

# **Appropriate Medication use in Elderly and Frail Elderly**

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# Objectives

- ▶ – Discuss metabolic change as patients age
- ▶ – Define BEERS criteria for medication use in elderly and frail elderly
  - Discuss limitations of use
- ▶ – Pharmacists' role in managing care of elderly in nursing facilities

Age is just a number...



# Age is just a number...

- ▶ Mobility changes
  - Transportation
  - Housing
- ▶ Physiological changes
- ▶ Metabolic changes
- ▶ Increased number of conditions and medications
  - Decreased compliance
  - Increased over-the-counter and herbal remedy
  - Increased drug interactions
- ▶ Sensory and cognitive impairments
  - Difficulty reading prescription labels
  - Difficulty hearing MD or pharmacist consultation

# Elderly vs Frail Elderly

Three of these five factors:

1. Unintentional weight loss (10 pounds or more in a year)
2. General feeling of exhaustion
3. Weakness (as measured by grip strength)
4. Slow walking speed
5. Low levels of physical activity

# Frail Elderly

Increased risk of:

- ▶ Falls
- ▶ Deteriorating mobility
- ▶ Disability
- ▶ Hospitalization
- ▶ Death

# Frail Elderly

## Contributing factors:

- ▶ Osteoporosis
- ▶ Arthritis
- ▶ Malnutrition/ loss of appetite/ anorexia
- ▶ Sarcopenia (excessive loss of muscle)
- ▶ Atherosclerosis (as a result of decreased oxygen to organs and tissues)
- ▶ Stroke
- ▶ Depression
- ▶ Cognitive impairment
- ▶ Hormonal changes (loss of testosterone in men)

# Metabolic changes



# Liver changes

- ▶ Decrease in mass
- ▶ Decrease in hepatic enzymes
- ▶ Decrease in blood flow
  - Decreased in rate of drug metabolism and elimination
  - Decreased drug effectiveness
  - Increased length of time of effects (toxicity) and side effects

# Liver changes

- ▶ Decreased metabolism → increased risk of toxicity (often delayed)
  - Ibuprofen
  - Naproxen
  - Warfarin
  - Alprazolam
  - Triazolam
  - Diazepam

# Kidney changes

- ▶ Decreased renal elimination → increased side effects
  - Meperidine, morphine, OxyContin, ciprofloxacin, levafloxacin, nitrofurantoin (Macrobid/Macrodantin), heparin, metoclopramide
- ▶ Medication adjustments
  - Lower dose
  - Less frequent dosing
- ▶ Dehydration also a factor

# Drug Absorption

- ▶ Slowed gastric emptying and motility -> Increased length of effect and side effects
- ▶ Increase in gastric pH (lower acidity) ->
  - Altered absorption of enteric coated dosage forms (EC)
  - Decreased bioavailability of vitamins from foods, particularly calcium
- ▶ Decrease in surface area of small intestine and bowel -> decreased amount of drug that is absorbed

# Drug Distribution

- ▶ Increase in total body fat
  - Lipophilic drugs can have prolonged effect (alprazolam, chlordiazepoxide, diazepam, trazodone)
- ▶ Decrease in muscle mass
- ▶ Decrease in total body water
  - Hydrophilic drug effects are decreased (alcohol, lithium)
- ▶ Decrease in serum albumin
  - Binding site for some drugs (phenytoin, warfarin)
  - Increase in toxicity of drug

