Primary Intended Outcome
Demonstrate clinical relevance, via use of a severity rating scale, of prescribing errors intercepted by pharmacists.

Relevant PPMI Recommendation
B24. Every pharmacy department should:

B24m. Track and trend pharmacist interventions.

Situation Analysis
Medication errors occur at each point in the medication use process. It has been shown that the majority of medication errors occur at the prescribing step. Lesar, et al. reported that 2.9 prescribing errors are caught for every 1,000 medication orders where pharmacists reviewed all orders and the errors were validated by a multidisciplinary team. Although it is well established that pharmacists intercept prescribing errors, the true impact of pharmacist intervention can only be known by evaluating the severity of the potential outcome had the errors not been caught. A standard methodology for categorizing severity is needed.

At Cedars-Sinai Medical Center, pharmacists document the prescribing errors they intercept by noting them in the pharmacy component of the clinical information system. Pharmacists also describe the severity of the potential outcome had the error not been caught.

The National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) index for categorizing medication errors is a validated scale (Appendix 1). The categories range from circumstances that could cause harm to errors that result in patient death. However, this index categorizes errors that actually happened, so we modified it to reflect pharmacist interception of errors and the prevention of potential harm. We also
combined elements of the original nine categories to create three broader categories according to type of prescribing error (Appendix 2). Our objectives were to use a modified NCC MERP index to categorize the severity of potential prescribing errors, validate the method, and use the trends to improve prescribing.

In addition to rating the severity of the potential outcomes, we also categorize intercepted errors based on the type of prescribing error, as follows:

- ADR detected
- Allergy
- Drug-drug interaction
- Duplicate therapy
- Incompatibility
- Incomplete order
- Omission of medication on transfer
- Recommended initiation medication
- Wrong:
  - Patient
  - Rate
  - Route
  - Concentration
  - Dosage form
  - Dose
  - Duration
  - Medication ordered
  - Frequency

We introduced the severity ratings to pharmacists in March 2010. In September 2010, we established the modified NCC MERP severity categories because pharmacists desired specific definitions for each of the three severity ratings. Education consisted of one-on-one or small group discussions to explain how the NCC MERP categories are to be used, and staff received laminated pocket cards that outlined the definitions.

To ensure that pharmacists were accurately rating the interventions, physicians trained in the modified NCC MERP categories independently rated 100 prescribing errors from the “Life-Threatening” and “Serious/Significant” categories. Analysis revealed that in 84% of the ratings, physicians and pharmacists agreed in their assessments of whether harm could possibly occur, which is consistent with published research.

**Service Description**

Pharmacists document intercepted prescribing errors and their potential severity in the electronic health record. The data is analyzed both quantitatively and qualitatively as part of the organization’s performance improvement program and periodically reported to the Pharmacy and Therapeutics Committee and medical staff committees, where department-specific examples are shared to educate physicians about common prescribing errors. Additionally, the data is used in the medical staff credentialing process. In the pharmacy, examples of potential prescribing errors are used in a clinical skills assessment for residents and are shared with pharmacy staff on a routine basis. Lastly, great catches are shared with pharmacists and executive management.

**Key Elements for Success**

1. Education of staff about how to apply severity categories,
2. Inter-rater evaluation of intercepted prescribing errors and severity categorization on an ongoing basis,
3. Physician validation of pharmacists’ accuracy in rating prescribing error severity,
4. Having a physician champion, and
5. Sharing trend data and examples of prescribing errors intercepted with medical staff and executive management.

**Resource Utilization**

**Personnel:** Fifteen hours per month of pharmacy management resident’s time and one or two hours per month of pharmacy management’s time.

**IT and other infrastructure:** Clinical information system to document errors intercepted.

**Recognized Intangible Benefits**
Continually reporting interceptions promotes a culture of safety. The severity rating brings clinical relevance to pharmacist interventions beyond the traditional measure of quantity of interventions.

**Outcome Measures**
The project resulted in concrete data that demonstrates the value of clinical pharmacy services to the organization. Although we didn’t increase FTEs, the program supports the need for pharmacist staffing throughout patient care areas.

**Lessons Learned**
1. Documenting the severity and quantity of intercepted prescribing errors demonstrates the value of clinical pharmacy services. An analysis conducted of prescribing errors prior to implementing CPOE revealed that approximately 55% of dosing errors will not have a decision support alert in CPOE, and approximately 97% of allergy errors may have a decision support alert in CPOE.
2. Documenting intercepted prescribing errors is valuable for teaching pharmacy staff and residents, medical residents and physicians.

**Other Considerations**
Working collaboratively with the medical staff throughout the process of validating the ratings of the intercepted prescribing errors has been helpful in gaining support for the project.

**Suggestions for Other Hospitals/Health Systems**

1. Approaching this project from a performance improvement perspective with medical staff support can help ensure success.
2. Work with pharmacists from the beginning to ensure that they understand the definitions of the severity ratings. Using a validated scale such as the NCC MERP is helpful in providing the definitions. Assigning ratings can be difficult at times because the errors have not actually occurred and the true outcome is not known.

**Helpful References**
Appendix 1. NCC MERP Index for Categorizing Medication Errors

Appendix 2. Modified Categories Based on NCC MERP

Low Capacity for Harm:
Category A: Circumstances or events have the capacity to cause error.
Category B: An error could have occurred but the error would not reach the patient (an “error of omission” does reach the patient).
Category C: An error could have reached the patient but would not cause patient harm.

Serious/Significant:
Category D: The identified and intercepted error could have reached the patient and would have required monitoring to confirm that it resulted in no harm to the patient or required intervention to preclude harm.
Category E: The identified and intercepted error may have contributed to or resulted in temporary harm to the patient and required intervention.
Category F: The identified and intercepted error may have contributed to or resulted in temporary harm to the patient and required initial or prolonged hospitalization.

Life-Threatening:
Category G: The identified and intercepted error may have contributed to or resulted in permanent patient harm.
Category H: The identified and intercepted error may have required intervention necessary to sustain life.
Category I: The identified and intercepted error may have contributed to or resulted in the patient’s death.