

# Medication Reconciliation & Polypharmacy Work Group

April 15, 2019



# Agenda

|  |                                 |         |
|--|---------------------------------|---------|
| Welcome and Call to Order                                      | Michael Matthews                | 2:00 PM |
| Public Comment   | Attendees                       | 2:05 PM |
| Review and Approval of March 18, 2019 Meeting Minutes          | Attendees                       | 2:10 PM |
| Update on Literature Review / Student Research Assignments     | Yi Lin & Sabrina Illham         | 2:15 PM |
| Outcomes from Medication Reconciliation Hackathon              | Tom Agresta                     | 2:35 PM |
| Update: Engagement & Safety Subcommittee                       | Nate Rickles & Anne VanHaaren   | 2:50 PM |
| Update: Medication Reconciliation & Deprescribing Subcommittee | Amy Justice                     | 3:05 PM |
| Update: Policy Subcommittee                                    | Marghie Giuliano & Sean Jeffery | 3:20 PM |
| Update: Tech & Innovation Subcommittee                         | Bruce Metz & Tom Agresta        | 3:35 PM |
| Remaining Schedule and Next Steps                              | Michael Matthews                | 3:50 PM |
| Next Steps and Adjournment                                     | Michael Matthews                | 4:00 PM |

# Public Comment

# Review & Approval of:

*March 18, 2019 Meeting Minutes*

# Medication Reconciliation Literature Review

Prepared by

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April. 15. 2019



# Outline

- Purpose
- Methodology
- Factors Affecting Medication Reconciliation
  - Site Variability
  - System Variability
  - Patient Variability
- Interventions
- Recommendations
- Next Steps/Questions

# Purpose

- To describe the factors that affect medication reconciliation process.
- To determine the impact of interventions to improve medication reconciliation process.
- To provide literature support for recommendations.

# Methodology

The following database were searched for relevant articles:

- Science Direct
- PubMed

Search terms:

- Medication reconciliation
- Accuracy of medications
- Errors in medication
- Patient verification
- Pharmacist involvement
- Initial medication non-adherence
- Different methods of medication reconciliation



# Categories of Factors Affecting Medication Reconciliation

- Site Variability: staff training, workflow, patient encounter etc.
- System Variability: systems that allow providers to electronically cancel a prescription vs those that are not capable to do so.
- Patient Variability: patient variables include age, #of prescriptions, #of initial prescriptions, #of OTC, gender, etc.

# Site Variability

- Disagreement was found between patient source and clinician source (EHR) (Kathleen EW et al. 2018).<sup>1</sup>
- Medication records in an outpatient EMR may have significant levels of data error. Data entry errors and the failure of the clinician to enter medication changes into the EHR accounted for a large % of the discrepancies across sites (Wagner and Hogan 1996).<sup>2</sup>

# System Variability

- E-prescribing systems that do not allow electronic cancellation of med orders, or e-discontinuation, and can lead to more medication reconciliation errors (Fischer and Rose 2017).<sup>3</sup>
- A large amount of prescriptions electronically canceled in EHRs were still filled at the pharmacy (Allen and Sequist 2012).<sup>4</sup>

# Patient Variability

- Errors in pre-admission medication histories are associated with older age and number of medications and lead to more discharge reconciliation errors (Salanitro et al. 2012).<sup>5</sup>
- All forms of complementary and alternative medicine (CAM) are poorly recorded, therefore, it increases the risk of potential drug-drug interactions (Cockayne, Duguid and Shenfield 2005).<sup>6</sup>
- Initial prescription nonadherence
  - inconsistent study results
    - The rate of initial medication non-adherence –defined as not obtaining a medication the first time it is prescribed- is high (Aznar-Lou, Fenandez and Girbuau 2016)<sup>7</sup>
    - 50% non-adherence are seen in long term therapy for chronic disease (Cutler et al. 2018).<sup>8</sup>

# Interventions to Improve Medication Reconciliation

## Patient Gateway (PG)

- Secure web based patient portal to facilitate communication between patients and doctors.
- Patient can log in and view their health record, medication list and allergy list, however cannot make any changes to their medication list.
- They can send message to update list of medications through gateway.
- Study by Maria et al.(2007) found that lower percentage of PG users' drug regimens were correct than non-user.

