Hidden in Plain Sight: Dangers of Commonly Used Nonprescription Medications

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Disclosure Statement

The presenter has nothing to disclose concerning possible financial or personal relationships with commercial entities that may be referenced in this presentation.
Objectives

- Identify populations at risk for adverse effects associated with use of common nonprescription medications

- Review nonprescription medications that pose health risks to adults including cough/cold products, NSAIDs, proton pump inhibitors (PPIs)

- Discuss strategies to mitigate risks of adverse effects associated with nonprescription medication use
Background

- Perception of safety with over-the-counter (OTC) medication use

- 7% hospitalizations due to medication-related events

- Failure to report use of OTC medications common

- Accurate medication histories, recognition of patient risk factors key to avoidance of toxicities
Dangers in the Cough & Cold Aisle
Dangers in the Cough & Cold Aisle

- Elderly and young adults at risk
  - Polypharmacy, drug interactions, BEERS List ‘Medications to Avoid’
  - Sedation, confusion, dementia
  - Overdose

- Direct to consumer advertising

- Offending medications
  - Cough suppressants
  - Analgesics
  - Antihistamines

Gray et al. JAMA.2015
# OTC Antihistamines

<table>
<thead>
<tr>
<th>Drug</th>
<th>Availability</th>
<th>Dosing</th>
<th>Onset</th>
<th>Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1&lt;sup&gt;st&lt;/sup&gt; GENERATION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diphenhydramine</td>
<td>Benadryl Allergy and Cold®, Theraflu®, Advil PM®, Mucinex Cold &amp; Flu®</td>
<td>12.5-50mg q4h</td>
<td>1-2h</td>
<td>CNS depression, glaucoma, BPH, urinary retention, constipation, concomitant sedatives</td>
</tr>
<tr>
<td>Chlorpheniramine</td>
<td>Coricidin Cough &amp; Cold®, Chlor-Trimeton®</td>
<td>4 mg q4 – 6h</td>
<td>2-3h</td>
<td></td>
</tr>
<tr>
<td>Doxylamine</td>
<td>Nyquil Cold &amp; Flu®, Unisom®, Tylenol Cold Unisom®</td>
<td>25 mg HS</td>
<td>1-2h</td>
<td></td>
</tr>
<tr>
<td><strong>2&lt;sup&gt;nd&lt;/sup&gt; GENERATION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loratadine</td>
<td>Claritin®, Walitin-D®</td>
<td>10 mg q24h</td>
<td>1h</td>
<td>Avoid if renal, liver impairment</td>
</tr>
<tr>
<td>Cetirizine</td>
<td>Zyrtec®, Zyrtec-D®</td>
<td>5-10 mg q24h</td>
<td>1h</td>
<td>CNS depression; Consider dose reduction in liver, renal impairment</td>
</tr>
<tr>
<td>Levocetirizine</td>
<td>Xyzal®</td>
<td>2.5 – 5mg HS</td>
<td>1h</td>
<td>Avoid in severe renal impairment</td>
</tr>
</tbody>
</table>
Dangers in the Cough & Cold Aisle

- **Oral $\alpha_1$ receptor agonists**
  - Phenylephrine (Sudafed PE®, Pseudoephedrine (Sudafed®))
  - AE: hypertension, myocardial infarction, stroke, insomnia
  - PEARLS: Avoid in ischemic heart disease, uncontrolled HTN, topical decongestants as substitute (oxymetolazine, phenylephrine)

- **Combination products counseling**
  - “Cold” = antihistamines, decongestants
  - “Cough” = dextromethorphan
  - “Flu = acetaminophen, ibuprofen
Prevalence of NSAID Use

- 17 million Americans
- >20 % drug-related hospitalizations
- Potential NSAID toxicities:
  - Renal
  - Cardiovascular
  - Gastrointestinal
- Public recognition of risk

Meara, Simon.*Pain Medicine*. 2013
ARACHIDONIC ACID

COX-1

NSAID/ASPIRIN

COX-2

Prostaglandins

Protection of gastric mucosa

Hemostasis

Renal Effects

Mediation of pain, inflammation, fever

Wolfe et al. NEJM 1999
Renal Effects of NSAIDs

**Arachidonic Acid**

NSAIDs \( \rightarrow \) COX-1,2

\[ \text{PGE}_2/\text{PGI}_2 \]

