

Prevention Is Better Than Cure: Reducing wrong drug and wrong strength dispensing errors at SKH Outpatient Pharmacy



¹Lim Cheong Cheng, ¹Claire Seet Ming Jing, ¹Ng Xin Hui, ¹Lee Shi Ying
¹Department of Pharmacy, Sengkang General Hospital

Background

Dispensing errors where an incorrect drug or dosage of the medication is dispensed to the patient may lead to patient harm. Such errors may lead to overdose, underdose, failure to receive appropriate drug therapy, and/or experiencing side effects due to unwarranted drug therapy. Significant time and effort must also be spent to investigate and correct such errors when they do occur. Due to the extensive danger posed by such dispensing errors, it is imperative to identify the most common causes of these errors and minimize their occurrence.

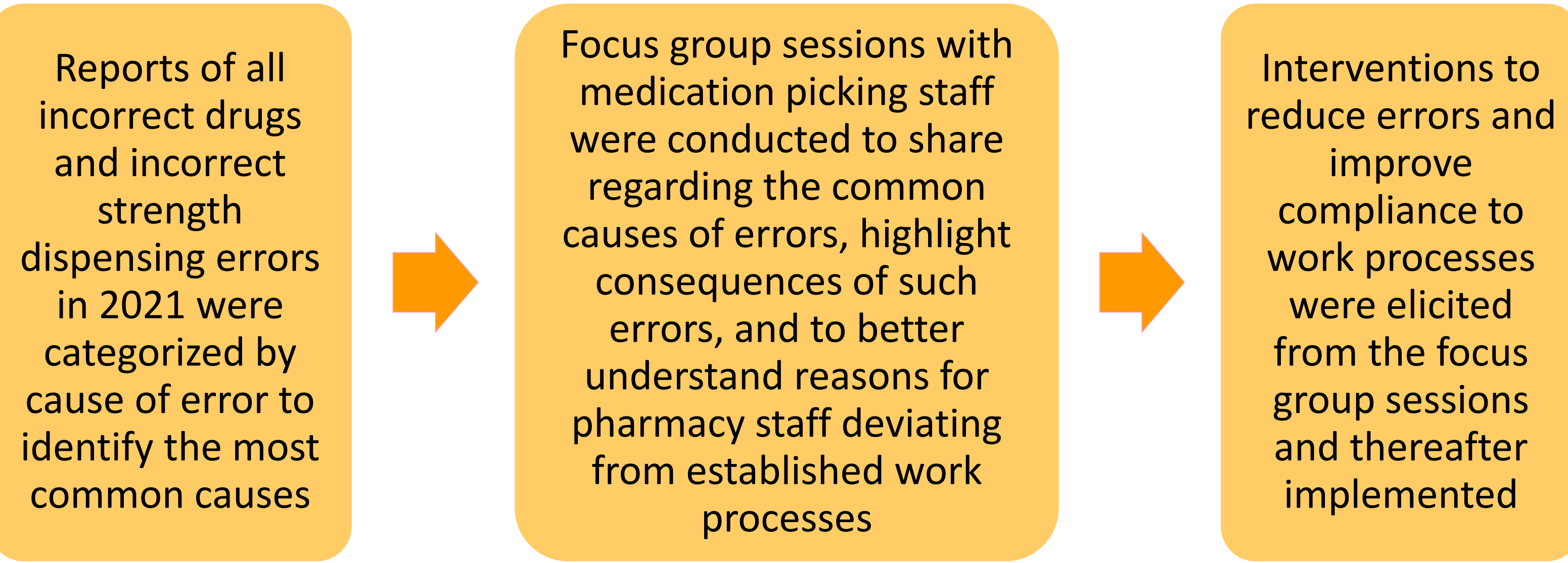
Current State

From Jan 2021 to Dec 2021, there were 0.645 wrong drug errors reaching the patient for 10,000 prescriptions processed and 0.469 wrong strength errors reaching the patient for 10,000 prescriptions processed.

