GERIATRIC POLYPHARMACY

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Pacific University
No Disclosures
Old age is no place for Sissies ~~ Betty Davis
There is no instruction manual for growing old.......
Objectives:

■ Explore geriatric polypharmacy prevalence and its dangers
■ Examine some of the more problematic medications given to the aging population
■ Develop a systematic approach to evaluating the risks and benefits of problematic common medications that are frequently prescribed
■ Introduce helpful tools to assist in reducing problematic medications with support and safety.

Note: Any changes in medications must be clinically appropriate relative to the individual patient and be approved by patient’s provider.
Polypharmacy is associated with.....

- increased risk of using potentially inappropriate medications (PIMs)
- negative effects on long-term physical and cognitive functioning
- Polypharmacy also results in medication nonadherence
- increased risk of drug duplication, drug–drug interactions and adverse drug reactions (ADRs)
- higher health care costs
Polypharmacy and Comorbidities

Journal of Pharmacy and Pharmaceutical Sciences 2014
Adverse Outcomes in Relation to Polypharmacy in Robust and Frail Older Hospital Patients
Author links open overlay panel Arjun Poudel PhD, Nancye Peel PhD, Lisa Nissen PhD, Charles Mitchell, Leonard Gray Ph D, Ruth Hubbard MD.
Journal of American Medical Directors Association 1 August 2016, Pages 767.e9-767.e13
The kidneys' ability to filter declines by 25 to 50% between the ages of 20 and 90.

The size of the liver decreases 25-35% with age and its blood flow is reduced by about 40%.

- Increasing drug concentrations
- Increasing amount of time drug remains in body
- More side effects or adverse events
- Increasing likelihood of prescribing cascade
Problematic Medications for the Aging Population

1. Opioids
2. Benzodiazepines
3. Anticholinergic
4. Antipsychotics for Insomnia or Dementia
Opiates and the aging

- From 1996 through 2010, the number of opioid prescriptions provided to older patients increased 9-fold.

- More alarming, 35% of patients aged older than 50 years with chronic pain reported misuse of their opioid prescriptions in the past 30 days.

- According to the American Geriatric Society, nearly 80% of elderly patients in long-term care settings have substantial pain, yet 25% do not receive any treatment.

Opiates and the aging

- Nausea
- Constipation
- Urinary retention
- Pruritus
- Central nervous system adverse effects

Sedation and mild cognitive impairment are the other common side effects of opioids in elderly.

Combinations of opioids and other central nervous system (CNS) depressant drugs such as barbiturates, benzodiazepines, antidepressants, and antipsychotics often have additive effects on sedation.
Opiates and the aging

- Respiratory depression – COPD/asthma - greater danger hypoxia

- Opioid-induced hyperalgesia

Patients who are receiving increasing doses of opioids may have opioid-induced hyperalgesia. This is the phenomenon of increasing sensitivity to both pain (hyperalgesia) and non-painful stimuli (allodynia).

The mechanism of action is due to toxic metabolites of opioid (morphine-3-glucuronide (M3G) or hydromorphone-3-glucuronide (H3G), activation of N-methyl-D-asparate (NMDA) receptors in the CNS. Since it is due to the effect of toxic metabolites, the other opioid hyper excitability effects such as myoclonus,
Opiates and the aging

- **Cardiovascular system** - Less well known adverse effects include cardiovascular instability. Opioid therapy increases catecholamine secretion via the hypothalamus and brain stem.


- **Endocrine** - Opioids exert this effect via the hypothalamic-pituitary-gonadal axis. Additional effects on adrenal hormones, weight and blood pressure.

- **Diminished bone density**
Opiates and the aging

- Non-opioid pharmacotherapy and non-pharmacological therapy are the preferred modalities of treatment for chronic pain. However, in the proper contexts, opioids can be a useful treatment option. They are most beneficial in the short term for acute injuries, including the management of pain postoperatively.

