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## Title

*Ambulatory Medication Safety in Primary Care – A Systematic Review of Its Measurements and Outcomes*

## Priority 1 (Research Category)

Prescribing and pharmacotherapeutics

## Presenters

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## Abstract

Context:  Medication safety is a concern in primary care, but its measurement may be complex and implications uncertain.

Objective: To review of the literature of medication safety in primary care in the electronic health record era, examining the definitions and instruments used, and the primary outcomes.

Study Design and Analysis: Systematic Review

Dataset: Medline, EMBASE, and SCOPUS from January 1999 to December 2020, supplemented with hand searches.

Included Studies: Studies measuring rates and outcomes of medication errors in primary care clinics with electronic prescribing managed by primary care physicians/teams. 4 investigators independently reviewed titles and analyzed abstracts with dual-reviewer review for eligibility, characteristics, and risk of bias. All identified observational studies were determined to be at low risk of bias, there were some biases in the intervention studies.

Results: Of 1,464 articles identified, 56 met the inclusion criteria. 42 studies were observational and 14 included an intervention. The majority of the studies (29) used their own definition of error. Others used Beers list (14), Screening Tool of Older Persons' Prescriptions (STOPP) (13), and other definitions (including 10 studies that used more than one method). The most common outcomes were potentially inappropriate prescribing/medications (PIP) (42), adverse drug events (ADEs) (12), and potential prescribing omissions (PPO) (5). Most of the studies only included high-risk sub-populations (38), usually older adults taking > 4 medications. The rate of PIPs varied widely (0.19% to 98.2%). High-risk populations with measurements of multiple clinic visits yielded the highest PIP rates. The rate of ADEs was lower (0.47% to 14.7%). Less commonly measured outcomes were ED visits and hospitalization associated with ADEs (6). No studies adjusted results for patient shared decision making, nor measured

patient-oriented harms such as unnecessary hassle and expense, or decreased trust between physician and patient.

Conclusions:  The majority of medication safety studies in primary care were in high-risk populations and measured potential harms rather than actual harms. No study considered individual patient factors in measuring ADEs or prescribing errors. Applying algorithms such as Beers and STOPP lists to primary care prescribing exaggerates the rate of actual harms and does not capture the complexity of primary care medical decision making.