Geriatric Pharmacology: Quick Facts and Tips

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1. The chance of an adverse drug event (ADE) or drug-drug interaction (DDI) increases with the number of drugs. In age, 15-50% of all hospital admissions are due to ADEs. In a patient taking more than 5 drugs, the statistical chance of a DDI or ADE is 100%.

2. Many drugs are distributed [are active] primarily into the body's water compartment. Total body water decreases significantly with age. Diuretics and poor oral intake worsen this. Therefore, there is a greater risk of drug toxicity. Examples: digoxin, theophylline, lithium, aminoglycosides, anti-arrhythmics, lidocaine.

3. In age, renal function declines about 1% per year over age 50. This is markedly increased if the patient is also dehydrated. The majority of drugs are renally excreted and are therefore at risk to accumulate. Examples: meperidine, metabolites of morphine, anti-arrhythmics.

4. In age, liver function stays about the same under normal circumstances. However, liver blood flow is decreased with dehydration or CHF, and liver function decline with cachexia or metastases.
Therefore many drugs have prolonged half-lives: tricyclic antidepressants, many opioids, verapamil, benzodiazepines.

5. Elderly people are very susceptible to anticholinergic drugs. They cause delirium, memory loss, urinary retention, constipation, dry eyes and mouth)
CLUE: Any drug that causes dry mouth is probably anticholinergic.

RED-FLAG DRUGS: never use these in elderly people

- Meperidine (Demerol), toxic metabolite accumulates, delirium)
- Codeine: must be metabolized by liver to work
- Propoxyphene (Darvocet, Darvon)—no more effective than aspirin, toxic in elderly
- Careful with fentanyl patches (Duragesic)—prolonged T ½ in elder, very potent. Never use in opioid naïve pt.
- Diazepam (Valium), chlordiazepoxide (Librium)—prolonged T ½ up to 90 hours after a single dose
- Theophylline: toxic, other drugs work better
- Muscle relaxers [except tizanidine (Zanaflex)]—strongly anticholinergic, and not very effective. Ex: Robaxin, Flexeril, Soma
- 1st generation antihistamines: diphenhydramine (Benadryl), chlorpheniramine, etc, unless for treatment of dystonia.
- Amitryptaline (very anticholinergic); use desipramine, nortryptaline

Rules of Thumb

1. Think, "small frequent feedings". Use small doses of a short acting drug, more frequently, until pt is stabilized on it. Then can switch to a longer acting. For starters, I typically use ½ of the smallest tablet size available and titrate, titrate, titrate!
2. Anticipate drug accumulation at about 3-5 days after any new or changed drug. Opioids and BZP may need to be down titrated. The drug that accumulates is not necessarily the one that is new or increased.
4. If an elderly person on multiple meds becomes nauseated or confused, it is probably a drug side effect.
5. As pts become dehydrated, reduce med doses!
6. To avoid polypharmacy, use time-limited medication trials. If the med does not help within 2 weeks, stop it. Do not leave it on as "prn"—you never know who will administer it anyway.

Cases

1. A 90 y/o, 90-pound woman with end-stage CHF is on digoxin 0.125 mg qd, Lasix 40 mg tid, captopril 25 mg tid, and stool softener. She is anorexic and her oral intake is poor. She is noted to be more edematous and SOA, so her Lasix is increased to 80 mg tid. Five days later, she calls, c/o nausea. What is the most likely cause?

2, A 75 y/o 110 pound man with end-stage lung cancer and severe COPD is started on MS Contin 15 mg bid for generalized discomfort with good results. One month later he c/o radiating, sharp pain in a radicular distribution, thought to be due to tumor invasion of thoracic nerves. He is started on amitryptaline 100 mg hs. Two days later, he becomes more lethargic and restless. His wife calls, stating that he hasn't urinated in two days and is severely constipated. What should you do?

3. A 72 y/o 90-pound woman is admitted to hospice for end-stage breast CA with bony metastases. She has known renal insufficiency (creatinine 2.5). When you examine her, she confused and lethargic, c/o severe pain over her right rib cage. Her attending physician (not Dr Brungardt) has prescribed Darvocet N 100, 1 tab qid prn pain; Indocin (indomethacin) 50 mg tid for bone pain; (methocarbamol) Robaxin 1000 mg tid for muscle spasm; and diazepam (Valium) 5 mg tid for anxiety.

What medication recommendations would you make?