- **Sodium Retention**
  - Peripheral edema
  - Hypertension
  - Congestive Heart Failure

- **Acute Renal Failure**
  - Prerenal azotemia
  - Acute tubular necrosis

- **Hyperkalemia**
  - Renal tubular acidosis

Renal Effects of NSAIDs

- **Risk factors**
  - Higher doses
  - Prolonged duration of therapy
  - Advanced age
  - Uncontrolled HTN
  - Preexisting renal impairment, history AKI
  - Heart failure, hepatic impairment
  - Drug interactions

Hsu et al. *Hypertension*. 2015
Papadopoulos et al. Drug Induced Complications in the Critically Ill Patient. 2012.
Antihypertensives, NSAIDs & Acute Renal Injury

### Table 2: Rate ratio of acute kidney injury associated with exposure to current double or triple therapy combination. Values are numbers (percentages) unless stated otherwise

<table>
<thead>
<tr>
<th>Current use*</th>
<th>Cases (n=2215)</th>
<th>Controls (n=21993)</th>
<th>Rate ratio (95% CI)</th>
<th>Crude</th>
<th>Adjusted†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diuretics only</td>
<td>209 (9.4)</td>
<td>2632 (12.0)</td>
<td>Reference</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Diuretics plus NSAIDs</td>
<td>156 (7.0)</td>
<td>1739 (7.9)</td>
<td>1.16 (0.93 to 1.44)</td>
<td>1.02 (0.81 to 1.28)</td>
<td></td>
</tr>
<tr>
<td>ACE inhibitors or angiotensin receptor blockers only</td>
<td>148 (6.7)</td>
<td>1889 (8.6)</td>
<td>Reference</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>ACE inhibitors or angiotensin receptor blockers plus NSAIDs</td>
<td>138 (6.2)</td>
<td>1907 (8.7)</td>
<td>0.96 (0.75 to 1.22)</td>
<td>0.89 (0.69 to 1.15)</td>
<td></td>
</tr>
<tr>
<td>Diuretics plus ACE inhibitors or angiotensin receptor blockers</td>
<td>414 (18.7)</td>
<td>2432 (11.1)</td>
<td>Reference</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Diuretics plus ACE inhibitors or angiotensin receptor blockers plus NSAIDs</td>
<td>544 (24.6)</td>
<td>2424 (11.0)</td>
<td>1.34 (1.17 to 1.54)</td>
<td>1.31 (1.12 to 1.53)</td>
<td></td>
</tr>
</tbody>
</table>

ACE=angiotensin converting enzyme; NSAID=non-steroidal anti-inflammatory drug.
*Within 90 days before index date; current users of other antihypertensive drugs and past users (>90 days before index date) of double and triple therapy combinations are not shown but were considered in regression model.
†Adjusted for covariates listed in table 1.

n = 487,372
<table>
<thead>
<tr>
<th>Drug</th>
<th>Usual Analgesic Dose</th>
<th>Max Daily Dose</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirin</td>
<td>325 – 650 mg Q4-6 hr</td>
<td>4000 mg</td>
<td>Irreversible platelet inhibition</td>
</tr>
<tr>
<td>Ibuprofen</td>
<td>400 mg Q4-6 hr</td>
<td>3200 mg (acute) 2400 mg (chronic)</td>
<td>Short half-life, duration of action</td>
</tr>
<tr>
<td>Diclofenac</td>
<td>50 mg Q8 hr</td>
<td>150 mg</td>
<td>Topical preparations available</td>
</tr>
<tr>
<td>Etodolac</td>
<td>IR 200 - 400 mg Q8 hr</td>
<td>IR 1000 mg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ER 400 – 1000 mg Q24 hr</td>
<td>ER 1200 mg</td>
<td></td>
</tr>
<tr>
<td>Indomethacin</td>
<td>IR 25 – 50mg Q8 -12 hr</td>
<td>150 mg</td>
<td>Higher risk renal and CV toxicities</td>
</tr>
<tr>
<td></td>
<td>CR 75 mg Q12 – 24 hr</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Naproxen</td>
<td>275 – 550 mg Q12 hr</td>
<td>1375 mg (acute) 1100 mg (chronic)</td>
<td>Lower incidence CV toxicity</td>
</tr>
<tr>
<td>Nabumetone</td>
<td>500 -750 mg Q 8-12 hr</td>
<td>2000 mg</td>
<td>Contraindicated with CABG</td>
</tr>
<tr>
<td>Oxaprozin</td>
<td>1200 mg Q24 hr</td>
<td>1800 mg</td>
<td></td>
</tr>
<tr>
<td>Meloxicam</td>
<td>7.5 – 15 mg Q24 hr</td>
<td>15 mg</td>
<td>Relative COX-2 selectivity</td>
</tr>
<tr>
<td>Piroxicam</td>
<td>10 – 20 mg Q24 hr</td>
<td>20 mg</td>
<td>Higher relative GI risk</td>
</tr>
<tr>
<td>Celecoxib</td>
<td>200 mg q24 hr</td>
<td>400 mg</td>
<td>COX-2 selective; Dose related renal, CV risks</td>
</tr>
</tbody>
</table>
## Risk of Chronic Kidney Disease

