resources to improve processes and outcomes.
- Project interventions persisted 6 months post-implementation.
- The project results have created interest in other laboratories to use RPA to automate their work processes.

Project Category

Technology

Digitalisation, Automation, Robotics Process Automation

Care & Process Redesign

Productivity, Time Saving, Cost Saving

Keywords

Diagnostic tests, bone marrow, haematological, documentation, Meditech administration, sustainability, CPOE, Digital worksheet

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Cytogenetics Bone Marrow Section – Automating specimen requisition & set-up documentation

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Background to the problem

— This Laboratory offers various diagnostic tests, such as conventional karyotyping of bone marrow (BM) specimens for patients with haematological malignancies.
— Specimen requisition is laborious, involving repetitive copying and pasting of information in the Meditech Laboratory Information System.
— This information is handwritten multiple times on the batch worksheet and the logbook, resulting in tedious data entry effort.
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— This project aligns with SGH's quality priorities for enhanced efficiency by making full use of resources to improve processes and outcomes.

Mission statement

To reduce the time spent on specimen requisition and set-up documentation by 30% in the Cytogenetics Bone Marrow Section within 6 months.

Analysis of problem

The team comprises various stakeholders involved in different aspects of the bone marrow specimen requisition process, including specimen set-up, Meditech administration, and solutions automation.

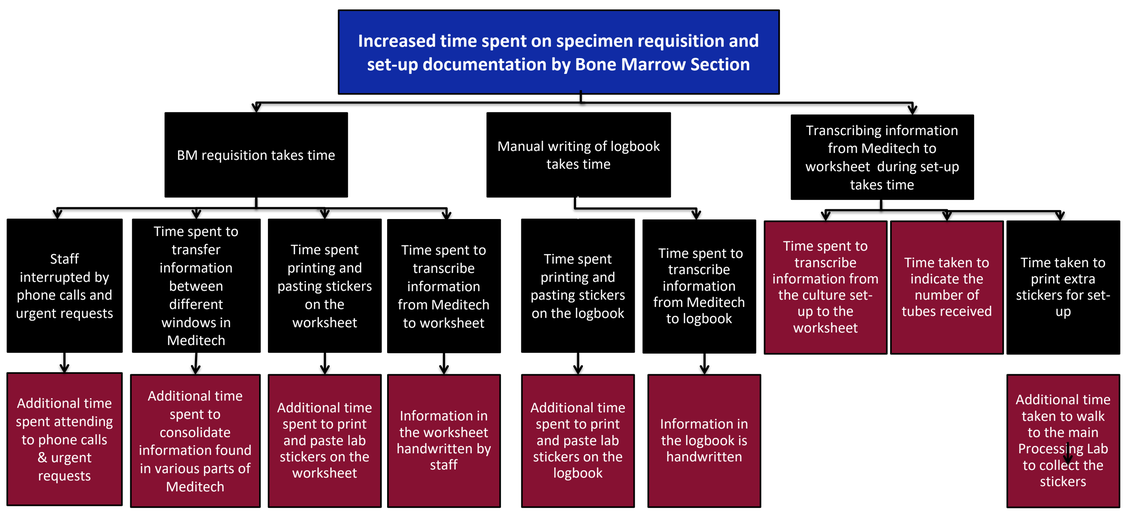

Fig 1: 5-Why diagram showing factors contributing to increasing time spent on specimen requisition and bone marrow set-up documentation.

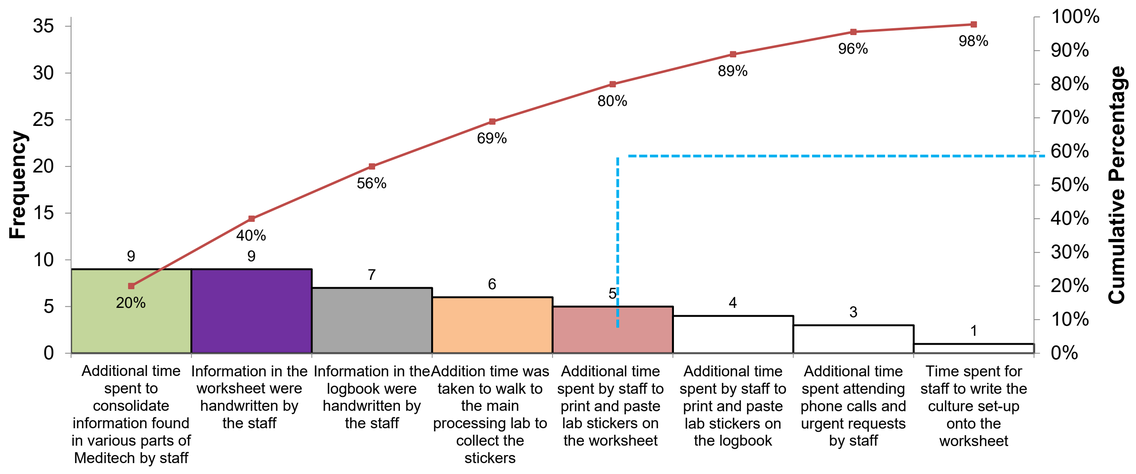

Fig 2: Pareto Chart to prioritise the top root causes that will most likely lead to the increased time spent on bone marrow requisition and set-up documentation.

