Title: **Retrospective review of penicillin allergy documentation within an electronic medical record and application to allergy triage for inpatient penicillin allergy testing**

Author(s): Hannah D. Fjeld and Ryan W. Stevens

Institution: UAA/ISU College of Pharmacy Anchorage, Alaska and Providence Alaska Medical Center Anchorage, Alaska

Abstract Text:

Purpose: Penicillin allergy is the most common self-reported allergy with a rough population prevalence of ten percent; furthermore, only ten percent of those who self-report are likely to have a true immunoglobulin E (IgE) mediated allergy. As penicillin skin testing (PST) has become more available clinicians are faced with the need to quickly triage a patient's electronic medical record (eMR) to determine appropriate candidates for PST. This project was designed to retrospectively review the allergy input structure for patients self-reporting penicillin allergies and describe whether a potential true allergy could be distinguished from intolerance using the eMR allergy documentation section alone.

Methods: A report was run to identify patients with a documented penicillin allergy that received any antibiotic as an inpatient at the index facility over a 12-month period ranging from September 2016 to September 2017. Patients were excluded if they had a concurrent cephalosporin allergy documented in the eMR. The eMR allergy record consists of two non-mandatory drop downs for reaction and reaction severity and a free text comment field. Patient reactions were classified as follows: IgE-mediated (anaphylaxis, hives, shortness of breath, swelling), non-IgE-mediated (rash), adverse reaction (diarrhea, itching), intolerance (nausea and vomiting or nausea only), and family history only (identified from "other – see comments" field) and unknown. This information was used to triage patients into two groups: those appropriate for empiric cephalosporin administration or those who may be candidates for PST. Furthermore, a historical chart review was performed to assess previous inpatient tolerance of cephalosporin class anti-infectives. Results were compared to eMR allergy record documentation alone with regards to ability to identify potential PST candidates. In both analyses, PST candidates include those with reactions classified as IgE-mediated with no previously documented cephalosporin administration and patients with non-IgE-mediated or unknown reaction marked as high or unknown severity.

Results: 652 patients were included in this review. The distribution of penicillin allergy reactions was 43 percent IgE-mediated, 26 percent unknown reaction, 19 percent non-IgE mediated, 6 percent adverse reaction, 4 percent intolerance and 2 percent family history only. Using the eMR allergy record alone, 260 patients were assigned to the empiric cephalosporin group and 392 patients to the PST group. Comparatively, full review of the historical medical record identified 381 patients as being appropriate for empiric cephalosporin administration and 271 patients as PST candidates. This is a variance of 121 patients identified for cephalosporin administration when the historical medical record is reviewed versus use of the eMR allergy record alone. After full historical record review, it was found that 46 percent (n equals 76 of 166) in the "unknown reaction" classification were assigned to the PST group only because there is no recorded reaction or reaction severity and they had no previous cephalosporin administration documentation. These patients account for 28 percent (n equals 76 of 271) of the total PST group. Overall, 19 percent (n equals 126) of the eMR allergy records evaluated had no reaction, no reaction severity, and no relevant information in the open text comment field.

Conclusions: Within our institution, the eMR allergy record alone does not lend sufficient information to effectively identify patients that may be appropriate for empiric cephalosporin administration versus those appropriate for PST. We identified a significant number of patients with allergies documented with no associated reaction or reaction severity, thus preventing assessment of a patient's risk for cross reactivity with a cephalosporin. Potential options to remedy the inaccurate documentation would include: requiring "hard stops" for allergy reaction, defaulting entered reactions to an associated severity, and providing information regarding methods for obtaining a comprehensive allergy history within the eMR allergy input system.