Goal

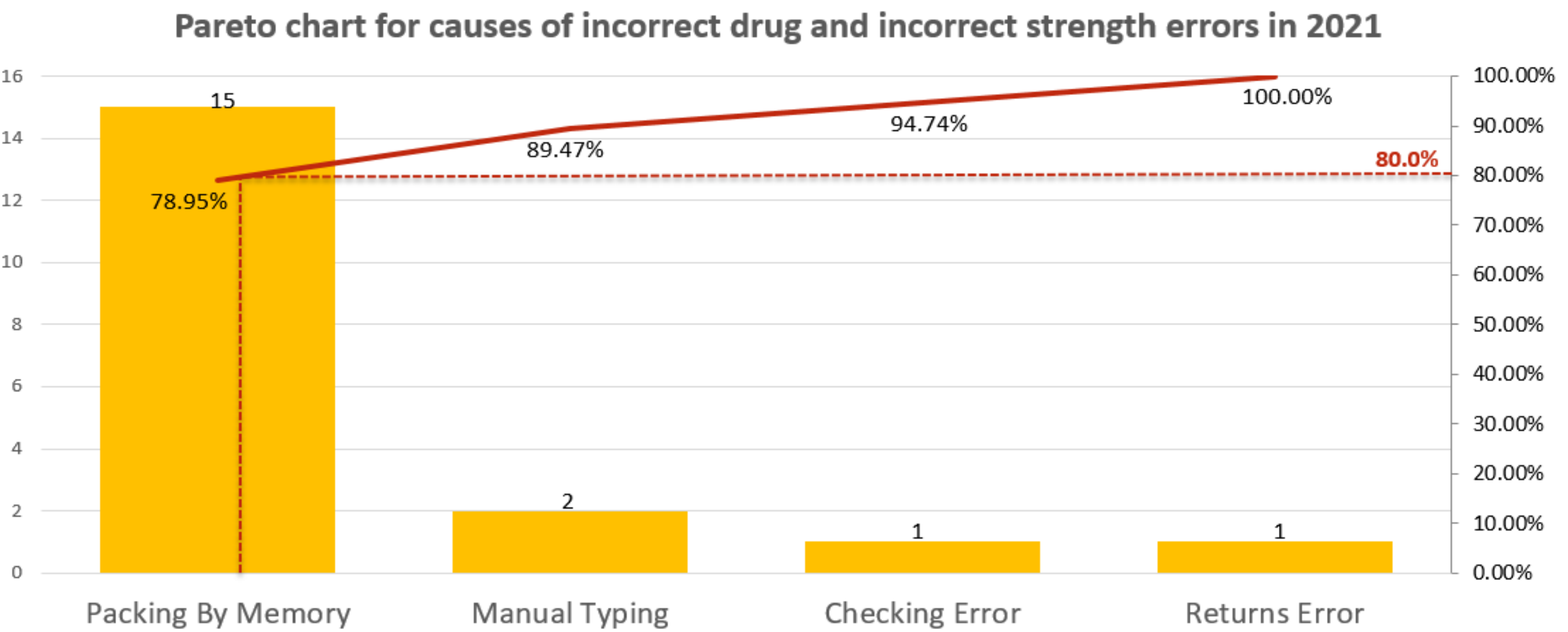
Primary Objective: To reduce number of incorrect drug or incorrect strength dispensing errors at SKH Outpatient Pharmacy by 80% over 7 months

Methodology



Root Cause Analysis

Using data from error reports for all of 2021, a Pareto chart was created to identify the root cause of incorrect drug and incorrect strength errors.



Based on the Pareto chart, errors due to “Picking by Memory” accounted for almost 80% of incorrect drug and incorrect strength errors.

“Picking by Memory” refers to how pharmacy staff may rely on their memory to identify the location of medication bin when picking drugs based upon the medication name on the medication label. This deviates from the established workflow of using the bin location code on labels to identify the bin location. Errors may occur due to picking of a look-alike-sound alike medication.

