

Optimizing Medication Use for Long-Term Care Residents

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Long-Term Care Research Education Day
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Chronic Disease Management in Long-Term Care

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Objectives

- Outline challenge of applying clinical practice guidelines for drug use to LTC residents
- Discuss tensions between avoiding harmful drugs vs. optimizing effective drugs
 - Avoiding harmful drugs: errors of commission
 - Optimizing effective drugs: errors of omission
- Discuss practical approaches to optimizing medication use for residents in LTC with multiple comorbid illnesses



Demographics and Disease

- Rapidly rising population of elderly LTC residents with multiple comorbid illnesses
- Rising prevalence rates for many chronic diseases:
 - Diabetes mellitus
 - Coronary artery disease
 - Congestive heart failure
 - Osteoporosis
 - Alzheimer's disease and related dementias, etc...
- Many of these conditions typically require multi-drug regimens



Treating Chronic Disease

- Diabetes mellitus



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 - Hypoglycemic agent(s):
(glyburide, metformin, rosiglitazone, insulin, etc)
 - ASA
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 - Diuretic (eg. furosemide)
 - ACE inhibitor +/- ARB
 - Beta-blocker
 - +/- Digoxin, Spironolactone, ASA/warfarin, Statin, etc



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- Congestive heart failure
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Treating Chronic Disease

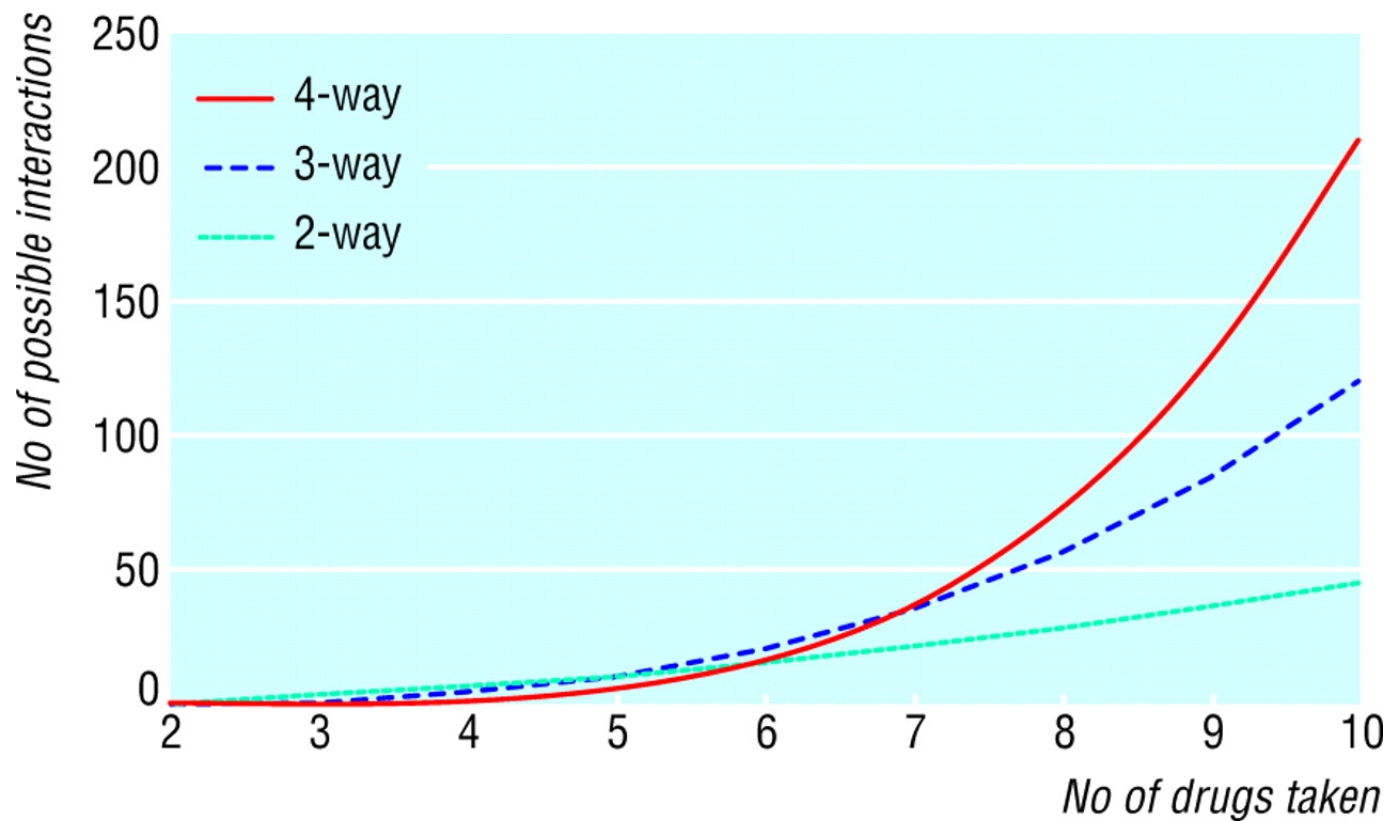
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- Osteoporosis
 - Calcium, Vitamin D
 - Bisphosphonate/Raloxifene



