Medication Use and Patient Outcomes
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Objectives

- Describe the elements of a standard medication-use evaluation
- List criteria for selecting an appropriate agent for medication-use evaluation (MUE)
- Evaluate the Joint Commission requirements for applying medication-use evaluation initiatives in your facility
Medication-Use Evaluation (MUE)

What IS a MUE?

- A performance improvement method that focuses on evaluating and improving medication-use processes with the goal of optimal patient outcomes

Why might the MUE apply to?

- Medication or therapeutic class
- Disease state or condition
- Medication-use process
- Specific outcomes

What is the biggest difference between a DUE and MUE?

- MUE incorporates and expands on the objectives of the DUE
- Emphasis on IMPROVED patient outcomes
- Multifaceted approach to improving medication use
- Helps identify actual and potential medication-related problems, resolve actual problems, and prevent potential problems that could adversely impact outcomes from medication therapy
- MUE is a COLLABORATIVE effort – Interdisciplinary Team
Which of the following can be considered appropriate objectives for conducting a medication use evaluation?

- A) Identify areas for improvement within your facility or health-system
- B) Evaluate the impact of a recent change in practice
- C) Validate current practices
- D) All the above
Which of the following can be considered appropriate objectives for conducting a medication use evaluation?

- A) Identify areas for improvement within your facility or health-system
- B) Evaluate the impact of a recent change in practice
- C) Validate current practices
- D) All the above
Objectives of Medication Use Evaluation

- Identify areas for improvement within your facility or health-system
  - Find the culprit
  - Determine measures for quality improvement

- Evaluate the impact of a recent change in practice
  - Are the plausible solutions effective?
  - Ask Why X 5
Objectives of Medication Use Evaluation

- Validate current practices
  - Things do not have to be broken to be tested
- Assuming is not knowing
  - Is no news really good news?
- Health care practice is dynamic
  - How does one know if a process or agent continues to work well over time if it is not evaluated?
The Elements of a Standard Medication-Use Evaluation

- Purpose
- Focus
- Priorities
- Criteria
- Collection of Data Phase

Evaluation of Care
Actions to Improve Medication Use
Assessment, Documentation, and Reports
Annual Appraisal
Elements Continuous Quality Improvement

Purpose

Focus

Priorities

Criteria

Collection

Evaluation

Actions

Assessment

Appraisal
The Elements of a Standard Medication-Use Evaluation

• Purpose
  • Evaluate and Improve Medication Use and Patient Outcomes
  • Interdisciplinary Team (Multidisciplinary Approach)
    • Medical staff, nursing services, pharmacy, administration, quality services
    • DOP Oversight
The Elements of a Standard Medication-Use Evaluation

- **Focus**
  - Effective, appropriate, and safe use of drugs
    - Selection, Procurement, and Storage
    - Ordering/Prescribing Drugs
    - Preparing and Dispensing Drugs
    - Administration of Drugs
    - Monitoring the Effects of Drugs
      - Patient Drug Monitoring
The Elements of a Standard Medication-Use Evaluation

- Priorities
  - Characteristics of Targeted Drugs
    - Frequently Prescribed
    - Presenting Risk to Patients
      - Known or Suspected
    - Problem Prone
      - Known or Suspected
    - Critical Component of Care
  - Expensive to obtain
- Medical Staff Committee Approval
The Elements of a Standard Medication-Use Evaluation

- Criteria
  - Standards to which Evaluated Medications are Compared
  - Presence or Absence of:
    - Structures
    - Processes
    - Desirable/Undesirable Outcomes
The Elements of a Standard Medication-Use Evaluation

- Collection of Data
  - Data Sources
    - Patient Profiles
    - Patient Medical Records
    - Laboratory Tests
    - ADR Reports
    - MARs
    - Other Sources
The Elements of a Standard Medication-Use Evaluation

- Evaluation of Care
  - Important Single Events
  - Variances
- Patterns &/or Trend Development
- Discovery of Improvement Opportunities
The Elements of a Standard Medication-Use Evaluation

