MSOS Member Briefing
November 2022

MSOS Member Briefing
November 2022

Moderated by: E. Robert Feroli, PharmD, FASHP

MSOS
MEDICATION SAFETY OFFICERS SOCIETY

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REMS Medication Infrastructure & Education

Stacy L. Carson, PharmD, BCPS, FISMP
Medication Safety Officer
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November 2022

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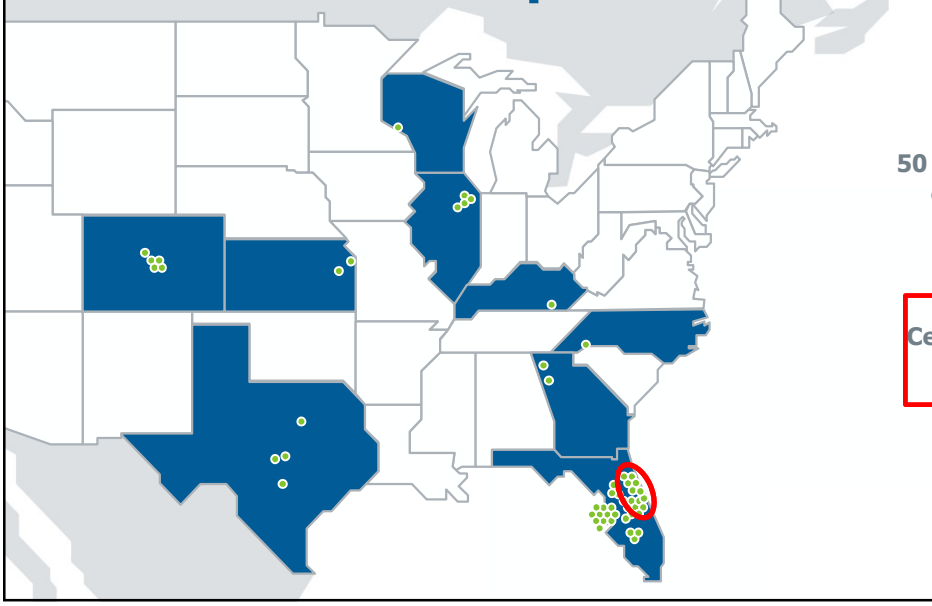

50 campuses in nine states
9,000+ licensed beds

Central Florida Division =
15 hospitals

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Historical REMS Process

- Policy and procedures to obtain and document required information for each REMS medication in patient chart
- Developed documentation solution in Cerner
  - Pop-up alert for Providers
  - PowerForm documentation for Pharmacists
  - Education task for Nurses

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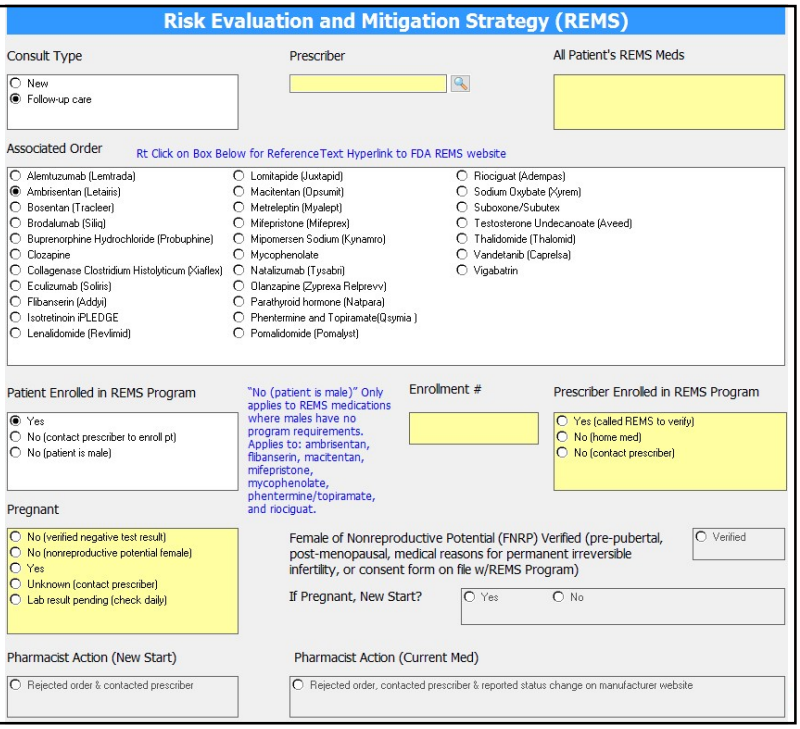
Cerner PowerForm

- Fires a task with each REMS medication order
- Pharmacists required to fill out PowerForm to document required information
- Based on drug selected, certain fields are required



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REMS Audits

- Received citations for not having documented education for all required parties after updates made to REMS program
  - Nurses, pharmacists, and providers

- **ACTION**:
  - Develop and launch REMS education to: providers, nurses, and pharmacists to get us into compliance.
  - Add education as a referenced document to REMS Policy and update twice per year

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Creation of REMS Education Document

- Contains inpatient formulary REMS medications
- Plan to update twice per year
- Education assigned to nurses, providers, pharmacists initially for full document and then education on changes twice annually thereafter
  - Nurses & Pharmacists: Online learning module with quiz
  - Providers: Official email sent out with attachments
  - Embed into new hire orientation requirement

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Snapshot of the REMS education document

Generic (Brand) Name	Dosage Form	REMS Purpose	Last Update	REMS Elements to Assure Safe Use (ETASU)	Recent Updates	Notes
ambrisentan	Tablet	Mitigate risks of embryo-fetal toxicity	6/8/21	• Prescriber to be registered for all new start patients • Dispensing pharmacy registered by authorized representative • Staff involved in dispensing complete education • Verify the female patient is under the care of a certified prescriber and that she is or will be enrolled to the REMS program prior to discharge • Confirmation of negative pregnancy test • Counsel patient on risk of embryo-fetal toxicity • Do NOT distribute, transfer loan, or sell REMS drug except to certified dispensers	Provision for prescribers to authorize > 30-day supply for females of reproductive potential due to travel or personal extenuating circumstances No recent updates, refer to Guidance Document (in Notes section) for full information Modified to align inpatient and outpatient pharmacy requirements within Prescriber and Pharmacy guide	• Formulary • Shared system REMS • Guidance document