Treating Chronic Disease

- Thus, having multiple comorbid diseases can predispose to polypharmacy:
- ↑ risk of adverse drug events
- ↑ risk of drug-drug interactions (DDIs)
 - pharmacokinetic DDIs
 - pharmacodynamic DDIs
- ↑ risk of drug-disease interactions

Number of possible 2-way, 3-way, & 4-way interactions in patients taking multiple drugs



Ferner RE, et al. BMJ, 2006



Inappropriate Prescribing

- Moving beyond just counting the number of medications (e.g. “polypharmacy”) – more complex than that
- Why do elderly people use more drugs?
 - More chronic medical conditions
 - Multiple physicians – “too many cooks”
- Why are they more prone to adverse drug events?
 - More drug use, thus more potential for drug-drug interactions
 - More comorbidity, thus more potential for drug-disease interactions



Inappropriate Prescribing

○ **Errors of *Commission*:**

- Study of 1999 prescribing patterns in >750,000 US subjects > 65 yrs old
- 21% filled prescription for a drug deemed to be potentially inappropriate by expert panel
 - 51% = drugs with potentially severe adverse effects
 - 23% = amitriptyline, doxepin
 - 15% filled prescriptions for 2 drugs of concern, 4% filled prescriptions for > 2 drugs of concern
- Similar studies date back at least 10 years with similar results, and little or nothing has been done to address the problem

Curtis LH, et al. Arch Intern Med, 2004



Inappropriate Prescribing

- **Errors of *Commission*:**
- Drugs/doses to avoid in most cases:
 - Meperidine (Demerol)
 - Strongly anticholinergic tricyclic antidepressants:
 - amitriptyline, doxepin, imipramine
 - Other anticholinergic medications:
 - e.g. diphenhydramine (Benadryl)
 - Long-acting benzodiazepines such as diazepam
 - Long-acting NSAIDs (piroxicam)
 - High-dose thiazide diuretics (> 25 mg HCTZ)
 - Iron (325 mg once daily is usually enough)



The “Prescribing Cascade”

- A common but under-recognized mechanism by which errors of commission may develop
- Examples:
 - NSAID → HTN → antihypertensive therapy
 - Antipsychotic → Parkinsonism → Sinemet
 - Metoclopramide → Parkinsonism → Sinemet
 - Antipsychotic → akathisia (restlessness) → more antipsychotic
 - Cholinesterase inhibitor (e.g. donepezil, galantamine) → urinary urgency, incontinence → anticholinergic (e.g. oxybutynin)



Inappropriate Prescribing

- **Errors of *Commission*:**

- Several lists of inappropriate prescribing have been published

Beers MH, et al. Arch Intern Med, 1991

McLeod PJ, et al. CMAJ, 1997

- Beers criteria updated:

Fick DM, et al. Arch Intern Med, 2003

- These criteria have helped define rates of inappropriate prescribing in variety of settings
- However:
 - They are arbitrary, consensus-based criteria (strength of evidence re: harm with these drugs?)
 - These criteria only cover “*errors of commission*”: what about “*errors of omission*”?



Inappropriate Prescribing

○ **Errors of *Omission*:**

- Study of pharmacologic “quality indicators” using 1998-99 prescribing data
- Used different list of “inappropriate prescribing practices” vs. study by Curtis et al.
- Found that relatively few patients were being given inappropriate drugs, but many were *NOT* prescribed medications for which they had indications

Higashi T et al. Ann Intern Med, 2004



Inappropriate Prescribing

- **Errors of *Omission*:**
- Under-treatment is common among elderly:
 - Coronary artery disease (“risk treatment paradox”)
 - ASA (primary and secondary prevention)
 - Beta-blockers (post-MI)
 - Anticoagulation in atrial fibrillation
 - Hypertension, especially isolated systolic HTN
 - Osteoporosis
 - Calcium, vitamin D, +/- bisphosphonates/raloxifene
 - Pain
 - Unwarranted fear of narcotic use by patient/physician
- Long-term adherence
 - (May be less problematic in LTC vs community setting)



Inappropriate Prescribing

Polypharmacy
(errors of commission)



OPTIMAL PRESCRIBING



Under-treatment
(errors of omission)



Practical approaches to optimizing medication use for LTC residents with multiple comorbid illnesses



Medication Appropriateness Index

1. Is there an indication for the drug?
2. Is the medication effective for the condition?
3. Is the dosage correct?
4. Are the directions correct?
5. Are the directions practical?
6. Are there clinically significant drug-drug interactions?
7. Are there clinically significant drug-disease/condition interactions?
8. Is there unnecessary duplication with other drugs?
9. Is the duration of therapy acceptable?
10. Is this drug the least expensive alternative compared with others of equal usefulness?

