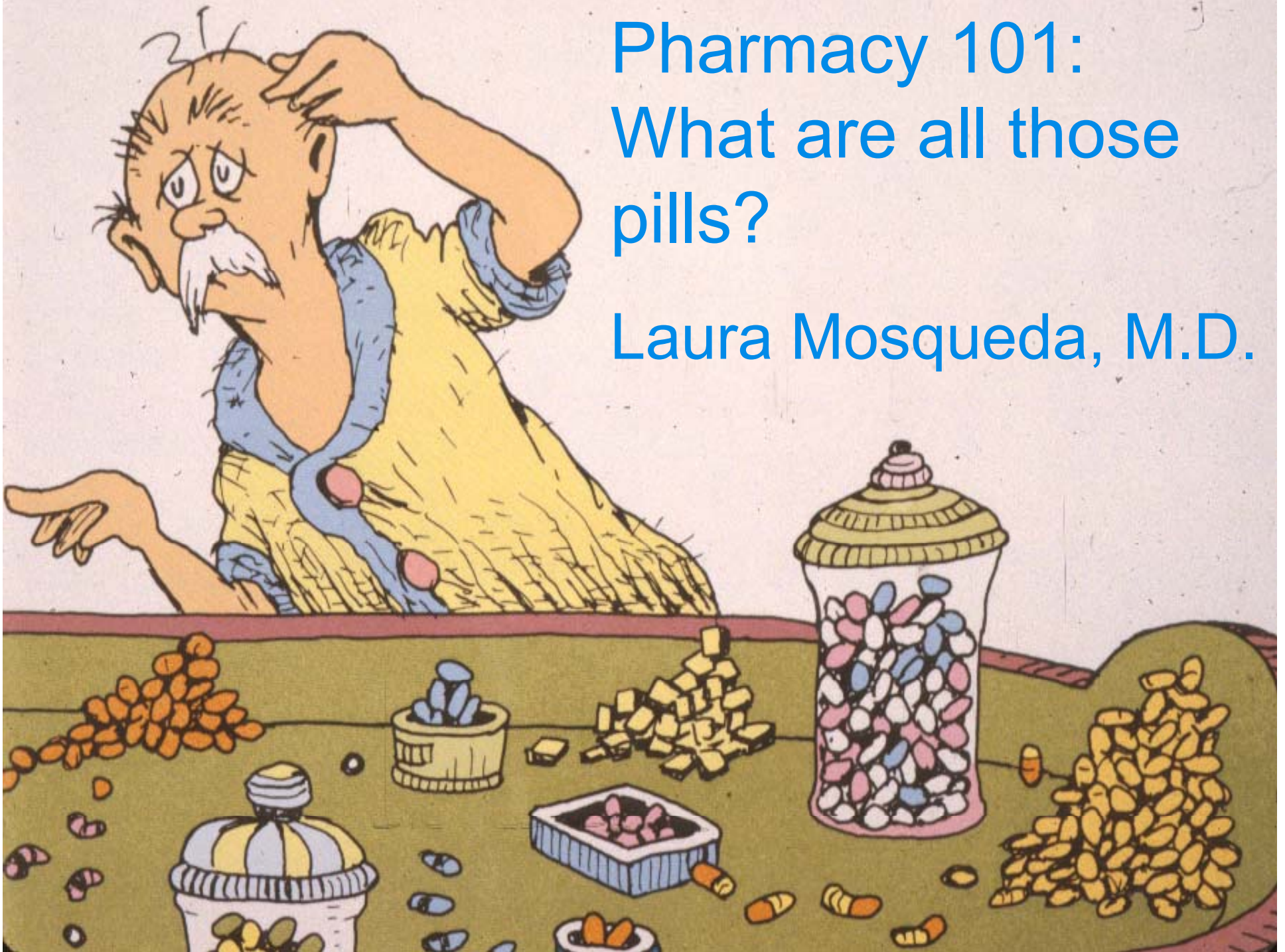


Pharmacy 101: What are all those pills?

Laura Mosqueda, M.D.



On alternate nights at nine pm,
I swallow pinkies, two of them.
The reds, which make my
eyebrows strong,
I eat like popcorn all day long.

Theodore Geisel (aka Dr. Seuss), *You're Only
Old Once*

87 year old woman was living by herself until 4 months ago. Now she is sitting in a wheelchair, drooling, barely able to speak.

- Aricept
- Ditropan
- Verapamil
- Haldol
- Digoxin
- Sinemet
- Lasix

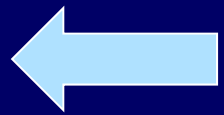
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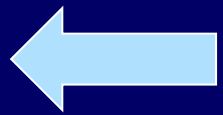
Hypertension



Digoxin
&
Lasix



CHF



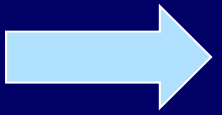
Verapamil



Dementia
&
Incontinence



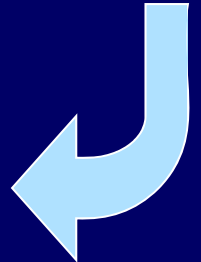
Haldol
Aricept
Ditropan



Sinemet



Parkinson's Disease



What Is Polypharmacy?

Polypharmacy is the use of unnecessary medications, and is independent of the number of medications being taken.