Updates pertaining to:
Physician Nurse Pharmacist

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Transitioned to Epic EHR in 2022

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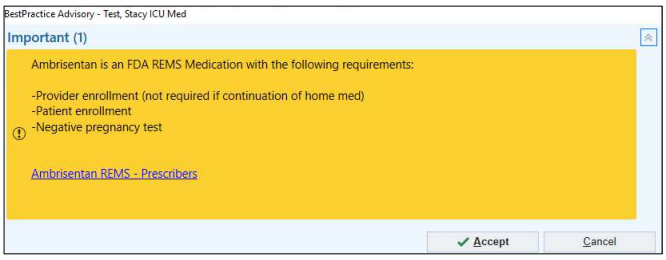
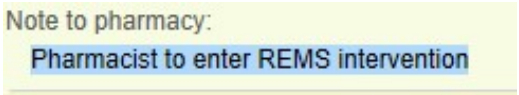
Provider Alerted When Ordering REMS Medication



Pharmacists have note during order verification of REMS medication

- Also, part of clinical monitoring dashboard



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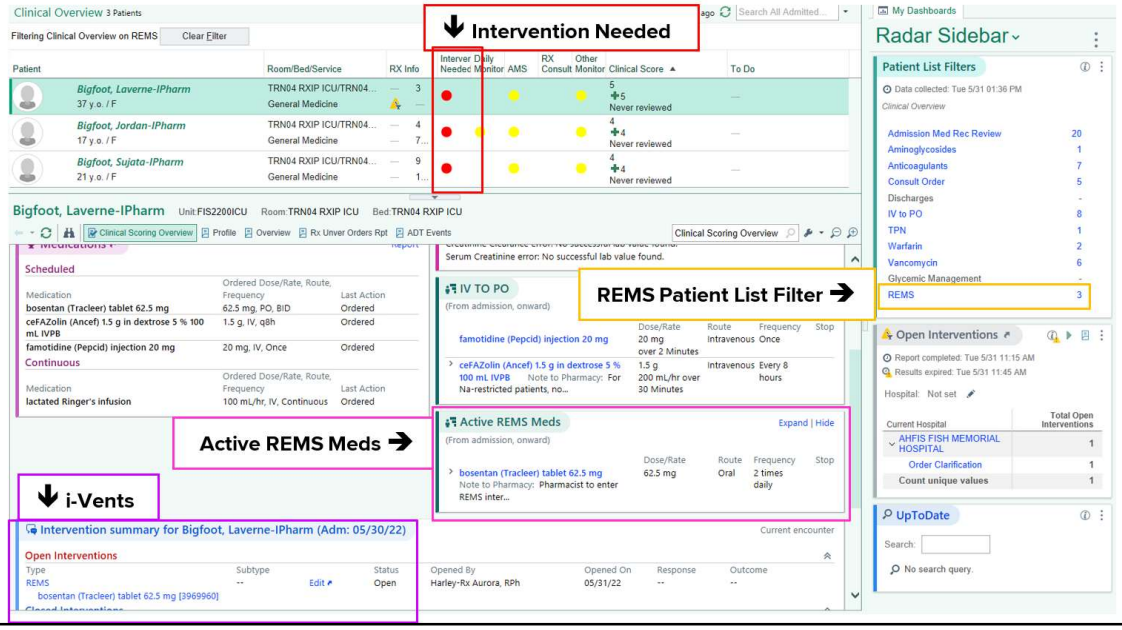
UPDATED REMS Pharmacist workflow in Epic



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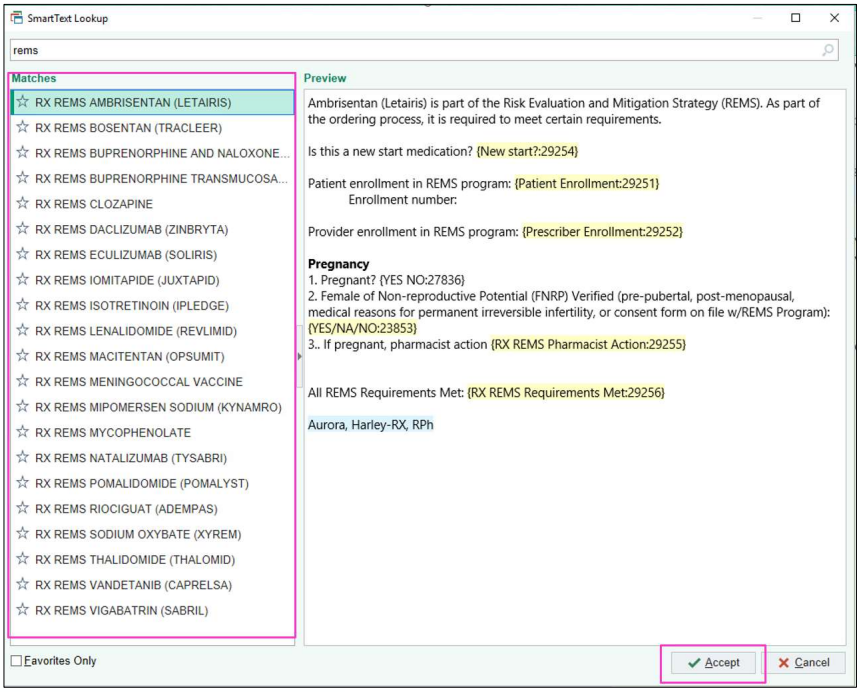
iVent Smart Text Templates for Pharmacist Documentation



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Documented Nurse Education Task (for specific meds)

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Next Steps

- Resident assigned medication use evaluation on Epic REMS pharmacist documentation for this year
- Roll out to the whole company as Epic is implemented (SOP, education document, and Epic workflow)
- Determine workflow for non-formulary REMS medications, especially for outpatient infusion centers

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Thank you!
Questions?

