

Prescribing Focus:

## Geriatric RxMonitor Medication Appropriateness Evaluation (MAE) Tool

Intervention Number	Drug Class <sup>1,2</sup>	Drug(s)	Clinical Rationale/Reasons
1	Amphetamines	<ul style="list-style-type: none"> <li>• Benzphetamine</li> <li>• Dexmethylphenidate</li> <li>• Dextramphetamine</li> <li>• Diethylpropion</li> <li>• Metamphetamine</li> <li>• Methylphenidate</li> <li>• Mixed amphetamines</li> <li>• Phendimetrazine</li> <li>• Phentermine</li> </ul>	Amphetamines may have the potential for causing dependence, hypertension, angina, and myocardial infarction in the elderly. Their use is not recommended in the elderly. <sup>3,4</sup>
2	Analgesic	<ul style="list-style-type: none"> <li>• Ketorolac</li> </ul>	Immediate and long-term use is not recommended in the elderly since a significant number of elderly patients have asymptomatic—but pathologically evident—GI conditions. <sup>4,5</sup>
3	Antianxiety (includes combination drug)	<ul style="list-style-type: none"> <li>• Meprobamate</li> <li>• Meprobamate-ASA</li> </ul>	Meprobamate is a highly addictive and sedating anxiolytic and is not recommended in the elderly. Consider the use of shorter-acting benzodiazepines. <sup>5-7</sup>
4	Antiemetic	<ul style="list-style-type: none"> <li>• Trimethobenzamide</li> </ul>	Trimethobenzamide is not recommended for use in the elderly because it is one of the least effective antiemetics and has a high potential for extra-pyramidal side effects. <sup>6,7</sup>
5	Antiemetic	<ul style="list-style-type: none"> <li>• Scopolamine</li> </ul>	Scopolamine has high anticholinergic effects and it can cause an additive effect when given together with other anticholinergic medications. Scopolamine is contraindicated in patients with angle-closure (narrow angle) glaucoma. <sup>8</sup> Use caution when using Scopolamine in the elderly.
6	Antihistamines (includes combination drugs)	<ul style="list-style-type: none"> <li>• Cyproheptadine</li> <li>• Dexchlorpheniramine</li> <li>• Diphenhydramine</li> <li>• Hydroxyzine</li> <li>• Promethazine</li> </ul>	All non-prescription and many prescription antihistamines have potent anticholinergic properties which can cause prolonged sedation, dizziness, and increased risk of falls in elderly patients. Cough and cold products that do not contain antihistamines should be used whenever possible. <sup>6</sup>
7	Antipsychotics, typical	<ul style="list-style-type: none"> <li>• Thioridazine</li> </ul>	Thioridazine has a high incidence of causing CNS and extrapyramidal adverse effects in the elderly. Please consider safer alternatives. <sup>3,4</sup>

