Inappropriate Drug Use in the Elderly-Revised Beer's Criteria for 2006

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Session Objectives

- 1. List drugs considered inappropriate for use in the elderly and discuss rationale
- 2. State safer alternatives for inappropriate drugs
- 3. Discuss evidence that inappropriate drug use results in adverse drug outcomes
- 4. Delineate an action plan for intervention when inappropriate drug use is detected in ones practice

Latest Research

- Liu GG and Christensen DB, JAPhA 2002;42:847-57 reviewed 11 studies and found that up to 40% of nursing home and 21% of community-dwelling elderly were receiving inappropriate drugs-predominantly propoxyphene, amitriptyline and LABZs-
- Risk factors were: polyRx, poor health status and female sex

Beer's Studies to date-

- Beers MH et al Explicit criteria for determining inappropriate medication use for nursing home residents, Arch Intern Med 1991;151:825-32.
- Beers MH. Explicit criteria for determining potentially inappropriate medication use by the elderly. An update ibid 1997; 157:1531-6.
- Fick DM, Cooper JW, Wade WE, Beers MH et al. Updating the Beers Criteria for Potentially Inappropriate Medication Use in Older Adults Arch Int Med 2003;163:2716-24.

Categories of Inappropriate Use in 2003 Study Fick et al.

- Criteria for potentially inappropriate medication use in older adults:
- 1. Considering diagnoses or conditions
- 2. Independent of diagnoses or conditions

Drugs and why?

- Propoxyphene (Darvon) and combination products (Darvon Cpd, Darvocet N, Wygesic)-Offers few analgesic advantages over acetaminophen, yet has the side effects of other narcotic drugs-to include 20-36 hrs. half life of norpropoxyphene metabolite and increased risk of delirium, confusion, falls, TdP due to QTc prolongation (Cooper JW Cons Pharm 1997)
- Alternative-Detox carefully at a dose/week if taking for more than 2 weeks at BID->QID-replace each dose with 500-650mg APAP up to3g/day. If opioid is needed consider tramadol 37.5/325mg APAP as Ultracet up to 3 tabs/day or hydrocodone 2.5-5mg QID with APAP (codeine has many drug interactions preventing conversion to morphine)-Also Propoxyphene increases adverse health outcomes(ER visits, deaths and hospitalization costs) 240% compared with APAP for pain in NH residents . Perri M, Cooper JW et al Ann Pharm 2005.

Pain Intervention Cases and Costs

- MG a 77 yowf, 5'6" 220 lbs. GDS=2 , VAS=5-7, Given propoxyphene/APAP (DVN) QID for OA. Over 2 weeks became progressively more disoriented to time, place and person (GDS 2->6). Thioridazine and flurazepam added and admitted to NF 3 X for 3 to 4 months/admission over next year-
- Cost?-

$60,000+

MG Case Intervention

- Taper DVN weekly QID->TID->BID->QHS then d/c, replacing each DVN dose decrease with 650mg APAP
- Taper thioridazine then flurazepam 25% of dose q 2 weeks . VAS then 6-7, GDS=1-2 ;After DVN and psychotropic tapered and pt. Taking 500mg of APAP QID VAS=5-7, changed to celecoxib 400mg/day but HBP/CHF , then back to APAP 500mg QID +Ultracet ½ tab BID X one week then one tab BID. Added 70% sorbitol 30->60ml HS.

MG Case Outcome

- Over next three years, MG lived with daughter on this regimen at $7,200/yr
- MG kept GDS of 1-2 and VAS scores of 2-3 on this regimen
- MG resumed knitting and making pralines
- Cost savings? 1st-2nd year: $60,000-7,200= $52,000 saved

Analgesics and Antiinflammatrories-cont'd

- Indomethacin (Indocin, Indocin SR)Of all available nonsteroidal, anti-inflammatory drugs, this drug produces the most central nervous system side effects and has high likelihood of causing gastritis, anemia and GI bleeds.Alternatives- APAP, low-dose ibuprofen (up to 800mg/day), or naproxen 220mg BID or COX-2 selectives for up to two weeks, but no more, due to risk of HBP, MI, CVA and CHF, (Cooper JW, Overstreet K, Wade WE, Cook CL in prep.)