Stacy L. Carson, PharmD, BCPS, FISMP
Medication Safety Officer
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Flatlining QT alerts: Tackling the highest firing drug-drug interaction to decrease alert fatigue

Gina Gayed, PharmD, BCPS, CPPS
Medication Safety Officer
Grady Health System – Atlanta, GA

Lucy Von Korff, PharmD
Pharmacy Informatics Specialist
Epic Willow Analyst, Clinical Decision Support IT Lead
Wellstar Health System – Marietta, GA

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When the Stars Align…

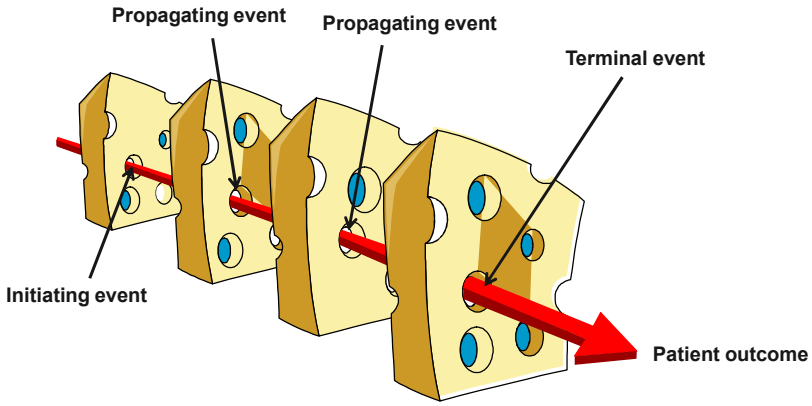

Figure provided courtesy of E. Robert Feroli, PharmD, FASHP, retired Medication Safety Officer, The Johns Hopkins Hospital; MPSC Board of Directors; Faculty Medication Safety, Armstrong Institute for Patient Safety and Quality

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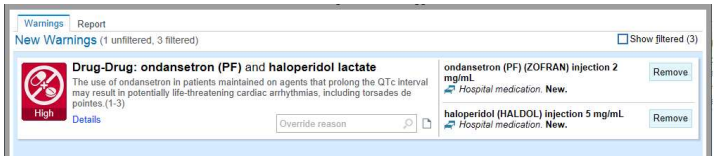
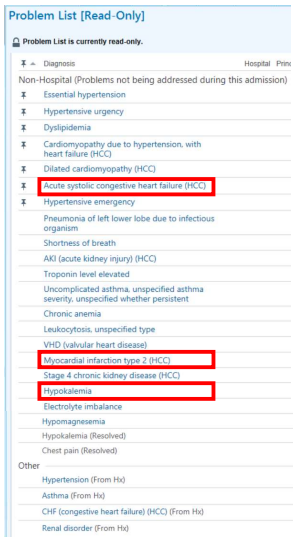


How does this medication warning tie back to the patient?

	2/20/2021 2016	2/20/2021 2322	5/26/2021 1429	7/15/2021 1833	7/30/2021 1933
EKG					
Atrial Rate	104 *	84 *	92 *	89 *	101 *
P Axis	80 *	74 *	-11 *	67 *	75 *
PR Interval	158 *	144 *	172 *	172 *	142 *
QRS Duration	112 *	114 *	120 *	116 *	112 *
QT Interval	404 *	482 *	464 *	448 *	418 *
QTC Calculation	531 *	569 *	573 *	545 *	542 *
R Axis	58 *	11 *	43 *	23 *	30 *
T Wave Axis	210 *	197 *	202 *	199 *	-79 *
VENT RATE	104 *	84 *	92 *	89 *	101 *
EKG, 12-LEAD					

	7/13/2021 1011	7/15/2021 1929	7/16/2021 0045	7/16/2021 0616	7/30/2021 2025
CHEM PROFILE					
SODIUM,S	139 *	139		137	134
Potassium	2.6 *	2.8	2.7 *	2.5 *	2.4 *



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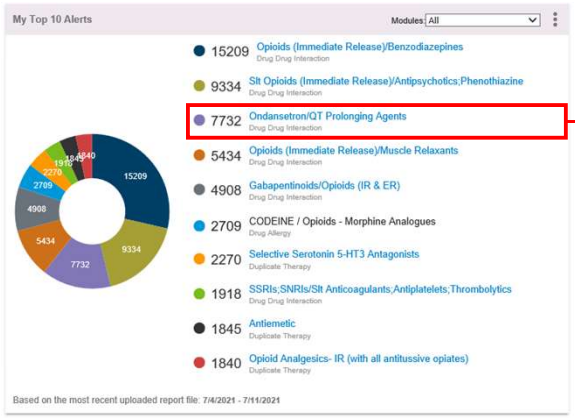
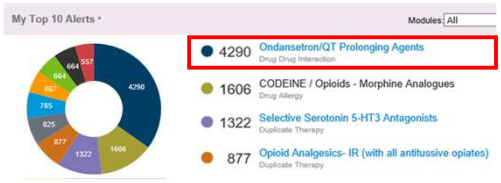
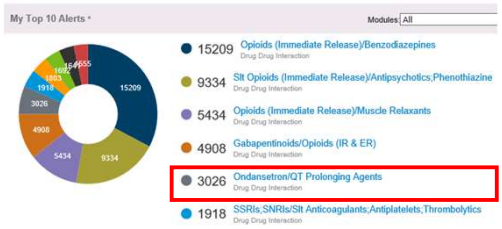
Medication Warnings Overview



Providers: Severe and contraindicated DDIs



Pharmacists: Moderate, severe and contraindicated DDIs



Data from July 4, 2021 – July 11, 2021
Imported from third-party vendor, First Databank (FDB)
Types: Drug-Drug, Duplicate Therapy, Drug-Disease, Dosage Range Check, Geriatric Precautions, Lactation Precautions, Pregnancy Precautions, Pediatric Precautions

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Alert Fatigue is Real!