# BEERS criteria



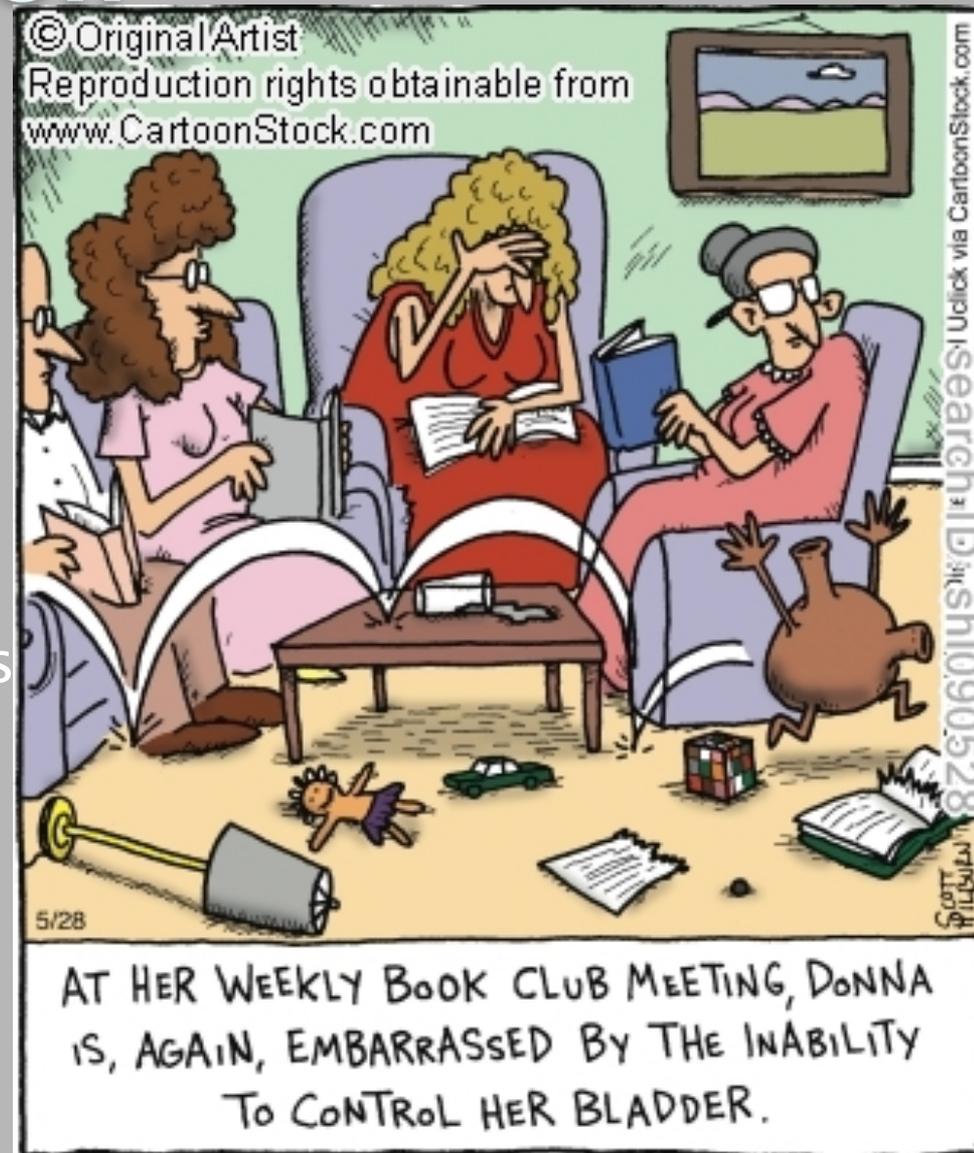
# BEERS criteria

- ▶ Guide for prescribing medications in elderly in which risks are greater than benefit
  - Ranked based on severity
- ▶ Last updated in 2002 to include all persons over 65 regardless of functional capacity
  - Not specific to frail elderly
- ▶ Ambulatory seniors prescribed these medications are more likely to be hospitalized
- ▶ Commonly used in nursing facilities (NF) and long-term care facilities (LTCF)