- Actions to Improve Medication Use
  - Revising Processes
  - Providing Educational Programs
  - Education of Facility and Staff
  - Developing, Revising, and Implementing Policies & Procedures that Improve Medication Safety
  - Establishing Formulary and Prescribing Restrictions
  - Developing Standardized Drug Therapy Protocols
  - Implementing Therapeutic Substitution Policies
  - Requiring Special Order Forms for Selected Drugs
The Elements of a Standard Medication-Use Evaluation

- Assessment, Documentation, and Reports
  - Findings
    - Data, Variances, and unjustified variances
  - Conclusions
    - Problems identified, improvement Opportunities, Causes of problems, and usage patters/trends
  - Recommendations
    - Proposed plausible solutions
  - Action Taken
    - What has to be done to date
  - Effectiveness or Results of Action Taken
    - Problems resolved and improvements in medication use
The Elements of a Standard Medication-Use Evaluation

- Periodic Appraisal
  - MUE activity should be Reviewed for Effectiveness
    - Annual Appraisal
    - Appropriate Delegated Authorities
      - DOP & P&T Committee
        - Assure On-going Validity of Indicators and Effectiveness
  - Revisions Performed as Needed
Question for the Audience

In order to be considered an appropriate selection for medication use evaluation the agent must be considered to be of high risk, high cost, and high use.

- A) TRUE
- B) FALSE
In order to be considered an appropriate selection for medication use evaluation the agent must be considered to be of high risk, high cost, and high use.

- A) TRUE
- B) FALSE
Joint Commission Requirements

- MM Standards
- MUE Application
Medication Management Standards

Medication management is an important component in the palliative, symptomatic, and curative treatment of many diseases and conditions.

HOWEVER...

Medications are also capable of causing great harm if the incorrect dose or medication is inadvertently administered to a patient.

Source: CAMH Update 2, September 2012
Medication Management Standards

So, to simplify...the goal is ultimately to support patient safety and improve quality of care by:

- Reducing variation, errors, and misuse
- Using evidence-based practices to develop med management processes
- Managing critical processes to promote safe med management throughout the hospital
- Standardizing equipment and handling processes across the hospital
- Monitoring the med management process for efficiency, quality, and safety
So, HOW do these MM Standards Apply?

While there is a whole CHAPTER dedicated to Medication Management Standards in the CAMH, our primary focus for application, specific to MUEs, comes from Standard MM.08.01.01

*The hospital evaluates the effectiveness of its medication management system.*

(Note: This evaluation includes medication reconciliation...see NPSG.03.06.01 for more info.)
MUE Application

- Medication Use Evaluation of Alvimopan (Enterog®)
- Levofloxacin (Levaquin®) Medication Use Evaluation
- Intravenous Iron Usage Evaluation
- Medication Use Evaluation Albumin
- Medication Use Evaluation of Ketorolac (Toradol®)
Medication Use Evaluation of Alvimopan (Entereg®)

- MUE Objectives
  - Promoting optimal medication therapy
  - Improving Patient Safety
  - Preventing medication related Problems
Medication Use Evaluation of Alvimopan (Entereg®)

- Overview/Discussion
  - Alvimopan
    - Indication
      - Accelerate upper/lower GI recovery time following large/small bowel resection surgery
    - Contraindications
      - Severe hepatic impairment, ESRD, & patients undergoing surgery for complete bowel obstruction.
Medication Use Evaluation of Alvimopan (Enterog®)

- Overview/Discussion Cont.
  - Alvimopan
    - Terms of Use
      - Initiated 0.5-5 hours prior to surgery
      - Continued as 1 capsule PO BID X 7 days (max: 15 doses)
    - E.A.S.E. Program
      - Restricted hospitalized patients
    - Low Use/High Cost
      - Safety Concerns
Medication Use Evaluation of Alvimopan (Enterig®)