Case A. False alarms & alert fatigue: The hidden cost of bad design on the healthcare system. Available at caseorganic.medium.com/false-alarms-alert-fatigue-the-tragic-design-of-hospital-alerts-8c78dc8bb512. Published Oct 31, 2018. Accessed Sep 14, 2022.
Andrews C. End alarm fatigue with CA application performance management. Available at https://www.broadcom.com/sw-tech-blogs/aiops-blog/end-alarm-fatig. Published Dec 5, 2017. Accessed Sep 14, 2022.

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QTc Prolongation Drug-Drug Interaction Warnings

Previous State

- **Ondansetron QTc prolongation is the top firing drug-drug interaction alert to providers, yet of low clinical relevance**
  - Override reason requirement depends on severity category of alerts
- **Does not take any patient-specific risk factors into account**

Proposed State

- **Goal:** Increase clinical relevance of QTc prolongation alerts, driving the user to take appropriate action based on relevant patient-specific data points
- **"Rights" of decision support:**
  - Right information
  - Right person
  - Right time in the workflow
  - Right action/intervention (alert, order set, etc.)
  - Right context/channel

Osheroff, Teich, Levick et al., 2012. Improving outcomes with CDS: an implementer's guide, Second Edition.

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Building a Better Mouse Trap

Development and Validation of a Risk Score to Predict QT Interval Prolongation in Hospitalized Patients

James E. Tisdale, PharmD[*,†], Heather A. Jaynes, MSN[*], Joanna R. Kingery, PharmD[‡], Noha A. Mourad, MS[*], Tate N. Trujillo, PharmD[‡], Brian R. Overholser, PharmD[*,†], and Richard J. Kovacs, MD[*,§]

[*]Department of Pharmacy Practice, College of Pharmacy, Purdue University

[†]Department of Medicine, School of Medicine, Indiana University

[‡]Department of Pharmacy, Indiana University Health Methodist Hospital

[§]Krannert Institute of Cardiology, Indianapolis, IN

Effectiveness of a Clinical Decision Support System for Reducing the Risk of QT Interval Prolongation in Hospitalized Patients

James E. Tisdale, PharmD, Heather A. Jaynes, MSN, Joanna R. Kingery, PharmD, Brian R. Overholser, PharmD, Noha A. Mourad, MS, Tate N. Trujillo, PharmD, and Richard J. Kovacs, MD

Department of Pharmacy Practice, College of Pharmacy, Purdue University, Indianapolis, IN (J.E.T., H.A.J., B.R.O., N.A.M.); Department of Medicine, School of Medicine, Indiana University, Indianapolis (J.E.T., B.R.O., R.J.K.); Department of Pharmacy, Indiana University Health Methodist Hospital, Indianapolis (J.R.K., T.N.T.)

Effect of Replacing Vendor QTc Alerts with a Custom QTc Risk Alert in Inpatients

Steven Stettner[1] Sarah Adie[2] Sarah Hanigan[2] Michael Thomas[3] Kristen Pogue[2] Christopher Zimmerman[4]

[1] Department of Pharmacy, New York-Presbyterian/Weill Cornell Medical Center, New York, New York, United States
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Address for correspondence Christopher Zimmerman, PharmD, Health Information and Technology Services, Michigan Medicine, Suite 500; 510-05, 777 E. Eisenhower Parkway, Ann Arbor, MI 48108-3273, United States (e-mail: chriszim@med.umich.edu).

Appl Clin Inform 2022;13:19–29.

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Risk Score

Risk Factor	Number of Points
Age ≥ 68 years	1
Female gender	1
Loop diuretic	1
Serum potassium ≤ 3.5 mEq/L	2
Admission QTc ≥ 450 ms	2
Acute myocardial infarction	2
Sepsis	3
Heart failure	3
At least one QT prolonging medication	3
Two or more QT prolonging medications	3
Maximum Risk Score	**21**

Risk Category	Number of Points
Low risk	< 7
Moderate risk	7–10
High risk	≥ 11

Tisdale JE. *Circ Cardiovasc Qual Outcomes*. 2013;6(4):479-87.

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Risk Score Alert

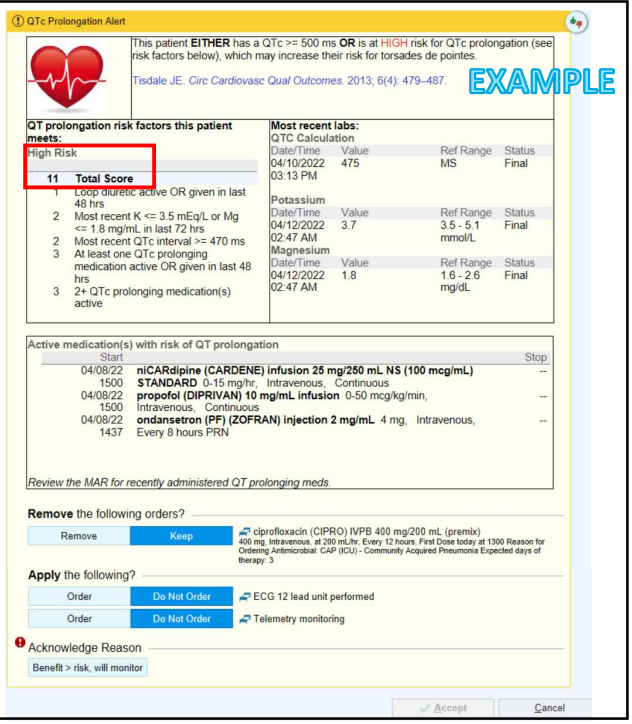
The alert fires on patients

EITHER

- With a most recent QTc result ≥ 500 ms

OR

- With a QT prolongation risk score of 11 points or greater



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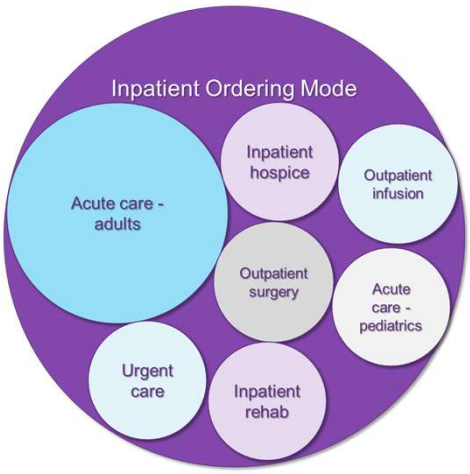
One Size Does NOT Fit All!