# Use with caution

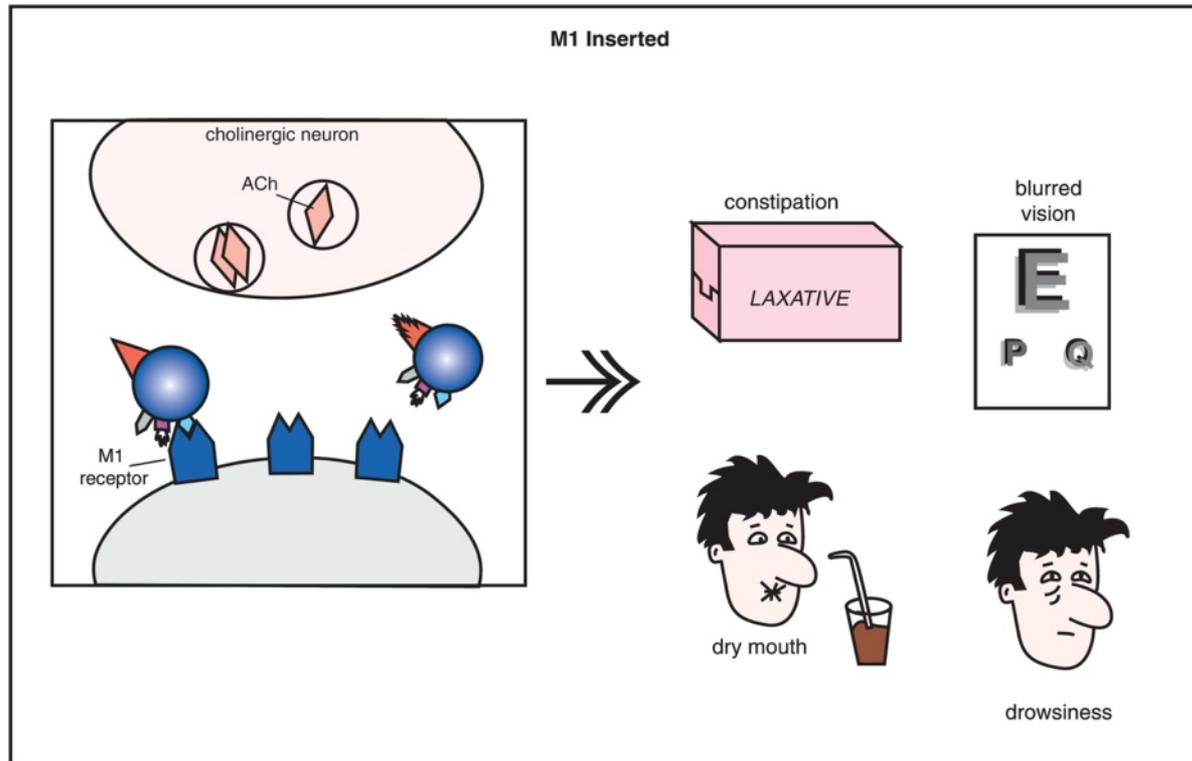
- ▶ Anticholinergic medications
- ▶ CNS depressants
- ▶ Anti-thrombotics
- ▶ Alpha<sub>1</sub> blockers
- ▶ Anti-arrhythmics
- ▶ Diabetes agents
- ▶ Hormones
- ▶ Non-COX selective NSAIDs
- ▶ Skeletal muscle relaxants
- ▶ Anti-psychotics/ anti-depressants



# BEERS criteria

- ▶ Anticholinergic side effects:
  - Acetylcholine: neurotransmitter that acts in secretory glands of eyes and central nervous system
  - Blocks acetylcholine in central and peripheral nervous system
  - Effect is decreased secretions → dry mouth, constipation
  - Increased risk of blurry vision, orthostatic hypotension, delirium
- ▶ Dry mouth is worse in first two weeks of therapy

# Anti-cholinergic Side Effects



# BEERS Criteria:

## Meds with Anticholinergic Effects

- ▶ Anti-spasmodics:
  - Dicyclomine (Bentyl), Hyoscyamine (Levsin)
  - Carisoprodol (Soma), Cyclobenzaprine (Flexeril), Methocarbamol (Robaxin)
- ▶ Tricyclic Antidepressants:
  - Amitriptyline (Elavil), Doxepin over 6mg/day
- ▶ First generation antihistamines:
  - Chlorpheniramine (Chlortrimaton), Diphenhydramine (Benadryl)
- ▶ Muscle relaxants:

# BEERS Criteria

## Meds with Anticholinergic Effects

- ▶ Benzodiazepines:
  - Alprazolam (Xanax), Diazepam (Valium), Temazepam (Restoril), Clonazepam (Klonopin)
  - Increased risk of cognitive impairment
- ▶ Non-benzodiazepines:
  - Zolpidem (Ambien), Eszopiclone (Lunesta)
  - Increased risk of cognitive impairment

# What CAN we use?!?

- ▶ Anti-spasmodics:
  - Constipation: fiber, lactulose, Miralax
  - Diarrhea: Loperamide, Cholestyramine
- ▶ Tricyclic Antidepressants:
  - Nortriptyline (Pamelor), Trazodone (Desyrel), Desipramine
  - SSRIs, SNRIs, Mirtazapine, Bupropion

# What CAN we use?!?

- ▶ Muscle relaxants:
  - Nerve blocks, proper footwear or seating, hot/ cold application, Baclofen
  - Tizanidine if no delirium
  
- ▶ First generation antihistamines:
  - Cetirizine (Zyrtec), Fexofenadine (Allegra)
  - Loratidine (Claritin) if no delirium or urinary retention

# What CAN we use?!?

- ▶ Benzodiazepines:
  - Used for anxiety, seizures
  - SSRIs, SNRIs, Buspirone (Buspar)
  