- Use should be time-limited, except in managing certain cancer-related pain syndromes and as a part of end-of-life care.
Opiates and the aging

- Titrate down in small amounts - Cutting 10-20% weekly, more if tolerated.
- Follow-up with patient every 2 weeks - If only cutting the dose by a small fraction -- That is still success.
- Add on other medications to assist with pain relative to injury or dysfunction such as Tylenol “Arthritis,” Lidocaine patches, lidocaine gel, capsaicin cream, Aspercreme, Diclofenac Cream, CBD oil/cream
- Non-oral med Modalities: Physical therapy, chiropractor, stretching/exercise therapy, Geriatric centric yoga, tai chi or qigong, epidural steroid injections, platelet rich plasma injections
# Tapering-Off Program

We recommend that you follow this schedule under the supervision of your doctor or your pharmacist.

<table>
<thead>
<tr>
<th>WEEKS</th>
<th>TAPERING SCHEDULE</th>
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</thead>
<tbody>
<tr>
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<td>17 and 18</td>
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</table>

### Explanations

- **Full dose**
- **Half dose**
- **Quarter of a dose**
- **No dose**
Benzodiazepines/ Hypnotics
You May Be at Risk

You are taking one of the following sedative-hypnotic medications:

- Alprazolam (Xanax®)
- Bromazepam (Lectopam®)
- Clorazepate
- Cloridiazepoxide-amitriptyline
- Clobazam
- Clonazepam (Rivotril®, Klonopin®)
- Diazepam (Valium®)
- Estazolam
- Flurazepam
- Loprazolam
- Lorazepam (Ativan®)
- Lorazepam (Ativan®)
- Lormetazepam
- Nitrazepam
- Oxazepam (Serax®)
- Quazepam
- Temazepam (Restoril®)
- Triazolam (Halcion®)
- Eszopiclone (Lunesta®)
- Zaleplon (Sonata®)
- Zolpidem (Ambien®, Intermezzo®, Edluar®, Sublinox®, Zolpimist®)
- Zopiclone (Imovane®, Rhovane®)

Deprescribing.org
Number of Deaths from Benzodiazepines

USA

Source: National Center for Health Statistics, CDC Wonder
Benzodiazepines

Anxiety often a nonspecific symptom – adaptive
No evidence base for use in behavioral disturbances in dementia.

- 1989 study indicates can worsen attention in Dementia
- Highly correlated with delirium and somnolence
- Can increase confusion
- Definitely increases risk of falls
- Can disinhibit patient

Fick et al. Arch Int Med 1639(22):2716-2724, 2003 (Beers criteria)
<table>
<thead>
<tr>
<th>Benzodiazepine Use</th>
<th>All-Cause</th>
<th>Fracture-Related</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any benzodiazepine</td>
<td>0.77 (0.51-1.17)</td>
<td>2.71 (0.37-19.76)</td>
</tr>
<tr>
<td>Diazepam equivalents, &gt;5 mg/d†</td>
<td>0.98 (0.64-1.51)</td>
<td>3.82 (0.52-27.80)</td>
</tr>
<tr>
<td>More than 1 benzodiazepine</td>
<td>1.21 (0.49-2.97)</td>
<td>7.75 (0.75-79.86)</td>
</tr>
<tr>
<td>Benzodiazepine with long half-life‡</td>
<td>1.38 (0.73-2.63)</td>
<td>NA</td>
</tr>
</tbody>
</table>

Abbreviations: CI, confidence interval; NA, not available because no deaths were observed; RR, relative risk.

*From Cox proportional hazards model using the annually observed use of benzodiazepine as the time-dependent covariate, adjusted for sex.
†Equivalents calculated per Salzman. ⁰
‡Diazepam, chlordiazepoxide, flunitrazepam, flurazepam, and nitrazepam.
Why is patient taking a BZRA?
If unsure, find out if history of anxiety, past psychiatrist consult, whether may have been started in hospital for sleep, or for grief reaction.