- Depending on the patient's age and care setting, an alert fires upon ordering and/or verifying QT prolonging medication(s):
  1. **Risk score alerts:** Adult patients in hospital or outpatient infusion
  2. **Non-risk score alerts:**
     a) Adult patients in other care settings
     b) Pediatric patients



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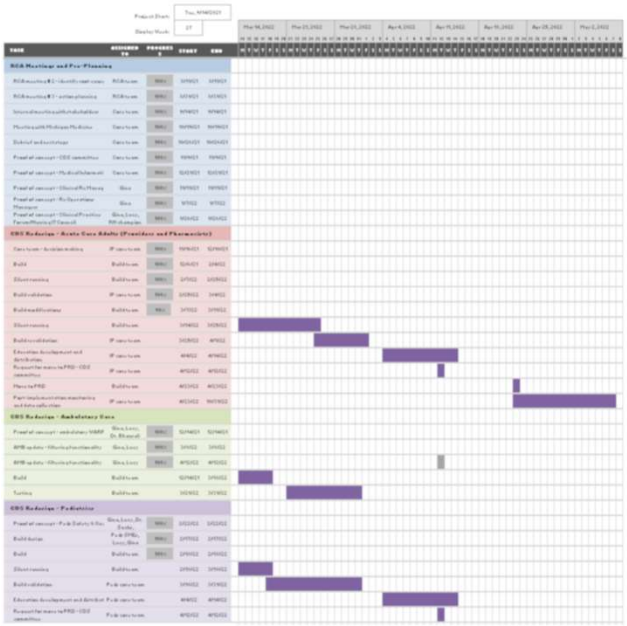
Strategy

- Assess impact
- Define scope
- Form a multidisciplinary team
- Set milestones
- Communicate progress
- Socialize change



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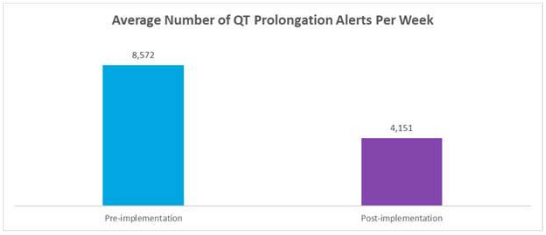
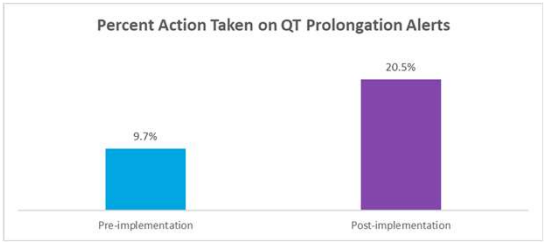
Preliminary Results





Override Reason	Percent Overrides
Benefit outweighs risk	83.1%
Patient being monitored	9.4%
Previous use tolerated	3.0%
Notified provider, ordered to continue	2.8%
Previously addressed	1.8%

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Pearls

- Get as close as possible to the workflow with leadership support
- Maximize internal and external collaborations
- Keep detailed and accurate notes on all decisions
- Roll with the curveballs, but be mindful of scope and timeline
- Prepare for the worst
- Develop plans for post-implementation monitoring and sustainable maintenance
- It takes a village!

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Future Directions

- Review firings for potential optimization opportunities:
  - Top offending medications?
  - Default checked medications in order sets?
  - Lookback times on comorbidities?
  - Other?
- Add most recent QTc result to order composer
- Explore the utility of a MAR infographic for ongoing monitoring
- Evaluate impact on patients' clinical outcomes

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Acknowledgements

- Chris Zimmerman, PharmD – Michigan Medicine
- Elena Levenfeld, MSChE, RT(T)
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- Jody Hughes, MD, FCCP
- John Kueven, FACHE, MBA, MSHA, RN
- Bruce Gould, MD
- Maria Paradisis, MD
- Brendon Banes, PharmD, BCPS, BCCP
- Kris Bedenbaugh, PharmD
- Jenna Sherrer, PharmD
- Ashley Hall, PharmD
- Elizabeth McCormick, PharmD, BCPPS
- Nirali Naik, PharmD, BCPS
- Shirmil White, PharmD, BCPS
- Mnesha Patel, PharmD, MBA
- Timothy Coyle, PharmD
- Leslie Busby, BSN, RN
- Pooja Mistry, RN

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Appendix

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EXAMPLE

Infographic on MAR

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Flatlining QT alerts: Tackling the highest firing drug-drug interaction to decrease alert fatigue
Gina Gayed, PharmD, BCPS, CPPS
Medication Safety Officer
Grady Health System – Atlanta, GA
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Pharmacy Informatics Specialist
Epic Willow Analyst, Clinical Decision Support IT Lead
Wellstar Health System – Marietta, GA
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Inpatient Pharmacist
Discharge Order Verification
Sabra Douthit, PharmD
Internal Medicine Pharmacy Coordinator
Geisinger Medical Center
Danville, PA
Geisinger

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Geisinger

- Geisinger Medical Center
  - 550 bed hospital in Danville, PA
  - Includes Janet Weis Children's Hospital
- Geisinger Shamokin Community Hospital
  - 30 bed hospital in Shamokin, PA

