

# ZOE CO

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## EDUCATION

**University of Michigan, Ann Arbor, MI** **08/2023 -- PRESENT**

**Ph.D.:** Health Infrastructures and Learning Systems (HILS)

**Department:** Learning Health Sciences

**Advisor:** Gretchen A. Piatt, PhD, MPH

**University of Pittsburgh, Pittsburgh, PA**

**08/2012 -- 04/2017**

**B.S.:** Biological Sciences

**Certificate:** Conceptual Foundations of Medicine

## RESEARCH EXPERIENCE

**University of Michigan**

**03/2024 -- PRESENT**

**College of Pharmacy**

**Role:** Graduate Student Research Assistant

**Principle Investigator:** Corey Lester, PharmD, PhD, MS

**Study Description:** Assessment and pilot of an *artificial intelligence (AI)* tool that provides decision support to aid pharmacists in the medication verification process. During the study sessions, pharmacists performing the medication verification task in Labvanced, which is a software used to track the eye movements of participants as they complete the task.

- Screen potential study participants for the pilots through telephone calls.
- Oversee study sessions with each study participant to ensure any technical difficulties are resolved.
- Participate in mock study sessions using Labvanced to identify and solve potential technical barriers that participants may encounter during study sessions.

**University of Utah**

**01/2024 -- PRESENT**

**Department of Internal Medicine, Division of Epidemiology**

**Role:** Independent Research Consultant

**Principle Investigator:** David C. Classen, MD, MSc

- Develop strategies for management and maintenance the clinical content for the Leapfrog Group's inpatient **Computerized Physician Order Entry (CPOE) Evaluation Tool** in collaboration with research pharmacists and clinical content experts. The CPOE Evaluation Tool assesses hospital's ability to detect and prevent serious medication errors.

- Lead the piloting of 4 new testing modules for the CPOE Evaluation Tool with 5 academic medical centers across the country.
- Provide strategic direction and feedback about the clinical content and testing methodology for CPOE Evaluation Tool based off analyses about hospital performance in the tool.

**Brigham and Women's Hospital**

**10/2021 – 08/2023**

**Department of General Internal Medicine**

**Role:** Research Project Coordinator

**Principle Investigator:** David W. Bates, MD, MSc

- Developed and implemented 4 new testing modules for the Leapfrog Group's *Computerized Physician Order Entry (CPOE)* Evaluation Tool targeting different capabilities of clinical decision support, targeting usability, deep vein thrombosis prevention, clinical overuse based on the Choosing Wisely® recommendations, and medication reconciliation.
- Led, developed, and piloted a new version of the CPOE Evaluation Tool targeted at ambulatory medication clinical decision support, which was piloted with 10 outpatient clinics across the country.
- Analyzed and disseminated results from the CPOE Evaluation Tool for conference presentations and peer reviewed publications. This includes 7 conference presentations, 2 co-authored and 3 first-authored peer reviewed publications related to the CPOE Evaluation Tool.

**Brigham and Women's Hospital**

**10/2017 – 02/2021**

**Department of General Internal Medicine**

**Role:** Research Assistant I & II

**Department:** General Internal Medicine

**Principle Investigator:** David W. Bates, MD, MSc

- Managed and maintained the clinical content for the Leapfrog Group's inpatient CPOE Evaluation Tool, which is used by over 2000 hospitals annually to assess the ability of their *electronic health record (EHR)* systems to detect and prevent medication-related errors.
- Contributed to 6 other projects related to patient safety and clinical informatics. Notable projects include: (1) implementation of a problem oriented EHR for clinical data retrieval, (2) a scoping review about the use of artificial intelligence decision support tools to detect adverse drug events, and (3) derivation of a clinical risk score to predict hypoxia, ICU admission, and death among COVID patients.
- Promoted from RA I to RA II on 02/2019

## AWARDS & RECOGNITIONS

### University of Michigan – Rackham Graduate School

03/2024

- Rackham Conference Travel Grant - \$900

### Journal of the American Medical Informatics Association (JAMIA)

- Featured journal article in Volume 27, Issue 8, August 2020 for “*The tradeoffs between safety and alert fatigue: Data from a national evaluation of hospital medication-related clinical decision support*”