Pain Meds- cont'd

- Pentazocine (Talwin)-is a narcotic analgesic that causes more central nervous system side effects, including confusion and hallucinations, more commonly than other narcotic drugs. Additionally, it is a mixed agonist and antagonist
- Alternative-other opioid, preferably tramadol, hydrocodone, oxycodone, fentanyl or morphine if moderate to severe chronic pain is present (malignant or non-malignant)

Pain Meds- cont'd

- Meperidine- (Demerol or "Demonal") May not be an effective analgesic and may have many disadvantages to other narcotic drugs- esp. normeperidine metabolite with t1/2 of 17-35 hrs and amphetamine-like side effects of CNS excitation to seizures (AHFS 2005). REMEMBER- meperidine was orginally a substitute for atropine!
- Alternatives- see prior opioids

Case Intervention

- RT an 81 yobm with RA/OA, NHL, given meperidine 25mg PO q 6 h over first week went from GDS 2-3 to 6-7 and had haloperidol 1-3mg TID added. 3 ER visits for fall evaluations and Fx left hip and right arm and 27 episodes of agitation/harmful behavior over the next month
- Unnecessary Costs- $800+/fall and $25 per agitation episode + hospitalization $12,000=$15,000

RT Case Intervention

- Intervention- Stop meperidine, taper haloperidol weekly by 25% dose and start celecoxib 200mg QD, then morphine CR 15->30mgBID stimulant laxative-Outcome-GDS improved to 3-4, VAS was 2-3 with Celebrex 200mg/day &morphine up to 60 mg BID and no ER visits nor falls after haloperidol taper for last 6 months of life-Pain Tx Costs after intervention-$1,500

Inappropriate Pain Meds-cont'd

- Ketorolac (Toradol)-Acute and long-term usage should be avoided in older persons as a significant number have asymptomatic gastrointestinal pathology. Up to ¾ of the elderly have GERD and ½ may have PUD Hx.
- Alternatives- APAP up to 3g/day, Celebrex or Mobic up to two weeks and/or topical ketoprofen gel 5-15% to affected areas BID-TID.

Case Intervention-

- An 81 yo male fell and broke rt. Hip- the orthopod did not consider Hx of PUD and ordered Toradol post-op. Pt. c/o epigastric distress after 1st dose and dark stools were noted next AM. H/H dropped from 12/36 - >11/33. RPh intervention to stop after 3 doses- orthopod started Vioxx 25mg led to BP 180/105 and edema-changed to Celebrex 200mg/day with Prevacid 15mg AM X 30 days with BP increase and 2+ edema, changed to Ultracet ½ tab up to QID.

Inappropriate NSAIDs

- Long-term usage of full dosage longer half-life non Cox selective NSAID agents (diclofenac, naproxen, oxaprozin, piroxicam) Potential to produce GI bleeding, acute renal failure, high blood pressure, heart failure, acute myocardial infarction- gastroprotection will not prevent GI problems-
- Alternatives- APAP, shorter-acting ibuprofen or naproxen in low dose, COX-2 selectives for up to two weeks- watch concurrent ASA, Fosamax, Actonel- prefer topical ketoprofen to affected areas
- (Cooper JW SMJ 1999, JAGS, 1996, Cons Phar, 1997)

Case Intervention

- MD was a 77 yowf with OA who was given full-dose LA NSAIDs that resulted in 5 hospitalizations for NSAID gastropathy over a 3-year period. Cost >$71,000 (Cooper JW, Wade WE JGDT 1998;12(1):95-6)
- Intervention-
  - Change attending prescriber!
  - place on APAP 650/hydrocodone 2.5 mg QID, 70% sorbitol 30ml hs. VAS went from 5-6 to 1-2. Cost=$650/yr

Inappropriate PolyRx

- The concomitant use of daily multiple gastropathic agents (NSAIDs, ASA, bisphophonates, corticosteroids) without gastroprotective agents (misoprostol or a proton pump inhibitor) Greatly increased risk of exacerbation of GERD, gastritis and PUD
- Alternatives- APAP for NSAIDs, weekly Actonel or Fosamax or yearly bisphosphonates (Zometa), Micaclcin or new PTH fragement self-injection (Forteo), H pylori eradication for safe ASA, corticosteroids to inhalation if COPD

Alendronate and Naproxen are Synergistic in Causing Gastric Ulcers (Arch Int Med 2001;161:107-110)

- Since both NSAIDs and bisphosphonates can cause gastric ulcers-be careful how they are used together!
- A 10-day study of 18 women and 8 men age >30 yrs given 10mg/day of alendronate, 500mg naproxen sodium BID or both found with 1-4 week washout between crossovers found that 2 alendronate (8%), 3 naproxen (12%) and ten (38%) receiving both developed endoscopic evidence of ulcers!

