



High Alert Medications: Reducing Patient Harm

Building a Bridge to Better Health Coalition

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Tennessee Pharmacist Coalition Vision

Reduce harm and preventable adverse drug events through directed inquiry into current pharmacy practices, identify medication safety-gaps, and make recommendations for best practice across Tennessee.



Tennessee Pharmacist Coalition Goals

- Inspire pharmacist's engagement as quality improvement partners
- Align partners and agencies efforts on medication safety
- **Identify performance measures in key topic areas**
- Collaborate to spread innovations and best practice recommendations
- Provide educational opportunities and resources for pharmacists and schools of pharmacy in regards to medication safety initiatives within Tennessee



Tennessee Pharmacists Coalition

The Tennessee Pharmacists Coalition is currently comprised of 66 pharmacists representing 49 different facilities/healthcare systems, 5 schools of pharmacy, the Tennessee Pharmacists Association, and the Tennessee Department of Health



TPC Current Initiatives

Areas of Primary Focus

- Medication Safety
- Anticoagulants
- Glycemic Management
- Opioids
- Antibiotic Stewardship
- Medication Reconciliation



Medication Safety

THA Board of Directors Endorsed Recommendations

- All hospitals should have a multidisciplinary medication safety team in place
- All hospitals should report on the non-mandatory ADE measures identified by the Tennessee Pharmacists Coalition and reported through the Tennessee Center for Patient Safety at the Tennessee Hospital Association



THA Board of Directors Endorsed Antibiotic Stewardship Recommendations

- Hospital demonstration of commitment to antibiotic stewardship via a written statement of support and consideration of dedicated pharmacy, clinician, and IT staff time for antibiotic stewardship activities
- All hospitals commit to reporting to the National Healthcare Safety Network antimicrobial use and resistance modules within specified timeframes
- All hospitals commit to a policy requiring documentation of indications for antibiotic therapy



THA Board of Directors Endorsed Antibiotic Stewardship Recommendations

- All hospitals commit to implementing a policy requiring an “antibiotic review” after 48-72 hours to allow for appropriate review of clinical indication of need, response and any therapeutic revisions that might be appropriate
- Participation by hospitals in an antibiotic stewardship collaborative to encourage best practice/lessons learned sharing, and development of appropriate educational programming, as well as any other steps or activities that would assist with antibiotic stewardship



Recognition

- July 2014 ASHP Journal article
- CMS/Partnership for Patients National webinars
- Medication Safety Affinity Group webinars
- CMS Community of Practice website and electronic newsletters
- Endorsed by THA Board of Directors



What has the Tennessee Pharmacists Coalition Accomplished to Date?

- Growing Membership
- ACPE Continuing Education Webinars
- Face-Face Meetings
- Tool Kits
- Resource Development
- Gap Analysis (anticoagulants/glycemic management, and opioids)
- Case Studies
- Annual Medication Safety Summit
- Collaboration



Why are doing this work?



Tennessee Center For Patient Safety

THA Board Strategic Aim:

***Zero
Preventable
Harm***





“Medications are the most common intervention in health care and are also most commonly associated with adverse events in hospitalized patients.”



Leape, et al, The nature of adverse events in hospitalized patients, Results of the Harvard Medical Practice Study II. *New England Journal of Medicine*, 323, 377 – 384.



An **Adverse Drug Event, or ADE, is defined by the Institute of Medicine (IOM) as “*an injury resulting from medical intervention related to a drug, which can be attributable to preventable and non-preventable causes.*”**

Mark SM, Little JD, Geller S, Weber RJ (2011), Chapter 5 - Principles and Practices of Medication Safety; DiPiro JT, Talbert RL, et al (Eds); *Pharmacotherapy: A Pathophysiologic Approach*, 8Ed. <http://www.accesspharmacy.com/content.aspx?aID=7966229>.