Interventions

Focus Group Engagement Sessions (End Dec 2021 – Early Jan 2022)

Small group sessions (2 – 5 staff) with all picking staff were conducted to share case studies of “Picking by Memory” errors and resulting implications. These sessions serve as a safety time-out for staff to reflect upon, review their picking process, and allow them an avenue to provide suggestions for workflow improvements and interventions.

While staff education and reminders to “be more careful” result in decreased error rates, such decreases may be transient so further interventions are warranted.

Interventions

Intervention 1: Redesign of Medication Label (from 11 March)

During the focus group sessions, some staff noted that “Picking by Memory” occurs as they see the drug name prior to seeing the location code on medication labels. By moving the location code above the drug name, picking staff may be more likely to take note of the location code first.

Intervention 2: Zone-based Picking (from 12 April)

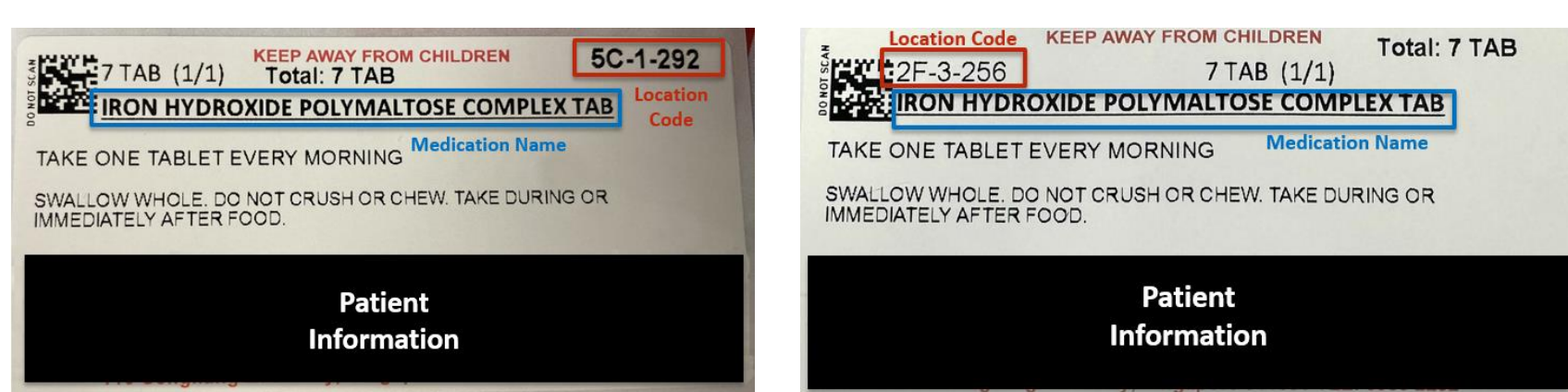
The medication picking area was separated into 3 different zones. Look-alike-sound-alike medications are identified and placed into separate zones. Each medication picker is assigned to a specific zone and may only pick drugs in that specific zone.

Zone	Picking Area
Zone 1	Gondola 1, 2 & 3
Zone 2	Gondola 4, 5 & 6
Zone 3	Gondola 7 & 8
All Zones	Fridge Items, Parata, Manual Shelves

Intervention 2: Arrangement for Zone-based Picking

Intervention 3: Redesign of Medication Bin Label (6 June onwards)

To increase the emphasis of picking by location code over picking by memory, we redesigned the medication bin labels to feature the drug location code more prominently.