Hanlon JT, et al. J Clin Epidemiol, 1992
Samsa GP, et al. J Clin Epidemiol, 1994



Reconsidering Medication Appropriateness for Patients in Late Life

- Providing guideline-adherent care for many conditions increasingly means the addition of more drugs to reach disease-specific targets
- When might it be best to withhold or discontinue medications that are otherwise appropriate on the basis of guidelines?
- Authors propose practical 4-step model for appropriate prescribing for patients late in life

Holmes HM, et al. Arch Intern Med, 2006



Reconsidering Medication Appropriateness for Patients in Late Life

- 1. Remaining Life Expectancy**
- 2. Time Until Benefit**
- 3. Goals of Care**
- 4. Treatment Targets**



1. Remaining Life Expectancy

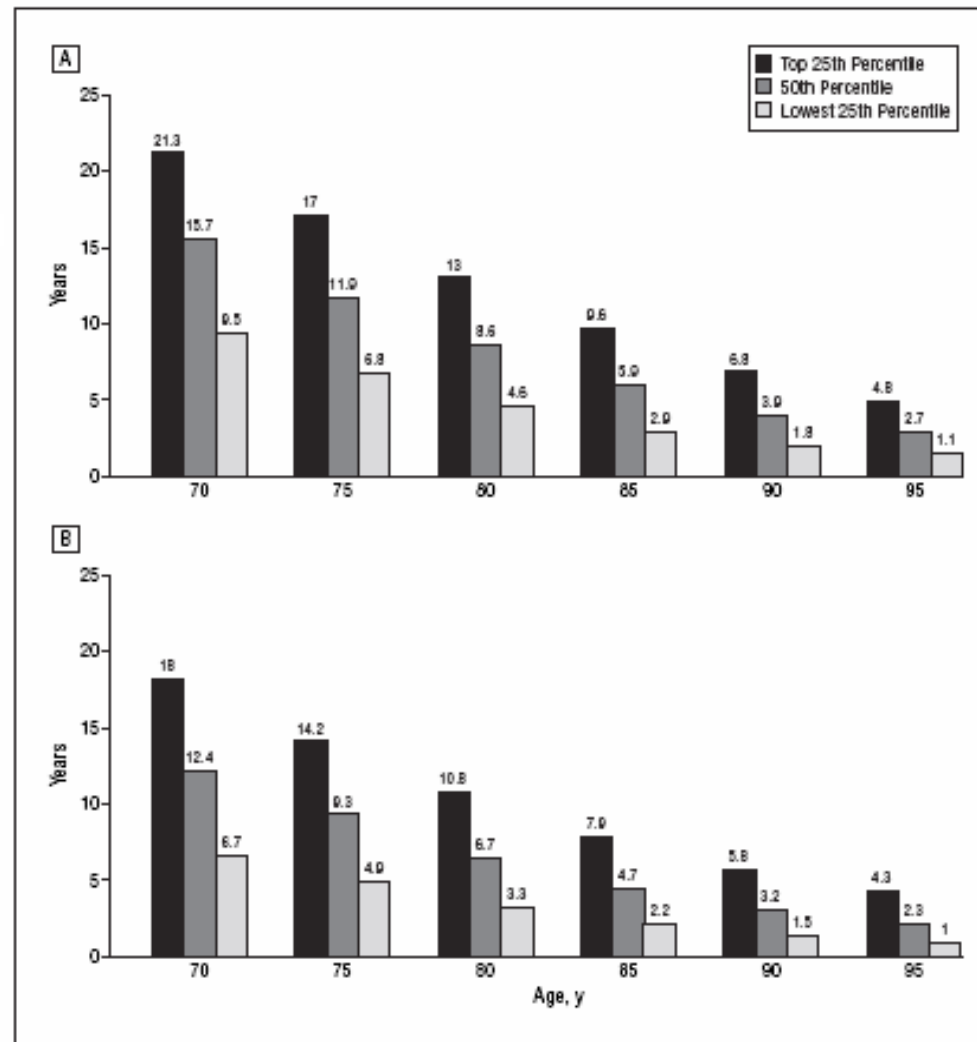


Figure 2. Upper, middle, and lower quartiles for life expectancies for women (A) and men (B) on the basis of the US life tables. The 3 numbers provided for each 5-year age cohort reflect remaining life expectancy for the top 25th, middle 50th, and lowest 25th percentile. For example, 75%, 50%, and 25% of 75-year-old women will live fewer