ADEs – Opportunity for Impact

INSIDE the
hospital

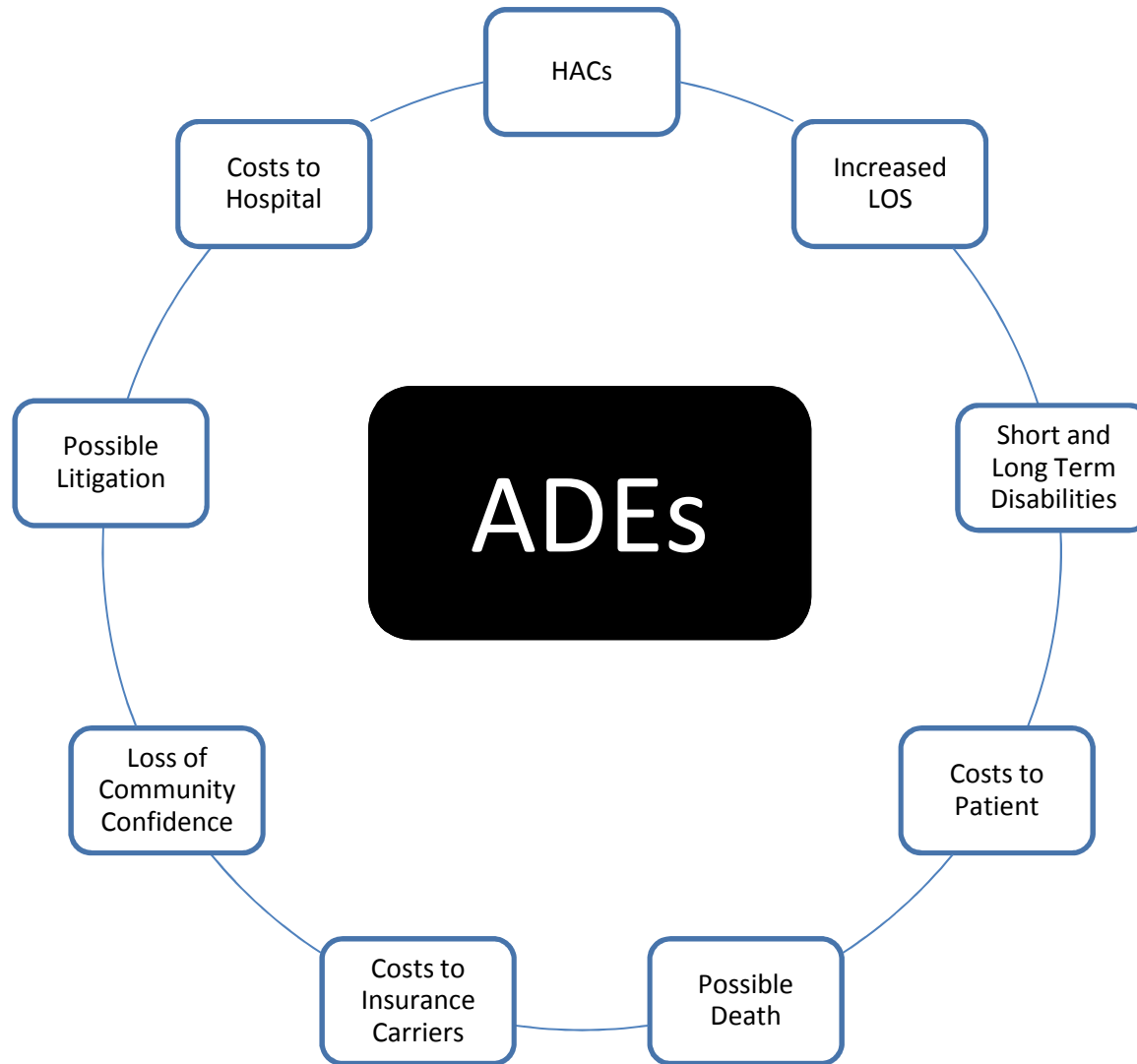
Most common causes of inpatient complications → prolong length-of-stay and increase costs