- Methods
  - Retrospective
  - Patient Selection
    - Alvimopan Use
      - AS/400 and/or Pyxis based
    - Random
      - n= 30 or 100% (lesser value)
  - Study Length
    - 1 year
Medication Use Evaluation of Alvimopan (Entereg®)

Criteria

Patient Age
Initiation of Therapy
  Within 5 Days of Surgery
Liver Function
  Child-Pugh Class
Creatinine Clearance
Number of Doses Received
  Max 15

Time to First Bowel Movement
Time to First Diet Ordered
  Ice Chips & Sips, General, etc.
Adverse Drug Reactions
Nurse Documentation
Medication Guide
Medication Use Evaluation of Alvimopan (Entereg®)

- **Findings**
  - 13 Patients
  - 8 Charts available for review
- **Ages**
  - Range = 57-83 years
  - Median & Mean = 71 years
- **Loading Dose**
  - 24 mg loading dose given to patients
  - Inappropriate
Medication Use Evaluation of Alvimopan (Entereg®)

- Findings
  - Liver Function
    - Child-Pugh Class
      - Not readily available
      - Based on labs
        - Bilirubin, albumin, PT/INR, etc.
  - ALT/AST levels
    - 4 patients WNL, 3 Unknown, 1 low AST (ALT indeterminant)
Medication Use Evaluation of Alvimopan (Enterax®)

Findings

- Renal Function (Creatinine Clearance)
  - ESRD Contraindicated
  - Creatinine Clearance
    - Range = 45-87 mL/min
    - No Dosage adjustment required for Alvimopan based on Est. CrCl
    - Usage appropriate with regards to kidney function
Medication Use Evaluation of Alvimopan (Entereg®)

- Findings
  - Number of doses received
    - Max 15 doses
    - One Patient Received 18 Doses
  - Time to First Bowel Movement
    - POD 1 – Unknown
  - Constipation
  - Time to First Diet Ordered
    - POD 1 - POD 3
Medication Use Evaluation of Alvimopan (Entereg®)

- Findings
  - ADRs
    - Constipation
      - Patients discharged prior to BM
      - 1 Transfer to higher level of care
    - Chest Pain
  - No evidence of Alvimopan being contributory
Medication Use Evaluation of Alvimopan (Entereg®)

- **Other Findings**
  - Physician Pre-Approval
  - Loading Dose Not Appropriate
  - Only 1 Approved Dosing Schedule
    - 12 mg PO BID
  - Medication Guide to Patients
  - Illegible Handwriting
    - Contributory to error in one chart
Medication Use Evaluation of Alvimopan (Enterex®)

- Recommendations
  - Additional Education
    - Physicians, Nurses, Pharmacists/Techs
  - Correct Pre-printed Order Forms
  - Prescribers Must Obtain Approval
    - Automatic STOP in AS/400
  - POST Surgical POI=Prevention
    - Chewing Gum
      - Decrease LOS
Levofoxacin (Levaquin®) Medication Use Evaluation

- **Purpose**
  - Evaluate proper dosing of Levaquin
    - Renal Function
    - Diagnosis
  - Assess Presence of Information
    - Patient Height, Weight, Allergies, Est. CrCl.
    - Pharmacists Interventions
Levofloxacin (Levaquin®)
Medication Use Evaluation

- Dosage & Administration
  - Levaquin 250 mg-500 mg IVPB
    - Q 24 Hours & over 60 minutes
  - Levaquin 750 mg IVPB
    - Q 24 hours & over 90 minutes
  - Normal Renal Function
    - Est. CrCl >= 50 mL/min
# Levofloxacin (Levaquin®) Medication Use Evaluation