Engage patients (discuss potential risks, benefits, withdrawal plan, symptoms and duration)

Recommend Deprescribing

Taper and then stop BZRA
(taper slowly in collaboration with patient, for example ~25% every two weeks, and if possible, 12.5% reductions near end and/or planned drug-free days)

- For those ≥ 65 years of age (strong recommendation from systematic review and GRADE approach)
- For those 18-64 years of age (weak recommendation from systematic review and GRADE approach)
- Offer behavioural sleeping advice; consider CBT if available (see reverse)

Monitor every 1-2 weeks for duration of tapering
Expected benefits:
- May improve alertness, cognition, daytime sedation and reduce falls
Withdrawal symptoms:
- Insomnia, anxiety, irritability, sweating, gastrointestinal symptoms (all usually mild and last for days to a few weeks)

Use non-drug approaches to manage Insomnia
Use behavioral approaches and/or CBT (see reverse)

Continue BZRA
- Minimize use of drugs that worsen insomnia (e.g. caffeine, alcohol etc.)
- Treat underlying condition
- Consider consulting psychologist or psychiatrist or sleep specialist

If symptoms relapse:
Consider:
- Maintaining current BZRA dose for 1-2 weeks, then continue to taper at slow rate
Alternate drugs:
- Other medications have been used to manage insomnia. Assessment of their safety and effectiveness is beyond the scope of this algorithm. See BZRA deprescribing guideline for details.
BZRA Availability

<table>
<thead>
<tr>
<th>BZRA</th>
<th>Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alprazolam (Xanax®)</td>
<td>0.25 mg, 0.5 mg, 1 mg, 2 mg</td>
</tr>
<tr>
<td>Bromazepam (Lectoram®)</td>
<td>1.5 mg, 3 mg, 6 mg</td>
</tr>
<tr>
<td>Chlordiazepoxide (Librax®)</td>
<td>5 mg, 10 mg, 25 mg</td>
</tr>
<tr>
<td>Clonazepam (Rivotril®)</td>
<td>0.25 mg, 0.5 mg, 1 mg, 2 mg</td>
</tr>
<tr>
<td>Clorazepate (Tranxene®)</td>
<td>3.75 mg, 7.5 mg, 15 mg</td>
</tr>
<tr>
<td>Diazepam (Valium®)</td>
<td>2 mg, 5 mg, 10 mg</td>
</tr>
<tr>
<td>Flurazepam (Dalmane®)</td>
<td>15 mg, 30 mg</td>
</tr>
<tr>
<td>Lorazepam (Ativan®)</td>
<td>0.5 mg, 1 mg, 2 mg</td>
</tr>
<tr>
<td>Nitrazepam (Mogadan®)</td>
<td>5 mg, 10 mg</td>
</tr>
<tr>
<td>Oxazepam (Serax®)</td>
<td>10 mg, 15 mg, 30 mg</td>
</tr>
<tr>
<td>Temazepam (Restoril®)</td>
<td>15 mg, 30 mg</td>
</tr>
<tr>
<td>Triazolam (Halcion®)</td>
<td>0.125 mg, 0.25 mg</td>
</tr>
<tr>
<td>Zopiclone (Imovane®, Rohovane®)</td>
<td>5 mg, 7.5 mg</td>
</tr>
<tr>
<td>Zolpidem (Sublinox®)</td>
<td>5 mg, 10 mg</td>
</tr>
</tbody>
</table>

T = tablet, C = capsule, S = sublingual tablet

BZRA Side Effects
- BZRA have been associated with:
  - Physical dependence, falls, memory disorder, dementia, functional impairment, daytime sedation and motor vehicle accidents
  - Risks Increase in older persons

Engaging patients and caregivers

Patients should understand:
- The rationale for deprescribing (associated risks of continued BZRA use, reduced long term efficacy)
- Withdrawal symptoms (insomnia, anxiety) may occur but are usually mild, transient and short-term (days to a few weeks)
- They are part of the tapering plan and can control tapering rate and duration