Examples Of Polypharmacy

- Medications with no apparent indication
- Use of duplicate medications
- Use of interacting drugs
- Drugs contraindicated in concurrent conditions
- Inappropriate dosages
- Pharmacotherapy of adverse drug reactions

Older Adults and Medications

- Persons aged 65 and older are prescribed the highest proportion of medications in relation to their percentage of the U.S. population
 - 2005: 13% buy 33% of all prescription medications
 - By 2040, 25% of total population will buy 50% of all prescription drugs

The Burden of Medications

ADEs are responsible for 5% to 28% of acute geriatric hospital admissions

- ADEs occur in 35% of community-dwelling elderly persons
- ADEs incidence: 26/1000 hospital beds
- In nursing homes, \$1.33 spent on ADEs for every \$1.00 spent on medications

Medications and Abuse

- Over-medicate
- Under-medicate
- Misuse medication

A bit of context

Epidemiology

- The elderly make up approximately 13% of the U.S population
- By 2030, one out of every five Americans living in the United States will be aged 65 or older
- Increase from 34 million in 1999 to 69 million in the year 2030

Life Span/Expectancy

Life Span

- How long it is possible to live
- Species-specific
- Immutable (at least, so far)

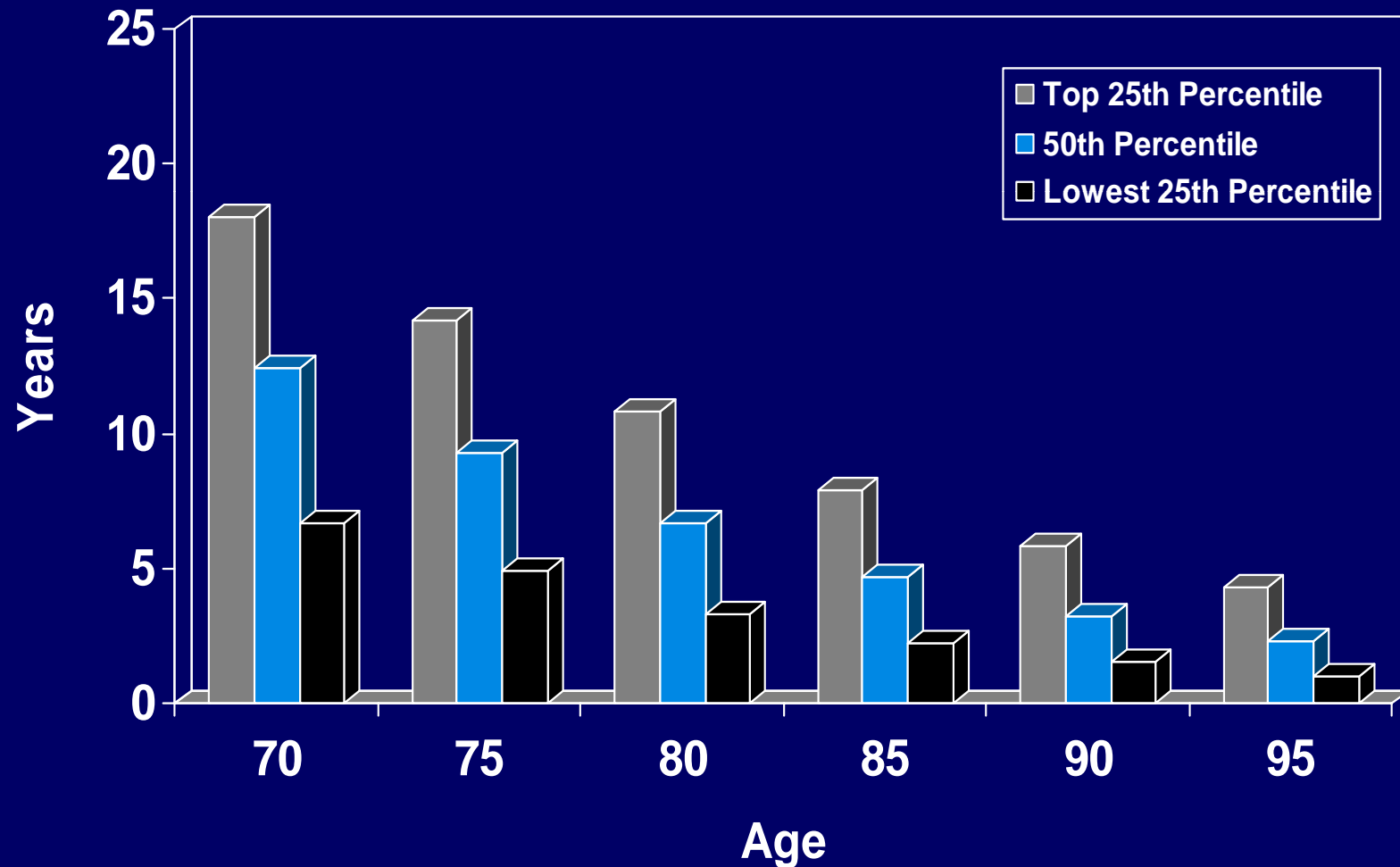
Life Expectancy

- How long it is likely for one to live
- Quite variable within a species and between species
- Has changed dramatically
- Changes as we age