Affect ~1.9 million hospital stays annually

Add 1.7 to 4.6 hospital days

Cost \$4.2 billion USD annually

Impact of ADEs





High-Alert Medications

- Winterstein et al.
 - Review of 317 preventable ADEs...following top three classes accounted for 50% of all ADE reports
 - 1) Anticoagulants associated with hemorrhagic events
 - 2) Opiates associated with somnolence and respiratory depression
 - 3) Insulin hypoglycemic events

Identifying clinically significant preventable adverse drug events through a hospital's data Base of adverse drug reactions reports. (2002)



High-Alert Medications

- IHI's 100,000 and 5 Million Lives Campaign(s) defined High-Alert Medications:
 - *“Medications that are most likely to cause significant harm to the patient, even when used as intended.”*
 - ISMP states “bear heightened risk of causing significant harm when used in error”
 - High-alert medications can also be linked to other care processes and interventions



Data Draws National Attention

The NEW ENGLAND JOURNAL of MEDICINE

SPECIAL ARTICLE

Emergency Hospitalizations for Adverse Drug Events in Older Americans

Daniel S. Budnitz, M.D., M.P.H., Maribeth C. Lovegrove, M.P.H., Nadine Shehab, Pharm.D., M.P.H., and Chesley L. Richards, M.D., M.P.H.

ABSTRACT

BACKGROUND

Adverse drug events are important preventable causes of hospitalization in older adults. However, nationally representative data on adverse drug events that result in hospitalization in this population have been limited.

METHODS

We used adverse-event data from the National Electronic Injury Surveillance System–Cooperative Adverse Drug Event Surveillance project (2007 through 2009) to estimate the frequency and rates of hospitalization after emergency department visits for adverse drug events in older adults and to assess the contribution of specific medications, including those identified as high-risk or potentially inappropriate by national quality measures.

RESULTS

On the basis of 5077 cases identified in our sample, there were an estimated 99,628 emergency hospitalizations (95% confidence interval [CI], 55,531 to 143,724) for adverse drug events in U.S. adults 65 years of age or older each year from 2007 through 2009. Nearly half of these hospitalizations were among adults 80 years of age or older (48.1%; 95% CI, 44.6 to 51.6). Nearly two thirds of hospitalizations were due to unintentional overdoses (65.7%; 95% CI, 60.1 to 71.3). Four medications or medication classes were implicated alone or in combination in 67.0% (95% CI, 60.0 to 74.1) of hospitalizations: warfarin (33.3%), insulins (13.9%), oral antiplatelet agents (13.3%), and oral hypoglycemic agents (10.7%). High-risk medications were implicated in only 1.2% (95% CI, 0.7 to 1.7) of hospitalizations.

CONCLUSIONS

Most emergency hospitalizations for recognized adverse drug events in older adults resulted from a few commonly used medications, and relatively few resulted from medications typically designated as high-risk or inappropriate. Improved management of antithrombotic and antidiabetic drugs has the potential to reduce hospitalizations for adverse drug events in older adults.

ADEs responsible for ~100,000 emergent hospitalizations in older Americans, annually

~ Two-thirds from just four medication classes

Anticoagulants

Insulin

Oral hypoglycemics

Antiplatelets

~ Two-thirds from unintentional overdoses or supratherapeutic effects



Tale of Three Patients





Patient # 1

- GW is a 68 year old male admitted at 08:00 for an elective Right Total Hip Arthroplasty. A fentanyl patch is placed on GW in pre-op/holding per Dr. Smith's standing orthopedic pre-op orders

