# Prescribing Patterns of Preferred or Formulary Medications

Evaluating the prescribing patterns of preferred or formulary medications can help organizations determine whether health IT, in particular, electronic prescribing (e-prescribing) and computerized provider order entry (CPOE) systems with included formularies, impact the use of preferred or formulary medications.

**Measure Category:** Workflow Impact

**Quality Domain:** Efficiency

**Current Findings in the Literature:** Although brand medications are commonly prescribed, published evidence-based guidelines often support the use of less expensive alternatives.[1,2] E-prescribing and CPOE systems offer the ability to provide clinicians with immediate access to the formulary and generic status of a prescribed medication. These drug alternatives could be part of an organization's preferred medication list or a health plan's formulary system. In addition, these systems typically include knowledge support around the efficacy, safety, and cost of medications, which providers may access at the time of prescribing. This decision support may help clinicians choose less expensive, but equally effective, drug alternatives.

Literature supports using health IT to increase the use of preferred or formulary medications by clinicians, although this finding is not universal.[3] For example, Kaiser Permanente in the Northwest Region has developed evidence-based practice guidelines and integrated them into their order entry application of their outpatient computer-based patient record system (CPR) (their electronic medical record). This system has an alternative medication functionality that prompts clinicians to order organizationally preferred alternatives within a class of medications. After implementation of this functionality, Zoloft® prescriptions decreased from 4.7 to 2.4 percent of total selective serotonin reuptake inhibitor (SSRI) prescriptions (from 1,042 to 738 total Zoloft® prescriptions).[4]

Researchers in an urban academic medical center implemented decision support for preferred histamine2-blockers (H2 blockers).[5] This hospital's pharmacy and therapeutics committee recommended nizatidine (Axid®) as their oral H2-blocker because of its lower cost to the hospital, compared with other oral H2-blockers with similar efficacy and side effects. Whenever any other oral H2-blocker was ordered, a screen appeared that explained the rationale for changing to the favored drug. In a time-series study, the researchers found that for the two baseline periods preceding the implementation, nizatidine was used for 11.7 and 16.1 percent of all oral H2-blocker orders; for the next 2 periods, after the order entry screens were in place, the percentage rose to 81.3 percent and then to 95.1 percent (p<.001).

Another group found that an e-prescribing system with integrated decision support shifted prescribing behavior away from high-cost therapies.[6] Researchers evaluated the prescribing patterns for the intervention and control groups by comparing prescriptions for specific high-cost drug classes and preferred drug classes within eight therapeutic categories. They found that prescriptions for high-

cost target medications decreased by 9.1 percent in the intervention group and increased by 8.2 percent in the control group.  Compared with the control group, the prescription ratio for high-cost drug classes was 17.5 percent lower in the group using the CDSS (35.8 percent versus 43.4 percent, p=0.03).

Another study, which evaluated the implementation of e-prescribing with formulary decision support (FDS) that prompted providers to prescribe lower cost medications, found that even when controlling for baseline differences between prescribers and for changes over time, e-prescribing corresponded to a 3.3-percent increase (95% confidence interval (CI), 2.7-4.0 percent) in tier 1[a] prescribing.[7] During the intervention period, there was an increase of 6.6 percent in tier 1 prescriptions (95% CI, 5.9 to 7.3 percent) over baseline for the intervention group, compared with the 2.6 percent (95% CI, 2.5 to 2.7 percent) increase in the control group.  The tier 2 prescription rate decreased by 5.2 percent (95% CI, –5.9 to –4.5 percent) in the intervention group compared with a 2.7-percent decrease (95% CI, –2.8 to –2.6 percent) for controls.  Finally, tier 3 prescriptions for the intervention decreased by 1.4 percent (95% CI, –1.8  to –1.0 percent), compared with a 0.2-percent increase for controls (95% CI, 0.1 to 0.2 percent).

**Source of Data for the Measure:** : E-prescribing or CPOE logs.

## Methodology for Measurement

*Study Design 1:* Pre- and post-health IT implementation

*Study Period 1:* Define baseline and intervention time periods (e.g., number of months).

*Evaluation 1:* Change in the proportion of prescriptions for preferred or formulary medications pre- to post-health IT implementation.

Preimplementation Rate = (number of preferred or formulary prescribed medications actions in baseline period/total prescriptions in specified therapeutic class in baseline period)

Postimplementation Rate = (number of preferred or formulary prescribed medications actions/total prescriptions in specified therapeutic class in intervention period)

*Study Design 2:* Comparison of the proportions of prescriptions of preferred or formulary medications between control and intervention groups.
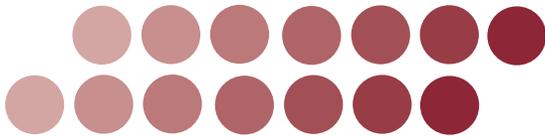
Control Rate = (number of preferred or formulary prescribed medications actions in control/total prescriptions in specified therapeutic class in control group)

Intervention Rate = (number of preferred or formulary prescribed medications actions/total prescriptions in specified therapeutic class in intervention group)

*Analysis Considerations*

Several issues should be addressed before proceeding with an analysis plan:

1. Your data collection and analysis plan should be based on sound methodology. To achieve valid, robust results, consider planning your analysis with the input of a trained statistician to determine sample size and appropriate statistical

[a]A method of  encouraging lower cost medications is called variable cost sharing, where insurers identify preferred medications, or "tier 1" medications which have the lowest copayment.  Tier 1 medications are usually generic medications. Tier 2 medications, with a higher copayment, may be lower priced brand medications, while Tier 3 medications are usually expensive brand medications for which generic alternatives are usually available.

techniques. It is not uncommon to begin analyzing data, only to find the original statistical plan was flawed, leaving you with data that is inadequate for analysis.

2. A simple chart or graph that visually displays the proportion of preferred medications over time is an effective way to communicate this information to stakeholders.

3. You may want to consider the patient as the unit of analysis since the same physician may see a mix of patients supported by a myriad of payers and where the formulary for each payer will be different. Another way to understand this is to be sure to consider each patient's preferred formulary based on their payer when analyzing the data.

4. You may need to account for how often a provider uses the health IT (e.g., e-prescribing) system. For example, some providers may not use the system for all prescriptions written, or may not have access to it in all the settings they practice in; therefore, the impact of the implementation may be underestimated.

5. You may need to take into account which insurance formularies have been reliably integrated into your system. If not all formularies from all available insurance carriers have been integrated, a provider may end up prescribing the nonpreferred drug from the perspective of the insurer, inadvertently reducing the impact of the application.

**Relative Cost:** Low: if these data are readily available.

**Potential Risks:** Ensure that you are examining physician prescribing data and not pharmacy data. Pharmacies may automatically switch patients to preferred or formulary medications without informing the physician. Using pharmacy data would intermingle physician behavior and pharmacist behavior, thus falsely increasing the effect of the implementation you are trying to measure.

## References

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