<table>
<thead>
<tr>
<th>Type of Infection</th>
<th>Dosed Every 24 Hours</th>
<th>Duration (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nosocomial PNE</td>
<td>750 mg</td>
<td>7-14</td>
</tr>
<tr>
<td>CAP (MSSA etc.)</td>
<td>500 mg</td>
<td>7-14</td>
</tr>
<tr>
<td>CAP (S. Pneumoniae, etc.)</td>
<td>750 mg</td>
<td>5</td>
</tr>
<tr>
<td>Acute Bacterial Sinusitis</td>
<td>500 mg or 750 mg</td>
<td>5 or 10-14</td>
</tr>
<tr>
<td>Acute Bacterial Chronic Bronchitis</td>
<td>500 mg</td>
<td>7</td>
</tr>
<tr>
<td>Complicated SSSI</td>
<td>750 mg</td>
<td>7-14</td>
</tr>
<tr>
<td>Uncomplicated SSSI</td>
<td>500 mg</td>
<td>7-10</td>
</tr>
<tr>
<td>Chronic Bacterial Prostatitis</td>
<td>500 mg</td>
<td>28</td>
</tr>
<tr>
<td>cUTI or AP (E. coli)</td>
<td>750 mg</td>
<td>5</td>
</tr>
<tr>
<td>cUTI or AP (E. faecalis, etc.)</td>
<td>250 mg</td>
<td>10</td>
</tr>
<tr>
<td>Uncomplicated UTI</td>
<td>250 mg</td>
<td>3</td>
</tr>
</tbody>
</table>
Levofloxacin (Levaquin®) Medication Use Evaluation

- Renal Dosing
  - CRCL $\geq 50$ mL/min
    - No renal adjustment necessary
  - CRCL 20-49 mL/min
    - 500 mg X 1, then 250 mg Q 24 hours
    - CSSI: 750 mg X 1, then 750 mg Q 48 hours
Levofloxacin (Levaquin®)
Medication Use Evaluation

- Renal Dosing
  - CRCL < 20 mL/min
    - 500 mg X 1, 250 mg Q 48 hours
    - CSSI: 750 mg X 1, then 500 mg Q 48 hours
  - Hemodialysis or PD
    - Same as above
    - On dialysis days, schedule dose post dialysis
Levofloxacin (Levaquin®) Medication Use Evaluation

- Criteria
  - Sample Size
    - 30 patients
  - Source of Data
    - AS/400, Pyxis Connect Patient Medical Record
  - Study Length
    - < 30 days
  - Sampling Criteria
    - Use of Levaquin
Levofloxacin (Levaquin®) Medication Use Evaluation

Findings

- Data Point 1
  - Presence of Ht., Wt., & Allergy Information
  - All parameters were available on 100% of subjects

- Height
  - R= (50-75 inches); Mean & Median= 66 inches & 62.5 inches

- Weight
  - R=(26-180 kg); Mean & Median (82 & 103 kg)

- Allergy
  - 16 different Allergies; none to Levaquin
Levofloxacin (Levaquin®) Medication Use Evaluation

Findings

- Data Point 2
  - Creatinine Clearance Calculation
- Cockcroft-Gault Equation
  - Used as Gold Standard for renal assessment
- Est. CrCl $\geq 50$ mL/min
  - 18 Patients
- Est. CrCl 20-49 mL/min
  - 11 Patients
- Est. CrCl < 20 mL/min
  - 1 Patient
Levofloxacin (Levaquin®) Medication Use Evaluation

- **Findings**
  - Data Point 3
    - Was the dose appropriate?
  - Levaquin ordered on 30 subjects by IV route
    - 36.7% (11 subjects) not in compliance
      - 8 (26.7%) based on Est. CrCL
      - 2 (6.7%) based on diagnosis
      - 1 (3.3%) based on Est. CrCl & Diagnosis
Levofloxacin (Levaquin®) Medication Use Evaluation

Findings

Data Point 4

- Pharmacist Intervention Recorded?
- 41 Pharmacist Interventions Recorded
  - 30 Interventions = Renal Function Monitoring
  - 11 Interventions = Dose Adjustments
Levofloxacin (Levaquin®) Medication Use Evaluation