# Interventions to Improve Medication Reconciliation

## Patient Gateway (PG)

- In the Maria et. al study (2007), they mailed a paper-based survey to the patients that were pre-populated with their medication lists from EHR.
- The survey was sent to those patients who signed up for PG.
- Patients were told to review their medications and indicate any changes and mail it back.
- The survey information was entered in the medical record by the researchers.
- Another study by Jeffrey et al.(2012) reported the positive impact that PG has on medication reconciliation process.
- This study used interactive approach (in-person, phone call to update the medication list).

# Interventions to Improve Medication Reconciliation

## Patient Gateway (PG)

### Barriers

- Multiple/ Complex drug regimen
- Use of Medical Terminology “PRN”
- OTCs were mostly excluded
- EHR did not get updated irrespective of patients’ generated messages in the PG

# Interventions to Improve Medication Reconciliation

## Cancel Rx

- A Cancel Rx Request is an electronic message transaction generated by a prescriber using their EHR system to cancel a patient's existing prescription therapy or a prescribed medication that is on file in the pharmacy's system.
- The receiving pharmacy responds to this message by generating a Cancel Rx Response transaction that includes an acknowledgement message denoting whether they were successfully able to cancel the prescription, cancel remaining refills, etc.
- Study by Yang et al (2018) suggested that the use of New RX messages with cancellation instruction in the note field can cause duplicate and unnecessary therapy



# Interventions to Improve Medication Reconciliation

## Cancel Rx

### Barriers:

- Many pharmacies do not have Cancel Rx built in their EHR
- Patients existing home medication
- Caregiver's awareness of the change

# Interventions to Improve Medication Reconciliation

## Pharmacist-led Deprescribing

- Study by Martin et al. (2018) on elderly patients who were on 1 of 4 beer criteria medications.
- Educational brochure to patients for deprescribing.
- Evidence-based literature to physicians to recommend deprescribing.
- Pharmacist led intervention led to greater discontinuation of inappropriate prescriptions after 6 months.

# Intervention to Improve Medication Reconciliation

## Pharmacist-led Medication Reconciliation

- Study by Maria et al. (2013).
- One pharmacist acted as a link between the primary care and internal medicine.
- Medication reconciliation was performed both during admission (n=2473) and discharge(n=1150).
- Reconciliation was done by collecting medication lists from the patients before admission and reviewing the list of active medication prescribed to find out any unjustified discrepancies
- At discharge, reconciliation process included patients with a treatment of more than 5 drugs
- A total of 866 discrepancies were detected.

# Intervention to Improve Medication Reconciliation

## Pharmacist-led Medication Reconciliation(cont.)

- 64% of errors were incomplete prescription (ED department), 17% were medication omissions and 10.5% were errors in dosage, frequency etc.
- Pharmacist interventions focused on medication reconciliation was well accepted by physicians.
- Intervention improved the quality of clinical history documented in the system.

# Recommendations on Medication Reconciliation

- Our aim should be a “more” accurate med list (most accurate list possible).
- A standard medication reconciliation training should be provided to all healthcare personnel before employment to minimize data entry errors.
- The medication reconciliation process should include OTCs and complementary alternative medication used according to patient and/or caregiver report.
- Criteria should be established/prioritized on what constitutes an accurate list at a given moment in time. For example, list should reflect currently used doses and frequency of medications, what has been prescribed, and the consistency of use of each medication.

# Recommendations on Medication Reconciliation

- Efforts should be made with each site to advance patient and provider campaigns on the importance of ensuring accurate medication lists and keeping such lists portable to enhance patient safety across transitions of care.
- Sites should implement a robust protocol to periodically update the EHR by communicating with patients at every visit about medication changes and noting patient has verified list in the system.
- A protocol should be implemented to ensure a technician has also verified list periodically (every quarter?) with across at least two data sources- patient, EHR, pharmacy, prescription claims
- Both the prescriber and the pharmacy need to come under the same system to implement Cancel Rx.