Hx GERD/PUD

- Nonsteroidal anti-inflammatory drugs, aspirin (>325mg) (Coxibs excluded ?)-GERD ins 75% and Gastric or duodenal ulcers Hx in over 50%-ALL NSAIDs May exacerbate existing ulcers or produce new/additional ulcers
- Alternatives- APAP for pain, H. pylori eradication for safe ASA use with clarithromycin+ PPI for 5-7 days followed by daily PPI, NO LONG-TERM NSAIDs!!!!!

Pharmacoeconomic outcomes of NSAID intervention acceptance and rejection

- NSAID recommendation 90% acceptance has been shown to save over $100,000 per 100 bed facility per year when accepted and decrease hospitalizations by 92%
- NSAID recommendation 10% rejection has been shown to cost more than $40,000 per year in same facility and triple hosp. Rate! Cooper JW, Cons Pharm1997

Patients at risk for GI Bleeding Still receive NSAIDs

- Nearly three-fourths (73%) of older patients who have been hospitalized for GI bleeds still receive NSAIDs at some point after their discharge (Rotterdam study).
- 51% low-dose ASA;4% NSAID with oral anticoagulant (OA) but no antiulcer drug; 35% received NSAID with an antiulcer drug; 8% received NSAID with OA and an antiulcer drug . Visser LE et a;. Br J Clin Pharmacol 2002; 53:183-8

Warfarin, LMWH or heparin Interactions

- Aspirin >325mg/day, any NSAIDs, with Dipyridamole (Persantin), Ticlopidine (Ticlid) and clopidrogrel (Plavix) Blood-clotting disorders receiving anticoagulant therapy- May prolong clotting time and elevate INR values, or inhibit platelet aggregation, resulting in an increase potential for bleeding

Case

- An 81 year-old minister with CHF and DVT was taking ASA 81mg/day. On admission to hospital for acute CHF secondary to rofecoxib, the ASA dose was increased to 325mg/day, warfarin 10mg/day started and Lovenox 50mg q12 hrs started. Pt. c/o acute stomach pain on 3rd hospital day and despite 8 units of packed rbcs died that night.
- Intervention- a lawsuit for wrongful death !

Platelet Inhibitors-

- Ticlopidine-Has been shown to be no better than aspirin in preventing clotting and may be considerable more toxic to the bone marrow and requires periodic CBC
- Alternative-Plavix –note may be used with low-dose ASA for CABG and post angioplasty for high-risk pts. But need gastroprotection with PPI (Aciphex or Prevacid) and probably H. pylori eradication before long-term PPI.

Inappropriate Psychotropics/Psychoactives

- Amphetamines, pseudoephedrine and anorexic agents-due to concerns about potential for dependence, hypertension, angina, myocardial infarction, TIAs and CVAs.
- Alternatives-NS nasal spray and PAT (push-away table)

Inappropriate Antiemetic

- Trimethobenzamide (Tigan)Is one of the least effective antiemetic drugs, yet it can cause extrapyramidal side effect (EPS)
- Alternatives- all other antiemetics, but some are also considered inappropriate?

