Quality Improvement Project to determine the number of medication errors made whilst dispensing medicines

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1. Introduction
There are limited studies focussing on Medication Errors detected at the final check stage of the dispensing process. Studies referring to hospital dispensing error rates have been quoted as:
- A European Medicines Agency workshop as 1.6 – 2.1%.
- A NHS England directive in March 2014 as 0.02 – 2.7% of dispensed medicines.

From December 2012 to March 2013, a quality improvement (QI) project took place in the pharmacy department at Altnagelvin Hospital. This is an acute hospital containing 475 inpatient beds. The pharmacy dispenses approximately 3500 medicines each week. Pharmacists and pharmacy technicians were involved in the project.

2. Aim
The improvement project aimed to determine the number of medication errors made whilst dispensing medicines and introduce methods to reduce errors. These errors are normally detected at the final check stage of the dispensing process, so this project focussed on processes (labelling and preparation / dispensing) that could be improved to minimise an error reaching the final check stage.

3. Method

IH model for improvement methodology using Plan – Do – Study – Act (PDSA) cycles was used to test each change introduced to the process. A run chart displayed in the dispensary (run chart 1) was updated weekly to inform staff of improvements that took place.

4. Strategy for Change

Following the baseline all pharmacy staff were informed that a QI plan would be taking place over the next 4 months. Throughout the project weekly updates were discussed at the dispensary team meetings / ‘huddles’. Tests of change were introduced every 1-2 weeks via the ‘huddles’ and reinforced by the QI champions based in the dispensary.

5. Summary of Cycles of Change
Examples of Plan-Do-Study-Act cycles are shown below and their effect on reducing error rate is displayed in run chart 2.

6. Effects of Change / Results

The PDSA cycles introduced and their impact on reducing errors is annotated in run chart 2:
- Discussing errors at the weekly meeting
- Appointing champions
- Promoting ‘self-checking’ - Prompts displayed
- Defining what should be included in a self check
- Introduction of a self check sticker - ‘red dot’
- Procedure written and all staff asked to read
- OSCe style training

The majority of errors are detected at the final check stage of the dispensing process before leaving the pharmacy dispensary, however this needs to be minimised to prevent an error reaching a patient. By reducing the number of errors that reach the final check stage will minimise errors slipping through to the ward or patient. The error rate did fluctuate throughout the QI project, however it is evident in run chart 2 (see below) that there was a reduction in medication error rates, the rate decreased from the baseline 0.7% to 0.4%. This is currently lower than the European dispensing error rate in hospitals - 1.6 - 2.1%.

Run chart 2:

7. Lessons Learned

The project worked well. It was key to have champions on board to give regular feedback and support for the dispensary team and staff who rotated into the dispensary. The benefits of the project were:
- Staff now understand and have embraced QI methodology
- Error rates are discussed weekly
- Tests of change continue to happen following the official finish of the QI study
- The dispensary have adapted the reporting mechanism to now use an electronic scanner with defined barcodes for error types. This speeds up the reporting process and will in the future improve analysis of incidents that occur.

8. References