Redesign Medication Picking Process to Improve Safety

Singapore Healthcare Management 2025

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Background

Block 4 Level 1 Pharmacy dispenses an average of 1750 items daily. The supply process involves picking of medication and consumables based on bin locations indicated on medication labels.

From August 2022 to July 2023, the Pharmacy recorded a monthly average of 15 medication incidents from inaccurate picking. These events resulted in extensive investigations where staff interviews were conducted, inventory records were checked, CCTV footages were played, patients were contacted for rectification of errors and subsequent service recoveries which were resource intense.

Aim

1) Redesign the medication picking process to enhance accuracy, reduce errors, improve overall operational efficiency and staff satisfaction.
2) Reduce the number of picking-related medication incidents from 15 to 10 per month (30%) at Block 4 Level 1 Pharmacy from August 2023 to July 2024.

Methodology

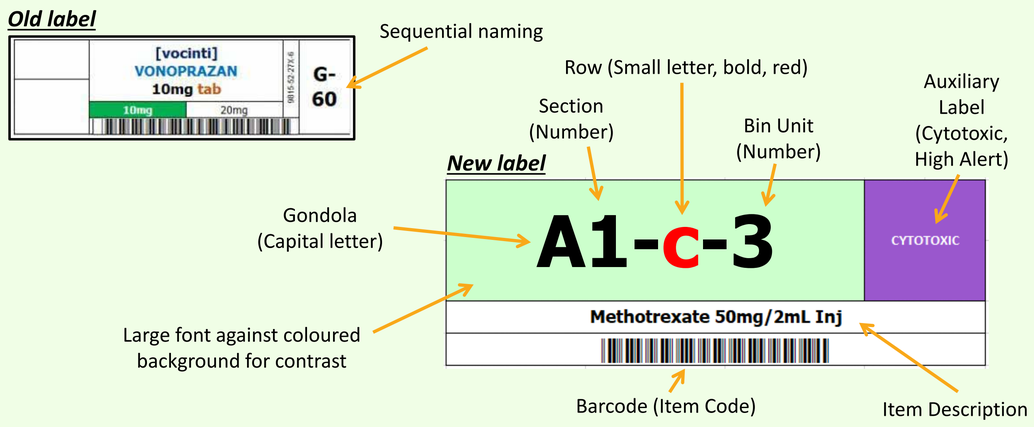
A Cause-and-Effect Diagram was employed to identify potential root causes, and a Pareto Chart was utilised to determine the vital few root causes. Solutions were brainstormed using Tree Diagrams and Prioritisation Matrix. During solutioning, a human factors expert was consulted to provide inputs on medication bin label design. Medication bin location was printed on larger font size on colour coded labels and the HDB naming convention was adopted to help staff accurately identify the medication bin locations. Staff feedback were sought to continuously re-fine the medication bin label design.

Solutions

The solution was implemented in 2 PDSA cycles.

- 1st PDSA cycle involved review and spacing apart look-alike and multiple strengths medications.
- 2nd PDSA cycle focused on redesigning medication bin label and gondola naming by incorporating human factor elements.

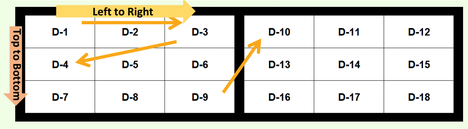
Medication Bin Label



Medication bin label was redesigned to place emphasis on guided-picking based on medication bin location. Alert stickers were removed to minimise distraction and information overload to pickers.

