



Highmark/West Virginia Medical Institute

# Drug Safety Project



## **Background**

Medication toxic effects and drug related interactions can have profound medical and safety consequences for older adults and economically affect the health care system. Studies link prescription drug use by the elderly with adverse drug events (ADEs) that contribute to hospitalization, increased length of stay and duration of illness, falls, fractures and even death.

Although national guidelines have been published to define specific medications to be avoided in the elderly, many elderly patients continue to receive these medications inappropriately. Providers have been encouraged to use electronic prescribing systems that screen for potential drug on drug interactions (DDIs) or drug disease interactions that could result in an ADE. Too often, however, the appropriate actions are not taken to avoid ADEs in the setting of a potential drug on drug or drug disease event.

## **Objectives**

The purpose of this initiative is to reduce the potential for ADEs in a targeted population of elderly Highmark FreedomBlue Medicare Advantage members.

Goal One: Decrease the frequency of a set of high risk medications (HRMs) prescribed to the targeted population. These drugs include:

1. Nitrofurantoin
2. Propoxyphene and combinations
3. Muscle relaxants – Carisoprodol, Cyclobenzaprine, Methocarbamol

Goal Two: Decrease ADEs resulting from the harmful DDI of the following medications in patients with congestive heart failure:

- Verapamil or diltiazem and beta blockers

Goal Three: Decrease ADEs resulting from potentially harmful drug disease interactions:

- Tricyclic antidepressants or anticholinergic agents in patients with dementia\*

## **Action**

West Virginia Medical Institute (WVMI) will provide direct follow up to a select group of primary care practices in West Virginia. Variations in prescribing patterns and patient profiles will be provided and reviewed by WVMI staff. Where possible, formulary alternatives have been identified and confirmed by pharmaceutical experts and are included in the following table.

\*Dementia patients will be identified as those currently taking Aricept, Nimendia, or Exelon

## High Risk Medications (HRMs)

| Drug Group                                     | Medication   | Adverse Effects  | Comments   |
|--|--|--|--|
| <b>Antibiotics</b>                             | nitrofurantoin (Macrochantin)  | Potential for renal impairment   | There are a number of medications used to treat UTIs. There has been growing concern around the overuse of fluoroquinolones. Therefore, the literature recommends the use of Sulfamethoxazole/Trimethoprim (Bactrim) as the first line agent. If the patient is intolerant or allergic to SMX/TMP, fluoroquinolones (Cipro) remain a viable treatment option. In rare cases, antibiotic choice may need to be driven by bacterial sensitivities. |
| <b>Analgesic-Propoxyphene and combinations</b> | propoxyphene hydrochloride (Darvon)  | CNS adverse effects include drowsiness, dizziness and confusion. Offers few analgesic advantages over acetaminophen yet has the adverse effects of other narcotic drugs. | Dependent upon severity of pain:<br>acetaminophen<br>opioid/acetaminophen combinations<br>opioid for severe pain   |
| <b>Muscle Relaxants</b>                        | carisoprodol (Soma)<br>cyclobenzaprine (Flexeril)<br>methocarbamol (Robaxin) | Most muscle relaxants and antispasmodic drugs are poorly tolerated by elderly patients, since they cause anticholinergic adverse effects, sedation and weakness.         | baclofen, tizanidine<br><br><b>Non pharmacologic:</b><br>Avoid complications, restore movement, implement motion/gait training   |

## Drug on Drug Interactions (DDIs)

| Drug Class  | Drug Class   | Comments   |
|---|--|--|
| <p><b>Calcium Channel Blockers</b><br/>                     verapamil<br/>                     (Calan, Covera, Isoptin, Verelan)</p> <p>diltiazem<br/>                     (Cardizem, Cartia XT, Dilacor XR, Diltia XT, Tiazac)</p> | <p><b>Beta Blockers</b></p> <ul style="list-style-type: none"> <li>• <a href="#">acebutolol</a> (Sectral)</li> <li>• <a href="#">atenolol</a> (Tenormin)</li> <li>• <a href="#">betaxolol</a> (Kerlone)</li> <li>• <a href="#">betaxolol</a> (Betoptic, Betoptic S)</li> <li>• <a href="#">bisoprolol</a> fumarate (Zebeta)</li> <li>• carteolol (Cartrol)</li> <li>• <a href="#">carvedilol</a> (Coreg)</li> <li>• <a href="#">esmolol</a> (Brevibloc)</li> <li>• <a href="#">labetalol</a> (Trandate, Normodyne)</li> <li>• <a href="#">metoprolol</a> (Lopressor, Toprol XL)</li> <li>• <a href="#">nadolol</a> (Corgard)</li> <li>• nebivolol (Bystolic)</li> <li>• penbutolol (Levatol)</li> <li>• pindolol (Visken)</li> <li>• <a href="#">propranolol</a> (Inderal, InnoPran)</li> <li>• <a href="#">sotalol</a> (Betapace)</li> <li>• <a href="#">timolol</a> (Blocadren)</li> </ul> | <p>Concomitant administration of diltiazem or verapamil with beta blockers in the management of HF is not recommended unless there is a compelling indication.</p> |

