PARTNERSHIP for HEALTH IT PATIENT SAFETY
*Making healthcare safer together*

ECRI Institute
The Discipline of Science. The Integrity of Independence.

# *Partnership* Update

November, 2018

## Data Snapshot: Coding Allergies in Electronic Health Records May Decrease Adverse Events from Drug-Allergy Interactions

### Background

Clinical decision support (CDS) in the healthcare setting aims to provide the *right information* to the *right person* in the *right intervention format* through the *right channel* at the *right time* in the workflow. CDS has the potential to improve healthcare quality and outcomes by providing tools that enhance the delivery and safety of patient care. Drug-allergy alerts, one such CDS feature, act as a safeguard. They provide information of possible drug-allergy interactions by comparing ingredients and cross-reactivity between documented allergies and prescribed medications (Topaz et al., 2016). However, allergies can be documented as free text and, therefore, do not contribute to generating these alerts.

The case study below is based on an event that was submitted under the protection of the ECRI Institute PSO and reviewed by patient safety analysts for shared learning.

### Case Study Event

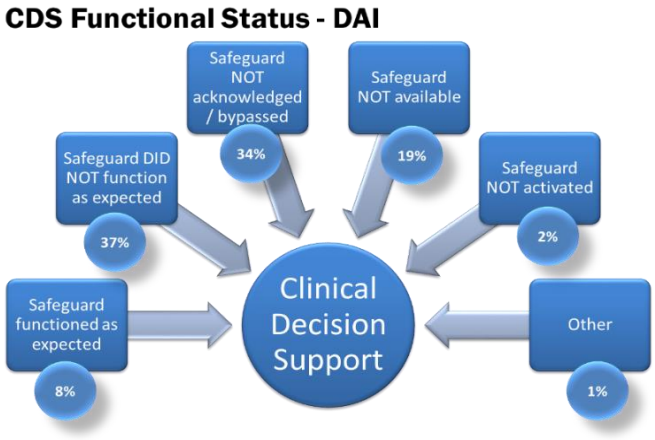
> *The electronic health record (EHR) of a 32-year-old female with no significant past medical history contained documented allergies to a brand name of the antibiotic eye drop moxifloxacin (Vigamox) and amoxicillin. Her primary care physician had used free-text entry to document the allergy to the brand name a few years ago, after the patient developed significant facial swelling and hives upon using the antibiotic eye drop to treat suspected bacterial conjunctivitis (an eye infection). At the present visit to the primary care physician, the patient presented with complaints of painful urination and urinary frequency. A resident physician rotating in the practice evaluated the patient, performed a urine dipstick, and diagnosed a urinary tract infection. He sent an electronic prescription to the patient's pharmacy for a three-day course of brand name Cipro (ciprofloxacin).*
>
> *Later that day, the patient's primary care physician reviewed the resident physician's documentation and noticed that Cipro presented a potential drug-allergy interaction. The antibiotics Vigamox and Cipro, the generics of which are moxifloxacin and ciprofloxacin, are both within a drug class called fluoroquinolones. Because there can be cross-sensitivity within the class, a documented hypersensitivity reaction to one fluoroquinolone is a relative contraindication to prescribing another. The primary care physician called the patient to explain this and to inform her that she would prescribe an alternative antibiotic. The patient had not yet picked up the prescription for the antibiotic and instead picked up the new prescription later that evening*.