- Findings
  - Data Point 5
    - Pharmacist Intervention Accepted?
    - 11 Pharmacist Interventions Pended for Dose Adjustments
      - 1 (9.1%) accepted and implemented
Levofloxacin (Levaquin®) Medication Use Evaluation

- Conclusion
  - Non-compliance within Facility
  - Miscommunication
    - Pharmacist to Physician

- Recommendations
  - Levaquin specific dose adjustment form
  - Pharmacist-driven dose adjustment protocol
The use of albumin in the clinical setting has been controversial for years! Due to increase in costs and incidents of drug shortage occurring nationwide, in addition to safety concerns, prompted development of guidelines for usage and various protocols to do so.

Thus, Albumin was selected for MUE: To examine usage, review for appropriate utilization, and make recommendations for improvement.
Albumin MUE

MUE included:

- **Background** *(WHY this drug was selected)*
- **Indications for Use of Albumin** *(Evidence-based)*
  - NIH Guidelines were the starting point for this MUE
  - University Hospital Consortium (UHC) guidelines used in development of the “Albumin Utilization Monitoring Criteria Form” used for data collection
Albumin MUE

Methods:

- $n=30$
- Patient charts selected randomly, based on availability
- Data collected using the Albumin MUE data collection form (adapted from NY University Medical Center)
- Included in the documentation:
  - Patient demographics
  - Indication for Usage
  - Prescribed therapy (ie albumin/furosemide drip, albumin, or albumin IV plus furosemide IVP)
  - Assessment for appropriateness based on renal function
Albumin MUE

Purpose:

- To describe demographics of patients receiving albumin
- To review indications reported to justify utilization at facility
- To determine appropriateness of therapy based on indication, renal function, labs, and guidelines
- To identify opportunities for improvements, including a cost-analysis of alternative therapies
Findings:

- **Demographics**: 53% Female, 47% Male, Age distribution 30-90, with largest group (30%) age 80-89; 73% of participants were age 60 or older.

- **Indications**: Hypovolemia & shock (10), HF or MI w/shock (3), Low U/O (2), Cirrhosis & Paracentesis (2), Dialysis – IDH prevention/treatment (Intradialytic hypotension) (5), Fluid overload from IV fluids (1), Other (5)
  - Malnutrition (2) – not a valid indication for albumin usage

- ** Appropriateness**: Albumin usage for 10 of the 30 charts reviewed (33%) were either considered to be outside of the guidelines for appropriateness or lacked documentation to determine whether usage was appropriate; 66% were found to meet the guidelines.

- **Improvement**: ? Albumin/Furosemide Drip?
Cost Analysis Done, based on AWP (2008 Data)

Opportunities for Improvement:

- Opportunity to utilize crystalloids and nonprotein colloids rather than albumin as first-line therapy

  - Evidence-based guidelines AND cost-savings!

  - No evidence that albumin reduces mortality when compared with cheaper alternatives, such as saline (Anderson et al – The Albumin Reviewers)

  - In fact, the Chochrane report in the BMJ in July 1998 reported that the pooled relative risk of death with albumin was 1.68 (95% CI) and the pooled difference in the risk of death was 6% (3-9%)...or SIX additional deaths for every 100 patients treated.

<table>
<thead>
<tr>
<th>Medication</th>
<th>Size:</th>
<th>AWP:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin 25% for Inj</td>
<td>50mL (1 vial)</td>
<td>$98.50</td>
</tr>
<tr>
<td>Hetastarch</td>
<td>500mL (1 bag)</td>
<td>$51.54</td>
</tr>
<tr>
<td>Dextran</td>
<td>No longer avail</td>
<td>0</td>
</tr>
<tr>
<td>NS 1L</td>
<td>1000mL (1 bag)</td>
<td>$2.60</td>
</tr>
<tr>
<td>LR 1L</td>
<td>1000mL (1 bag)</td>
<td>$11.86</td>
</tr>
</tbody>
</table>
Albumin MUE

