DRUGS for the ELDERLY

HOW MEDICATION AFFECTS THE ELDERLY PATIENT

Debbie Harrell, M.S., DPh.

OBJECTIVES

- Understand the need to individualize medication for the elderly patient.
- Recognize medications that may have a negative impact on the elderly
- Discuss factors that limit effectiveness of the medication regimen

THE TYPICAL ELDERLY PATIENT

- 35% of individuals >65yrs have 3 or more chronic conditions
- Patients at home take 3 or more different drugs daily
- Patients in institutions take >10 different drugs daily
- Inherited therapy
Caregiver Burden in AD

- Compared with noncaregiver controls matched by age, gender, race and marital status, caregivers of persons with AD or related disorders require
  - 46% more physician visits
  - 71% more prescribed medications
  - Higher diastolic blood pressure
  - Hypercoagulable state
  - Higher plasma norepinephrine

Polypharmacy

“The unwanted duplication of drugs that often results when patients go to multiple physicians or pharmacies”
and Self-Medicate

“Administration of a drug or drugs is the most common and cost effective therapeutic intervention provided to ill senior citizens when they seek medical attention.”

Risks

♦ ½ of all hospital days used by the elderly
♦ 30% of hospital admissions in elderly patients may be linked to medications
♦ 20% incidence of drug interactions if taking 10 or more medications
♦ 5th leading cause of death
Epilepsy in an Extended Care Facility

- 12.2% were taking anti-epileptics
- 36% had no documented indication
- 46% were taking two or more agents
- 53% had at least one serum concentration outside the therapeutic range

Customizing Medications

- Begin with a complete medication history
- Compliance
- Communication

Medication History

- Determine all medications the patient is taking.
  - What
  - How long
  - Why
  - Source
  - Cost
<table>
<thead>
<tr>
<th>Side Effect</th>
<th>Adverse Reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drowsiness</td>
<td>Hairgrowth</td>
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<tr>
<td></td>
<td>Loss of appetite</td>
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<tr>
<td>Skin rash</td>
<td>Increased temperature</td>
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<tr>
<td></td>
<td>Tardive dyskinesia</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Anticholinergic Side Effects</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Red as a beet</td>
<td>Dry as a bone</td>
</tr>
<tr>
<td>Blind as a bat</td>
<td>Hot as a hare</td>
</tr>
<tr>
<td>Mad as a hatter</td>
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<table>
<thead>
<tr>
<th>Alterations in Taste Perceptions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of Taste</td>
<td>Bitter Taste</td>
</tr>
<tr>
<td>Metallic Taste</td>
<td>Decreased Salt Sensitivity</td>
</tr>
<tr>
<td>Decreased Sweet Sensitivity</td>
<td>Salty Taste</td>
</tr>
<tr>
<td>Decreased Taste Sensitivity</td>
<td></td>
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</tbody>
</table>
Compliance

- Simplify
  - use long acting medications
cardizem cd
  - combine medications
ACE / diuretic
- Schedule to fit lifestyle
furosemide
- Write it down

What Your Patient is Reading

Are you throwing away good drugs?
Is the oral route the best choice?

### Routes of Administration
- Oral
- Per tube
- Sublingual / mucal
- Transdermal
- Intramuscular
- Subcutaneous
- Intravenous
- Per rectum

### Medication Forms
- Tablets/capsules
  - immediate release
  - extended release
- Liquids
  - syrups
  - suspensions
- Topical patches
- Parenteral
- Suppositories
DRUGS AND ENTERAL FEEDINGS

- **Gel Formation**
  - Dimetane elixir
  - Robitussin expectorant
  - Sudafed syrup
  - Mellaril oral solution
  - Thorazine concentrate
  - Cibalith-S syrup
  - Feosol elixir
  - Potassium liquid
  - Dilantin suspensions
  - Lanoxin elixir

AGING AND DRUG DISPOSITION

- **Absorption** -- the GI tract
- **Distribution** -- the body composition
- **Metabolism** -- the liver
- **Excretion** -- the kidneys
Absorption
the GI tract
- Dry mouth, dehydration
- Difficulty swallowing
- Decreased acid production?
- Decreased GI motility
- Constipation

Distribution
the body composition
- Decreased water
- Increased fat
- Decreased muscle
- Loss of organ function

Metabolism
the liver
- First pass metabolism
  - beta blockers: metoprolol vs propranolol
  - statins: lower doses - simvastatin 5 mg starting dose
- Decreased albumin
  - phenytoin
- Decreased protein stores
  - coumadin
- Cytochrome P450 system
  - many many meds affected
Excretion of the kidneys
- Removes medication and metabolites from the body
- Decreased function: approximately 10% every decade
- Lab values may appear normal

Estimating kidney function
- Cockcroft and Gault Equation for calculating creatinine clearance

\[
(140 - \text{Age})(\text{ideal body weight in kg}) \quad \text{for men} \\
\frac{\text{for men}}{(72)(\text{serum creatinine})} \\
\text{Multiply } x 0.85 \text{ for women}
\]

Renal dosing
- Gentamicin, tobramycin, amikacin
- Vancomycin
- Enoxaparin
- Digoxin
- Mirtazapine
- Other antibiotics, antidepressants, opiates, antihypertensives
Electrolyte Imbalances
- Hyponatremia
- Hypokalemia
- Hyperkalemia

Heart Failure
- Affects 6% to 10% of the elderly
- Requires 4 or more medications
- Concomitant diseases often present
- NSAID's
- COX-2 inhibitors
- Rosiglitazone & pioglitazone
- Carbamazepine
- Pergolide

Pain Meds
- Morphine
- Demerol
- Dilaudid
- Methadone
- Percocet
- Lortab
- Fentanyl
Beer’s Criteria

♦ 1991 original criteria
♦ 1997 updated Beer’s criteria
♦ 1999 Adopted by CMS
♦ 2003 published update
  by U.S. consensus panel

Goal

♦ Every drug is clinically indicated for this individual patient and is prescribed at its lowest effective dose
Resources
- FDA
- Medwatch
- NIH Senior Health
- Patient Advocate
- AARP
- Clinical Trials

FDA Medwatch
- Deaths with atypical antipsychotics in elderly patients with behavioral disturbances
  - Deaths due to heart related events
  - Infections
- Atypical antipsychotics are not approved for treatment of behavior disorders in patients with dementia.
- Warning also expected for older antipsychotics
Recommended Reading

Updating the Beers Criteria for Potentially Inappropriate Medication Use in Older Adults by Donna Fick, James Cooper, William Wade, etc in Arch Intern Med. 2003; 163: 2716-2724