than 17, 11.9, and 6.8 years, respectively. Although the median life expectancy for 75-year-old women is 11.9 years, women with advanced comorbidities and functional impairments may live fewer than 6.8 years. Reprinted with permission from JAMA.⁷



2. Time Until Benefit

3. Goals of Care

4. Treatment Targets

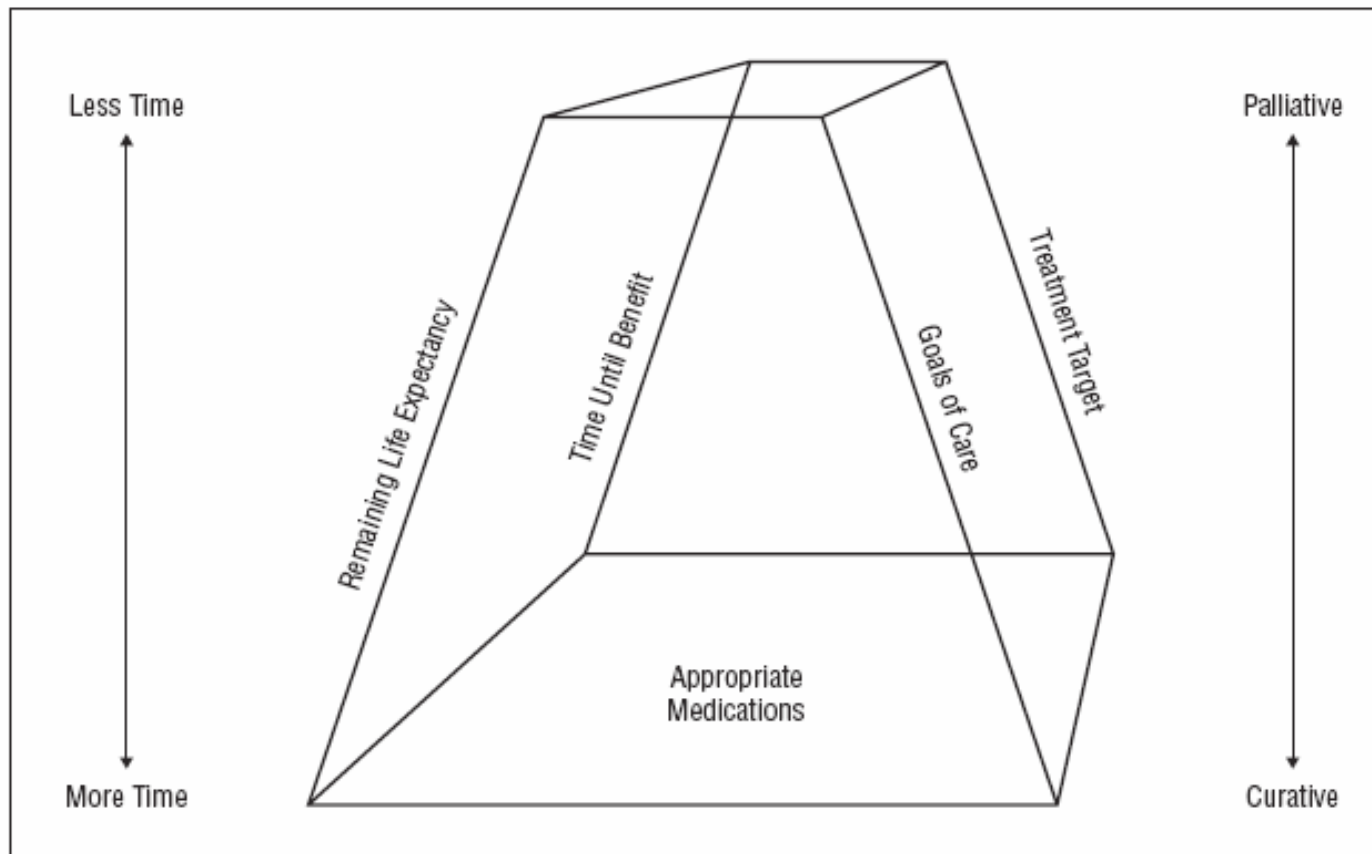


Figure 3. The model shows that the 4 steps in medication decision making form a pyramid, visually representing the appropriate medications at any level. At the top are represented patients for whom remaining life expectancy is limited, drugs should have the shortest time until benefit, goals of care are palliative, and treatment targets are focused on symptom management. Moving toward the bottom, the base of appropriate medications expands as the patient's life expectancy is longer, time until benefit may be longer, goals of care are more aggressive, and treatment targets are aimed more at preventive strategies. The bottom of the pyramid therefore contains all medications that are otherwise appropriate according to existing criteria for patients 65 years and older.

