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Reducing near misses associated with inappropriately translated dosage strength combinations

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BACKGROUND

In Singapore General Hospital, outpatient medications are prescribed electronically by doctors via computerised physician order entry. The orders are electronically transmitted to the pharmacy system to dispense the correct drug, reducing medication errors caused by illegible handwritten prescriptions. However, the system occasionally does not take into account the most appropriate combination of strengths to dispense for drug products available in multiple strengths. Some unintended consequences of this include (1) increased pill burden, (2) increased medication cost, (3) less convenient drug dosing when transcribed dose requires patient to halve the tablet and (4) increased confusion to the patient.

If this inappropriate translation is not manually amended by the typist, the dispenser has to make the amendment at the counter, resulting in increased waiting time for the patient. An example of this process is illustrated in Figure 1 below.

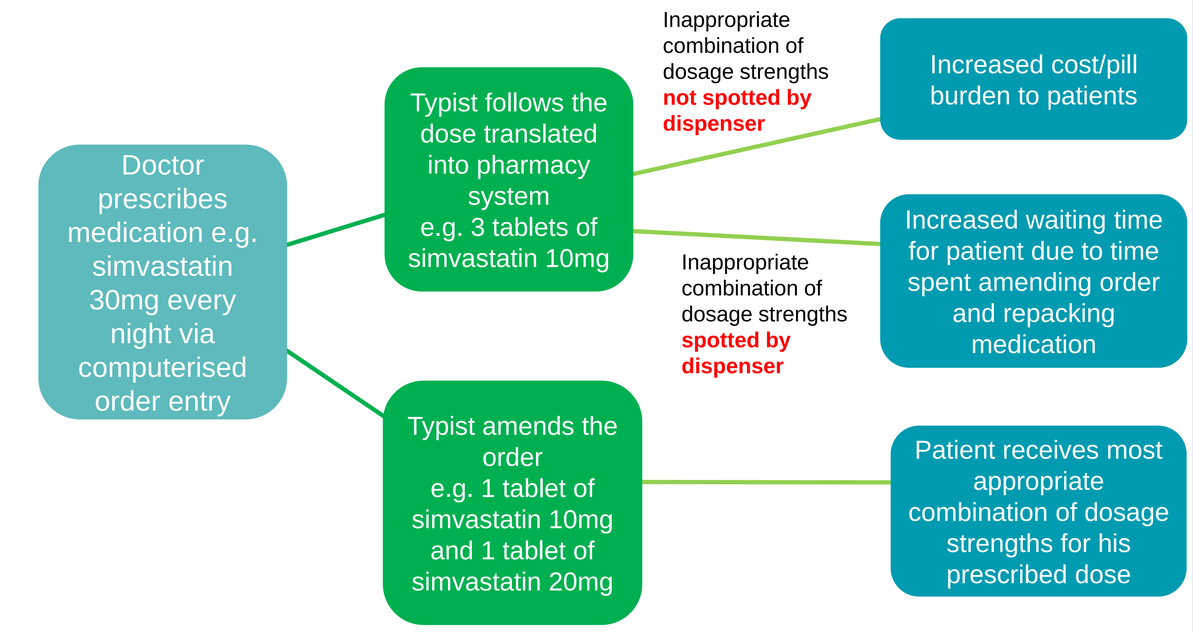

Figure. 1: Flow chart showing sequence of events from doctor ordering medication to patient receiving medication

ANALYSIS

Pharmacy staff routinely self-report “near misses”, which are defined as errors in the processing of patients’ medication that are discovered before the medication is dispensed to the patient. An analysis of near miss data from January to September 2016 revealed that on average, near misses related to inappropriately translated combinations of dosage strengths occurred at least twice per month. A root cause analysis was conducted and the results presented in Figure 2 below. The team concluded that the main root cause for such near misses was pharmacy staff utilising the electronic translation, even when a less appropriate combination of dosage strengths was selected by the system. Hence, by blocking the electronic translation for such inappropriately translated combinations of dosage strengths, such near misses would be reduced.