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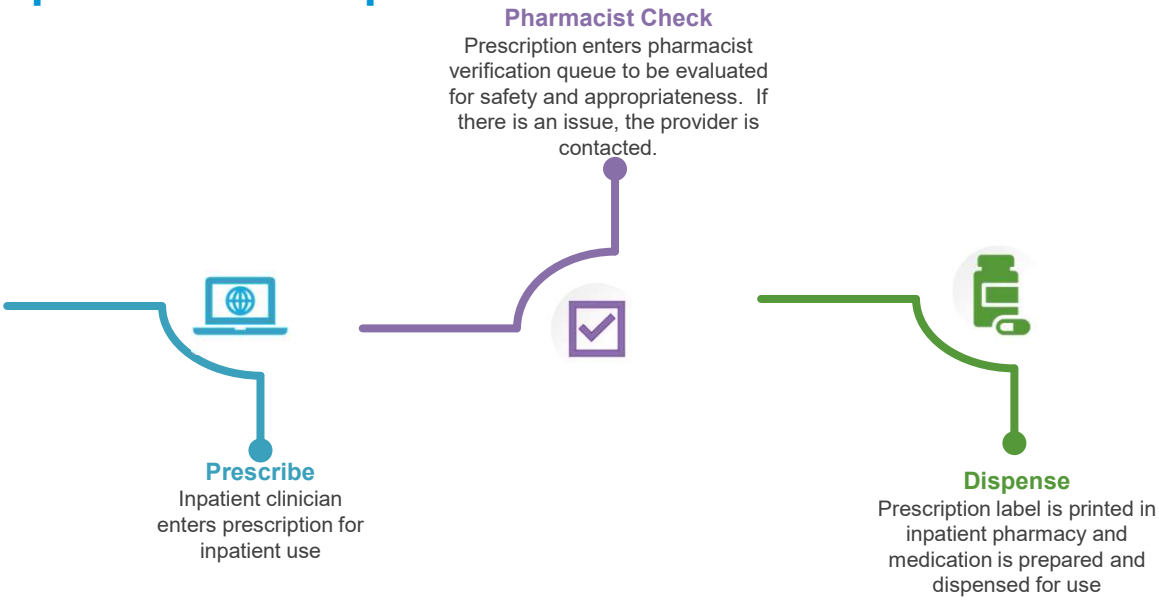
Inpatient Prescriptions



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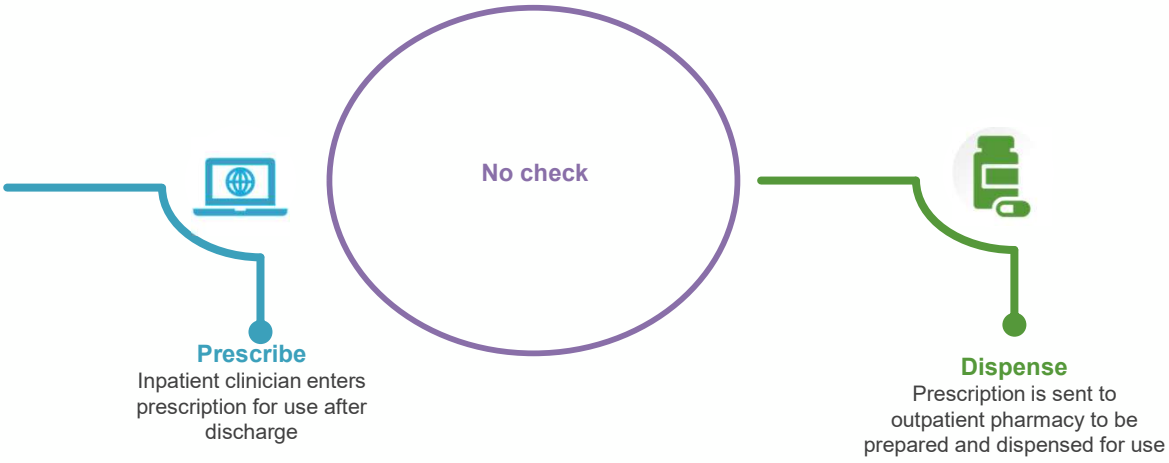
Discharge Prescriptions



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Problem

- Receiving reports of inappropriate discharge prescriptions
  - Insufficient quantities (ex. not enough tablets for prednisone tapers)
  - Incorrect packaging (ex. enoxaparin vials vs syringes)
  - Inappropriate tablet strengths (ex. risperidone 4mg tablets sig: Take 3mg (0.75 tablet) by mouth daily)
  - Unnecessarily replacing home medications with hospital formulary products (ex. on Advair (fluticasone/salmeterol) at home, interchanged with Breo Ellipta (fluticasone/vilanterol) during admission, then prescribed Breo Ellipta at discharge)
  - Pediatric dosing errors (ex. sildenafil suspension 50mg by mouth TID for patient who had been receiving 4.2mg during admission. Provider had meant to order 5mg by mouth TID)
- Pharmacists at outpatient pharmacies unable to quickly contact provider to resolve issue

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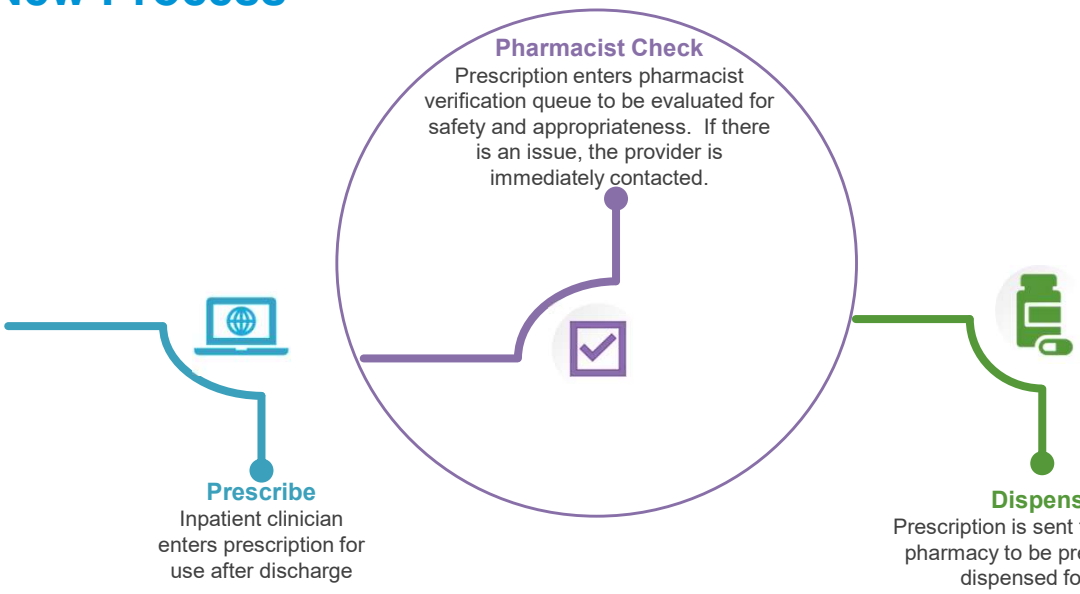
New Process