Inappropriate Antihistamines

- Single and combination preparations containing chlorpheniramine (Chlor-Trimeton), diphenhydramine (Benadryl), hydroxyzine (Vistaril, Atarax), cyproheptadine (Periactin), promethazine (Phenergan), tripelennamine, and dexchlorpheniramine (Polaramine)All nonprescription and many prescription antihistamines may have potent anticholinergic properties- Diphenhydramine (Benadryl) Should not be used as a hypnotic and when used to treat allergic reactions it should be used in the smallest possible dose. May cause confusion and sedation and falls and worsen BPH in men
- Alternatives- Claritin NOW OTC, Clarinex, Allergra, other phenothiazine and haloperidol as antiemtics, but NOT Zyrtec as its active metabolite of hydroxyzine

Insomnia and meds

- Decongestants, Theophylline (Theodur), pentoxyphylline (Trental) Methylphenidate (Ritalin), MAOIs are likely to worsen insomnia due to CNS stimulant effects
- Fluoxetine (Prozac) DAILY –Insomnia due to CNS stimulant effects and 10-14 day half-life- OK weekly-

Inappropriate in Parkinsonism

- Metoclopramide (Reglan) >10-15mg/day, conventional antipsychotics, Tacrine (Cognex), donepezil (Aricept), galantamine (Razadyne), but rivasitgmine (Exelon) has been approved for Parkinsons dementia- Due to their antidopaminergic cholinergic effects. Cognex is Inappropriate for dementia, with other three agents and Namenda preferred.
- Alternatives for harmful behavior-Depakote ER low-dose (250 or 500mg) atypical antipsychotics, esp. risperidone

Inappropriate in Cognitive Impairment or Depression

- Barbiturates, Anticholinergics, Antispasmodics, Muscle Relaxants in cognitively impaired, due to CNS altering effects-
- CNS stimulants in Cognitive impairment-Due to CNS-altering effects CNS stimulants, thyroid preparations and in hyperthyroidism may produce or worsen hyperthyroid states
- Long-term benzodiazepine use in depression may produce or exacerbate depression
- Sympatholytic agents in depression may produce or exacerbate depression

Inappropriate meds in Anorexia and malnutrition

- CNS stimulants, due to appetite suppressing effects-DAILY Fluoxetine (Prozac) and methylphenidate produces anorexia and malnutrition-due to appetite suppressing effects
- Amphetamines-Due to CNS stimulant side effects , remember that seligelene (Eldepryl) has two amphetamine metabolites
- Alternatives-weekly Prozac, other SSRIs that may cause wt. gain e.g. Paxil, Celexa/Lexapro Remeron and dose Eldepryl AM only

Inappropriate Muscle Relaxants

- Methocarbamol (Robaxin), Carisoprodol (Soma), Oxybutynin (Ditropan), Orphenadrine (Norflex) Chlorzoxazone (Paraflex), Metaxalone (Skelaxin), Cyclobenzaprine (Flexeril) Most muscle relaxants and antispasmodic drugs are poorly tolerated by the elderly, leading to anticholinergic side effects, sedation, and weakness. Additionally, their effectiveness at doses tolerated by the elderly is questionable
- Alternatives- Detrol-LA, Sanctura or Oxytrol patch

Inappropriate BZs

- Flurazepam (Dalmane), diazepam (Valium), chlorazepate (Tranxene), and other longer-acting benzodiazepines-Benzodiazepines with an extremely long half-life in the elderly (5-7 days), producing prolonged sedation and increasing the incidence of falls and fracture. Alternatives-SSRIs, buspirone or medium- or short-acting benzodiazepines (BZs) e.g. oxazepam are preferable (Cooper JW submitted)

Inappropriate BZs

- Doses greater than lorazepam (Ativan), 3mg; oxazepam (Serax), 60mg; alprazolam (Xanax), 2mg; temazepam (Restoril), 15mg; zolpidem (Ambien), 5mg; triazolam (Halcion), 0.25mg-Because of increased sensitivity to benzodiazepines in the elderly, smaller doses may be effective as well as safer. Total daily doses should rarely exceed the HCFA suggested maximums
- Alternatives- SSRIs for 30 days before BZ taper if pt. wants to d/c BZ or lessen use (e.g. paroxetine 10-20mg, sertraline 25-50mg, citalopram 20-40mg or escitalopram 10-20mg/day continuously and increasing to max dose to d/c BZs)

Inappropriate BZ Combos

- Chlordiazepoxide (Librium), chlordiazepoxide-amitriptyline (Limbitrol) clidinium-chlordiazepoxide (Librax), and diazepam (Valium)Chlordiazepoxide and diazepam have a long half-life in the elderly (often several days), producing prolonged sedation and increasing the risk of falls and fractures. Alternative-Short- and intermediate-acting benzodiazepines are preferred if a benzodiazepine is required, but again an SSRI may be preferable