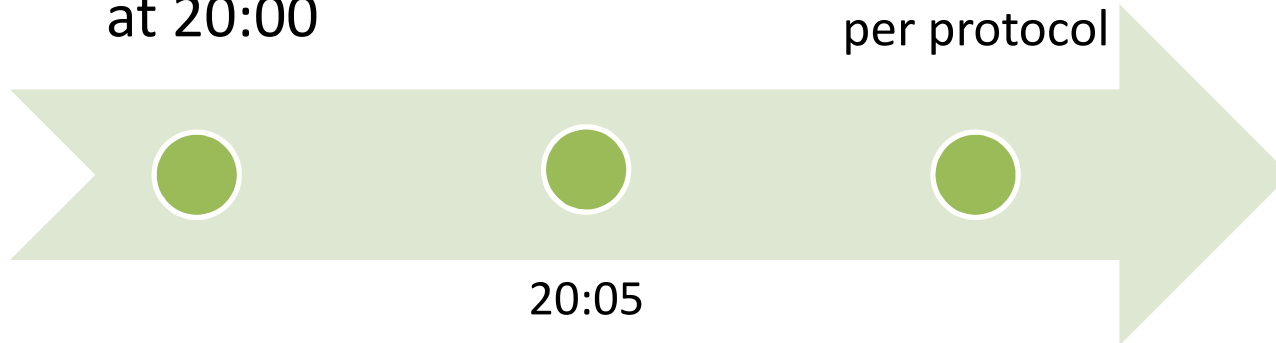




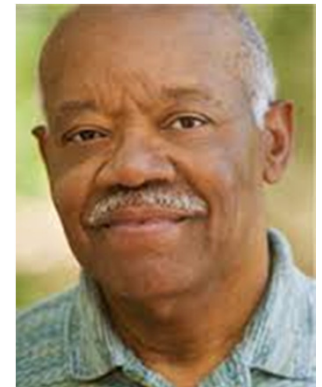
Patient #1 Suffers an Adverse Event

12 hours
Post-
Operative
at 20:00

20:08
Naloxone
0.4mg
administered
per protocol



20:05
Patient found
over-sedated-
Rapid
Response
called





Cause and Effect

- What was the route cause of the patient adverse event?
 - Inappropriate opioid selection pre-operatively
- Potential harm?
 - Over-sedation
 - Respiratory depression
 - Lethargy/confusion
 - **Patient Fall**



FentaNYL Patch Safety

- Indication: “persistent, moderate to severe chronic pain” **in opioid-tolerant patients**
- 75 TO 100 times more potent than morphine
- Initial application-12-18 hours to reach peak level of pain relief

KEY: Not recommended for the management of preoperative/postoperative pain

Institute of Safe Medication Practices Canada (ISMP Canada). *Medication incidents related to the use of fentanyl transdermal systems: An international aggregate analysis. October 2009*



Adverse Drug Events with Opioids

- Common Causes:
 - Inadequate patient assessment
 - Inaccurate pain assessment
 - Improper pain management
 - Inadequate patient monitoring
- Joint Commission's Sentinel Event database (2004-2011)
 - 47% Wrong dose medication errors
 - 29% improper monitoring
 - 11% related to other factors



Pain Management

- Could the emphasis on pain control (“pain as the fifth vital sign”) contribute to an overly aggressive prescribing of higher doses?
- HCAHPS and Press Ganey scores
- Promises- “you will be pain free”



Opioid tolerant definition

- An opioid tolerant patient is defined as a patient who has been receiving either morphine 60mg, oxycodone 30mg or hydromorphone 8mg, daily for one week or longer

Katz N, Rauck R, Ahdieh H, et al. A 12-week, randomized, placebo-controlled trial assessing the safety and efficacy of oxymorphone extended-release for opioid-naïve patients with chronic low back pain. *Curr Med Res Opin.* 2007;23(1):117-128.