Tapering doses
- No published evidence exists to suggest switching to long-acting BZRAs reduces incidence of withdrawal symptoms or is more effective than tapering short-acting BZRAs
- If dosage forms do not allow 25% reduction, consider 50% reduction initially using drug-free days during latter part of tapering, or switch to lorazepam or oxazepam for final taper steps

Behavioural management

Primary care:
1. Go to bed only when sleepy
2. Do not use bed or bedroom for anything but sleep (or intimacy)
3. If not asleep within about 20-30 min at the beginning of the night or after an awakening, exit the bedroom
4. If not asleep within 20-30 min on returning to bed, repeat #3
5. Use alarm to awaken at the same time every morning
6. Do not nap
7. Avoid caffeine after noon
8. Avoid exercise, nicotine, alcohol, and big meals within 2 hrs of bedtime

Institutional care:
1. Pull up curtains during the day to obtain bright light exposure
2. Keep alarm noises to a minimum
3. Increase daytime activity & discourage daytime sleeping
4. Reduce number of naps (no more than 20 mins and no naps after 2 pm)
5. Offer warm decaf drink, warm milk at night
6. Restrict food, caffeine, smoking before bedtime
7. Have the resident toilet before going to bed
8. Encourage regular bedtime and rising times
9. Avoid waking at night to provide direct care
10. Offer backrub, gentle massage

Using CBT

What is cognitive behavioural therapy (CBT)?
- CBT includes 5-6 educational sessions about sleep/insomnia, stimulus control, sleep restriction, sleep hygiene, relaxation training and support

Does it work?
- CBT has been shown in trials to improve sleep outcomes with sustained long-term benefits

Who can provide it?
- Clinical psychologists usually deliver CBT, however, others can be trained or can provide aspects of CBT education; self-help programs are available

How can providers and patients find out about it?
- Some resources can be found here: [sleepwell.ca](http://sleepwell.ca/)
How to get a good night’s sleep without medication
Anticholinergic Medications

Anticholinergic drugs competitively inhibit binding of the neurotransmitter, acetylcholine. They target either muscarinic acetylcholine receptors or, less commonly, nicotinic acetylcholine receptors. Muscarinic receptors are found on nerve endings to smooth muscles cells, secretory glands and the eye.
**ANTICHOLINERGIC SIDE EFFECTS**

- Hot as a hare
- Dry as a bone
- Dizziness
- Blind as a bat
- Red as a beet

- Can't urinate
- Constipation
- Lose Appetite

Cognition Changes
<table>
<thead>
<tr>
<th>Score 1</th>
<th>Score 2</th>
<th>Score 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>alprazolam</td>
<td>Xanax</td>
<td></td>
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<tr>
<td>atomoxetine</td>
<td>Wellbutrin</td>
<td>amoxapine</td>
</tr>
<tr>
<td>brompheniramine</td>
<td>Veltane</td>
<td>sumatriptane</td>
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<tr>
<td>donepezil</td>
<td>Memont</td>
<td>Carbatrol, Teril</td>
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<tr>
<td>escitalopram</td>
<td>Zoloft</td>
<td>All</td>
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<tr>
<td>escitalopram</td>
<td>Zoloft</td>
<td>All</td>
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<tr>
<td>fluoxetine</td>
<td>Prozac</td>
<td>All</td>
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<tr>
<td>haloperidol</td>
<td>Haldol</td>
<td>All</td>
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<td>haloperidol</td>
<td>Haldol</td>
<td>All</td>
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<tr>
<td>imipramine</td>
<td>Tofranil</td>
<td>All</td>
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<tr>
<td>lorazepam</td>
<td>Ativan</td>
<td>All</td>
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<tr>
<td>lorazepam</td>
<td>Ativan</td>
<td>All</td>
</tr>
<tr>
<td>moclobemide</td>
<td>Proventil</td>
<td>All</td>
</tr>
<tr>
<td>mirtazapine</td>
<td>Remeron</td>
<td>All</td>
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<td>mirtazapine</td>
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<td>mirtazapine</td>
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<tr>
<td>mirtazapine</td>
<td>Remeron</td>
<td>All</td>
</tr>
<tr>
<td>nortriptyline</td>
<td>Pamelor</td>
<td>All</td>
</tr>
<tr>
<td>oxcarbazepine</td>
<td>Trileptal</td>
<td>All</td>
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<td>oxcarbazepine</td>
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<tr>
<td>oxcarbazepine</td>
<td>Trileptal</td>
<td>All</td>
</tr>
</tbody>
</table>