- ▶ Non-benzodiazepines:
  - Used for insomnia
  - Low dose Trazodone (Desyrel) or Doxepin
  - Ramelteon (Rozerem)

# CNS Depressants

- ▶ Used for motion sickness, memory loss, seizures, and pain
- ▶ Donepezil (Aricept) in patients with hypotension
  - Increased risk of falls/ fractures
  - Preferred: Memantine (Namenda)
- ▶ Dramamine, Meclizine (Bonine) in patients with delirium
  - Worsening delirium, constipation, urinary retention

# Anti-Thrombotics

- ▶ Aspirin for primary prevention has little documented efficacy in 80 years and older
- ▶ Ticlopidine (Ticlid), Prasugrel (Effient)
  - Increased risk of bleed due to decreased clearance
  - Preferred: Clopidogrel (Plavix), Ticagrelor (Brilanta)
- ▶ Dabigatran (Pradaxa)
  - Increased risk of bleed at 75 years or older
  - Preferred: Warfarin (Coumadin)

# Alpha<sub>1</sub> Blockers

- ▶ Used for enlarged prostate (BPH) and high blood pressure
- ▶ Doxazosin, (Cardura), Prazosin (Minipress), Terazosin (Hytrin)
  - Increased risk of orthostatic hypotension, incontinence
  - Preferred: Thiazide, ACE-I/ ARB, beta blockers, calcium channel blockers

# Anti-Arrhythmics

- ▶ Used to control irregular heart rhythm, afib
- ▶ Amiodarone, Flecainide, Propafenone, Sotalol
  - Amiodarone-induced hypothyroidism
  - Fatigue, dizziness
  - Rate control benefits exceed benefit of treating rhythm

# Diabetes Control Medications

- ▶ Decrease risk of complications of diabetes
- ▶ Insulin, Sliding scale
  - Increased risk of hypoglycemia
  - Preferred: Basal + Mealtime insulin dosing, Premixed insulin QD or BID
- ▶ Glyburide
  - Increased risk of hypoglycemia
  - Preferred: Glimiperide (Amaryl)
- ▶ Pioglitazone (Actos) in heart failure
  - Worsens heart failure
  - Preferred: metformin (Glucotrol)

# Hormones

- ▶ Used to regulate endocrine functions
- ▶ Megestrol (Megace): used for appetite stimulation
  - Increased risk of thrombosis
  - Preferred: feeding assistance, snacks between meals
- ▶ Estrogens (oral and topical):
  - Increased risk of breast cancer & endometrial cancer; no cardio protection
  - Preferred: Venlafaxine (Effexor) for hot flashes, Estrace vaginal estrogen, calcium & bisphosphonates for bone density
- ▶ Desiccated thyroid (Naturethroid, Armour thyroid):
  - Increased cardiac adverse events
  - Preferred: levothyroxine (Synthroid, Levoxyl)

# Non-COX Selective NSAIDs

- ▶ Used for inflammation and pain
- ▶ Diclofenac, Etodolac, Ibuprofen, Meloxicam, Ketorolac, Indomethacin
  - Increased risk for GI bleeding, edema in heart failure
  - Preferred: acetaminophen, hydrocodone/APAP, oxycodone/APAP, or short-acting NSAID + stomach protectant
    - Colchicine for gout
    - Nortriptyline, venlafaxine, duloxetine for neuropathic pain
    - Celecoxib (Celebrex) UNLESS heart failure

# Anti-psychotics / Anti-depressants

- ▶ Used to treat psychological disorders and depression; some use in nerve pain and insomnia
- ▶ Chlorpromazine, Fluphenazine, Olanzapine (Zyprexa), perphenazine
  - Worsen delirium, constipation, urinary retention
  - Preferred: Aripiprazole (Abilify), Saphris, Latuda, Geodon, risperidone (Risperdal), quetiapine (Seroquel)
- ▶ SSRIs (fluoxetine, paroxetine, citalopram) with history of falls
  - Increased risk of falls
  - Preferred: bupropion (Wellbutrin), mirtazapine (Remeron)

So, is BEERS too  
confusing?