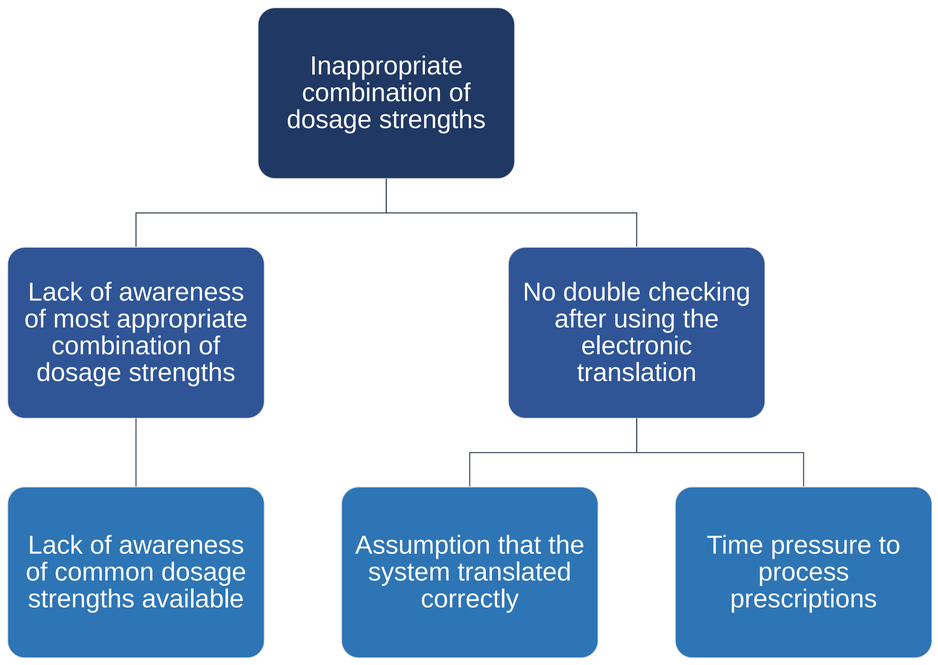

Figure. 2: Results of root cause analysis

MISSION STATEMENT

The objective of this project was to reduce the number of near misses associated with inappropriately translated dosage strength combinations by 75% within 3 months.

INTERVENTIONS / INITIATIVES

After assessing the various root causes identified, the team decided to focus on the root cause “assumption that system translated correctly”, as lack of awareness of common dosage strengths available is addressed by in-house typing and picking competency tests. Upon analysis of the near miss data, the team identified seven dosage strength combinations, as listed in Table 1, which were found to be more commonly associated with such near misses. We then liaised with the IT pharmacists to disable the electronic translation of these dosage strength combinations. This initiative was implemented on 3 Oct 2016.

Drug dosage	Inappropriate dosage strength combination	Suggested regimen
Simvastatin 30mg	Simvastatin 10mg x3 tabs	Simvastatin 10mg x1 tab + Simvastatin 20mg x 1 tab
Simvastatin 50mg	Simvastatin 20mg x2.5 tabs	Simvastatin 10mg x 1 tab + Simvastatin 20mg x2 tabs
Lisinopril 15mg	Lisinopril 5mg x3 tabs	Lisinopril 5mg x1 tab + Lisinopril 10mg x1 tab
Lisinopril 30mg	Lisinopril 10mg x3 tabs	Lisinopril 10mg x1 tab + Lisinopril 20mg x1 tab
Ethambutol 600mg	Ethambutol 400mg x1.5 tabs	Ethambutol 100mg x2 tabs + Ethambutol 400mg x1 tab
Prednisolone 30mg	Prednisolone 20mg x1.5 tabs	Prednisolone 20mg x1 tab + Prednisolone 5mg x2 tabs
Losartan 150mg	Losartan 100mg x1.5 tabs	Losartan 100mg x1 tab + Losartan 50mg x1 tab

Table 1: Summary of the drug dosages for which electronic translation was blocked

RESULTS

Following the disabling of electronic mapping for the inappropriate dosage strength combinations mentioned previously, the team continued to monitor near miss data to assess the effectiveness of this intervention. As seen in Figure 3 below, there was an overall decrease in the number of near misses associated with the drug dosages affected by this initiative. Comparing the near miss data 6 months pre- and post-implementation, average number of near misses per month decreased from 2.67 to 0.5. This decrease of 81% met our target of decreasing number of near misses by 75%.

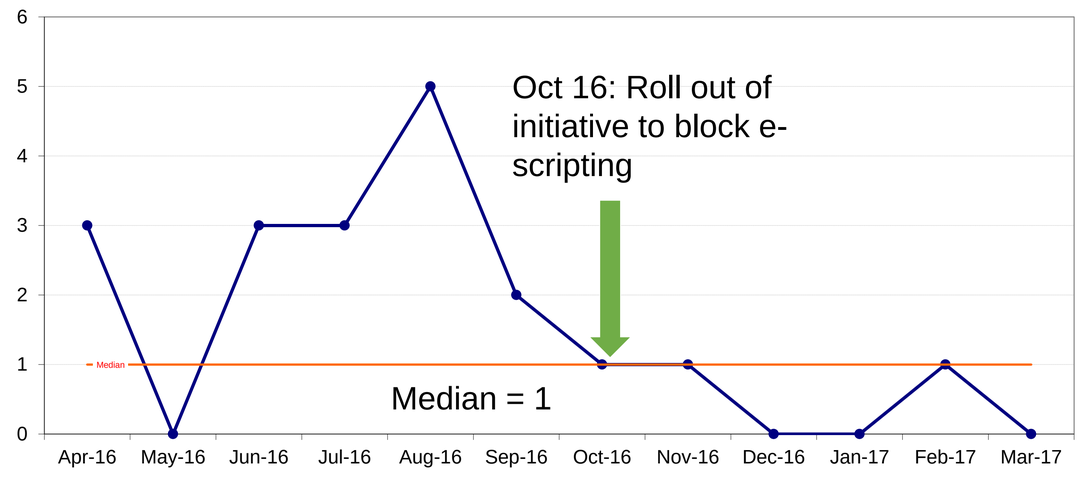

Figure. 3: Number of near misses associated with drug doses with inappropriately translated dosage strength combinations

CONCLUSION & SUSTAINABILITY PLANS

Overall, the initiative to reduce near misses associated with drug dosages with inappropriately translated dosage strength combinations by blocking the electronic translation was successful in achieving our primary aim.

Moving forward, the team plans to implement the following to sustain this project:

- ✓ Continue to collect and analyse near miss data to ensure that number of near misses has not increased due to the disabling of the electronic translation for these drug dosages
- ✓ Collect feedback from staff regarding other drug dosage combinations which may also be frequently translated inappropriately and liaise with the IT pharmacists to disable electronic translation for these combinations