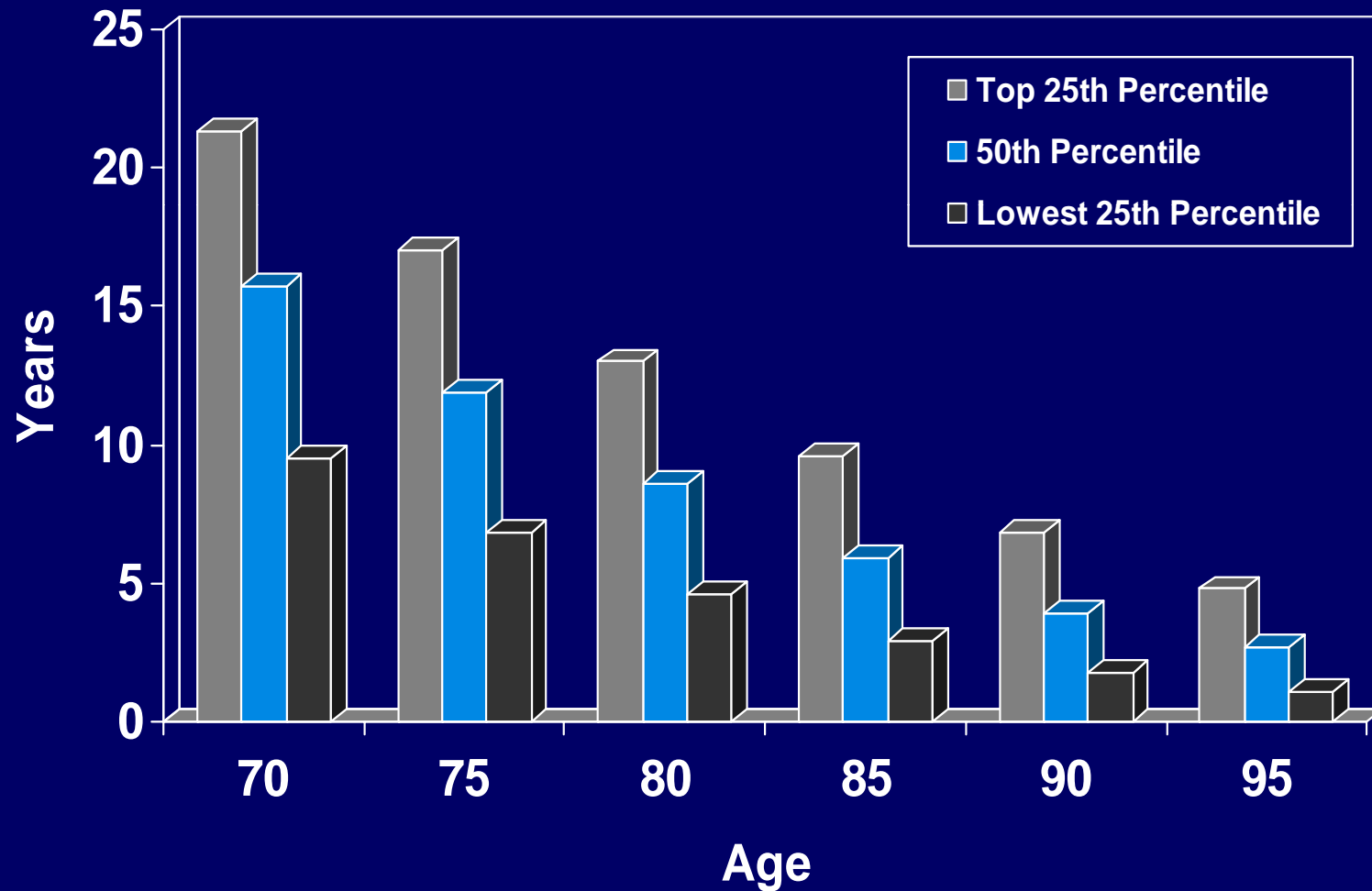
Change in Life Expectancy

- Early man
- 20-30 years
- Early 20th century
- 50 years
- Early 21st century
- 80 years

Life Expectancy for Men



Life Expectancy for Women



Clinical concerns

- The elderly in general have an increased incidence of chronic disease.
- 80% of the elderly have at least one chronic disease, and many of them have multiple diseases
- The older population is a physiologically and functionally heterogeneous group

Pharmacokinetics

Absorption

- Delayed onset
 - Lower peak serum levels
-

Distribution

- Prolonged half-life for fat-soluble drugs
 - Reduced protein binding
-

Metabolism

- Reduced hepatic first-pass effect
 - Slowed metabolism of some drugs
 - Dependent on competition for CYP enzymes
-

Excretion

- Accumulation of renally-cleared drugs

Pharmacodynamics

CNS

- Greater sedative response
 - More pronounced CNS effects
 - Impaired gait & balance
-

CV System

- Increased vascular tone
 - Widened pulse pressure
 - Decreased exercise tolerance
 - Greater risk for orthostasis
-

Receptors

- Decreased β -receptor response
 - Reduced parasympathetic response
-

Integumentary System

- Decreased vascularity of the dermis
- Decreased melanin production
- Decreased sebaceous and sweat gland function
- Decreased collagen and subcutaneous fat
- Decreased thickness of epidermis

Integumentary System

- Decreased turnover of epidermal cells
- Increased capillary fragility
- Thinning of hair
- Decreased rate of nail growth
- Thickening of connective tissue

Respiratory System

- Decreased number of cilia
- Decreased gas exchange
- Decreased lung capacity
- Increased AP diameter
- Increased A-a gradient ($\text{Age}/4 + 4$)
- Thickening of alveoli
- Decreased PaO₂ ($\text{Pao}_2 = 110 - (0.4 \times \text{Age})$)

Musculoskeletal System

- Decreased bone calcium
- Decreased blood supply to muscle
- Decreased muscle mass
- Decreased tissue elasticity
- Decreased lean body mass
- Increased Lipofuscin (age-related pigment)

Nervous System

- Decreased number of brain cells
- Decreased reflexes
- Decreased balance and coordination
- Decreased motor responses
- Decreased sensory perception
- Increased demyelination

Cardiovascular System

- Increased heart size due to LV wall thickening
- Decreased cardiac output
- Increased arteriosclerosis
- Thickening and fibrosis of heart valves
- Decreased elasticity of heart muscle
- Decreased maximum heart rate
- Increased systemic vascular resistance