Inappropriate Antidepressants

- Daily Fluoxetine-Long half-life of drug and risk of producing excessive CNS stimulation, sleep disturbances and increasing agitation, as well as the need for anxiolytics, hypnotics, or antipsychotics
- Alternatives- weekly fluoxetine 20-80mg or other SSRIs previously mentioned

Inappropriate Antidepressants

- Amitriptyline (Elavil), Chlordiazepoxide-amitriptyline (Limbitol), Perphenazine-amitriptyline (Triavil)-Because of its strong anticholinergic and sedating properties, amitriptyline is rarely the antidepressant of choice for the elderly-
- Doxepin (Sinequan)Because of its strong anticholinergic and sedating properties, doxepin is rarely the antidepressant of choice for the elderly
- Alternatives-SSRIs previously mentioned and may be use also for neuropathic pain (e.g. PHN)

Inappropriate Antipsychotics

- Thioridazine (Mellaril)-CNS, QTc and EPS side effects and Mesoridazine (Serentil)-CNS, QTc and EPS side effects. Taken off the market in the UK! Ray W et al. Arch Gen Psych 2001; 58:1161-7. Examined Tenn. Medicaid pts. 1988-1993 and found that those with severe CV disease who received moderate doses of older conventional antipsychotics had 3.5-fold increase of sudden cardiac death (TDP?) compared with similar pts.not receiving these drugs.All PRN antipsychotics without orders for routine dosing No data of efficacy; much data on toxicity
- Olanazapine (Zyprexa)-Obese patients may stimulate appetite and increase weight gain as well as cause new type 2 DM and much higher fall rate than other APs and prevent cholinesterase inhibitor efficacy. (Cooper JW in prep [falls] and Meyer JM. J Clin Psychiatry 2002 May;63(5):425-33 for DM risk relative to risperidone.
- Alternatives- risperidone (Risperdal), quetiapine (Seroquel), aripriprazole (Abilify) may be safer in terms of CV and wt. gain risk. Ziprasidone (Geodon) may be safer in terms of wt. Gain and diabetes risk.

Inappropriate Anxiolytics

- Meprobamate (Miltown, Equanil)-is a highly addictive and sedating anxiolytic. Those using meprobamate for prolonged periods may be addicted and may need to be withdrawn slowly- use an SSRI or buproprion for 2-4 weeks before trying taper- Soma(carisprodal) is meprobamate pro-drug!
- All barbiturates (except phenobarbital)* Except when used to control seizures.-

Inappropriate Antidiabetic Agent

- Chlorpropamide (Diabinese)It may have a prolonged half-life in the elderly and could cause prolonged hypoglycemia. Additionally, it may be the only oral hypoglycemic agent that causes SIADH
- Alternatives- insulin-sensitizing agents first if C-peptide >1ng/ml indicating pt. still making insulin- e.g. metformin, glitazones, Precose/Glyset, then sulfonylureas or glitinides (Starlix or Prandin)

Inappropriate GI Meds

- The following gastrointestinal antispasmodic drugs- Dicyclomine (Bentyl), hyoscyamine (Levsin, Levsinex), propantheline (Pro-Banthine), belladonna alkaloids (Donnatal and others), and clidinium-chlordiazepoxide (Librax) should be avoided (especially for long-term use)- Gastrointestinal antispasmodic drugs may be highly anticholinergic and generally produce substantial toxic effects in the elderly to include confusion, disorientation, delirium, falls and interference with cholinesterase inhibitors for dementia (Aricept and Razadyne) (Cooper JW, Burfield AH, Annals LTC,2003:4[11]: 50)

Inappropriate GI drugs

- Mineral Oil Potential for aspiration and adverse-effects. Safer alternatives available- 70% sorbitol 30-120ml/day
- Cimetidine (Tagamet) Central nervous system side-effects including confusion-prefer ranitidine or famotidine or PPI
- Long term use of stimulant laxatives, except in the presence of chronic pain requiring opiate analgesics, but try 70% sorbitol and MOM first if not in CRF