**Table 3. Relationship Between Use of NSAIDs and Risk of Developing CKD in Subjects With Hypertension**

<table>
<thead>
<tr>
<th>Duration/Dosage</th>
<th>Crude HR (95% CI)*</th>
<th>Adjusted HR (95% CI)†</th>
<th>Adjusted HR (95% CI)‡</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of NSAID use days during 1 y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjects not taking any NSAIDs§</td>
<td>Ref</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>Subjects taking NSAIDs for 1–89 d</td>
<td>1.21 (1.11–1.32)</td>
<td></td>
<td>1.18 (1.08–1.29)</td>
</tr>
<tr>
<td><strong>Subjects taking NSAIDs for ≥90 d</strong></td>
<td>1.44 (1.32–1.56)</td>
<td></td>
<td><strong>1.32 (1.21–1.44)</strong></td>
</tr>
<tr>
<td>Average DDD of NSAID use (DDD per d)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DDD/d=0§</td>
<td>Ref</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>DDD/d &gt;0 and ≤1</td>
<td>1.37 (1.24–1.51)</td>
<td></td>
<td>1.26 (1.14–1.40)</td>
</tr>
<tr>
<td><strong>DDD/d &gt;1</strong></td>
<td>1.30 (1.20–1.41)</td>
<td></td>
<td><strong>1.23 (1.13–1.34)</strong></td>
</tr>
<tr>
<td>Cumulative DDD of NSAID use during 1 year (cumulative DDDs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cumulative DDDs=0§</td>
<td>Ref</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>Cumulative DDDs &gt;0 and ≤15</td>
<td>1.16 (1.02–1.33)</td>
<td></td>
<td>1.14 (1.00–1.30)</td>
</tr>
<tr>
<td>Cumulative DDDs &gt;15</td>
<td>1.35 (1.25–1.46)</td>
<td></td>
<td>1.26 (1.16–1.37)</td>
</tr>
</tbody>
</table>

n = 31,976

p <0.05  

Hsu et al. *Hypertension*.2015
“CAN INCREASE THE CHANCE OF HEART ATTACK AND STROKE.”
VIGOR Confirmed CV/Thrombotic Events

https://www.fda.gov/ohrms/dockets/ac/01/slides/3677s2_06_villalba.PPT.accessed March 6, 2017.
In Vitro Selectivity: COX-2/COX-1 Ratio

Adapted from Warner et al. FASEB J. 2004:18:790-804
**Fig. 4** Rate ratios and 95% confidence intervals for major vascular events due to non-steroidal anti-inflammatory drugs. Data from the CNT meta-analysis [68] and McGettigan and Henry [67] meta-analysis.
Cardiovascular Safety of Celecoxib, Naproxen, or Ibuprofen for Arthritis

Steven E. Nissen, M.D., Neville D. Yeomans, M.D., Daniel H. Solomon, M.D., M.P.H., Thomas F. Lüscher, M.D., Peter Libby, M.D., M. Elaine Husni, M.D., David Y. Graham, M.D., Jeffrey S. Borer, M.D., Lisa M. Wisniewski, R.N., Katherine E. Wolski, M.P.H., Qiuqing Wang, M.S., Venu Menon, M.D., Frank Ruschitzka, M.D., Michael Gaffney, Ph.D., Bruce Beckerman, M.D., Manuela F. Berger, M.D., Weihang Bao, Ph.D., and A. Michael Lincoff, M.D., for the PRECISION Trial Investigators*
A Primary APTC Outcome: Intention-to-Treat Population