Hemotopoietic and Lymph System

- Increased plasma viscosity
- Decreased red blood cell production
- Decreased immune response

Gastrointestinal System

- Decreased gag reflex
- Decreased salivary production
- Decreased gastric secretions
- Decreased esophageal and gastrointestinal peristalsis
- Decreased sphincter tone

Reproductive System

- Decreased estrogen levels
- Decreased testosterone levels
- Increased prostate gland

Visual Sensory Changes

- Decreased color perception
- Decreased peripheral vision
- Decreased night vision
- Thickening of the lens, presbyopia
- Decreased tear production
- Increased sensitivity to glare
- Decreased accommodative capacity

Hearing Sensory Changes

- Decreased ability to distinguish high frequency sounds
- Decreased number of hair cells in inner ear
- Thickening of eardrum-decreased ability to hear
- Impaired speech discrimination
- Excessive cerumen accumulation

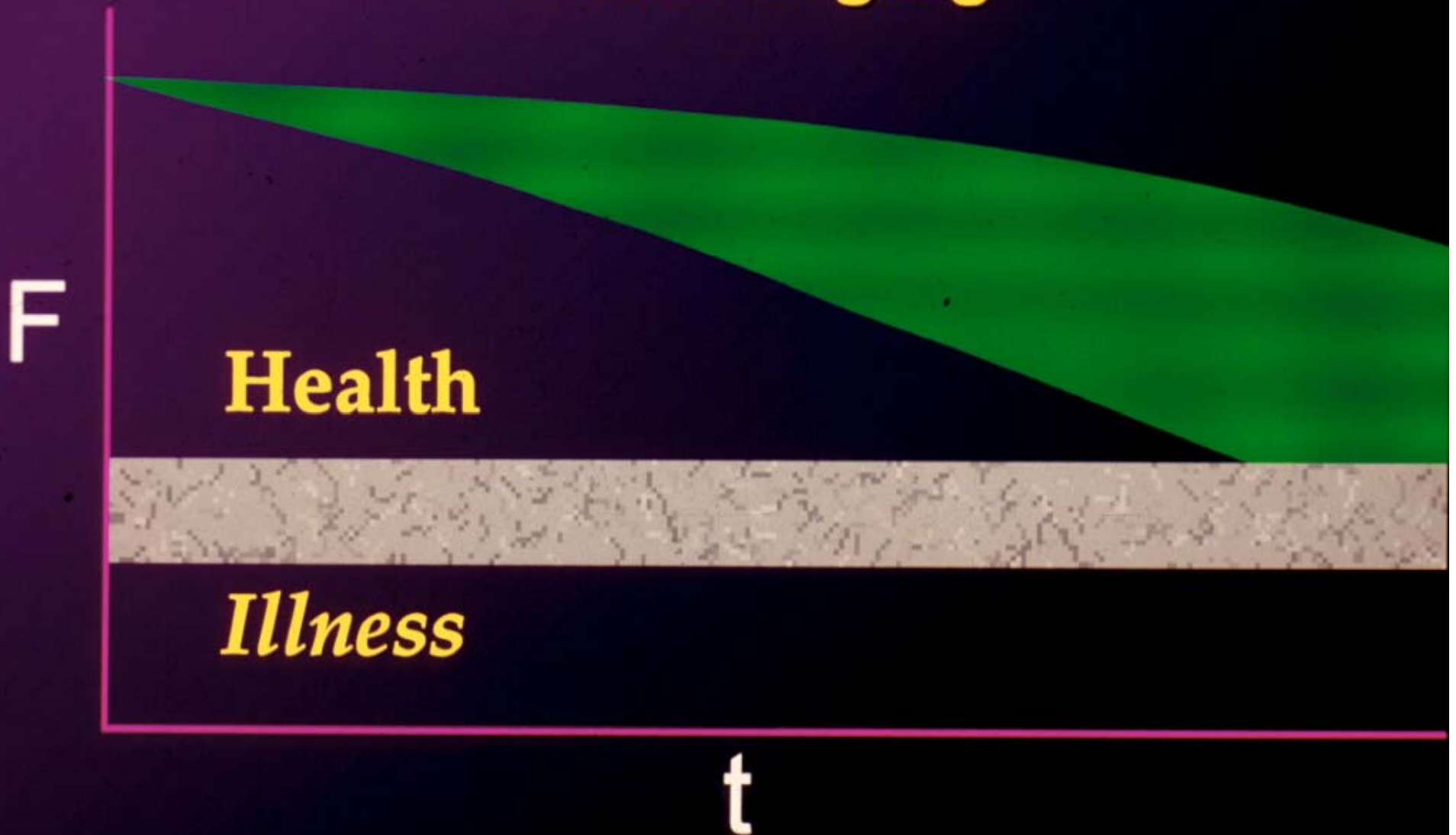
Urinary Systems

- Decreased urinary filtration rate
- Increased concentration of urine
- Decreased bladder capacity
- Increased volume of residual urine
- Decreased nephrons

Changes Affecting All Body Systems

- Decreased production of TSH
- Decreased production of PTH
- Decreased body fluid

Decrease in Physiologic Reserve - Normal Aging



Effects of these changes

- Greater susceptibility to illness
- Difficulty in recovering from illness
- Sensitivity to side effects of medication
- Vulnerability to abuse

Successful Pharmacotherapy

- Uses the correct drug
- Prescribes the correct dosage
- Targets the correct condition
- Is appropriate for the patient

Failure in any one of these areas can result in adverse drug events (ADEs)