# Recommendations on Medication Reconciliation

- Sites should consider allocating part-time or full-time staff positions such as a Medication Reconciliation Pharmacist, Technician, and/or medical assistant to oversee and integrate medication data from different sources.
- There should be a system in place to communicate medication changes to pharmacy and pharmacy communicate to patient to ensure all are aware of new changes even if not new prescription needed.

# Next Steps and Questions

- 20 papers reviewed and 10 to be reviewed from what is currently filed in Dropbox.
- Construction of tables identifying authors, key methods, key findings, and what factor(s) identified as improving or negatively impacting med reconciliation process.
- Continual drafting of recommendations for approval by OHS and committees and report to Governor's Office
- Any questions or suggestions for ways to enhance review processes?



# References

1. Walsh, K., Marsolo, K., Davis, C., Todd, T., Martineau, B., Arbaugh, C., Verly, F., Samson, C. and Margolis, P. (2018). Accuracy of the medication list in the electronic health record—implications for care, research, and improvement. *Journal of the American Medical Informatics Association*, 25(7), pp.909-912.
2. Wagner, M. and Hogan, W. (1996). The Accuracy of Medication Data in an Outpatient Electronic Medical Record. *Journal of the American Medical Informatics Association*, 3(3), pp.234-244.
3. Fischer, S. and Rose, A. (2017). Responsible e-Prescribing Needs e-Discontinuation. *JAMA*, 317(5), p.469.
4. Allen AS, Sequist TD. Pharmacy dispensing of electronically discontinued medications. *Ann Intern Med*. 2012;157:700-5. [PMID: 23165661]
5. Salanitro, A., Osborn, C., Schnipper, J., Roumie, C., Labonville, S., Johnson, D., Neal, E., Cawthon, C., Businger, A., Dalal, A. and Kripalani, S. (2012). Effect of Patient- and Medication-Related Factors on Inpatient Medication Reconciliation Errors. *Journal of General Internal Medicine*, 27(8), pp.924-932.
6. Cockayne, N., Duguid, M. and Shenfield, G. (2005). Health professionals rarely record history of complementary and alternative medicines. *British Journal of Clinical Pharmacology*, 59(2), pp.254-258.
7. Cutler, R., Fernandez-Llimos, F., Frommer, M., Benrimoj, C. and Garcia-Cardenas, V. (2018). Economic impact of medication non-adherence by disease groups: a systematic review. *BMJ Open*, 8(1), p.e016982.
8. Aznar-Lou, I., Fernández, A., Gil-Girbau, M., Fajó-Pascual, M., Moreno-Peral, P., Peñarrubia-María, M., Serrano-Blanco, A., Sánchez-Niubó, A., March-Pujol, M., Jové, A. and Rubio-Valera, M. (2017). Initial medication non-adherence: prevalence and predictive factors in a cohort of 1.6 million primary care patients. *British Journal of Clinical Pharmacology*, 83(6), pp.1328-1340.
9. Staroselsky, M., Volk, L., Tsurikova, R., Newmark, L., Lippincott, M., Litvak, I., Kittler, A., Wang, T., Wald, J. and Bates, D. (2008). An effort to improve electronic health record medication list accuracy between visits: Patients' and physicians' response. *International Journal of Medical Informatics*, 77(3), pp.153-160.
10. Yang, Y., Ward-Charlerie, S., Kashyap, N., DeMayo, R., Agresta, T. and Green, J. (2018). Analysis of medication therapy discontinuation orders in new electronic prescriptions and opportunities for implementing CancelRx. *Journal of the American Medical Informatics Association*, 25(11), pp.1516-1523.
11. Martin, P., Tamblyn, R., Benedetti, A., Ahmed, S. and Tannenbaum, C. (2018). Effect of a Pharmacist-Led Educational Intervention on Inappropriate Medication Prescriptions in Older Adults. *JAMA*, 320(18), p.1889.
12. Allende Bandrés, M., Arenere Mendoza, M., Gutiérrez Nicolás, F., Calleja Hernández, M. and Ruiz La Iglesia, F. (2013). Pharmacist-led medication reconciliation to reduce discrepancies in transitions of care in Spain. *International Journal of Clinical Pharmacy*, 35(6), pp.1083-1090.
13. Dhavle, A. (2019). [online] Available at: <https://www.linkedin.com/pulse/case-electronic-cancel-discontinuation-prescription-therapy-dhavle/> [Accessed 12 Apr. 2019].
14. Schnipper J, Gandhi T, Wald J, et al. Design and implementation of a web-based patient portal linked to an electronic health record designed to improve medication safety: the Patient Gateway medications module. *Journal of Innovation in Health Informatics*. 2008;16(2):147-155. doi:10.14236/jhi.v16i2.686.