Inappropriate Thyroid

- Dessicated Thyroid Due to concerns about cardiac effects ("T3 storms"). Safer alternatives available-Thyroxine
- Be sure that sensitive TSH is done q 3-6 months in all pts. on any thyroid or antithyroid med (N=2-6ng/ml)- high means not enough thyroid, low means too much and need to cut dose

Inappropriate Antihypertensive Agents

- Methyldopa (Aldomet); methyldopa/hydrochlorothiazide (Aldoril)May cause bradycardia and exacerbate depression in the elderly
- Reserpine at doses > 2.5mg-May induce depression, impotence, sedation, and orthostatic hypotension
- Alternatives- diuretics, ACEI/ARBs

Inappropriate Antihypertensive and Vasodilating Agents

- Guanethidine (Ismelin)-May cause orthostatic hypotension due to 5-7 day half-life. Safer alternatives exist (ACEI/ARBs).
- Guanadrel (Hylorel) May cause orthostatic hypotension
- Cyclandelate (Cyclospasmol) Lack of efficacy. Safer alternatives available.
- Isoxsuprine (Vasodilan) Safer alternatives available

Inappropriate Antihypertensives

- Short acting Nifedipine (Procardia, Adalat)- Potential for angina
- Clonidine (Catapres) Potential for orthostatic hypotension and CNS adverse effects

Inappropriate BP/BPH Meds

- Doxazosin (Cardura), prazosin and terazosin (Hytrin)- Potential for toxicity – cardiac, dry mouth, and urinary problems and CHF from ALLHAT trial-Flomax and Uroxaltra NOT linked with BP/CHF problems
- Clonidine (Catapres)-Potential for orthostatic hypotension and CNS adverse effects
- Alternatives- Diuretics, ACEI, ARBs, beta blockers

Inappropriate in Stress incontinence

- Alpha-blockers (Doxazosin, Prazosin, Terazosin), Anticholinergics, Tricyclic antidepressants, long-acting benzodiazepines (BZ)-May produce polyuria and worsening of incontinence
- Alternatives- Kegel if coherent, more Chux pads if not!

Inappropriate CV Drugs

- Disopyramide (Norpace, Norpace CR) Of all antiarrhythmic drugs, this may be the most potent negative inotrope and therefore may induce heart failure in the elderly. It is also strongly anticholinergic. When appropriate, other antiarrhythmic drugs should be use
- Digoxin (Lanoxin).- in doses >0.125mg/day Except when treating atrial arrhythmias.

Inappropriate CV Drugs

- Short-acting Dipyridamole (Persantine) ALONE-Do not consider the long-acting Dipyridamole (which has different properties in older adults)-except with patients with artificial heart valves
- Aggrenox is fine in TIA and ischemic/thrombotic CVA prevention

Inappropriate CV Meds

- Amiodarone (Cordarone)-Due to association with QT interval problems, risk of provoking torsades de pointes, hypothyroidism, pulmonary fibrosis, catarracts and lack of efficacy in older adults- BUT CAST study is extrapolated
- May still see used in Hx of sudden CV standstill- do ECG, TFTs, PFTs and eye exams q 6-12 months

Inappropriate in Heart failure

- Disopyramide (Norpace), high sodium content drugs (sodium, sodium salts (alginate bicarbonate, biphosphate, citrate, phosphate, salicylate, & sulfate), glitazones (Actos and Avandia), oral HRT and all full-dose NSAIDs
- Due to negative inotropic effect or potential to promote fluid retention and exacerbation of heart failure

NSAIDs and CHF in Elderly Pts.