Common Adverse Effects due to Polypharmacy

- Confusion
- Cognitive impairment
- Arterial hypotension
- Acute renal failure

Potentially Inappropriate Meds

- More than 765,000 Medicare beneficiaries
 - 21% received ≥ 1 medication of concern
 - 15% received ≥ 2 medications of concern
 - 4% received ≥ 3 medications of concern
- 50.8% for “high-severity” agents
 - 12.6% for amitriptyline
 - 8.2% for diazepam

--Curtis, et al., Arch Intern Med, 2004

Potentially Inappropriate Medications for Older Persons (CMS)

➤ High Potential for Severe ADEs

- Amitriptyline
- Chlorpropamide
- Digoxin > 0.125 mg/d
- Disopyramide
- GI antispasmodics
- Meperidine
- Methyldopa
- Pentazocine
- Ticlopidine

➤ High Potential for Less Severe ADEs

- Antihistamines
- Diphenhydramine
- Dipyridamole
- Ergot mesylates
- Indomethacin
- Meperidine, oral
- Muscle relaxants

Risk Factors for ADEs

- 6 or more concurrent chronic conditions
- 12 or more doses of drugs / day
- 9 or more medications
- Prior adverse drug reaction
- Low body weight
- Age 85 or older
- Estimated CrCl < 50 mL / min

ADE Cascade

DRUG 1



Adverse drug effect-
misinterpreted as a new medical condition



DRUG 2



Adverse drug effect-
misinterpreted as a new medical condition



- **Source Note: Rochon PA, Gurwitz JH. Optimising drug treatment for elderly people: the prescribing cascade. *BMJ*. 1997;315(7115):1097.**

Drug-Drug Interactions

- May lead to ADEs
- Likelihood ↑ as number of medications ↑
- Most common: cardiovascular and psychotropic drugs

Drug-Drug Interactions

- Absorption can be ↑ or ↓
- Drugs with similar or opposite effects can result in exaggerated or diminished effects
- Drug metabolism may be inhibited or induced
- Herbal preparations may also interact

Drug-Drug Interactions

Combination	Risk
ACE inhibitor + diuretic	Hypotension, hyperkalemia
ACE inhibitor + potassium	Hyperkalemia
Benzodiazepine + antidepressant, antipsychotic, or benzodiazepine	Confusion, sedation, falls
Calcium channel blocker + diuretic or nitrate	Hypotension

“Non-Compliance”

- May be as high as 50% among elderly patients
- May result from **clinician's** failure to consider patient's financial, cognitive, functional status
- May result from **patient's** beliefs and understanding of drugs and diseases

High-risk Patients

Multiple diseases

- Complex regimens
- Drug-disease interactions

Multiple drugs

- Adverse effects
- Drug-drug interactions

Frail

- Risk for overdose

Depressed

- Multiple somatic complaints
- Non-adherence

Demented

- Unreliable regarding adherence, adverse effects, etc.
-

Maximizing Pharmacotherapy

- Medication review
- Set therapeutic goals and assess if they are being met
- Involve the patient in the decision
- Choose appropriate medications
- Get assistance

Appropriate Medications

- Take into account
 - Age
 - Physiologic characteristics
 - Function
- Fit the regimen to the patient

Psychotropic Medications

Introduction

- Psychotropic medications can cross the blood brain barrier (BBB) and primarily acts on the central nervous system (CNS) and can alter brain function
 - Perception
 - Mood
 - Consciousness
 - Cognition
 - Behavior

Psychotropic Medication

- Antidepressants
- Antipsychotics
- Insomnia Tx
- Anti-Anxiety Medications
- OTC/Supplements that have CNS effects
- Anti-Hypertensives

Antipsychotics

Antipsychotics

- **Used to treat Schizophrenia and Sx of Psychosis**
 - Two generations of medications
 - 1st Generation (Typical)
 - 2nd Generation (Atypical)
 - **Class Black Box Warning:**
 - Elderly patients with dementia-related psychosis treated with atypical antipsychotic drugs are at an increased risk of death compared to placebo.

Typical Antipsychotics

- **Medications in this class:**
 - Chlorpromazine (Thorazine)
 - Thioridazine (Mellaril)
 - Molindone (Moban)
 - Fluphenazine (Prolixin)
 - Haloperidol (Haldol)
- These medications work on **blocking dopamine receptors**

Typical Antipsychotics

➤ **Common Side Effects:**

- Weight gain
- Anti-cholinergic reactions (drowsiness, dry mouth/eyes, urinary retention)
- Orthostasis
- Extrapiramidal symptoms such as pseudoparkinsonism, dystonia, akathisia and tardive dyskinesia

Atypical Antipsychotics

- **Medications in this class:**
 - Risperidone (Risperdal)
 - Quetiapine (Seroquel)
 - Clozapine (Clozaril)
 - Olanzapine (Zyprexa)
 - Ziprazidone (Geodon)
 - Aripiprazole (Abilify)
 - Paliperidone (Invega)
- Have dual mechanism and **block dopamine and serotonin**

Atypical Antipsychotics

➤ **Common Side Effects:**

- Cause less extrapyramidal symptoms than typical antipsychotics at traditional dosing regimens
- Can cause metabolic side effects such as increase in blood sugar, blood pressure and cholesterol.
- Depending on the agent used, may also cause differing severity of anticholinergic reactions, sedation, and weight gain.