# START/STOPP tools

- ▶ Take the BEERS criteria one step further
- ▶ BEERS list has become a 'hit list' of medications that may be necessary in certain patients
- ▶ START: Screening Tool to Alert doctors to Right Treatment
- ▶ STOPP: Screening Tools of Older Persons' potentially inappropriate Prescriptions

# START Examples

- ▶ Antihypertensive therapy: only start if repeated SBP > 160mmHg
- ▶ Antidepressant therapy: only start if depressive symptoms for 3 months or more
- ▶ T2DM: start treatment with metformin
- ▶ Warfarin: start if chronic afib
- ▶ Optimize therapy to treat multiple conditions with single agent
  - Diabetes with hypertension: use ACE-I

# STOPP Examples

- ▶ Corticosteroid use in arthritis
  - Over 3 months use, stop and change to acetaminophen/topicals
- ▶ Alpha<sub>1</sub> blockers
  - More than 20mmHg drop in SBP upon standing, stop and change to ACE-I/ARB or beta blockers
- ▶ First generation antihistamines
  - More than 1 week, stop and change to second gen
  - 1 or more falls in last 3 months, stop and change to second gen
- ▶ Benzodiazepines
  - Use more than 1 month or 1 or more falls in last 3 months, stop and change to short-acting formulation (such as alprazolam, lorazepam)

# BEERS Criteria, START, and STOPP

- ▶ Treatment must be individualized
- ▶ Importance of pharmacists in healthcare teams
  - Identify inappropriate use of meds
  - Recommend alternatives
  - Monitor use of high-risk medications
  - Drug-drug and drug-disease state interactions

# Pharmacists' roles in nursing facilities



# Pharmacists' Roles

- ▶ Patient counseling
- ▶ Drug regimen review
- ▶ Therapeutic drug monitoring
- ▶ Quality assurance programs
- ▶ Drug information
- ▶ Legal compliance
- ▶ Dispensing

# Pharmacists' Roles

- ▶ Transition from office to direct patient interaction
- ▶ Assist nurses, physicians, & administrators to improve patient care outcomes
  - Cost savings
  - Regulatory compliance
  - Quality assurance
  - Drug information
  - DME (Durable Medical Equipment)
  - Pharmacokinetic dosing and monitoring

# Regulatory Compliance

- ▶ Schedule II opiates:
  - Hydromorphone, morphine, oxycodone, **hydrocodone**
  - Important in end-of-life treatment for comfort
  - Regulated by DEA due to diversion potential; Texas is more restrictive than federal requirements

# Regulatory Compliance: Schedule II controlled substances

## COOL

- ▶ Phoned in prescriptions:
  - Verify prescriber (DEA, NPI, DPS, office address, office phone)
  - Emergency period only (typically 72 hour supply)
  - Written rx received within 7 days (postmarked)
  - Indicates 'Authorization for emergency prescription' and original date on face of rx
  - Can change: strength, directions, quantity, dosage form

## NOT COOL

- ▶ Phoned in prescriptions:
  - Leaving them on the voice mail
  - Some RPhs are unaware/ unwilling to fill them regardless
  - Office staff calling in without any prescriber verification (DEA, NPI, DPS, phone number)
  - Not receiving written rx within 7 days
  - Cannot change: Name of drug, name of doctor, name of patient, date written/ earliest fill date

# Regulatory Compliance: Schedule II controlled substances

## COOL

- ▶ Prescription information:
  - Signed and dated on date issued
  - No refills
  - Maintenance: one 90-days supply or three 30-days supply
  - May partial fill rx if not enough in stock, but must complete within 72 hours

## NOT COOL

- ▶ Prescription information
  - No date; no signature
  - Only good for 21 days from written date or 'earliest fill' date (TX law); This is 81 days if a 90-days supply.
  - Insurance often limits if a patient can receive 30-days or 90-days. Any remainder is voided. Often, patients choose to fill only 30-days due to cost.

# Regulatory Compliance: Schedule II controlled substances

- ▶ LTCF specific rules:
  - Indicate 'LTCF' or 'terminally ill' on rx: allows partial fill for up to 60 days
  - Faxes – OK for oral meds for any inpatient LTCF or at home hospice patient
    - Indicate on rx fax 'LTCF' or 'hospice'
    - No follow-up hardcopy needed
- ▶ Extra documentation required causes extra time for rx processing
  - Quality Care Coalition for Patients in Pain (QCCPP) advocates for less restrictive regulations for patients in NF and LTCF
  - Allow prescriber's agent to retrieve and administer controlled substances for patients suffering
  - No drug–drug or drug–allergy review performed by pharmacist

# Pharmacists' Roles

- ▶ Team effort to process legally and efficiently
- ▶ Leverage pharmacists' knowledge of pharmacokinetics and drug monitoring
- ▶ Ask us questions! We love looking stuff up!

# Thank you!!!

»» QUESTIONS???

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