Aim	Areas of improvement	Specific Solutions	Time Saving	Cost Saving	Feasible	Sustainability	Total Score
To reduce time spent on BM requisition and set-up documentation	Root Cause 1: Time spent to consolidate information found in various parts of Meditech	Reduce information to transfer in Meditech	5	5	1	2	13
		Use RPA to transfer information in Meditech	5	5	5	5	20
		Additional staff to help in the requisition	3	1	3	2	9
	Root Cause 2: Information in the worksheet were handwritten	Use digital Meditech worksheet only	5	5	4	4	18
		Use RPA to conslidate information from Meditech to excel worksheet	5	5	5	5	20
	Root Cause 3: Information in the logbook were handwritten	Elimate use of logbook. Write result on batch worksheet	4	5	4	3	16
		Reduce unneccesary information written on the logbook	5	5	5	5	20
	Root Cause 4: Addition time was taken to walk to the main processing lab to collect the stickers	Handwrite the stickers	2	5	3	3	13
		Program bot to print additional lab stickers needed	5	4	5	5	19
	Root Cause 5: Additional time spent by staff to print and paste lab stickers on the worksheet	Handwrite the information to save sticker	1	5	3	3	12
		Use RPA to print the information to worksheet	5	5	5	5	20

Fig 3: Driver's Diagram & Prioritisation matrix

— To solve the problem, a 5-why diagram and Pareto chart were used to identify and prioritise causes. A driver's diagram and prioritisation matrix (Fig 3) were then used to brainstorm and rank ideas based on time, cost, feasibility, and sustainability. The best solutions for each root cause with the highest score based on time-saving, cost-saving, feasibility and sustainability were implemented.

Interventions / Initiatives

Implementation 1: Use of RPA for BM requisition and label printing (from 24/08/23)

— Using RPA for CPOE specimens reduces staff hands-on time for requisition by automating information transfer from different parts of Meditech (Root Cause 1) and printing information to the worksheet (Root Cause 5).
— Automating label printing with RPA based on the number of specimen tubes reduces workload and eliminates multiple trips to collect additional stickers for set-up in the main Processing Room (Root Cause 4).

Implementation 2: Use of RPA to extract data from Meditech (from 24/08/23)

— Adopting digital worksheets allows easy transfer of information by RPA for printing and reduces the time required to write manually otherwise (Root Cause 2).
— Reducing transcription of unnecessary information in the logbook (Root Cause 3).

Results

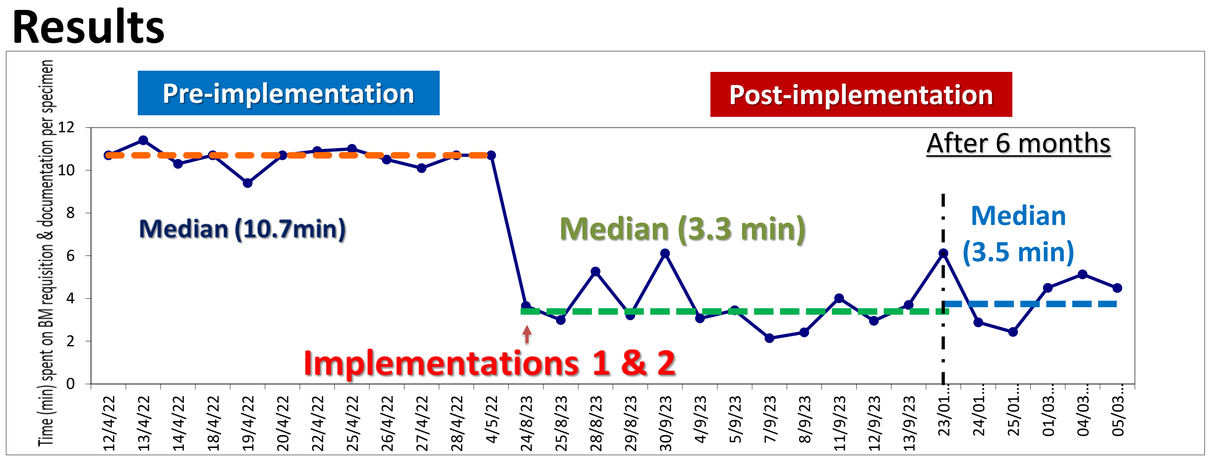

Fig 4: Run Chart diagram showing a shift reduction of 7.4 min in medium time per specimen after Implementations 1 & 2 and a sustained improvement after 6 months.

— There was a significant reduction in the median time spent in bone marrow requisition and set-up documentation from 10.7 min to 3.3 mins, or about **69%** (7.4 min) time-saving per specimen.
— With an average of 1800 specimens per year, the total time saving is 13,320 min/year, amounting to **$12,254** in manpower savings.

Sustainability Plans

— The project's result is aligned with SGH's quality priorities for efficient use of resources to improve processes and outcomes.
— Project interventions persisted 6 months post-implementation.
— The project results have created interest in other laboratories to use RPA to automate their work processes.

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