➤ **Rare & Severe Side Effect**

- Neuroleptic Malignant Syndrome which may present as muscle rigidity, hyperthermia, altered consciousness, and autonomic dysfunction.
- Each agent differs in their side effect profile and some medications such as clozapine must be closely monitored during therapy (very important to follow up with medical and laboratory appointments)

Antipsychotics

- **Time to Effect:**
 - Not immediate and may take up to several months to correct cognitive symptoms.
- **Clinical Pearls:**
 - Antipsychotics are usually used in small doses in demented patients to correct very specific behaviors which prevent them from receiving good care, or endangering the caregiver. Monitoring of those behaviors is very important. If the behaviors you are trying to eliminate do not go away, these medications should be stopped.

Antidepressants

Antidepressants

Medications in this Class:

- Fluoxetine (Prozac)
- Paroxetine (Paxil)
- Citalopram (Celexa)
- Escitalopram (Lexapro)
- Bupropion (Wellbutrin)
- Trazodone (Desyrel)
- Venlafaxine (Effexor)
- Desvenlafaxine (Pristiq)
- Mirtazapine (Remeron)
- Duloxetine (Cymbalta)
- Amitriptyline (Elavil)
- Imipramine (Tofranil)
- Nortriptyline (Pamelor)
- Phenelzine (Nardil)
- Selegiline (Emsam)

Antidepressants

- **Side Effects:**
 - Commonly can cause stomach upset during the 1st couple weeks of therapy that usually diminishes with continued therapy and commonly cause sexual dysfunction (50%)
 - Depending on the agent used, may be activating (Fluoxetine, Bupropion try to take in the morning), sedating and cause weight gain (Paroxetine and Mirtazapine, take in the evening), and some agents are neutral in these aspects and may be a good choice in geriatric patients who are sensitive to side effects (Citalopram/Escitalopram). Keep in mind, that elderly pts may be frail and weight gain may be a beneficial side effect.
- **Drug interactions may be a concern:**
 - Citalopram/Escitalopram are less likely to interact. Other Medications such as Paxil and Prozac can cause significant drug interactions by raising levels of other medications.

Antidepressants

- Agents such as Amitriptyline, Imipramine, and Nortriptyline are older antidepressant agents that have many side effects associated with them.
 - Are not used 1st line
 - Should be avoided in the elderly, if possible. Lots of side effects, such as dry mouth, constipation, urinary retention, confusion, mental status changes
 - These agents are more commonly used in much lower doses as pain medications.

Antidepressants

- Time to effect is not immediate and can take 4 – 8 weeks to see an effect.
 - Initial benefit is usually seen if the side effects of the antidepressants match the symptoms of depression a patient presents with.
 - For example: If you give a sedating antidepressant to someone who is having trouble sleeping, the benefit will be seen sooner than 4-8 weeks.

Dementia & Alzheimer's Disease

Dementia & Alzheimer's Disease Treatment

- These medications are marginally effective.
- At best, they slow down the progression of the dementia.
- Patients' family needs to understand that dementia symptoms will not be "reversed". At best, function may be maintained at current level slightly longer than without medications. So if you see "NO CHANGE" the medication is working.
- It is important to monitor patients for side effects, and make sure that they do not impair quality of life. Once disease progresses substantially, it is important to discuss with family whether to continue these medications. In addition to questionable efficacy, they are quite expensive.

Cholinesterase Inhibitors

➤ Medications in the Class:

- Donepezil (Aricept)
- Rivastigmine (Exelon)
- Galantamine (Razadyne)

➤ Indication:

- Can be used to treat mild to severe dementia
 - These agents have very modest effects and efficacy is short term

Cholinesterase Inhibitors

➤ Common side effects:

- Stomach upset (nausea, vomiting, and diarrhea)
- Dose-related symptoms such as:
 - Urinary incontinence
 - Dizziness
 - Bradycardia
 - Muscle weakness
 - Salivation
 - Sweating

NMDA Therapy

➤ Medication in this Class:

- Memantine (Namenda)

➤ Indication:

- Currently approved as monotherapy and combination therapy with a cholinesterase inhibitor in moderate to severe Alzheimer's disease

NMDA Therapy

➤ **Common Side Effects:**

- Constipation
- Diarrhea
- Confusion
- Dizziness
- Hypertension
- Cough
- Headache

Urinary Incontinence Medications

Urinary Incontinence Treatment

- **Anti-cholinergic/Anti-Spasmodic Agents**
 - **Medications in this class:**
 - Oxybutynin (Ditropan, Oxytrol)
 - Tolterodine (Detrol)
 - Trospium (Sanctura)
 - Solifenacin (Vesicare)
 - Darifenacin (Enablex)
 - **MOA:**
 - These medications work on the bladder to help with urinary incontinence but have overlapping action on the brain and can cause CNS side effects

Urinary Incontinence Treatment

- **Common Side Effects:**
 - Dry mouth
 - Constipation
 - Dizziness
 - Blurry vision
 - Cognitive impairment

Urinary Incontinence Therapy

➤ **Clinical Pearls:**

- In geriatric patients at risk for dementia, risk versus benefit should be assessed as anti-cholinergic therapy can induce and worsen cognitive function
- Before these meds are started it is important to go through the current list of medications to make sure that none of the meds contribute to symptoms of incontinence.

Anti-Anxiety Medications

Benzodiazepines

➤ Common Uses

- Anxiety Disorders
 - Generalized Anxiety Disorder
 - Persistent, uncontrolled excessive anxiety and worry
 - Worry impairs daily functioning
 - Common worries: family, money, work, health
 - Panic Disorder
 - Recurrent panic attacks with fear of having another attack

Pharmacologic Effects

- Benzodiazepines are:
 - Anxiolytic
 - Sedative
 - Anticonvulsants
 - Muscle relaxants
- Onset of action is very fast
 - Normally within one hour

Side Effects

- Sedation
- Drowsiness, dizziness
- Decreased alertness and concentration
 - Increased chance of car accidents
- Lack of coordination
 - Increased chance of falls
- Paradoxical reactions
 - Increased aggression and agitation instead of a calming effect

Dependence

- Body may become dependent on these drugs
- Patients should not change or skip doses or stop using these medications on their own; always contact a doctor.