Other “Opportunities for Improvement”

- Documentation!
  - Many charts didn't contain a definitive “Indication for Use”
    - Helpful from a monitoring and pharmacist-intervention standpoint
    - Has been shown to reduce medication errors in dispensing and administration
    - Helpful when patient-specific case requires use of agent (provides explanation for and/or confirms justification for usage)
  - Accuracy of heights/weights was found to be an additional opportunity for improvement
    - Renal function (calculations for which Ht/Wt are required) may play a role in determining appropriateness of usage
- Peer Review requested on 11 charts – due to lack of documentation justifying appropriate usage for albumin, death as an outcome, and/or other identified reasons.
Ketorolac (Toradol®) MUE

Objectives:

- Promoting optimal medication therapy
- Improving patient safety
- Preventing medication-related problems
Ketorolac (Toradol®) MUE

Overview/Discussion:
- Indicated for the short term (up to 5 days in adults) management of moderately severe acute pain that requires analgesia at the opioid level
- Tablet (oral) administration is only indicated as continuation of IM or IV dosing, if necessary
- The total combined duration of oral AND parenteral use should NOT exceed 5 days.

(Source: Epocrates Essentials Deluxe iPhone app. Also available online at www.epocrates.com)

This MUE will evaluate duration of dosing of ketorolac in an effort to promote optimal medication therapy.
Ketorolac (Toradol®) MUE

Overview/Discussion:
- Ketorolac contains multiple black-box warnings.
- C/I as propylactic analgesic before any major surgery
- C/I in patients:
  - In L&D (including nursing mothers)
  - With Renal risk
  - Following CABG surgery
  - With GI risks (PUD, recent GI bleed or perforation, or history of either)
  - With Risk of Bleeding (including those with confirmed cerebrovascular bleeding, hemorrhagic diathesis, incomplete hemostasis, and those at high risk of bleeding)

(Source: Epocrates Essentials Deluxe iPhone app. Also available online at www.epocrates.com)

The inclusion of this evaluation criteria will be one component of the patient safety objective.
Ketorolac (Toradol®) MUE

**Overview/Discussion:**
- Ketorolac has the highest upper GI complication, according to a 2010 study, of any of the NSAIDs studied. *(Masso et al)*
- The appropriate maximum dose for IM/IV multiple dose therapy is 30mg q6h.
- Note: the appropriate max dose for single dose is 30mg via IV route (one-time dose only) and 60mg via IM route (one-time dose only).
*The max single dose is 30mg IM and 15mg IV in pediatrics.*
- The max total daily dose is 120mg/day IV/IM; 60mg IV/IM if >65 yo, 50kg, and mod. elevated Cr
- The max dose is 40mg/day PO; start 20mg PO x1 if <65 yo and >50kg; only for patients who received parenteral tx
- The Duration of therapy is not to exceed 5 days (PO/IM/IV) total.

**Thus, this drug was selected based on high usage, to improve patient safety, and to prevent medication-related problems associated with usage.**

(Source: Epocrates Essentials Deluxe iPhone app. Also available online at www.epocrates.com)
Methods:
• Retrospective study
• Random selection, n=30 or 100% (whichever is less)
• Time period – 3 month period immediately preceding the approval of study criteria
• Specific criteria included:
  - Patient age
  - Date/time of initiation of therapy
  - Route of Administration
  - Date/time of change (IM/IV to PO)
  - Notation if patient to continue PO after discharge
  - Location of patient at initiation of therapy and/or change
  - Notation if patient was currently receiving PPI therapy (and what drug, if applicable)
  - C/I identified during chart review
  - Adverse events, if any
Ketorolac (Toradol®) MUE

Criteria: DOSE*

- The recommended total daily dose of oral ketorolac (40mg) is significantly lower than the recommended daily dose for injectable (120mg).

- Increasing the dose beyond maximum or labeled doses will not provide better efficacy, but will increase the risk of developing serious adverse events.