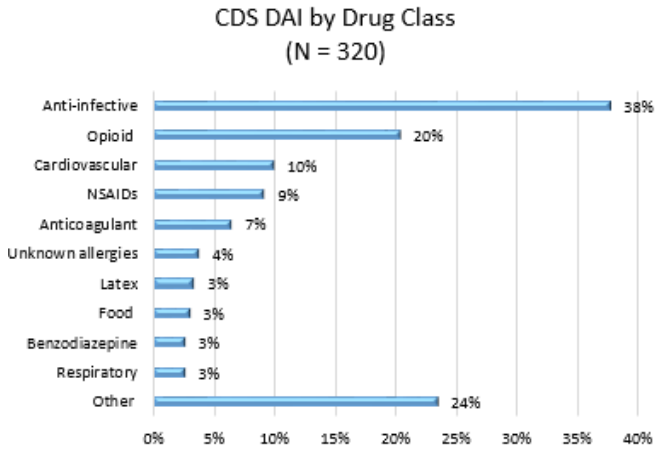
How did this event happen? The contraindication to prescribing ciprofloxacin (Cipro) for the patient was not readily evident. This may have been due to an oversight because it was not immediately clear that the drugs were of the same class, or that the oral medication had the same potential to create an allergic reaction as the topical medication, the inability to visualize documented allergies, unfamiliarity with the location of allergy information in that particular EHR, or difficulty navigating the EHR. Whatever the reason, there was no reminder in place that alerted the prescriber of the potential drug-allergy interaction and the contraindication went unnoticed by the prescriber. There was no ability for a duplicate check because the pharmacist did not have information regarding the patient's allergies. Thus, the pharmacist prepared the prescription for pick-up without any further interaction with the prescriber.

## What We Are Learning

In a review of 320 events submitted to ECRI Institute PSO that involved CDS for drug-allergy interactions between September 2005 and January 2018, a safeguard was unavailable in 19% of the events (see the breakdown below). The case study event we described is one such example; a safeguard in the form of a drug-allergy interaction alert did not generate. The 320 events were also broken down by drug class.Thirty-eight percent of the events of drug-allergy interactions occurred within the anti-infective drug class (see bar graph below).

The *Partnership* has been reviewing published research for health information technology (IT) interventions with potential to improve the effectiveness of CDS for drug-allergy interaction alerts. One such intervention is coding allergy information into a central data repository that triggers alerts by comparing ingredients and cross-reactivity between documented allergies and prescribed medications. A descriptive review by Zimmerman et al. (2009) reported successfully reducing unstructured allergy information in the electronic medical records in a hospital system from 52.4% to 2.6% using techniques such as improving the data-entry screen for allergy information. The researchers reported a low transfer time of free-text allergens into coded terms within a central data repository and that only 1% of all hard-stop alerts were assessed to be inappropriate. To combat provider alert fatigue, Brodowy et al. (2016) described success in adjusting alert firing parameters to reduce the firing of lower-utility alerts.




## Contributing Factors

In the case study event, the patient's primary care physician had dutifully documented the brand name (Vigamox) of the antibiotic eye drop moxifloxacin as a drug allergy after an adverse drug reaction. However, she entered this information as free text. As such, the EHR was unable to generate a drug-allergy alert during a future encounter when the patient was prescribed ciprofloxacin. If present, this safeguard could have popped up as box during the medication-ordering process to alert the physician of the potential interaction and required the physician to acknowledge the interaction, potentially taking action to avoid the interaction, before advancing.

## Lessons Learned

The health IT intervention of coding allergy information into a central data repository has the potential to enhance the delivery and safety of patient care. Standardization of allergy information coding does not currently exist among EHRs, but would augment the impact of this health IT intervention. As mentioned previously, the information contained within the central data repository would generate drug-allergy alerts within the EHR by comparing ingredients and cross-reactivity between documented allergies and prescribed medications. Once such a system is in place, monitoring override rates of these alerts to adjust firing parameters may decrease the number of unneeded alerts and improve the efficacy of the intervention.

## Conclusion

Adverse events from drug-allergy interactions continue to occur in healthcare despite current efforts to avoid them. Coding allergies into a central data repository in order to detect potential drug-allergy interactions and trigger drug-allergy alerts has the potential to decrease the incidence of drug-allergy interactions if implemented and monitored correctly.

# Important Announcements

## Save the dates in 2019 for Upcoming *Partnership Meetings*

The *Partnership for Health IT Patient Safety* gathers stakeholders quarterly. Three of these meetings occur via web conferencing, and the fourth is an annual in-person meeting. The *Partnership* meeting dates coming up next year are:

- January 22, 2019
- April 23, 2019
- Juy 23, 2019
- In-person meeting September 12, 2019

Mark your calendars. We hope to see you there!