Celecoxib vs. ibuprofen, hazard ratio, 0.85
(95% CI, 0.70–1.04); noninferiority P<0.001
Celecoxib vs. naproxen, hazard ratio, 0.93
(95% CI, 0.76–1.13); noninferiority P<0.001
Ibuprofen vs. naproxen, hazard ratio, 1.08
(95% CI, 0.90–1.31); noninferiority P=0.02

B Primary APTC Outcome: On-Treatment Population

Celecoxib vs. ibuprofen, hazard ratio, 0.81
(95% CI, 0.65–1.02); noninferiority P<0.001
Celecoxib vs. naproxen, hazard ratio, 0.90
(95% CI, 0.71–1.15); noninferiority P<0.001
Ibuprofen vs. naproxen, hazard ratio, 1.12
(95% CI, 0.89–1.40); noninferiority P=0.025
Risk of acute MI with NSAIDs in real world use

Onset of CV risk within 7 days

Greatest CV risk 1 – 7 days

Increase in CV risk days 1 - 30

Higher doses = greater CV risk

ibuprofen > 1200 mg
naproxen > 750 mg
celecoxib > 200 mg
diclofenac > 100 mg

No differences in risk among NSAIDs

n = 446, 763

Bally et al. BMJ. 2017
Minimizing the Cardiovascular Risk

- NSAID avoidance of all NSAIDs if known CVD, HTN
- Lowest effective NSAID dose
- Naproxen (<750 mg) preferred
- Aspirin administration 2h before NSAID
- Inquiry regarding OTC use, counseling
NSAID Gastrointestinal Effects

• GI effects are common
  ◦ COX-1 inhibition
  ◦ 60% of nonselective NSAID users
  ◦ PUD develops in 25% chronic NSAID users

• Risk factor awareness

• Employ strategies to reduce GI risk

Hawboldt. US Pharmacist. 2008
### Patients at Increased Risk for NSAID GI Toxicity

#### High risk

1. History of a previously complicated ulcer, especially recent
2. Multiple risk factors (>2)

#### Moderate risk (1-2 risk factors)

1. Age > 65 years
2. High Dose NSAID therapy
3. Previous history of uncomplicated ulcer
4. Concurrent use of aspirin, corticosteroids or anticoagulants

*H. Pylori is an independent and additive risk factor*

---

### Recommendations for prevention of NSAID-related ulcer complications

<table>
<thead>
<tr>
<th>Gastrointestinal risk</th>
<th>Low CV risk</th>
<th>Moderate CV risk</th>
<th>High CV risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low CV risk</td>
<td>NSAID alone</td>
<td>NSAID + PPI/misoprostol</td>
<td>Alternative therapy or COX-2 + PPI/misoprostol</td>
</tr>
<tr>
<td>High CV risk (low dose aspirin)</td>
<td>Naproxen + PPI/misoprostol</td>
<td>Naproxen + PPI/misoprostol</td>
<td>Avoid NSAIDs Use alternative therapy</td>
</tr>
</tbody>
</table>

Lanza et al. *Am J Gastroenterol*. 2009
Minimizing Risks with NSAIDs

- Regular inquiry regarding use
- Lowest effective dose, shortest duration
- Avoidance if age \( \geq 65 \) years
- Topical NSAIDs
- Concomitant PPI, misoprostol
- Monitor renal function, GI symptoms
Proton Pump Inhibitors

- Widespread chronic use
  - >15 million Americans
  - 70% PPI prescriptions with no indication
  - 25% PPI users could discontinue therapy without concerns

- Use associated with older age, multiple comorbidities

Place in Therapy

- GERD, PUD, GI bleeding, Zollinger-Ellison, Barretts Esophagus, H. pylori infection

- Presence of multiple risk factors for bleeding
  - Concurrent antiplatelets, anticoagulants, NSAIDs, advanced age