- A matched case-control study of the relationship of NSAIDs and CHF hospitalization found:
  - Use of NSAIDs week before admission doubled risk of admission
  - Longer-half life NSAIDs were more likely than shorter-half life agents to cause exacerbation
  - One in 5 of CHF admissions were associated with NSAID usage (Page J, Henry D Arch Int Med 2000;160:777-784)

NSAID Use increases risk of CHF relapse

- Rotterdam study of 7,277 non-institutionalized ~70yo, 62% female pop. Found that use of any NSAID (not low dose ASA) after Dx of CHF increased RR of relapse by 9.9 (little OTC NSAID use in netherlands)
- Feenstra J et al. Arch Int Med 2002;163:265-70

Fluid Retention and NSAIDs

- A 5-year study of NSAIDs and wt. Gain before COX-2s selectives were introduced found 4 suspected cases with traditional NSAIDs. A five-year subsequent study since COX-2s were introduced in the same long-term care facility found 34 suspected cases with almost exclusive use of COX-2 inhibitors and the same prevalence of OA between both periods , with rofecoxib more likely than celecoxib or valdecoxib to lead to BP, edema or CHF admission[rofex coxib half-life 18-20hrs vs. 8-10 hrs for cele-or valdecoxib (Cooper JW, in prep data)

Inappropriate Antinfective

- Macrodantin, Macrobid-due to functional renal impairment in elderly (Cooper JW J Pharmacoepi 1991) ave. Creatinine clearance 40-45mlmin of 80 yo and higher risk of peripheral neuropathy, pneumonitis and hemolytic anemia. Safer alternatives available (TMP)

Inappropriate Dose and Indications

- Iron supplements >325mg daily Total absorption may not occur with higher doses. May increase constipation
- Iron also does not get Hgb>10 in anemia of chronic disease
- Reverse situation- refusal to use iron when Procrit/Epogen or Aranesp is in use- one case used $15,000 before Fe started! Hgb 6-7---->10 in 30 days

Inappropriate in Syncope or Falls

- Short to intermediate- to longer-acting benzodiazepines, Tricyclic antidepressants, most antipsychotics (APs), propoxyphene- May produce ataxia, impaired psychomotor function, syncope, and additional falls-
- Alternatives- Buspirone, SABZ (oxazepam), SSRI, dose reduction of APs or different AP- risperidone is safest! And APAP
-

Conventional Psychotropic tapering, Buspirone Conversion, Agitation and Falls

- In a recent study of NF residents with AD who were agitated and treated with conventional psychotropics (CPs), CP tapering and buspirone conversion decreased the number of agitation AND fall episodes by 75% and improved cognition over a 6-month study period (Cooper JW, Cobb HH , Burfield AH , Cons Pharm, 2001;16:358-363; Cooper JW, Cons Pharm & JAMA 1997)

Other Fall Risk Interventions That Work

- Gait , Balance, Exercise and Strength Assessment and training
- Environmental changes-removal of throw rugs, change slippery shoes & floors, add assist devices
- Home Assessment

Impact of Interventions on Geriatric Prescribing

- Impact of consultation on geriatric patient prescribing (Lipton HL, et al., Med Care 1992;30-646-58). 236 Hospitalized patients 65 yo or older with 3 or more meds, 88% had at least one-->
- Clinically-significant Rx problem and 22% had serious to life-threatening ADR problem due to meds; pharmacist consult intervention in-hosp., discharge &1 & 2 months afterward decreased problems vs. control group

In-hospital ADRs and Costs

- In hospital ADRs rank between 4th and 6th as leading causes of death in the USA- Lazarou J, et al. JAMA 1998;279:1200-5) 2.2 million hospitalized pts. Had serious ADRs and 106,000 died in 1994 via meta-analysis of 39 studies
- Two studies document high costs of ADRs within the hospital: Classen DC, et al. JAMA 1997;277:301-6 & Bates DW, et al. Ibid:307-11. In 1st, a 4-year study, ADRs occurred in 2.43/100 admissions AND-->

ADR costs cont'd-

- In 1st study, each ADR added 2+ days to LOS, >$2,200 in costs and doubling of death rate
- 2nd study (Bates) over 6 months, 247 ADRs were identified from 4,108 admssions
- Almost one-third of ADRs were deemed preventable.
- For preventable ADRs there was a 4.6 days increase in LOS & cost of $5,857; for all ADRs 2.2 days and $3244 increase in cost/ADR

Intervention Cost-Savings by Prevalence of Problems

- 1. NSAID Gastropathy hospital admissions- leading ADR: 5-year study routine H/Hs with NSAIDs-check lower eyelid/nailbeds color- reduced from 39 in 4 years (JAGS) to 3 in 5 years in recommendation acceptance group
- Even with 90% recommendation acceptance, the 10% rejection group had 9 hospitalizations; saving/year $115,489 for acceptance, but lost $40,166 with rejection. Aver. Cost per admission=$14,419 (Cooper JW, Consult Pharm 1997;792-6)

