INTRODUCTION

Medication errors are the fourth cause of death in the USA, and 1 in 9 patients are at risk for a medication error. The growth in medication use has undoubtedly led to an increase in the complexity of the medication process with some hospitals identifying about 50-80 steps between a drug's decision to order a medication and its delivery to the patient. Such a complex medication circuit is prone to errors, which can be critical to ensuring efficient and effective medication management, and ultimately, patient safety. This can be done by placing barriers at vulnerable steps in the circuit.

The medication circuit comprises five main stages: (a) ordering/processing, (b) dispensing and delivering, (c) administration, and (d) monitoring and reporting. The medication circuit is a hospital-wide highly complex process; thus it becomes increasingly important to develop and implement strategies to enhance barriers to errors while optimizing medication use, and ultimately, patient safety.

PURPOSE

The main objective of this project is to ensure patient safety through reducing the level of medication errors, unify the transmission of medical information, and create a systems-based approach to error identification and prevention.

METHODOLOGY & PROCEDURES

At Hôpital Libanais Geitaoui-CHU, we adopted a combined methodology of process analysis and practice evaluation, in line with international recommendations and analyzed reported adverse drug events, in order to identify areas for improvement. This multidisciplinary project began effectively in June 2015, for the next 6 months, and was fostered by the Medications Management and Use (MMU) Committee, involving members from the pharmacy, nursing administration, physicians, IT, quality, and patients safety departments.

Several areas for improvement and corresponding improvement actions were identified and are currently underway:

- In order to reduce transcription errors, the medication prescription and administration forms were re-designed into entering the medical information, enhancing medication recognition, and improving auditing by the pharmacy (yet study currently underway).
- Increasing the timely availability and sharing of patient information (home medication, allergies, diagnosis) in the Hospital Information System (HIS) to enhance the analysis of prescription accuracy. HIS supporting modules were added and future improvements are foreseen.
- Provision of various clinical decision support tools (drug references, dosage calculator) to internists and nurses to improve drug prescription and preparation practices.
- Optimization of cytotoxic drug preparation procedures and standardizing chemotherapy order sets.
- Building regular education/feedback sessions to concerned staff, in order to increase medication error reporting and correct use of supporting tools.
- Updating internal medication management standards to integrate international practice recommendations.

RESULTS

Reporting on Adverse Drug Events

<table>
<thead>
<tr>
<th>Year</th>
<th>Medication Errors</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>14%</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>36%</td>
<td></td>
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</tbody>
</table>

Availability of Patient Information

<table>
<thead>
<tr>
<th>Month</th>
<th>Available Patient Information (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>July</td>
<td>50%</td>
</tr>
<tr>
<td>August</td>
<td>60%</td>
</tr>
<tr>
<td>Sept</td>
<td>80%</td>
</tr>
</tbody>
</table>

DISCUSSION

As the complexity of medications circuits makes healthcare institutions more prone to errors, it does the risk of errors. One important, yet challenging method of describing medication errors, is through reporting adverse drug events, whether potential or actual.

In comparison to 2014, the level of medication related-onset occurrence variance reports (OVRs) doubled by 2015, even though the number of OVRs remained the same. One contributing factor is the three-fold increase in reporting by the pharmacy, which plays a crucial role in monitoring prescription, transcription and dispensing errors.

Providing on-site training to physicians, proved to aid in making patient information available to the HIS for the pharmacy, medical imaging and laboratory departments (currently 56% compliance rate), which can aid in the reconciliation and accuracy of prescription processes, but not maintain the improvement of analysis of prescriptions by the pharmacy. By eliminating the transcription step, and re-structuring medical order information, we expect that transcription errors will decrease, and the communication between different health care professionals improves.

A pilot study is currently underway in order to identify areas for improvement through process redefinition in hospital-wide practices.

Pharmacy drug prescriptions have now been standardized as electronic protocols among concerned physicians. Having a uniform format of prescribing hospital-wide, will evidently improve the efficiency of the pharmacy. Although the pharmacy team has already revised the method of patient identification during cytotoxic drug preparation, it is incorporating a three-step process of HD verification throughout.

A constant improvement action that we are adopting is regular feedback to concerned staff regarding the level of medication errors and possible causes, in order to raise awareness, and in addition encourage a multi-disciplinary problem solving approach. Evaluation of the above mentioned improvement actions will be done by the end of 2015.

ACKNOWLEDGEMENTS

We would like to acknowledge all members of the Patient Safety, Medical Record and Medication Management and Use committees for their support, in addition to all staff who are contributing to the success of this project at Hôpital Libanais Geitaoui-CHU.