Tapering of Benzodiazepines

- Slow tapering is needed if used long term
- Do NOT abruptly stop
 - 25% dose decrease every 1-2 weeks

Examples of Benzodiazepines

- Shorter acting (based on half life)
 - Alprazolam (Xanax)
 - Lorazepam (Ativan)
 - Temazepam (Restoril)
- Long acting
 - Clonazepam (Klonopin)
 - Diazepam (Valium)

Benzodiazepines in the Elderly

- Avoid using them long term
 - Highest risk and least benefits in the elderly population
 - If needed, use for a short period of time at a low dose.
 - Use on an “as needed” basis.
 - Once they are used daily, the length of time that these drugs remain effective is limited.
- Shorter acting benzodiazepines are preferred

Benzodiazepines in the Elderly

- Accumulation, longer half-life
- Decreased metabolism
- Increased risk for side effects
 - Risk of falls and vehicle accidents
 - Cognitive impairment/memory problems

Buspirone (Buspar)

- Non-benzodiazepine that can be used in Generalized Anxiety disorder
- Anxiolytic effects, but no muscle relaxant or hypnotic properties
- No dependence issues
- Slower onset of action compared to benzodiazepines.
 - May take up to 6-8 weeks to see the full benefit
- Taken on a scheduled basis, not as needed.
- Safer in elderly population

Buspirone (Buspar)

- Side effects
 - Drowsiness
 - Constipation
 - Nausea
 - Headaches

Anti-depressants and Anxiety

- Anti-depressants can treat anxiety effectively.
- Safer for long term management
- Take medications on a scheduled basis
 - May take months to see full benefit
- If anxiety symptoms are severe at the start
 - Can start a benzodiazepine and antidepressant concurrently
 - As the antidepressant starts working, discontinue the benzodiazepine.
- Examples of antidepressants:
 - Effexor, Paxil, and Celexa

Insomnia Treatment

Zolpidem (Ambien)

- Used for short-term insomnia
- Drug tolerance and dependence
 - Works best if used as needed only
 - Gradual dose reduction
- Fast onset of action, but short duration
- Use in the elderly
 - More sensitive to effects of drug
 - Increased risk of falls and cognitive side effects

Zolpidem (Ambien)

➤ Side effects

- Nausea
- Drowsiness
- Headache
- Difficulty maintaining balance
- Changes in appetite
- Impaired concentration
 - Increased chance of car accidents

Zaleplon (Sonata)

- Non benzodiazepine used for insomnia
- Dependence and drug tolerance is still a concern.
- VERY quick onset and VERY short duration of action.
 - Shorter than Ambien or Lunesta
- Use in the elderly
 - More sensitive to effects of the drug
 - May have increased fall risks

Zaleplon (Sonata)

➤ Side Effects

- Drowsiness
- Unsteadiness
- Headache
- Vision problems

Eszopiclone (Lunesta)

- Non benzodiazepine used for insomnia
- Dependence and drug tolerance is still a concern.
- Use in the elderly
 - More sensitive to effects of drug
 - May have increased fall risks

Eszopiclone (Lunesta)

➤ Side Effects

- Unpleasant taste
- Headache
- Dry mouth
- Dizziness

Trazodone (Desyrel)

- Old antidepressant that can be used for sleep at low doses
- Dosing range: 25mg-200mg
 - Slow titration
- Less addicting than other sleep medications
- May take a while to establish therapeutic dose

Antihypertensives

Antihypertensives

➤ Cautions

- Orthostatic hypotension
 - Can cause a drop in blood pressure as a person gets up from a chair or out of a bed, caution should be used to get up slowly and with support near by
- Electrolyte imbalance
 - ACE-I
 - ARB
 - Diuretics

Antihypertensives

➤ Cautions

- Decreased heart rate
 - Certain Calcium Channel Blockers (Diltiazem, Verapamil)
 - Beta Blockers
- Cough
 - ACE-I
- Edema
 - Certain Calcium Channel Blockers (Amlodipine, Felodipine)

OTC Medications with CNS effects

OTC medications with psychotropic action

- **Diphenhydramine (Benadryl)**
 - Antihistamine that is found in many OTC products used for allergies and itching.
 - Some Examples:
 - Benadryl
 - Theraflu Severe Cold
 - Tylenol PM
 - Advil PM
 - Commonly also used as a sleep aid due to its sedating properties

Diphenhydramine

- **Common Side Effects:**
 - Anti-cholinergic reactions such as:
 - Cognitive impairment
 - Urinary retention
 - Dry mouth
 - Dry eyes/blurry vision
 - Constipation

Diphenhydramine

➤ Clinical Pearls:

- Should be **avoided in geriatric patients** (> 65 years old) due to these reactions and increase in fall risk in this patient population
- Commonly found as an ingredient in Cold and Flu products.
 - If a patient is taking multiple OTC items for cold, flu, seasonal allergies, or sleep, it is possible that they may be taking multiple products with overlapping ingredients

St. John's Wort

- An herbal supplement used commonly for symptoms depression
- Can be found in supplements and also tea products
- Conflicting data about efficacy in use of mild – severe depression
 - Many different RCT have conflicting results
 - May be useful in *mild – moderate* depression
 - May be *less* useful in *major depressive disorders*.