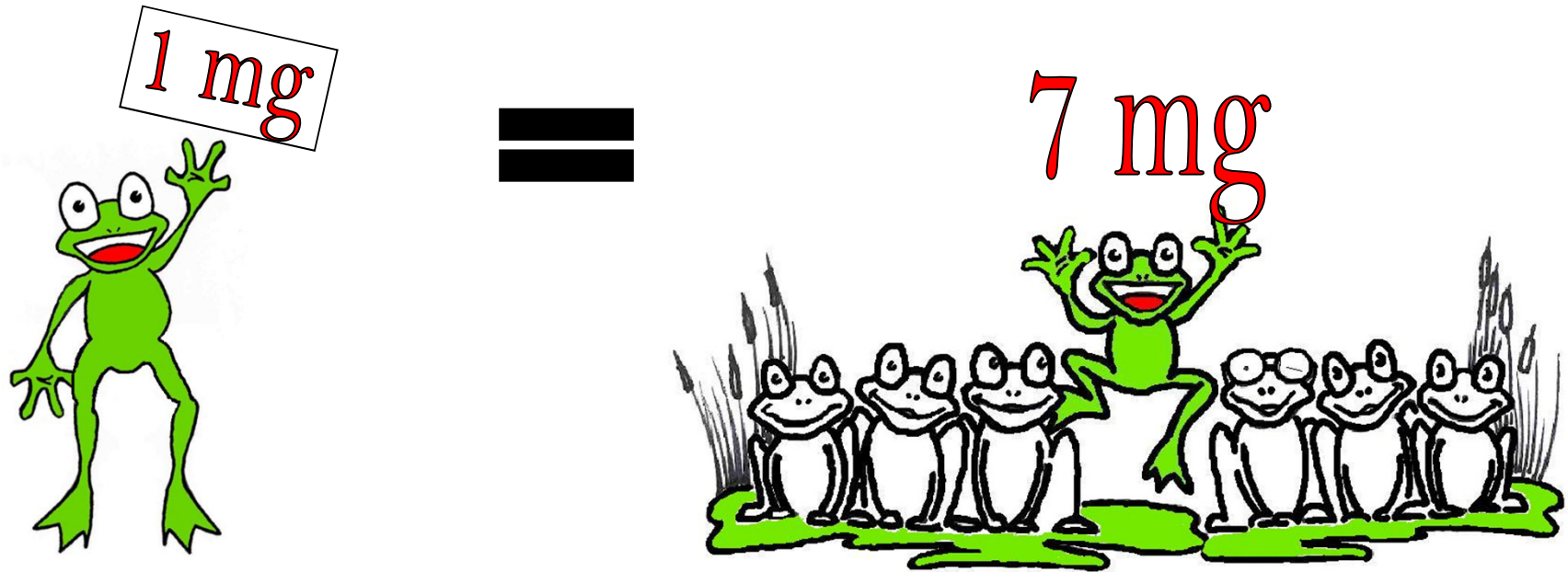


Strategies to Reduce Harm

- Standardize protocols for pain management
- Standardize patient assessment
 - Opioid tolerant vs. Naive
- Utilization of non-pharmacologic interventions
- Appropriate opioid equianalgesic dosing
- Treat all significant over sedation events as sentinel events

How-to Guide: Prevent Harm from High-Alert Medications. Cambridge, MA: Institute for Healthcare Improvement; 2012. (Available at www.ihl.org).

Think about it!!!



HYDROmorphine 1mg = Morphine 7mg

Listed in the Top 10 Drugs Causing Patient Harm in...

- Health and Human Services-Office of the Inspector General Report- "Adverse Events in Hospitals: National Incidence Among Medicare Beneficiaries"
- MEDMARX database

Endorsed by Institute of Safe Medication Practices (ISMP)



Patient #2

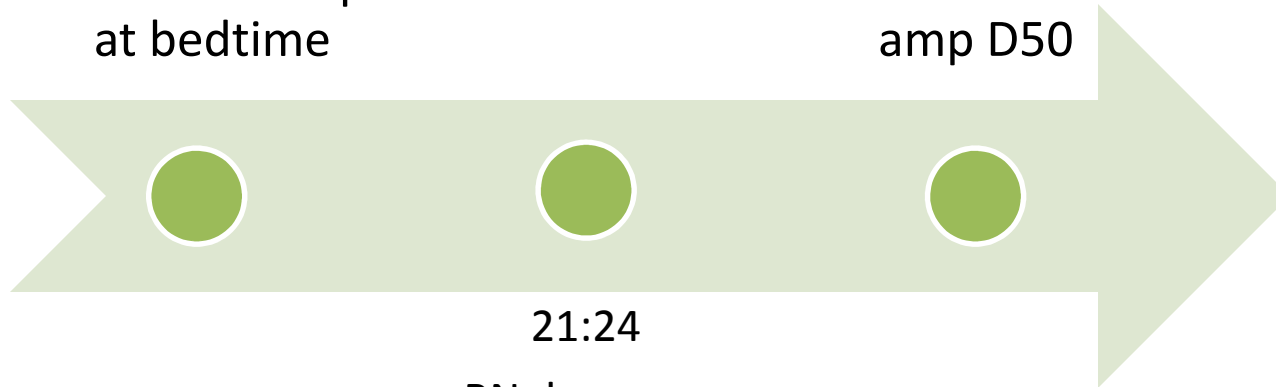
- BW is a 46 year old female that is admitted at 19:45 for Community Acquired Pneumonia. The patient's home medication of Lantus 90 units subq at bedtime is continued on admission.