### Brigham and Women’s Hospital

06/2019

- *Honorable Mention* for Research at the Division of General Internal Medicine’s Research Day, nominated by David W. Bates, MD, MSc

### Mass General Brigham

11/2018

- *Partners In Excellence* Award for Research on “Building Safer Electronic Health Records”

## PROFESSIONAL MEMBERSHIPS

### American Medical Informatics Association

08/2018 – PRESENT

## PEER REVIEWED JOURNAL ARTICLES

1. Lester C, Rowell B, Zheng Y, **Co Z**, et al. Effect of uncertainty-aware artificial intelligence models on human reaction time and decision-making: A randomized controlled trial. *JMIR Preprints*. 30/07/2024:64902. DOI: [10.2196/preprints.64902](https://doi.org/10.2196/preprints.64902). URL: <https://preprints.jmir.org/preprint/64902>
2. Wasserman RL, Seger DL, Amato MG, **Co Z**, et al. “Straight to the point: evaluation of a Point of Care Information (POCI) resource in answering disease-related questions”. *J Med Libr Assoc*. 2024;112(1):13-21. doi:10.5195/JMLA.2024.1770
3. **Co Z**, Classen DC, Cole JM, et al. “How Safe are Outpatient Electronic Health Records? An Evaluation of Medication-Related Decision Support using the Ambulatory Electronic Health Record Evaluation Tool”. *Appl Clin Inform*. 2023;14(5):981-991. doi:10.1055/s-0043-1777107
4. Nuckols TK, Berdahl CT, Henreid A, Schnipper JL, Rauf A, Ko E, Nguyen A, **Co Z**, Fanikos J, Kim JH, Leang D, Matta L, Mulligan K, Ray A, Shane R, Wassef K, Pevnick JM, and the PHARM-DC Group. “Comprehensive Pharmacist-led Transitions-of-care Medication Management around Hospital Discharge Adds Modest Cost Relative to Usual Care: Time-and-Motion Cost Analysis”. *Inquiry*. 2023;60:469580231218625. doi:10.1177/00469580231218625

5. **Co Z**, Classen DC. “Pilot Results from the Ambulatory Electronic Health Record (EHR) Evaluation Tool: Lessons Learned”. *J Clin Res Med*. 2023; 6(3): 1–2. DOI: 10.31038/JCRM.2023633
6. Syrowatka A, Song W, Amato MG, Foer D, Edrees H, **Co Z**, Kuznetsova M, Dulgarian S, Seger DL, Simona A, Bain PA, Purcell Jackson G, Rhee K, Bates DW. “Key use cases for artificial intelligence to reduce the frequency of adverse drug events: a scoping review”. *Lancet Digit Health*. 2022;4(2):e137-e148. doi:10.1016/S2589-7500(21)00229-6
7. **Co Z**, Holmgren AJ, Classen DC, et al. “The Development and Piloting of the Ambulatory Electronic Health Record Evaluation Tool: Lessons Learned”. *Appl Clin Inform*. 2021;12(1):153-163. doi:10.1055/s-0041-1722917
8. Semanik MG, Kleinschmidt PC, Wright A, Willett DL, Dean SM, Saleh SN, **Co Z**, Sampene E, Buchanan JR. “Impact of a problem-oriented view on clinical data retrieval”. *J Am Med Inform Assoc*, 2021;, ocaa332, <https://doi.org/10.1093/jamia/ocaa332>
9. Levine DM, Lipsitz SR, **Co Z**. *et al*. “Derivation of a Clinical Risk Score to Predict 14-Day Occurrence of Hypoxia, ICU Admission, and Death Among Patients with Coronavirus Disease 2019”. *J GEN INTERN MED* (2020). <https://doi.org/10.1007/s11606-020-06353-5>
10. **Co Z**, Holmgren AJ, Classen DC, Newmark L, Seger DL, Danforth M, Bates DW. “The tradeoffs between safety and alert fatigue: Data from a national evaluation of hospital medication-related clinical decision support”. *J Am Med Inform Assoc*. 2020 Aug 1;27(8):1252-1258. doi: 10.1093/jamia/ocaa098. PMID: 32620948
11. Levine DM, **Co Z**, Newmark LP, Groisser AR, Holmgren AJ, Haas JS, Bates DW. “Design and testing of a mobile health application rating tool”. *NPJ Digit Med*. 2020 May 21;3:74. doi: 10.1038/s41746-020-0268-9. PMID: 32509971; PMCID: PMC7242452
12. Classen DC, Holmgren AJ, **Co Z**, Newmark LP, Seger D, Danforth M, Bates DW. “National Trends in the Safety Performance of Electronic Health Record Systems From 2009 to 2018”. *JAMA Netw Open*. 2020 May 1;3(5):e205547. doi: 10.1001/jamanetworkopen.2020.5547. PMID: 32469412; PMCID: PMC7260621
13. Holmgren AJ, **Co Z**, Newmark L, Danforth M, Classen D, Bates D. “Assessing the safety of electronic health records: a national longitudinal