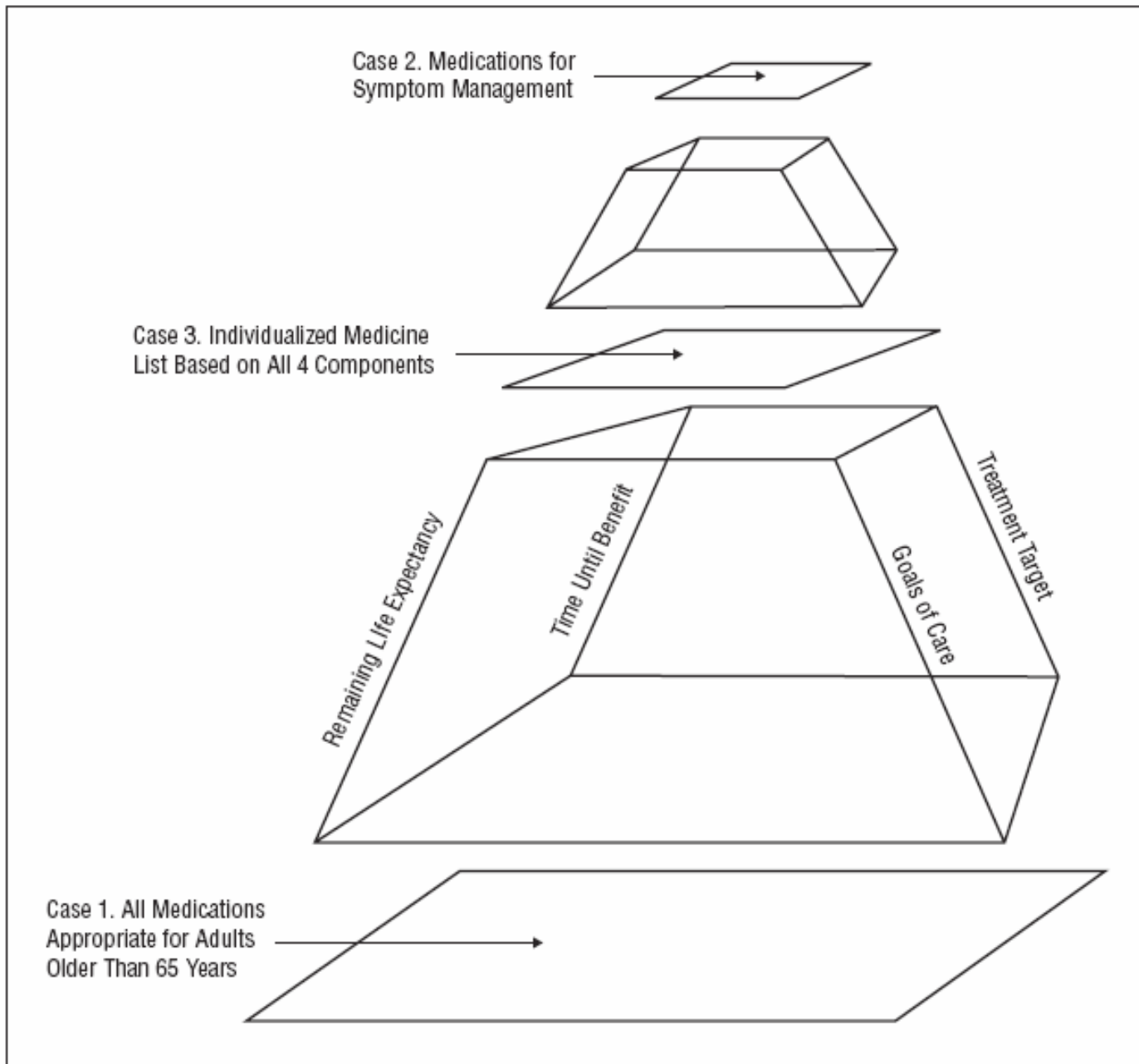


Figure 4. Use of the model in 3 distinct cases illustrates how it is used depending on the 4 components.



Summary (Return to Objectives)

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Questions