<b>8</b>	Barbiturates	<ul style="list-style-type: none"> <li>• Amobarbital</li> <li>• Butobarbital</li> <li>• Mephobarbital</li> <li>• Pentobarbital</li> <li>• Phenobarbital</li> <li>• Secobarbital</li> </ul>	Barbiturates may cause more side effects than most other sedative/hypnotic drugs in the elderly. They are highly addictive and are potentially fatal in case of an accidental overdose. Barbiturates should not be started as new therapy in the elderly except when used for seizures. <sup>6-9</sup>
<b>9</b>	Benzodiazepines, long-acting (including combination drugs)	<ul style="list-style-type: none"> <li>• Chlordiazepoxide</li> <li>• Diazepam</li> </ul>	Chlordiazepoxide and diazepam have a long half-life in the elderly (up to several days), producing prolonged sedation and an increased risk of falls and fractures. Short- to intermediate-acting benzodiazepines (such as lorazepam or oxazepam) are preferred if anxiolytic therapy with a benzodiazepine is necessary. <sup>6,7,10</sup>
<b>10</b>	Benzodiazepines, long-acting	<ul style="list-style-type: none"> <li>• Flurazepam</li> </ul>	Flurazepam has an extremely long half-life in the elderly (often up to several days), producing prolonged sedation and increased risk of falls. <sup>6,7</sup> Please consider safer alternatives for treatment of insomnia.
<b>11</b>	Calcium Channel Blocker	<ul style="list-style-type: none"> <li>• Nifedipine, short-acting</li> </ul>	Revised labeling for immediate-release nifedipine capsules recommends against use of the short-acting dosage form in treatment of chronic hypertension, acute hypertensive crisis, acute myocardial infarction, or in the setting of acute coronary syndrome. Use of the nifedipine immediate release dosage form in elderly patients with hypertension (71-years-old or older) has been associated with a nearly 4-fold increased risk for all-cause mortality when compared to beta-blockers, ACEIs, or other classes of calcium channel blockers. <sup>11</sup>
<b>12</b>	Gastrointestinal Anti-spasmodics (includes combination drugs)	<ul style="list-style-type: none"> <li>• Atropine</li> <li>• Belladonna alkaloids</li> <li>• Hyoscyamine</li> <li>• Propantheline</li> <li>• Dicyclomine</li> </ul>	GI antispasmodic drugs are highly anticholinergic and may produce substantial side effects in the elderly. Their effectiveness at doses tolerated by the elderly is questionable. These drugs are not recommended for use in the elderly, especially for long-term use. <sup>6</sup>
<b>13</b>	Narcotics (includes combination drug)	<ul style="list-style-type: none"> <li>• Meperidine</li> </ul>	Meperidine is not recommended for use in the elderly because accumulation of its metabolite (normeperidine) is associated with neurotoxicity and possible seizures. For severe pain, consider the use of other opioids such as morphine, hydromorphone, or codeine. <sup>6,8,9</sup>
<b>14</b>	Narcotics (includes combination drugs)	<ul style="list-style-type: none"> <li>• Pentazocine</li> </ul>	Pentazocine is a mixed opioid agonist-antagonist associated with more CNS side effects—including confusion and hallucinations—than other narcotic agents. Pentazocine may also cause falls, fractures, dependency, and withdrawal. Consider the use of other narcotic analgesics. <sup>5,6,9</sup>
<b>15</b>	Narcotics (includes combination drugs)	<ul style="list-style-type: none"> <li>• Propoxyphene</li> </ul>	Propoxyphene is not recommended for use in the elderly because it offers few analgesic advantages over acetaminophen, yet has the side effects of other narcotic agents. Consider the use of other analgesics such as acetaminophen. <sup>5,6</sup>
<b>16</b>	Oral Hypoglycemics	<ul style="list-style-type: none"> <li>• Chlorpropamide</li> </ul>	Chlorpropamide has an increased half-life in the elderly (> 35 hours) and can cause prolonged and serious hypoglycemia. It also causes SIADH and hyponatremia. Other antidiabetic agents (such as glipizide) should be considered. <sup>6,7</sup>
<b>17</b>	Skeletal Muscle Relaxants (includes combination drugs)	<ul style="list-style-type: none"> <li>• Chlorzoxazone</li> <li>• Cyclobenzaprine</li> <li>• Carisoprodol</li> <li>• Metaxalone</li> <li>• Methocarbamol</li> </ul>	Most muscle relaxants are poorly tolerated by the elderly. Side effects include prolonged sedation, weakness, and increased risk of falls. The efficacy of muscle relaxants at lower doses tolerated by elderly patients is questionable. The use of muscle relaxants by elderly patients is not recommended. <sup>6</sup>