Patient #2 Suffers an Adverse Event

20:30
Pharmacy
enters order
for Lantus
90units subq
at bedtime

03:00
Accucheck =
34, patient
receives 1
amp D50



21:24
RN draws up
9mL of Lantus
due to
confusing vial
label





Cause and Effect

- What was the route cause of the patient adverse event?
 - Change in Lantus label and human error
- Potential harm?
 - Hypoglycemia
 - Seizures
 - **Patient Falls**
 - Increased mortality





Strategies to Reduce Harm

- Coordinate meal and insulin times
 - *Rapid-acting with or immediately after meals*
- Draw-to-dose insulin in the pharmacy
- Remove insulin from floor stock if possible
- Remove tuberculin syringes from floor stock
- Eliminate use of sliding scale insulin
- Treat BG <40 mg/dL as a sentinel event

How-to Guide: Prevent Harm from High-Alert Medications. Cambridge, MA: Institute for Healthcare Improvement; 2012. (Available at www.ihl.org).



Patient # 3

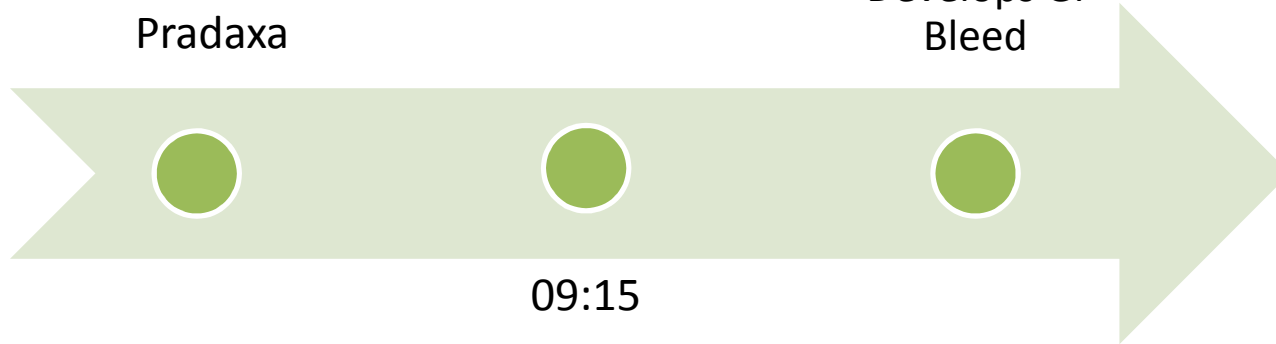
- WA is a 52 year old male presents to the emergency room at 03:45 with shortness of breath. Patient is diagnosed with atrial fibrillation and a weight-based heparin drip is ordered along with warfarin 5mg. Cardiology is consulted next am.



Patient #3 Suffers an Adverse Event

08:45
Cardiology see
patients and
changes
warfarin to
Pradaxa

Day #2 Heparin
drip still infusing
and patient on
Pradaxa-
Develops GI
Bleed



09:15
Home
medication
Ibuprofen
600mg PO q
6hrs is
continued





Cause and Effect

- What was the route cause of the patient adverse event?
 - Duplication of anticoagulation
 - Drug-Drug Interaction
- Potential harm?
 - Toxicity
 - Life-threatening bleeds
 - Clot/Stroke