St. John's Wort

➤ Side Effects:

- Dry Mouth
- Anxiety
- Dizziness
- GI upset
- Fatigue
- Sexual Dysfunction
- Increased Sensitivity to Light
- Headache

St. John's Wort

➤ Drug Interactions:

- **St. John's Wort induces cytochrome P450 enzyme 3A4**
 - Can reduce efficacy of antiretrovirals, immunosuppressants, antineoplastic, anticoagulants, digoxin, and oral contraceptives/hormone replacement therapies
 - Very important to assess patient's medication list to prevent therapy altering effects.

Melatonin

- Commonly used for symptoms of insomnia
 - Melatonin is a naturally occurring hormone associated with sleep
- Preliminary studies suggest that melatonin can help elderly people fall asleep faster
 - Effects are small
 - Usually seen in patients with a circadian rhythm abnormality

Melatonin

➤ Side Effects:

- Vivid dreams or nightmares
- Daytime drowsiness
- Stomach Cramps
- Dizziness
- Headache
- Irritability
- Decreased libido
- Breast enlargement (men)
- Decreased Sperm Count

Melatonin

- Some studies show that Melatonin can worsen depression and should be avoided in these patients
- Drug Interactions:
 - Warfarin (reports of bleeding complications)
 - Fluvoxamine (increase levels of Melatonin)
 - Nifedipine (increase in blood pressure)

Melatonin

- Some studies show that Melatonin can worsen depression and seizures and should be avoided in these patients
- Drug Interactions:
 - Warfarin (reports of bleeding complications)
 - Fluvoxamine (increase levels of Melatonin)
 - Nifedipine (increase in blood pressure)

Kava

- A herbal supplement that was popular for insomnia and anxiety symptoms
- **Should NOT be used in patients**
 - Can cause hepatic failure/toxicity
 - FDA issued a warning against the use of Kava supplements

Herbal Supplements

- General Warning: supplements are regulated by the FDA under DIFFERENT regulations from prescription and OTC medications
 - Different supplements may have varying amounts of the ingredients listed on the label
 - May contain NONE
 - May contain LESS
 - May contain MORE
 - May contain OTHER ingredients
 - Not required to prove efficacy or safety before marketing



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Promoting Excellence in Geriatric Health Care through Education and Certification.

Why Should your pharmacist be "Geriatric" Certified?

The Journal of the American Medical Association recently stated that if adverse reactions to medications were classified as a distinct disease, it would rank as the fifth leading cause of death in the U.S. The economic cost rivals that of cancer, Alzheimer's disease, diabetes, and other major diseases and conditions commonly affecting the elderly population. People over age 65 are especially vulnerable to medication-related problems, due to the number of medications they take and the biologic changes of aging and disease. Medical experts believe that many medication-related problems are predictable and thus preventable. If your pharmacist is a Geriatric Certified Pharmacist, he or she has demonstrated knowledge and skills in geriatric pharmaceutical care and will be better prepared to advise you on your drug therapy needs. [Click here](#) for more details.

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Helping You Make the Best Use of Your Medicines



The challenges of managing medications can sometimes be overwhelming for seniors. This site is a resource for seniors and anyone who cares for seniors.

Senior care pharmacists—specialists in geriatric drug therapy and the unique medication-related needs of seniors—identify and prevent medication-related problems through careful evaluation and monitoring of patients' drug regimens. People turn to senior care pharmacists when they or someone they know needs help making the best use of their medicines. The senior care pharmacist is your own personal health care consultant. You'll find us wherever seniors reside—anywhere there's a need for high-level medication management. We help fine-tune drug therapy so you, your grandmother, your father, your neighbor can get the best possible results. Senior care pharmacists are about more than just managing medications. They are dedicated to helping people live better and longer lives.



Do you need
a Senior Care Pharmacist?



What is a
Senior Care Pharmacist?



Find a Senior Care Pharmacist
in your area.

GO SLOW

START LOW

Principles of Prescribing

- Start with a low dose
- Titrate upward slowly, as tolerated by the patient
- Avoid starting 2 drugs at the same time

Medication Review

- ALL medicines EVERY visit
 - Prescription
 - Non-prescription
 - Supplements
- Re-evaluate at least annually or at
 - Change in health status
 - Hospital admission or discharge

Before I Write that Rx:

- Is this medication necessary?
- What are the therapeutic goals?
- Do the benefits outweigh the risks?
- Is it used to treat effects of another drug?
- Could 1 drug be used to treat 2 conditions?
- Could it interact with diseases, other drugs?
- Does patient know what it's for, how to take it, and what ADEs to look for?

The Bottles: Look on and in

➤ On

- Name of patient
- Name of doctor
- Phone number of pharmacy
- Number of refills
- Date of last refill
- Directions for use

➤ In

- Number of pills
- Mix of pills

Quick Review

Why worry about this in the elderly?

- They are prescribed more medications
- More medications = more drug interactions
- Body changes with aging:
 - Decreased renal function
 - Higher proportion of body fat
 - Changes in liver metabolism

Adverse Drug Reactions- Risk Factors

- >6 concurrent chronic diagnoses
- ≥ 12 doses of medications/day
- ≥ 9 medications
- Previous adverse reaction
- Low body weight
- Age >85
- Creatinine clearance <50 ml/min

Use with caution:

- Antihypertensives/diuretics
- Antiarrhythmics
- Psychoactive medication
(benzodiazepines, antipsychotics)
- Narcotics
- NSAIDs
- Anticholinergics (Benadryl, oxybutinin)

Principles of prescribing

- Start low and go slow!
- Do benefits outweigh risks?
- Before starting a medication for a symptom- is it a side effect of a drug?
- Will there be drug interactions?
- Does the patient understand how to take the medication?

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www.centeroneelderabuse.org