study of medication-related decision support”. *BMJ Qual Saf.* 2020 Jan;29(1):52-59. doi: 10.1136/bmjqs-2019-009609. Epub 2019 Jul 18. PMID: 31320497

## CONFERENCE PRESENTATIONS

1. **Co Z**, Classen DC, Danforth M, Bates DW. “Hospital Performance on Advanced Clinical Decision Support Areas in the Leapfrog Group’s 2022 CPOE Evaluation Tool”. Accepted at: **AMIA 2024 Annual Symposium**; November 2024; San Francisco, CA. Poster.
2. **Co Z**, Classen DC, Cole JM, Bates DW. “Characteristics of High-Performance Hospital in the Leapfrog Group's 2022 CPOE Evaluation Tool”. Presented at: **Academy Health - Annual Research Meeting 2024**; June 2024; Baltimore, MD. Poster.
3. **Co Z**, Newmark LP, Classen DC, Cole JM, Bates DW. “Development and Piloting of a Human Factors Survey Based on I-MeDeSA through the Ambulatory EHR Evaluation Tool”. Presented at: **AMIA 2022 Annual Symposium**; November 2022; Washington, D.C. Oral Presentation.
4. **Co Z**, Newmark LP, Classen DC, Seger DL, Danforth M, Bates DW. “Healthcare System Performance on Unsafe Medication Orders in the 2019 CPOE Evaluation Tool”. Presented at: **AMIA 2021 Annual Symposium**; November 2021; San Diego, CA. Poster.
5. **Co Z**, Classen DC, Pon B, Zimmer K, Seger DS, Cole JM, Bates DW. “Pilot Results from the Ambulatory Flight Simulator Tool: Lessons Learned”. Presented at: **AMIA 2020 Virtual Annual Symposium**; November 2020. Poster.
6. **Co Z**, Holmgren AJ, Newmark L, Seger D, Classen DC, Danforth M, Bates DW. “Hospital Performance on Unsafe Medication Orders in the 2017-2018 CPOE Evaluation Tool”. Presented at: **AMIA 2019 Annual Symposium**; November 2019; Washington D.C. Poster.
7. Holmgren AJ, **Co Z**, Newmark L, Danforth M, Classen D, Bates D. “Building Safer EHRs: Hospital Medication Order Safety Performance”. Presented at: **AMIA 2019 Annual Symposium**; November 2019; Washington D.C. Oral Presentation.
8. **Co Z**, Holmgren AJ, Newmark L, Seger D, Classen DC, Danforth M, Bates DW. “Variable Performance in the Computerized Physician Order Entry (CPOE) Tool: Areas for Improvement”. Presented at: **The 7th International**

**Jerusalem Conference on Health Policy**; September 2019; Jerusalem, Israel. Oral Presentation.

9. **Co Z**, Seger D, Newmark L, Classen DC, Danforth M, De Silva L, Bates DW. “Results from the 2017 CPOE Evaluation Tool: Areas for Improvement”. Presented at: **AMIA 2018 Annual Symposium**; November 2018; San Francisco, CA. Poster.