# Medication Reconciliation Hack-A-Thon

## Key Points, Lessons Learned & Next Steps

Thomas Agresta MD, MBI  
Professor and Director Medical Informatics  
Family Medicine – University of Connecticut SOM

# Background

## WHY A MED REC Hackathon?

- Medication Errors are common and many are related to incorrect med lists
- Getting A Correct Medication List is *Complicated*
  - Technology helps and hurts
    - ePrescribing –
      - No more handwritten prescriptions
      - Introduces unintended errors, difficulty with de-prescribing
    - Health Information Exchange
      - Tools to consolidate medication lists from several sources
      - Yet interoperability between systems is limited
      - Information & Cognitive Overload
- New Interoperability guidance from CMS and Office of National Coordinator
- Connecticut has a perfect eco-system to try and introduce creative change

# The Office of Health Strategy Medication Reconciliation Hackathon Presented by UConn Health

Date: April 5th & 6th 2019

Attendees: 84

- Prescribing clinicians
- Pharmacists
- Analysts
- Informaticians
- Software engineers
- Developers & programmers
- Students in medicine,  
pharmacy & engineering
- Patient advocates



APRIL 5 & 6, 2019

# MEDICATION RECONCILIATION HACKATHON

Presented by:  
Office of Health Strategy and UConn Health



# UConn

# Who was in the audience?

- Clinicians (MD, RN, APRN)
- Pharmacists (PharmD)
- Computer Scientists (MA, PhD)
- EHR Analysts
- State Agency (OHS, OSC, DPH, Consumer Protection)
- CMIO, CIO, CEO
- Patient Advocates
- Entrepreneurs
- Investors (CT Innovations)
- Medical Students
- Pharmacy Students
- Engineering students (CSE, BME)
- MBA students (UConn)
- Industry Representatives
  - Surescripts, CVS Health
- CT HIE Entity
- Planned Parenthood
- Medical Informatics Experts
- Faculty UConn, Yale, Temple, Johns Hopkins

# Med Rec Hackathon Workgroups

Two Hackathon Attendee Tracks:

1. Clinical and Administrative

- User-Centered Design Process
- Small groups describe desired functions / layout of solutions

2. Technical- programmers were trained on the basics of Fast Health Interoperability Resources (FHIR)- a global development standard for exchanging health information to use for prototype development

- Deeper dive into how FHIR works / Examples of solutions
- Review and practice with FHIR-PITS and OpenEMR infrastructure

# Goals

- Learn about challenges / opportunities to improve medication reconciliation
- Learn about FHIR the newest Interoperability Standard for Health IT
- Develop prototype ideas for Med Rec solutions that can inform HIE efforts
  - 4 Subgroups: each included clinical & technical participants
    - Ambulatory PCP (Dr. Phil Smith)
    - Inpatient hospitalist / nurse / PharmD (Dr. Brandon Elliott)
    - Skilled Nursing Facility & Home Health Agency (Dr. Sean Jeffrey)
    - Patient / Caregiver (Dr. Riddhi Doshi)

# Outcomes

## Clinical & Admin Workgroup

- Define problem further
- Describe Some Functional Requirements
- Describe Components of User interface
- User-Centered Design

## Technical

- Interoperability Standards
- FHIR - experience
- Develop simple prototype for each Med Rec scenario
- Meet a few functional requirements
- Gain experience working multidisciplinary teams