<b>18</b>	Skeletal Muscle Relaxants (includes combination drugs)	<ul style="list-style-type: none"> <li>• Orphenadrine</li> </ul>	Orphenadrine may cause more sedation and anticholinergic adverse effects than other muscle relaxants. Consider safer alternatives. <sup>3,4</sup>
<b>19</b>	Vasodilators	<ul style="list-style-type: none"> <li>• Ergoloid mesyloids</li> <li>• Ergotamine</li> <li>• Dihydroergotamine</li> </ul>	Ergot Mesyloids (such as Hydergine) have not been shown to be effective, in the doses studied, for the treatment of dementia or any other condition. Their use is not recommended in the elderly. <sup>6,12</sup>
<b>20</b>	Vasodilators	<ul style="list-style-type: none"> <li>• Dipyridamole, short-acting</li> </ul>	Dipyridamole when used alone is ineffective as an antithrombotic for patients with myocardial infarction. <sup>8</sup> Consider alternatives with better efficacy.
<b>21</b>	Vasodilators	<ul style="list-style-type: none"> <li>• Isoxsuprine</li> </ul>	Isoxsuprine is listed as possibly effective for its labeled indication. <sup>3</sup> Consider alternatives with better efficacy.
<b>22</b>	Others	<ul style="list-style-type: none"> <li>• Methyltestosterone</li> </ul>	Male androgens should be avoided in elderly patients due to the potential for causing and worsening prostatic hypertrophy and cardiac problems. <sup>3,4</sup>
<b>23</b>	Others	<ul style="list-style-type: none"> <li>• Nitrofurantoin</li> </ul>	Nitrofurantoin is not recommended in elderly patients due to the potential for renal impairment. Safer alternatives are available. <sup>3,4</sup>
<b>24</b>	Others	<ul style="list-style-type: none"> <li>• Thyroid, desiccated</li> </ul>	Caution should be exercised if desiccated thyroid is prescribed in the elderly. Elderly patients may have underlying cardiovascular instability; therefore, thyroid doses in this population should be lower than the normal adult dose. Please consider safer alternatives. <sup>3,4</sup>
<b>25</b>	Oral Estrogens	<ul style="list-style-type: none"> <li>• Conjugated estrogens</li> <li>• Conjugated estrogens-medroxyprogesterone</li> <li>• Esterified estrogens</li> <li>• Esterified estrogens methyltestosterone</li> <li>• Estropipate</li> </ul>	Oral estrogens should be avoided in elderly women due to the evidence of potential carcinogenic (breast and endometrial cancer) effects from these agents and the lack of cardioprotection in this population. <sup>3</sup> Oral estrogens should not be used as first-line agents for osteoporosis prevention.
<b>26</b>	Sedative/Hypnotic Agents	<ul style="list-style-type: none"> <li>• Zolpidem</li> <li>• Zolpidem CR</li> </ul>	Sedating agents pose an increased risk for falls, especially in patients with a prior history of falls. <sup>13,14</sup> If zolpidem or a related product must be prescribed, please caution patients about the potential for impaired motor function and increased risk for falls.
<b>27</b>	Antipsychotics, atypical	<ul style="list-style-type: none"> <li>• Quetiapine</li> <li>• Quetiapine SR</li> </ul>	Antipsychotic drugs, such as quetiapine, may cause orthostatic hypotension, dizziness, and syncope, which may increase the risk for falls in susceptible individuals, especially in patients with a prior history of falls. Please caution patients about this risk. <sup>13,15</sup>
<b>28</b>	Antidepressants	<ul style="list-style-type: none"> <li>• Amitriptyline</li> <li>• Amitriptyline/Chlordiazepoxide</li> <li>• Amitriptyline/Perphenazine</li> </ul>	Amitriptyline may impair motor skills and pose a risk for falls in older patients, especially in patients with a prior history of a hip fracture. <sup>8,13</sup> If clinically appropriate, please consider alternative therapies.
<b>29</b>	Antipsychotic/Antiemetic	<ul style="list-style-type: none"> <li>• Prochlorperazine</li> </ul>	Prochlorperazine may cause drowsiness, including CNS depression, which may impair motor skills and pose a risk for falls in older patients, especially in patients with a prior history of a hip fracture. <sup>8</sup>

<b>30</b>	Anticholinergic Agents	<ul style="list-style-type: none"> <li>• Tolterodine</li> <li>• Tolterodine SR</li> <li>• Oxybutynin</li> <li>• Oxybutynin ER</li> </ul>	Drugs with anticholinergic properties, such as tolterodine and oxybutynin, have been associated with cognitive impairment in elderly patients. Patients with dementia who concurrently use an anticholinergic drug may compromise the effectiveness of cholinesterase inhibitors. <sup>13</sup> Please initiate therapy with caution in this population.
<b>31</b>	Antiemetics	<ul style="list-style-type: none"> <li>• Meclizine</li> </ul>	Drugs with anticholinergic properties, such as meclizine, have been associated with cognitive impairment in elderly patients. Patients with dementia who concurrently use an anticholinergic drug may compromise the effectiveness of cholinesterase inhibitors. <sup>13</sup> Please initiate therapy with caution in this population.
<b>32</b>	Antidepressants	<ul style="list-style-type: none"> <li>• Amitriptyline</li> <li>• Amitriptyline/Chlordiazepoxide</li> <li>• Amitriptyline/Perphenazine</li> </ul>	Drugs with anticholinergic properties, such as amitriptyline, have been associated with cognitive impairment in elderly patients. <sup>13</sup> Patients with dementia who concurrently use an anticholinergic drug may compromise the effectiveness of cholinesterase inhibitors. <sup>13</sup> Please initiate therapy with caution in this population.
<b>33</b>	Antipsychotic/Antiemetic	<ul style="list-style-type: none"> <li>• Prochlorperazine</li> </ul>	Prochlorperazine has anticholinergic effects which may potentially compromise the effectiveness of cholinesterase inhibitors in patients with dementia. <sup>8</sup> Please consider other safer options.

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