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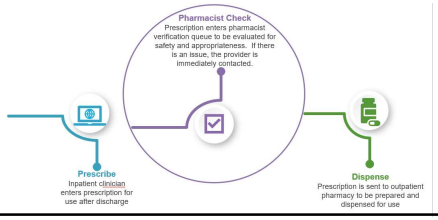
New Process

- Phased in on different units throughout 2021
- Included: Adult and pediatric inpatient units
- Excluded: Emergency department and same day surgery units

- Clinicians' discharge prescriptions flow into the same pharmacist verification queue as inpatient prescriptions
- Discharge prescriptions will not e-prescribe or print until pharmacist verification
- Inpatient pharmacist will review new prescriptions and entire discharge medication list
- Pharmacist can text clinician about inappropriate prescriptions and have either the clinician re-write the prescription or take a verbal to re-write it themselves
- Pharmacist places an I-Vent in EPIC to indicate they reviewed the discharge medication list and whether they had to make any changes



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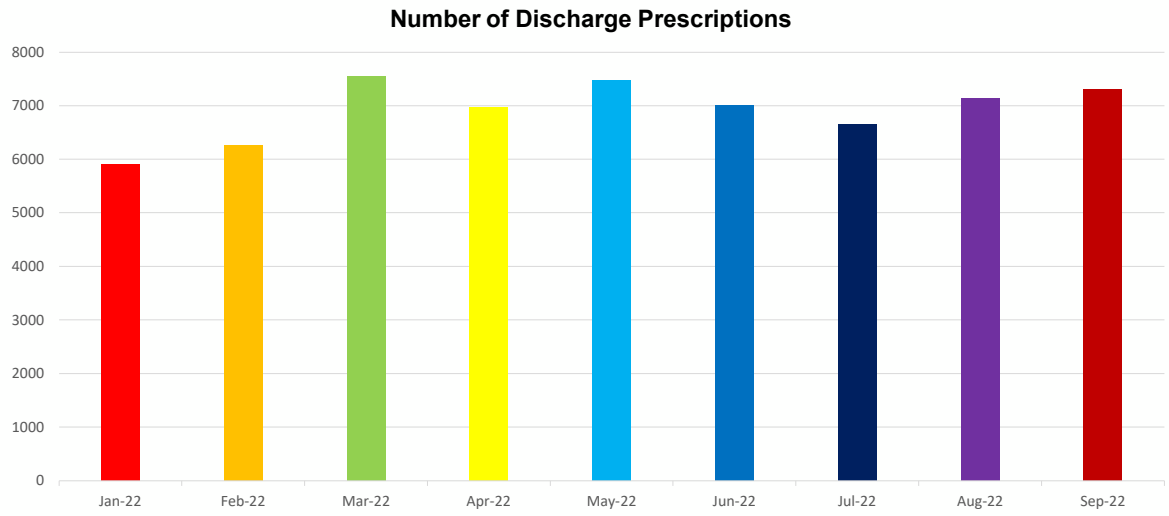
Data



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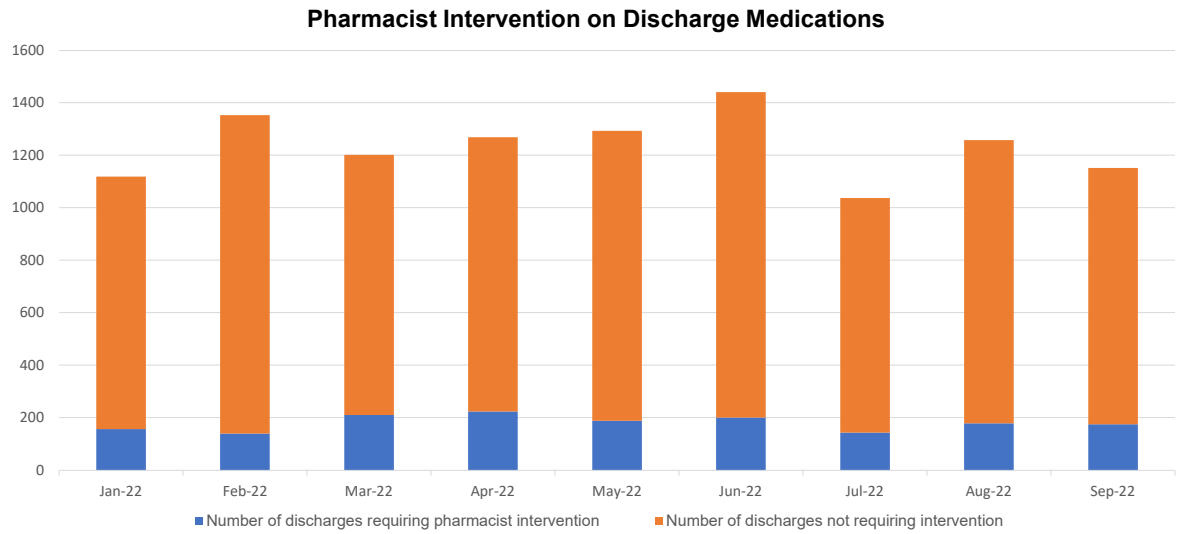
Data



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Challenges

- No hard stop on printing after visit summaries if the pharmacist hasn't yet verified the prescriptions
  - May lead to incorrect information on medication list
- Team must wait for pharmacy verification to get prescriptions printed
  - May hold up discharge
- Significant number of prescriptions added to pharmacist's workload

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Great Catches

- Clinician ordered 5 day supply of morphine sulfate extended release (MS Contin) 15mg tablets "take 1 tablet every 8 hours as needed for pain"
  - Pharmacist reached out to confirm formulation and confirmed clinician really meant to order morphine sulfate immediate release tablets
- Clinician ordered sacubitril/valsartan (Entresto) 49-51mg tablets, but left lisinopril on medication list
  - Pharmacist reached out due to duplicate medication therapy and provider discontinued lisinopril prescription
- Clinician ordered cefepime and tobramycin for pediatric patient and had e-prescription destination set for the hospital outpatient pharmacy
  - Pharmacist knew outpatient pharmacy does not dispense IV antibiotics and re-routed prescription to appropriate home infusion pharmacy

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Questions?