- Stress ulcer prophylaxis
  - Mechanical ventilation > 48 hours
  - Coagulopathy
  - Recent UGIB
  - 2 minor criteria
    - High dose steroids + presence of additional risk factors for ulcer development

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
<th>Time to Peak (hours)</th>
<th>Bioavailability</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Omeprazole* (Prilosec®)</td>
<td>20 mg</td>
<td>0.5 – 3.5</td>
<td>45%</td>
<td>Potent CYP2C19 Inhibitor (Plavix, warfarin)</td>
</tr>
<tr>
<td>Esomeprazole* (Nexium®)</td>
<td>20 mg</td>
<td>1.5</td>
<td>90%</td>
<td>Absorption ↓ with food</td>
</tr>
<tr>
<td>Lansoprazole (Prevacid®)</td>
<td>30 mg</td>
<td>1.5 - 3</td>
<td>85%</td>
<td>Absorption ↓ with food</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Potent CYP2C19 Inhibitor</td>
</tr>
<tr>
<td>Dexlansoprazole (Dexilant®)</td>
<td>30 mg</td>
<td>2</td>
<td>85%</td>
<td>Take with or without food</td>
</tr>
<tr>
<td>Pantoprazole (Protonix®)</td>
<td>40 mg</td>
<td>2 – 2.5</td>
<td>77%</td>
<td></td>
</tr>
<tr>
<td>Rapebrazole (Aciphex®)</td>
<td>20 mg</td>
<td>2 - 5</td>
<td>52%</td>
<td>Most potent acid suppression</td>
</tr>
</tbody>
</table>
Negative Health Associations

- Clostridium difficile infection (CDI) *
- Osteoporosis, bone fractures *
- Vitamin B12, Magnesium Deficiency *
- ESBL carriage
- Renal insufficiency
- Community acquired PNA

*FDA Warnings

FDA.gov/drugs/drugsafety/ucm290510.htm
Gordon et al. J Hosp Infection. 2015
PPIs and Risk of Enteric Infection

- Gastric acid secretion plays important role in maintaining balance of gastrointestinal microflora

- Increased risk of enteric infections
  - *C. difficile*: concomitant PPI + antibiotics > PPI monotherapy
  - *Salmonella*
  - *Campylobacter*
  - Spontaneous bacterial peritonitis

- Risk factors: elderly, immunodeficiency, cirrhosis

Deshpande et al.*J Gastroenterol Hepatol.* 2014
PPIs + Antibiotics: A Risky Combo

- Gordon et al. 2015
  - Retrospective cohort study of patients receiving PPIs + CDI
  - Increased risk with use of certain antimicrobials
    - Fluoroquinolones (Cipro > Levaquin)
    - Clindamycin
    - Cephalosporins
  - >2x incidence CDI when receiving PPI + high risk antimicrobials
    - (95% CI 1.52 – 3.23; p = 0.0001)
  - 1 case CDI per 104 patients on PPI + antibiotic

PPIs + Antibiotics: A Risky Combo

- Need for focus on PPI stewardship
  - Difference in high dose vs low dose PPIs?
  - Link with duration of use?
  - Extrapolation to H2 receptor antagonist use?

- Prevention of CDI
  - Patient counseling
  - Thorough medication history evaluations
  - Ongoing evaluation for PPI indication, dosing
  - Antimicrobial stewardship
PPIs and Risk of Pneumonia

![Graph showing summary forest plot of overall risk of community-acquired pneumonia with outpatient proton pump inhibitor use, subdivided by study design and effect estimate. Solid diamond represents effect estimate. Shaded box size is proportional to the weight of the study in the meta-analysis. Confidence intervals are denoted by horizontal lines, with arrows where confidence interval extends beyond figure. Vertical dashed line represents the null effect. The open diamond is centered at the summary effect estimate and proportional to the confidence interval.](image-url)

Dublin et al. *Pharmacoepidemiol Drug Saf.*2010
PPIs and Renal Damage

- Association with acute interstitial nephritis (AIN), chronic kidney disease (CKD)
- Deposition in kidneys stimulates immune response
- PPIs > H2RA
- Risk Factors
  - Elderly > young adults
  - Preexisting renal disease
# PPIs and AKI: The Evidence