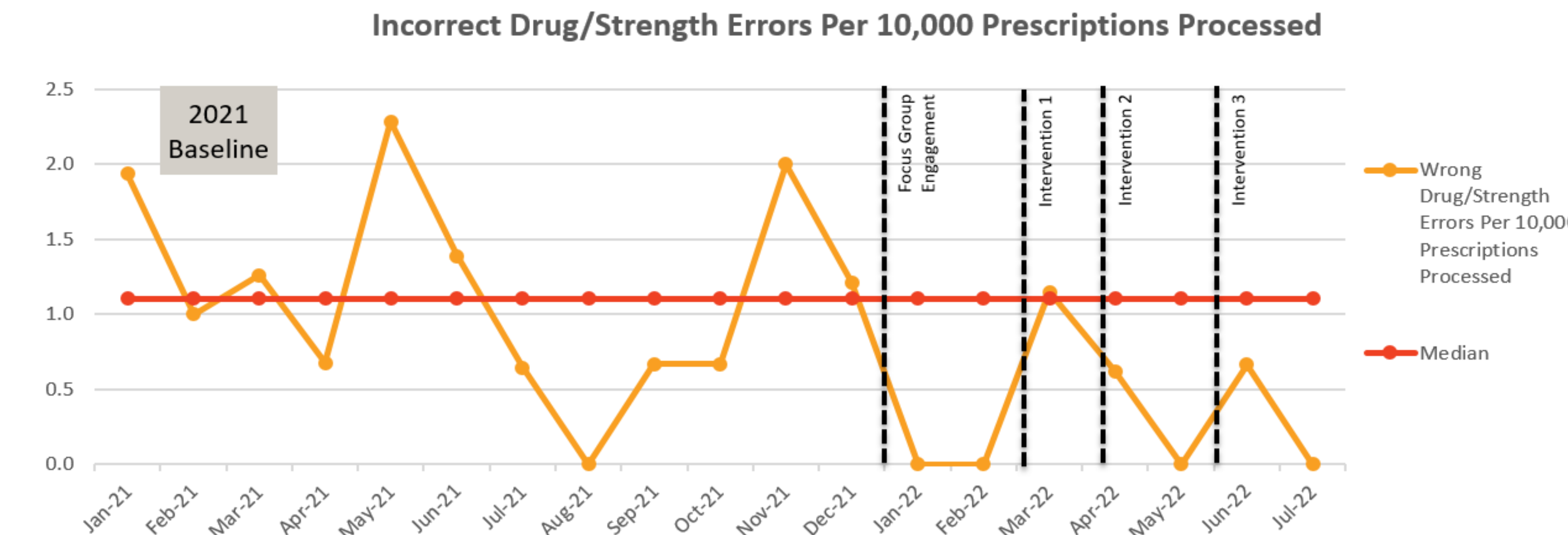


Intervention 1: Information is read in a left-to-right manner, resulting in medication name to be seen first on the original label (left). In the new label (right), the bin location code is shifted to the right above the medication name to catch the eye first.



Intervention 3: Newly redesigned labels on the medication bins (left) feature the bin location code more prominently as compared to the previous labels (right).

Results



There was a **67.5% decrease in number of incorrect drug and incorrect strength errors** from 1.114 errors per 10,000 prescriptions processed (2021 baseline data) to 0.362 errors per 10,000 prescriptions processed (Jan – July 2022). Analyzed separately, there was a **58.0% decrease in incorrect drug errors** (from 0.645 errors per 10,000 prescriptions processed to 0.271 errors per 10,000 prescriptions processed), and an **80.5% decrease in incorrect strength errors** (from 0.469 errors per 10,000 prescriptions processed to 0.095 errors per 10,000 prescriptions processed).

There were **zero errors** reaching the patient due to “Picking by Memory” from Jan – July 2022.

As shown in the run chart above, the data points post engagement sessions and interventions implementation are generally below median, demonstrating improvement.

Conclusion/Sustainability

Zone-based picking, an increased emphasis on drug location code and staff education of implications of such errors help to reduce the number of incorrect drug and incorrect strength errors reaching the patient significantly.

However, sustainability of zone-based picking may be limited. A minimum of three manpower is required to support the 3 picking zones, which may be challenging at lunchtime and/or closing time. Additionally, some medications may potentially be confused with more than 3 look-alike-sound-alike drugs and therefore cannot be separated into distinct zones.

Emphasizing drug location code through human factors design is a more sustainable approach as all future medication labels and bin labels are configured as such. Staff education shared during engagement sessions on the dangers of picking by memory has also been incorporated into new staff orientation.