# Key Points & Lessons Learned



# Next Steps based on Hackathon work

1. **Publish a White Paper (UConn Health)** – by mid-May shared with MRP workgroup
2. **Output of Business and Functional Requirements to be fed into Use Case for Health Information Exchange Medication Management Service (HIE Entity)**
3. **Structure the set of recommendations to help design technical infrastructure (UConn AIMS)**

## **Reminder: Presentation at AMIA**

Acceptance to present at the American Medical Informatics Association (AMIA) Clinical Informatics Conference, May 2, 2019

*Promoting medication safety through a multi-stakeholder state group in CT: Improving Deprescribing by use of the CancelRx messaging standard*

# Engagement & Safety Subcommittee

# Engagement & Safety Subcommittee



- Subcommittee met on March 28, 2019
- Nate Rickles is overseeing a student-led research project and literature review, which will inform the Subcommittee and Work Group recommendations
  - Subcommittee members provided Nate with guidance on scope of literature review and format/organization of findings/outcomes
- Subcommittee agreed to collaborate, via email, to develop a list of initial recommendations and/or hypotheses
  - Once an initial list of recommendations has been finalized, the list will be reviewed, discussed, and validated for submission to the MRP Work Group
- Next Meeting: April 25, 2019 (9am – 10am)

# Medication Reconciliation & Deprescribing Subcommittee

# Med Rec & Deprescribing Subcommittee



- Subcommittee met on February 20, 2019 and April 15, 2019
- Subcommittee is working to finalize summary documents to outline the current process, progress, barriers, and recommended next steps for the following three areas:
  - ❑ Obtaining an accurate list of filled, active, prescription medications and making this information available to patients, providers, and patient's designated care givers.
  - ❑ Cancelling prescriptions for medications and making this information available to patients, providers, and patient's designated care givers.
  - ❑ Convincing patients and providers to stop (deprescribe) medications that may be harmful due to known contraindications or due to problematic side effects, for example.
- Subcommittee will review summary documents and determine next steps for the finalization and distribution to other Subcommittees and MRP Work Group

# Policy Subcommittee

# Policy Subcommittee



- Subcommittee met on March 19, 2019
- Sean Jeffery and Marghie Giuliano volunteered to serve as co-chairs
- Subcommittee decided to a hybrid model (lead vs. follow) , in which some background research and literature review will be conducted up-front (lead), but the majority of the work will be focused on supporting other Subcommittees, as directed and requested (follow)
- Subcommittee agreed to conduct an initial research effort to gather and assess existing medication reconciliation-related policies and procedures from:
  - State agencies
  - Home health agencies
  - ACOs
  - Physician practices
  - Hospital systems
  - LTPAC
  - Professional societies
  - The Joint Commission
  - Academic hospitals
  - Educational institutions



# Technology & Innovation Subcommittee

# Technology & Innovation Subcommittee



- Subcommittee met on March 28, 2019
- Outcomes and lessons learned from Medication Reconciliation Hackathon (April 5 and 6) will be incorporated into Subcommittee's recommendations
- Subcommittee discussed the idea of developing a matrix of technology options and architectural models that exist in this space
- Subcommittee discussed the idea of developing a data dictionary and technical glossary
- Jennifer Boehne (CVS Health) has volunteered to support the development of a process diagram
- Subcommittee agreed to collaborate, via email, to develop a list of initial recommendations and/or hypotheses
  - Once an initial list of recommendations has been finalized, the list will be reviewed, discussed, and validated for submission to the MRP Work Group
- Next Meeting: April 25, 2019 (11am – 12pm)

# Remaining Schedule & Next Steps

# Remaining Schedule

## **MRP Work Group:\***

- May 15 (2pm – 4pm)
- June 17 (2pm – 4pm)
- July 15 (2pm – 4pm)

## **Engagement & Safety**

- April 25 (9am – 10am)
- May 23 (9am – 10am)

## **Medication Reconciliation & Deprescribing**

- April 15 (1pm – 2pm)
- May 15 (1pm – 2pm)

## **Technology & Innovation**

- April 25 (11am – 12pm)
- May 23 (11am – 12pm)

\*All MRP Work Group Meetings will be held at 195 Farmington Ave (Farmington, CT) – Subcommittee meetings will vary

# Next Steps

# Adjournment

# Contact Information

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