Cost-Savings: Falls and fractures

- 2. Second most common ADR admission: each fall costs $858. Drugs most commonly associated- BZs, antipsychotics, TCAs, narcotic analgesics, antihistamines;hospitialization=$12,000+
- Pyschoactive load reduction and buspirone conversion reduced falls from 0.4 to 0.06/pt/month for savings of $58,812/yr for acceptance and lost $99,211 with rejection of rec.s(Cooper Consult Pharm 1997; 12: 1294-1309 & JAMA 1997:278:1742-3.)

Intervention in Diabetics and hospitalizations

- 3. With monthly assessment, both fewer episodes of hypo-/ hyperglycemia & DM-related hospitalizations were seen with accepted (3/26) vs. rejected (9/31) rec. groups (Cooper JW, Consult Pharm 1995;10:40-5)
- DM consultation is current area of reimbursement mandate by states
- Question remains-how did patients get less than adequate medication assessment?

An Approach to Inappropriate Drugs in the Elderly

- 1st rule in health care- ”Do no harm”
- 2nd rule- “If its not broken do not try to fix it”
- 3rd rule-”if its broken offer several alternatives to fix it”
- Regulators may want to use the “inappropriate drug list” as a hammer and anvil for all HCPs
- Be sure you have a clinical problem before rec. change!

Summary and Conclusions

- In the year elderly become progressively to severely disabled a large proportion are hospitalized for a small number of diagnoses, most of which relate to drug use. (Ferruci L, et al JAMA 1997;277:728-34)
- ADRs are only 1/3 of drug-related admissions; other 2/3 are related to nonadherence to prescribed Tx (Cooper JW, et al. AJHP 1977; 34:738-42)
- How can health care practitioners improve drug use among older adults?

Consumer Responsibilities And Rights Concerning Medications

- Patients should be able to give the name of each drug, how to use the drug and what to expect from the drug in order to best use the drug in their overall treatment scheme-Patients should expect reasonable medication outcomes! If you want to present these slides, e-mail me at jcooper@rx.uga.edu for free copy. Dr. Jack Fincham's superb book "Taking Your Medicine" is highly recommended for the caregiver and layperson who wants to better understand their medications and may be ordered via e-mail to jfincham@rx.uga.edu or to Jack Fincham, UGa College of Pharmacy, Rm 262, Athens GA 30602 at $17.25+3.99 s/h=$21.24 , which is 25% less than the publishers price..Thank you!

Additional Resources

- For free slide set on "Safe medication use in the older adult", e-mail jcooper@rx.uga.edu
- 20 hrs Consultant Pharmacist and 30 hrs Geriatric Certificate and CGP Prep Program at -www.shca-ga.org click on pharmacists
- For other CGP prep or other CE resources, see ASCP.COM

Potential Conflicts of Interest

- Dr. Cooper has served on advisory boards, speakers bureaus and/or received grant support from: Abbott, Aventis, Bayer, BMS, Boehringer-Ingleheim, Ciba-Geigy, Forest labs, Glaxo-SKB, J&J,Janssen,Ortho-biotech, P&G, Pfizer-Roerig, Purdue-Pharma, Astra Zeneca, Lilly-Dista, Merck, Organon, Watson labs and Novartis

CE/CME/CNE Questions

- 1. Which analgesic is inappropriate?
- A. APAP
- B. propoxyphene
- C. tramadol
- D. hydrocodone
- 2. T or F-Inappropriate drugs are a cause of increased morbidity, mortality and health care costs in the elderly

Questions, cont'd

- 3. Drugs may be inappropriate with which of the following diagnoses?
- A. CHF
- B. HBP
- C. Gastric or duodenal ulcers
- D. Seizure history
- E. any or all of the above

Questions and Key

- 4. The 3rd rule in health care is-A.”Do no harm”
- B.“If its not broken do not try to fix it”
- C.”if its broken offer several alternatives to fix it”
- D. none of the above
- Key-
- 1.b, 2-T, 3-E, 4-C