Medication Gondola Naming

Old Gondola Naming – Sequential numbering



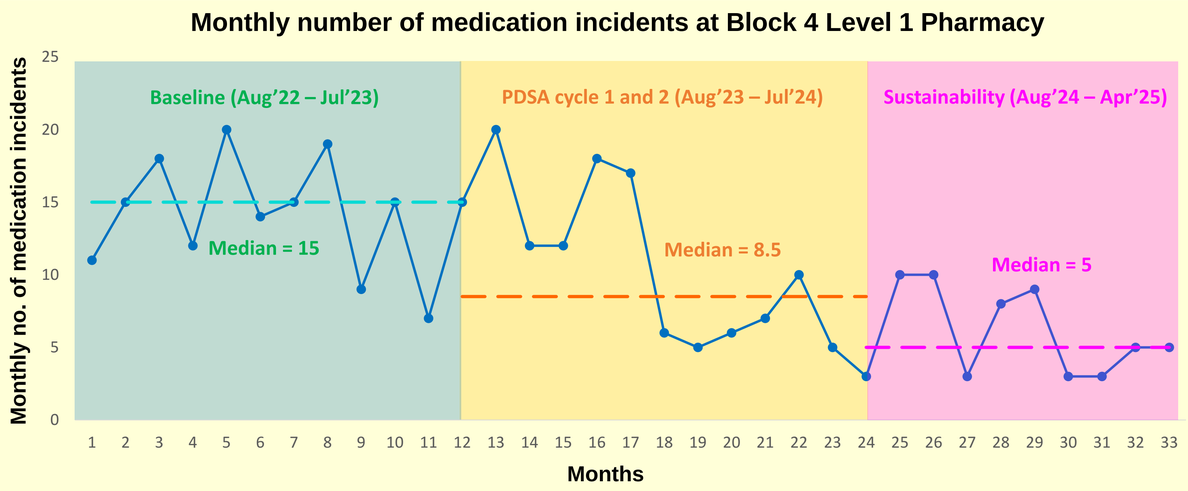
New Gondola Naming – 'HDB' naming convention

A1			A2		
A1-a-1	A1-a-2	A1-a-3	A2-a-1	A2-a-2	A2-a-3
A1-b-1	A1-b-2	A1-b-3	A2-b-1	A2-b-2	A2-b-3
A1-c-1	A1-c-2	A1-c-3	A2-c-1	A2-c-2	A2-c-3

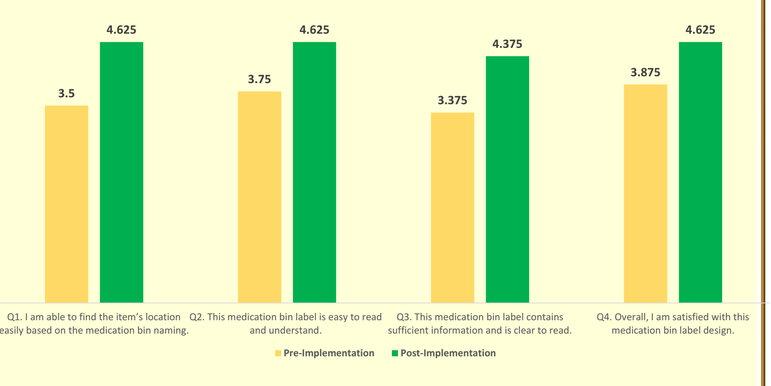
Block Level Unit

Medication gondolas were re-named with 'HDB' naming convention (Block, Level, Unit) to reduce confusion in locating the correct medication bins. Sequential naming with 3 digits was cognitively challenging for staff to read and locate the medication bins across the gondolas. In addition, there is also higher risk of human error in reading the numbers incorrectly.

Results



Following the implementation of the solutions in Aug 2023, Block 4 Level 1 Pharmacy reported a **43% reduction** in medication picking incidents, from 15 to 8.5 incidents per month between Aug 23 to Jul 24. The number of medication picking incidents reported further reduced to 5 per month from Aug 24 to Apr 25.



Staff reported better experience reading the new medication bin label compared to the previous version.

Annual cost savings

- *Annual time savings (rectify near misses): **1080 mins**
- ^Annual cost savings (rectify near misses): **$518.40**
- ˜Annual cost avoidance (medication errors): **$112,230.00**

**Time savings derived from extra time spent to repack and recheck the medication*

^Cost savings derived from QI calculator provided by Process Transformation & Improvement department

˜Cost avoidance is calculated by $18,705 per med error, based on WHO's estimation where cost associated with medication errors globally is approximately 1% of global health expenditure

Conclusion

The incorporation of human factor elements into medication gondola naming and medication bin label design, along with process standardisation, has successfully reduced picking errors at Block 4 Level 1 Pharmacy. The positive outcomes from this project have led to implementation of this safety initiative at other pharmacy locations within Singapore General Hospital.