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ISMP
Institute for Safe Medication Practices
An ECRI Affiliate

ISMP Update
MSOS Briefing November 2022

Rita K. Jew, Pharm.D., MBA, BCPPS, FASHP
President, Institute for Safe Medication Practices

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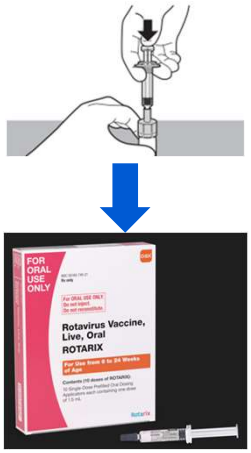
Two Components Vaccines to Single Component



Rotavirus Vaccine

Meningococcal Vaccine

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SAFETY briefs

Using VIGIV for monkeypox? The concentration is not as it may seem. A prescriber ordered Vaccinia Immune Globulin Intravenous (Human) (VIGIV) (NDC 60492-0173-1) 6,000 units/kg for a hospitalized 3.49 kg neonate (total dose of 20,940 units) with monkeypox-like symptoms. A single-dose vial arrived from the national stockpile in an unlabeled carton without a package insert. The immediate vial label displayed, "greater than or equal to 50,000 units per vial," without listing a corresponding volume or concentration (**Figure 1**). When trying to determine how to prepare this product, a pharmacist found the package insert on DailyMed (www.ismp.org/ext/997), which states that VIGIV is provided in a 20 mL single-dose vial containing antibodies to vaccinia virus at greater than or equal to 50,000 units per vial. The package insert states to remove the entire contents of the vial to obtain the labeled dosage of VIGIV. Practitioners might assume the vial contains a total

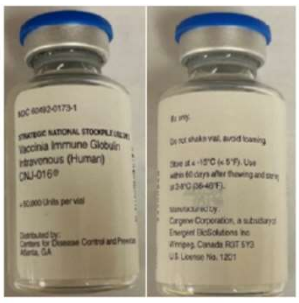

Figure 1. The Vaccinia Immune Globulin Intravenous (Human) CNJ-016 vial label displays greater than or equal to 50,000 units per vial, without a corresponding volume or concentration.

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Reminders

- It's the season – Safety plan to prevent mix up between COVID-19 and influenza vaccines
- Tall man letters survey – deadline December 2, 2022

ISMP survey on tall man (mixed case) lettering to reduce drug name confusion (alchemer.com)

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Specialty Pharmacy Medication Safety Membership

- Basic
  - **Specialty Pharmacy Resource page**
    - Toolkits on website
- Plus
  - **Include all offerings in Basic Membership**
  - **Additional resources**
    - ISMP Community/Specialty Pharmacy Newsletter
    - Bi-monthly Specialty Pharmacy user group meeting
  - **Proactive Risk Assessment Tool**
- Premium
  - **Include all offerings in Advanced Membership**
  - **Risk assessment of new specialty medications as they become available on market**

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Highlights of the refreshed certificate

1. **41 CE Hours**
   For pharmacists, physicians, nurses, and pharmacy technicians

2. **Recertification credit for CPPS**
   Credits earned can be applied toward maintenance of the Certified Professional in Patient Safety credential

3. **100% online, self guided program**
   Pass a comprehensive exam to earn an ASHP Professional Certificate

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For ISMP Members/MSOS Learners

1. Use code **MSC22MSOS** during checkout on the ASHP Store.
2. MSC22MSOS allows ISMP/MSOS learners to purchase the Medication Safety Certificate at the **ASHP member price of $445** ($545 Non-member)
3. The discount code will be active though December 31, 2022.

DISCOUNT CODE:

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[Transitioning to Ready-to-Administer IV Medications: Can it be Both Safe and Affordable? | Institute For Safe Medication Practices (ismp.org)]

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[Optimizing Sterile Compounding Best Practices: Leveraging Technologies and Removing Barriers to Improve Safety | Institute For Safe Medication Practices (ismp.org)]

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MSOS Member Briefing
November 2022

December 1, 2

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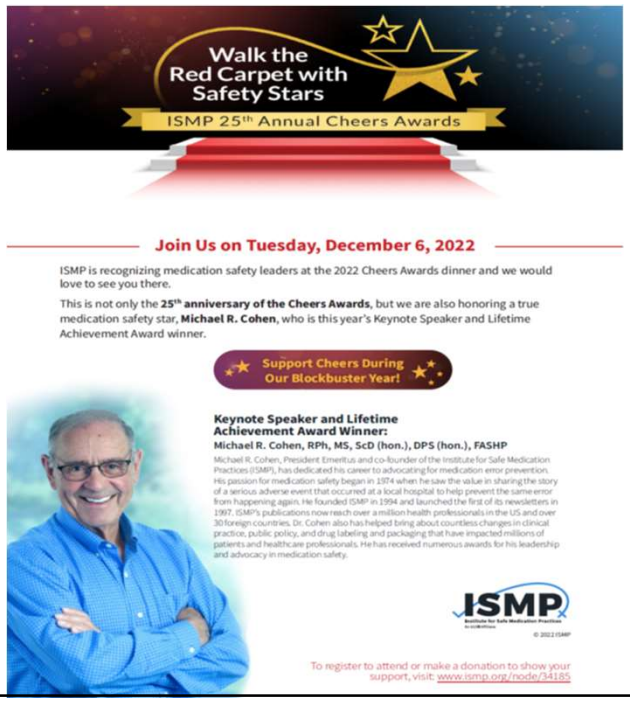

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Questions?

- A copy of today's slides will be posted on our website
- Next MSOS Briefing date – January 26, 2022.

https://ecri.zoom.us/webinar/register/WN_Loxe9LQVSXqXesV-X9yfGA

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