Anticoagulation Safety

National Patient Safety Goal.03.05.01

Reduce the likelihood of patient harm associated with anticoagulant therapy

- TJC requires protocols for dosing, monitoring and titrating heparin, LMWH, and warfarin
- TJC requires HCPs involved in ordering, dispensing, administering, and monitoring to have appropriate education



Strategies to Reduce Harm

- Inpatient and outpatient anticoagulant dosing service
- Standardized concentrations of heparin products
- Standardized dosing and monitoring protocols
- Point of Care testing-warfarin
- Education awareness of novel new anticoagulants

How-to Guide: Prevent Harm from High-Alert Medications. Cambridge, MA: Institute for Healthcare Improvement; 2012. (Available at www.ihp.org).



Tennessee Pharmacists Coalition Tools and Resources



TCPS Website - Initiatives

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INITIATIVES< DATA SUCCESS STORIES< RESOURCES< PATIENT & FAMILY ENGAGEMENT PSO

2015 A... ESTIMATED IMPACT

- Care Transitions
- CAUTI
- CLABSI
- C.difficile
- Falls
- Hospital Improvement Innovation Network (HIIN)
- Medication Safety and Adverse Drug Events (ADE)
- OB-Related Topics
- Pressure Ulcers
- Readmissions
- Sepsis
- Surgical Site Infections (SSI)
- Up Campaign
- Ventilator-Associated Events (VAE)
- Venous Thromboembolism (VTE)
- Worker Safety

READMISSIONS

\$27,134,806
estimated cost savings

REPORT

REDUCTIONS AND COMPLICATIONS

\$68,255,207
estimated cost savings

Making Safe, Quality Care Top Priority

The Tennessee Hospital Association's Tennessee Center for Patient Safety (TCPS) was launched in 2007 with funding from BlueCross BlueShield of Tennessee Health Foundation. The purpose of TCPS is to advance the adoption of proven evidence-based strategies that improve the reliability, safety, and quality of care received in Tennessee hospitals.

[Learn More](#)

<http://www.tnpatientsafety.com/initiatives/>

Key Initiatives

<> TCPS Quick Links



TCPS Website – Medication Safety



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Medication Safety and Adverse Drug Events (ADE)

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Introduction:

Medications are the number one treatment administered to patients in our hospitals and significantly impact care and outcomes. CMS has requested all hospitals in the Partnership for Patients program report on Adverse Drug Events in three areas: opioids, anticoagulants, and hypoglycemic agents. The Tennessee Pharmacists Coalition is dedicated to assisting hospitals in improvement for these three adverse drug event areas as well as in medication reconciliation/readmissions and antibiotic resistance/antibiotic stewardship.

In an effort to align both education and reporting on ADEs, THA and the Tennessee Pharmacist Coalition have identified measures for ADE reporting that will be utilized for the THA HEN facilities as well as all Tennessee facilities. The THA Board of Directors has endorsed the following recommendations to foster medication safety in Tennessee:

- All hospitals should have a multidisciplinary medication safety team in place.
- All hospitals should report on the non-mandatory ADE measures identified by the Tennessee Pharmacists Coalition and reported through the Tennessee Center for Patient Safety at the Tennessee Hospital Association.

We encourage all Tennessee hospitals to participate in measuring and sharing your ADE data for establishing a statewide benchmark for these ADE focus areas. Click [here](#) to submit data. To support this work, we have developed an ADE educational plan to include sharing of best practices.

Resources:

- [Medication Safety Webinar Series](#)
- [Pharmacy Resource Page](#)
- [Medication Safety Summits](#)

HRET Resources:

- [Adverse Drug Events \(ADE\) 2017 Change Package](#)
- [Adverse Drug Events \(ADE\) 2017 Top Ten Checklist](#)

THA ADE Contact

Jackie Moreland, RN, BSN, MS
Clinical Quality Improvement Specialist
615.401.7439
jmoreland@tha.com

Data

Need to report data? [Click Here](#)

Have a question? [Contact Us](#)

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- [Event Calendar](#)
- [Tennessee Surgical Quality Collaborative](#)
- [Patient Safety Organization](#)
- [Healthy Tennessee Babies are Worth the Wait](#)
- [Webinar Resources](#)
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Tennessee Pharmacists Coalition
Medication Use SAFETY Innovation Community