**Key**
- 1 Point = low risk of anticholinergic side effects
- 2 Points = moderate risk of anticholinergic side effects
- 3 Points = high risk of anticholinergic side effects

**References**


<table>
<thead>
<tr>
<th>Anticholinergic Side Effects</th>
<th>Potential Complications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PERIPHERAL</strong></td>
<td></td>
</tr>
<tr>
<td>Decreased salivation</td>
<td>Dental caries, ulceration of gums and buccal mucosa</td>
</tr>
<tr>
<td>Decreased bronchial secretions</td>
<td>Mucous plugging of small airways in patients with asthma or bronchitis</td>
</tr>
<tr>
<td>Increased pupil size</td>
<td>Photophobia, precipitation of acute narrow angle glaucoma</td>
</tr>
<tr>
<td>Visual Changes</td>
<td>Blurred vision, especially when reading small print</td>
</tr>
<tr>
<td>Increased heart rate</td>
<td>Angina, myocardial infarction</td>
</tr>
<tr>
<td>Difficulty urinating</td>
<td>Bladder distention, urinary retention</td>
</tr>
<tr>
<td>Decreased GI motility</td>
<td>Constipation</td>
</tr>
<tr>
<td><strong>COGNITIVE</strong></td>
<td></td>
</tr>
<tr>
<td>Cognitive Impairment</td>
<td>Impaired concentration, confusion, attention deficit, memory impairment</td>
</tr>
</tbody>
</table>
Betty 74 yr old female

**Hypertension**
- Metoprolol XL (Toprol) 100mg qd
- HCTZ/ Triamterene 25mg/37.5mg qd

**Depression with Anxiety**
- Zoloft 50 mg qd
- Wellbutrin 150 mg qd

**Stress/ Urge Incontinence**
- Oxybutynin 5 mg bid

**Back Strain**
- Cyclobenzaprine 10 mg qhs pm

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**Anticholinergic Risk Scale**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metoprolol XL (Toprol)</td>
<td>+1</td>
</tr>
<tr>
<td>HCTZ/ Triamterene</td>
<td>+1</td>
</tr>
<tr>
<td>Zoloft</td>
<td>0</td>
</tr>
<tr>
<td>Wellbutrin</td>
<td>+2</td>
</tr>
<tr>
<td>Oxybutynin</td>
<td>+3</td>
</tr>
<tr>
<td>Cyclobenzaprine</td>
<td>+2</td>
</tr>
</tbody>
</table>