## Drug Disease Interactions in Patients with Dementia

| Drug Class                              | Drugs to Avoid  | Alternative Treatment   |
|---|---|---|
| <p><b>Tricyclic Antidepressants</b></p> | <p>amitriptyline (Elavil)<br/>                     amoxapine<br/>                     amitriptyline/perphenazine<br/>                     doxepin<br/>                     imipramine (Tofranil)<br/>                     nortriptyline<br/>                     protriptyline (Vivactil*)<br/>                     trimipramine (Surmontil*)</p> | <p><b>Depression:</b><br/>                     citalopram<br/>                     paroxetine<br/>                     escitalopram (Lexapro®)<br/>                     sertraline<br/>                     bupropion</p> <p><b>Nonpharmacologic:</b><br/>                     (Insomnia):<br/>                     Bright light exposure<br/>                     Sleep hygiene<br/>                     Sleep restriction<br/>                     Stimulus control</p> |

## Anticholinergic Agents to be Avoided

| Drug Class                       | Drugs   | Alternative Treatment   |
|----------------------------------|---|---|
| <b>Skeletal Muscle Relaxants</b> | carisoprodol<br>chlorzoxazone<br>cyclobenzaprine<br>metaxalone (Skelaxin®)<br>methocarbamol<br>orphenadrine   | baclofen<br>tizanidine<br><br><b>Nonpharmacologic:</b><br><br>Avoid complications<br>Restore movement<br>Re-educate motion/<br>gait   |
| <b>Anti-Parkinson's</b>          | benztropine<br>trihexyphenidyl  | amantadine<br>carbidopa/levodopa<br>entacapone (Comtan®)*<br>pramipexole (Mirapex®)<br>ropinirole (Requip®)<br>selegiline   |
| <b>Antihistamines</b>            | azatadine<br>chlorpheniramine<br>cyproheptadine<br>diphenhydramine<br>promethazine<br>triprolidine<br><br>brompheniramine<br>clemastine<br>dexchlorpheniramine<br>hydroxyzine<br>tripelennamine | azelastine (Astelin®)<br>fexofenadine<br>desloratadine (Clarinex®)*<br>levocetirizine (Xyzal®)*<br>loratadine, cetirizine   |
| <b>Antispasmodics</b>            | belladonna<br>clidinium<br>flavoxate<br>propantheline bromide<br><br>oxybutynin<br>tolterodine (Detrol®)<br><br>trimethobenzamide<br><br>buclizine<br>dicyclomine<br>hyoscyamine                | <b>Diarrhea:</b> aluminum hydroxide, cholestyramine, loperamide<br><b>Constipation:</b> enemas, laxatives, stool softener, fiber supplement, polyethylene glycol, psyllium<br><br><b>Incontinence:</b><br>darifenacin (Enablex®)<br>solifenacin (Vesicare®)<br><b>BPH:</b> finasteride<br>dutasteride (Avodart®)<br>tamsulosin (Flomax®)<br>alfuzosin (Uroxatral®)*<br><br>ondansetron<br>granisetron (Kytril®)*<br>dolasetron (Anzemet®)*<br>metoclopramide† |
| <b>Antivertigo/Antiemetic</b>    | cyclizine<br>meclizine<br>scopolamine<br><br>dimenhydrinate<br>prochlorperazine   | <b>Antiemetic:</b> ondansetron<br>granisetron (Kytril®)*<br>dolasetron (Anzemet®)*<br>metoclopramide†   |

\*Denotes non-preferred product based on a Medicare Part D choice formulary. Formulary status is based on members benefit design and is subject to change.

*Italicized alternatives are available over-the-counter and typically excluded from the Medicare Part D benefit.*

†metoclopramide is associated with fewer anticholinergic effects than the agents listed. However, it may cause extrapyramidal symptoms and longterm use should be avoided.

This document serves as a guide and may not apply to all patients and clinical situations. Information presented is not intended to override clinicians' judgment.

#### REFERENCES

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