- Dosage Adjustment required in patients >65 years, patients <50 kg (110 lbs) of body weight, and those patients with moderately elevated serum creatinine. Doses of ketorolac injection are not to exceed 60mg (total dose per day) in these patients.

- For the purposes of this study, “moderately elevated serum creatinine” was viewed as 1.4 to 1.6 mg/dL.

*BlackBoxRx.com Website. (http://blackboxrx.com/app/display.php?id=99)
Ketorolac (Toradol®) MUE

**Demographics:**
- 30 charts reviewed
- Ages ranged from 17 to 89 year old (mean = 38.6 yrs; median = 34.5 yrs)
- This medication was administered to patients in ER, Surgery, L&D and MedSurg

**Results/Conclusions:**
- The **5-day maximum** duration of therapy (total doses, regardless of ROA) was loosely adhered to in the hospital setting.
  - One patient received med IV x2 days as in-patient, followed by discharge Rx for PO ketorolac x5 days.
    - Thus, the UMC issued a notification to the prescriber informing about the recommended 5-day limit.
  - One patient had a “PRN” order for 7 days, but appeared to take only a single dose.
Results/Conclusions (Continued):
The black box warning of use in nursing mothers was included for review.
- Five patients who received ketorolac were actively breastfeeding
- The source of these orders was identified to be the pre-printed standing orders for each of the L&D physicians.
Thus, the standing orders were to be reviewed by pharmacy and the appropriate medical staff to determine the appropriateness of this medication and/or the need to update the order forms.

The max daily dose of 60mg IV/IM if >65 y/o, <50 kg, and mod. elevated Cr requirement was reviewed.
- Two patients were identified to be >65 y/o – one of these patients received 90mg during a 24-hour period, which exceeds the maximum daily dose for the elderly.
  Thus, the UMC issued a notification to the prescriber.
- Two patients had no documented weight in chart; one was also below 50kg in weight. (However, only a one-time order of 30mg given.)
- Four patients had no documented Cr level; those remaining had Cr level <1.4 mg/dL.
Results/Conclusions (Continued):
Drug-drug interaction potential was noted in one patient who received simultaneous orders for Lovenox 60mg SQ q day and Ketorolac 30mg IV q6h x48 hours.
- While this combination is not an absolute C/I, there is an "AVOID/USE ALTERNATIVE THERAPY" recommendation (incr. risk of bleeding – additive anticoagulant/antiplatelet effects)
- This patient appeared to have NO adverse events and appeared to be appropriately monitored for such

PPI use was reviewed, to identify patients who may be undergoing treatment for stomach ulceration/bleeding.
- While no direct link was made indicating a C/I in those patients receiving PPI therapy, it was noticed that one patient was on PPI therapy BID, which may indicate an issue for concern.
- Recommendation was made for consideration of further review of this area.
Conclusion

- We have discussed:
  - Why MUEs are performed?
  - How to select and appropriate MUE agent(s)?
  - How to design an MUE?
  - What are the standard expectations for MUEs?
In regards to ASHPMUE guidelines and MM standards, which of the following statements is false?

- A) MUEs should strive to be designed around an interdisciplinary to enhance interdepartmental buy-in and continuum of care enhancement
- B) MUE results must be reviewed/appraised periodically
- C) Strictly the Joint Commission evaluates the effectiveness of a hospital’s medication management system.
In regards to ASHP MUE guidelines and MM standards, which of the following statements is false?

- A) MUEs should strive to be designed around an interdisciplinary team to enhance interdepartmental buy-in and continuum of care enhancement
- B) MUE results must be reviewed/appraised periodically
- C) Strictly the Joint Commission evaluates the effectiveness of a hospital’s medication management system.
The hospital evaluates the effectiveness of its medication management system.

(Note: This evaluation includes medication reconciliation...see NPSG.03.06.01 for more info.)
References


CAMH Update 2, September 2012


References


http://www.globalrph.com/levofloxacin_renal.htm


Questions