**Total points:**
- **High Risk:** 9 points
- **Lower risk:** 3 points
### Geriatric Polypharmacy

<table>
<thead>
<tr>
<th>Disease State</th>
<th>Preferred Drug (drugs to avoid in parenthesis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergies</td>
<td>loratadine, cetirizine (avoid diphenhydramine and 1st generation agents)</td>
</tr>
<tr>
<td>Depression</td>
<td>SSRIs including sertraline, escitalopram, or fluoxetine or an SNRI (avoid TCAs, paroxetine)</td>
</tr>
<tr>
<td>Insomnia</td>
<td>Trazodone (avoid antihistamines)</td>
</tr>
<tr>
<td>Movement disorder</td>
<td>Dopamine agonists, levodopa</td>
</tr>
<tr>
<td>Nausea</td>
<td>Ondansetron, metoclopramide (avoid meclizine, promethazine)</td>
</tr>
<tr>
<td>Pain</td>
<td>Tylenol, Gabapentin for neuropathic pain, short term oxycodone/acetaminophen, morphine (avoid meperidine)</td>
</tr>
<tr>
<td>Psychotic symptoms</td>
<td>Risperidone, palperidone, Ziprasidone, Lurasidone (phenothiazines, clozapine and olanzapine have the highest burden)</td>
</tr>
<tr>
<td>Urinary Incontinence</td>
<td>Trospium (Sanctura) or solifenacin (Vesicare) are more selective for the bladder (avoid oxybutynin or tolterodine)</td>
</tr>
<tr>
<td>Reflux disorder</td>
<td>PPIs such as esomeprazole, omeprazole, lansoprazole (avoid H2 antagonists such as cimetidine, ranitidine)</td>
</tr>
</tbody>
</table>

Note: Any changes in medications must be clinically appropriate relative to the individual patient and be approved by patient’s provider.
Antipsychotics
Antipsychotics use with Dementia

Antipsychotic drugs

challenging behaviors associated with dementia

FDA warns antipsychotics

increased risk of death severe muscle contractions Increased incidence of falls

Non-drug treatments are often more effective and safer than antipsychotics
Antipsychotics and Aging

- The use of antipsychotics has **serious** concerns about safety in elderly patients affected with dementia for possible risks for stroke and sudden death.

- In the case of elderly patients affected with dementia, every antipsychotic treatment must be prescribed at the **lowest** effective dosage and for the **shortest** period possible. The severity and frequency of symptoms and the global functioning and quality of life, as reported by caregivers, must be always **monitored** during treatment.
Consider these practical strategies for improving sleep behaviour:

For a person who lives in the community:

- Go to bed only when sleepy
- Do not use bed or bedroom for anything but sleep (or intimacy)
- If not asleep within 20-30 min on going/returning to bed, exit the bedroom
- Use alarm to awaken at the same time every morning
- Do not nap
- Avoid caffeine after noon
- Avoid exercise nicotine, alcohol, and big meals 2 hours before bedtime

For a person who lives in long-term care or hospital:

- Pull up curtains during the day for light exposure
- Keep alarm noises to a minimum
- Increase daytime activity
- Reduce the number of naps (no more than 30 min and no naps after 2 pm)
- Use toilet before going to bed
- Have regular bedtime and rising times
- Avoid waking at night for direct care
- Try backrubs, or gentle massages

Personalized antipsychotic dose reduction strategy
Problematic Medications for the Aging Population

1. Opioids
2. Benzodiazepines
3. Anticholinergics
4. Antipsychotics for Insomnia or Dementia
As You Age...
A Guide to Aging, Medicines, and Alcohol

Informed Consent for all treatment including pharmacological

Discussion and documentation of discussion with patient, family or surrogate decision-maker of:

- Risks
- Benefits
- Alternatives (including the risks of no treatment)
- Most important to discuss and document – common risks and most dangerous risks
Appropriate prescribing ....

- Medications have clear, scientific-based indication (efficacy)
- Well tolerated (safety)
- Cost effective
- Respect patient’s preferences, individualized
- Renal and liver function monitoring
- Recommend a medication card that is given for purse/wallet and educating patient to give to every provider at every visit.
- Recommend a medication reconciliation and drug interaction overview at every medication change and at every transition of care.
It is exercise alone that supports the spirits, and keeps the mind in vigor. ~~ Marcus Tullius Cicero
Age is irrelevant.
Ask me how many sunsets I have seen, hearts I’ve loved, trips I have taken or concerts I have been to. That’s how old I am.

~~Joelle
“Anyone who keeps the ability to see beauty never grows old.” ~Franz Kafka
References:


Fick et al. Arch Int Med 1639(22):2716-2724, 2003 (Beers criteria)