Introduction:

The Tennessee Pharmacist Coalition vision is to reduce harm and preventable adverse drug events through directed inquiry into current pharmacy practices, identify medication safety-gaps, and make recommendations for best practice across Tennessee. To this end, the Tennessee Pharmacists Coalition is dedicated to assisting facilities in identifying gaps in practice through created gap analysis tools and are willing to make recommendations for improvement strategies through sharing of best practice and resources. This site has gap analysis tools, and other resources, for your use as you work to improve medication safety at your institution.

Upon identifying medication safety practice gaps at your facility, please contact Jackie Morland at jmorland@tncps.com or 615-401-7439 so that you can be paired with a pharmacist champion to assist you in your improvement journey.

Resources:

- [Gap Analyses](#)
- [Antibiotic Stewardship Resources](#)
- [Medication Safety Summits](#)
- [Medication Reconciliation Toolkit](#)

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Pharmacy Resources

- [TN Pharmacists Coalition Members](#)
- [Vision and Goals for TN Pharmacists Coalition](#)
- [Medication Safety: Reducing Harm Across the Board—August 2014](#)
- [National Action Plan for ACE Prevention Draft](#)
- [Regional Meeting ACE Case Study—August 2014](#)
- [TJC Sentinel Alert Codes](#)
- [NRI Information from 2012 CHEST Guidelines](#)
- [ACA 2013 Diabetes Management Guidelines](#)

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TPC Anticoagulation Gap Analysis

Tennessee Pharmacist Coalition on
Medication Safety Anticoagulation and VTE
Adverse Drug Event Gap Analysis

Updated 06/16/2016





TPC Glycemic Gap Analysis

Tennessee Pharmacist Coalition on
Medication Safety
Glucose Management Gap Analysis

Updated 08/13/2015





TPC Opioid Gap Analysis

Tennessee Pharmacist Coalition on Medication Safety Opioid Adverse Drug Event Gap Analysis

Updated 06/24/2016





Medication



Reconciliation Toolkit



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Pharmacy Resources

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Antibiotic



Stewardship Resources



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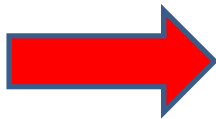
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ADE Reporting Measures!





Anticoagulants Outcome Measure:

Total # adult inpatients on Warfarin/Coumadin
with a post-admission INR $>$ or equal to 4.0

Total # adult inpatients receiving Warfarin or
Coumadin therapy



Hypoglycemic Agents Outcome Measure:

Total # adult inpatients receiving insulin with a post-admission blood glucose \leq or equal to 70

Total # adult inpatients who received Insulin



Opioids Outcome Measure:

Total # patients (excluding ED) treated with Opioids
and who also received Narcan/Naloxone

Total # patients (excluding ED) treated with Opioids



MUSIC recognized by ASHP

- “Hospital engagement networks report successes in decreasing adverse drug events”
 - *American Journal of Health System Pharmacy*
 - July 1, 2014
- THA HEN reports aggregate rate reduction of 62% in ADEs
 - Success directly tied back to formation of MUSIC coalition





CMS Recognition

National Content Developer's (NCD) *HEN sCOOP* Newsletter Recognition

Tool / Resource	Description
Medication Safety Anticoagulation and VTE ADE Gap Analysis	This VTE ADE gap analysis was performed by the Tennessee Pharmacist Coalition and was adapted from Minnesota Hospital Association's Medication Safety Road Map. Addresses questions around topics including Antithrombotic and Anticoagulation management, prevention and mitigation practices, specific therapies, and other relevant issues in preventing and treating VTE. This guide provides a checklist that organizations can use gauge their level of alignment with Antithrombotic, Anticoagulation and VTE ADE prevention strategies in health institutions.



Two Most Important words in safety!

1) Simplify

2) Standardize



**“Do not follow where the path
may lead. Go instead where there
is no path and leave a trail.”**

-Emerson

Questions