## *Partnership* News

### Annual Meeting

The *Partnership for Health IT and Patient Safety* held its fifth annual in-person meeting, **Collaboration: Building a Path to Sustaining Health IT Safety**, October 24, 2018, at ECRI Institute in Plymouth Meeting, PA. A big thank you to all those who contributed to this event and to those who have enriched the work that has been done and continue to work to make health IT safer.





The exceptional group of participants this year included clinical leaders, health IT vendors, hospital representatives, professional organizations, government agencies, safety scientists, and researchers.

The meeting participants heard from Jonathan Teich, MD, Chief Medical Information Officer and Director of Product Management at InterSystems, who

## Expert Advisory Panel



The *Partnership for Health IT Patient Safety* is sponsored through funding from the Gordon and Betty Moore Foundation.

spoke about optimizing CDS for patient safety; Shari Medina, MD, Regulatory Affairs Specialist at Harris Healthcare, who spoke about the EHRA Patient Safety Workgroup for which she is the Chair; Siraj Anwar, MBBS, MS, CPHIMS, Associated Chief Medical Information Officer at Memorial Hermann Health System, who spoke about the role of informatics in driving patient safety; and Janet Marchibroda, MBA, Fellow for the Bipartisan Policy Center, who spoke about recent data meetings for the National Collaborative for Health IT Safety.

The *Partnership* presented findings of the two 2018 health IT–focused workgroups, the EHRA workgroup: **Measures and CDS for Safer Opioid Prescribing and the Safer Health IT Practices for Drug-Allergy Interactions** workgroup via a panel discussion of health IT safe practices and considerations. The findings and recommendations resulting from the workgroups will be available on the *Partnership* public website early in 2019.

Breakout sessions focused on identifying measures for safety in the areas of clinical decision support, system interoperability, patient identification, documentation, and patient engagement with the attendees exchanging ideas for further investigation. While establishing simple, universal measures is difficult, things can be done today!

If you are interested in telling us about your projects, your implementations, what you are working on, or your experience with the *Partnership's* safe practices, please contact us at hit@ecri.org.

**Prototype Project in Preparation for the National Collaborative: Retract and Reorder**

The *Partnership* will be working on a prototype project to determine the best way to gather information for prioritizing safety events and shared learning in a national collaborative while still allowing organizations to maintain control of their data. This project is using system data contained in the electronic health record and correlated with clinical information.

The topic will use the retract-and-reorder measure developed by Dr. Jason Adelman and his team of researchers and endorsed by the National Quality Forum to determine whether an incorrect patient identification occurred. This tool is accessible for use in several vendor platforms.

Participants in the annual in-person meeting of the *Partnership* last month heard about this project in greater detail. If you would like to participate in this prototype project, please contact us at hit@ecri.org. We encourage you to get involved, as this project will help to inform and enhance the national collaborative effort.

**Look for the 2018 Annual Report**

The *Partnership* highlights the year's activities in its Annual Report. Watch for the 2018 annual report on the Partnership's public website! In the meantime, you can still access the 2017 annual report.

## Workgroup Updates

Stay tuned for more information on the upcoming 2019 workgroups.

### We Want to Hear from You

Not only is it important to develop safe practices, it is important to implement them in order to assess and measures their effectiveness. If your organization/practice has implemented any of the *Partnership's* health IT safe practice recommendations, we would like to hear from you.

What has your experience has been? Have you been successful? Did you have difficulty implementing these practices? How did you measure the outcomes? Start the conversation by emailing your responses and questions to hit@ecri.org.

## Collaborating Organizations


### Need to Submit an Event?

Partnership participants can submit events through your membership portal.

If you need assistance, please contact us at hit@ecri.org.

### Get in Touch with the Partnership

Do you have questions about any of these articles? Get in touch with us today by e-mailing hit@ecri.org. If you wish to submit information for this publication,

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