**Table 2: Association between proton pump inhibitor use and kidney outcomes in 290,592 patients newly prescribed proton pump inhibitor therapy and an equal number of matched controls**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group: no. (%) of events</th>
<th>Group: rate per 1000 person-years</th>
<th>HR (95% CI)*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PPI</td>
<td>Control</td>
<td>PPI</td>
</tr>
<tr>
<td>Kidney outcomes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute kidney injury</td>
<td>1,269 (0.4)</td>
<td>518 (0.2)</td>
<td>13.49</td>
</tr>
<tr>
<td>Acute interstitial nephritis</td>
<td>30 (0.0)</td>
<td>10 (0.0)</td>
<td>0.32</td>
</tr>
<tr>
<td>Tracer outcome</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cataract surgery</td>
<td>4,976 (1.7)</td>
<td>5,179 (1.8)</td>
<td>53.30</td>
</tr>
</tbody>
</table>

Note: CI = confidence interval; HR = hazard ratio; PPI = proton pump inhibitor.
*Reference group is patients not prescribed a PPI.

n = 290, 592

2-fold increase in hospitalization for AKI after PPI initiation
PPIs and CKD: The Evidence

- **Lazarus et. al**
  - Prospective cohort study, replication cohort study
  - >10,000 patients over 14 years
  - 50% increased risk of CKD in PPI users vs. nonusers (HR 1.45; 95% CI 1.11 – 1.90)
  - Dose related response
  - PPIs > H2RAs

- **Arora et. al**
  - Retrospective case-control study
  - >71,000 VA patients over 7 years
  - 34% developed CKD, were more likely to be chronic PPI users (95% CI 1.05 – 1.16)

- **Xie et. al**
  - Retrospective cohort study
  - Followed >170,000 new PPI users over 5 years
  - Increased risk CKD and doubling of serum creatinine level
  - (HR 1.22; 95% CI 1.18 – 1.26)

Consequences of Reduced Gastric Acidity

- $B_{12}$, magnesium deficiencies
  - Chronic > intermittent use
  - Annual monitoring
  - Discontinuation if symptomatic
    - Mg: tremors, paraesthesias, tetany
  - Resolution within weeks

- Bone fractures
  - Increased risk of wrist/hip/spinal fractures in elderly patients
  - Risk Factors
    - Age
    - Females > males
    - Smoker
    - PPI dose
    - PPI duration

Lam et al. JAMA.2013
Cheungpasitporn et al. Ren Fail.2015.
www.fda.gov/drugs/safety/ucm245011.htm
2015 Evaluation of PPI use at EHS

- 55% continued upon transfer from unit \(\rightarrow\) floor without documented indication for continued use
- 36% discharged on PPI without documented indication
- 5% developed Clostridium difficile infection during therapy

Policy: automatic discontinuation of stress ulcer prophylaxis when no longer indicated
Why is patient taking a PPI?

- Mild-mod Esophagitis or GERD treated 4-8wk
- Indication Unknown

- Treated peptic ulcer disease
- ICU stress ulcer prophylaxis
- Treated, uncomplicated h. pylori

- Barrett's esophagus
- Chronic NSAID users with high bleeding risk
- Severe esophagitis
- History of bleeding GI ulcer

**Recommend Deprescribing**

Decrease to lower dose
- OR - Stop and use on-demand

Stop PPI

Monitor at 4 and 12 weeks
- Heartburn
- Regurgitation
- Dyspepsia
- Epigastric pain

**Farrell et al. Can Fam Physician. 2017**
PPI Stewardship Strategies

- Continual evaluation for indication

- Consider home medication reconciliations
  - GERD not always indication for chronic therapy
  - Consider trial off of PPI, when appropriate
  - Counsel on strategies for symptom avoidance

- PPI initiation in acute care setting
  - Reevaluate indication upon transitions of care
  - Avoid duplication of acid suppressive therapies
Summary

- Counseling is key!
  - Frequent, thorough medications reviews key
  - Awareness of health literacy level

- Cough and Cold Products
  - Antihistamine avoidance in elderly
  - Judicious use of decongestants

- NSAIDS
  - Avoidance, low doses and short durations
  - Toxicities relative to COX selectivity
  - Monitor renal function

- PPIs
  - Stewardship
  - Discontinuation or step down therapy where appropriate
Hidden in Plain Sight: Dangers of Commonly Used Nonprescription Medications

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