Background:

- 48 % of Medicare participants aged ≥ 65
  - have ≥ 3 chronic conditions
  - 89% of Medicare budget Partnership for Solutions

  What does our existing evidence tell us about how best to make decisions for older patients with multiple chronic diseases?

Clinical Practice Guidelines (CPGs)

- developed for management of a specific disease
- intended to influence practice
- Little evidence on applicability to older persons with multiple diseases

  Tinetti et al. NEJM 2004;351:2870-2874
  - Limited representation in single disease clinical trials

Do CPGs apply to Older Adults with Multiple Diseases?

- Many single disease CPGs fail to adequately give guidance for older patients with multiple diseases
  - Attention
  - Quality of evidence
  - Specific recommendations
  - Time needed to treat
  - Quality of life
  - Goals of therapy
  - Patient preferences
  - Burden

Boyd, C. M. et al. JAMA 2005;294:716-724

What does it mean for the patient if health care providers try to follow all CPGs?

- Hypothetical patient:
  79 year old woman with 5 chronic conditions of *moderate severity:* COPD, HTN, DM, Osteoporosis, Osteoarthritis
- Generated an aggregate treatment regimen
  - explicit instructions
  - once a day dosing
  - generic
  - synergies between CPGs
  - least adverse effects / interactions
- Cost to patient

Boyd, C. M. et al. JAMA 2005;294:716-724

Time	Medications	Non-pharmacologic Therapy	All Day	Periodic
7 AM	Ipratropium MDI Alendronate 70mg weekly	Check feet Sit upright 30 min. Check blood sugar	Joint protection Energy conservation Exercise (non-weight bearing if severe foot disease, weight bearing for osteoporosis) Muscle strengthening exercises, Aerobic Exercise ROM exercises Avoid environmental exposures that might exacerbate COPD Wear appropriate footwear Albuterol MDI prn Limit Alcohol Maintain normal body weight	Pneumonia vaccine, Yearly influenza vaccine All provider visits:Evaluate Self-monitoring blood glucose, foot exam and BP Quarterly HbA1c, biannual LFTs Yearly creatinine, electrolytes, microalbuminuria, cholesterol Referrals: Pulmonary rehabilitation Physical Therapy DEXA scan every 2 years Yearly eye exam Medical nutrition therapy Patient Education: High-risk foot conditions, foot care, foot wear Osteoarthritis COPD medication and delivery system training Diabetes Mellitus
8 AM	Eat Breakfast HCTZ 12.5 mg Lisinopril 40mg Glyburide 10 mg ECASA 81 mg Metformin 850mg Naproxen 250mg Omeprazole 20mg Calcium + Vit D 500mg	2.4gm Na, 90mm K, Adequate Mg, ↓ cholesterol & saturated fat, medical nutrition therapy for diabetes, DASH		
12 PM	Eat Lunch Ipratropium MDI Calcium+ Vit D 500 mg	Diet as above		
5 PM	Eat Dinner	Diet as above		
7 PM	Ipratropium MDI Metformin 850mg Naproxen 250mg Calcium 500mg Lovastatin 40mg	3800-4800$ per year out of pocket.		
11 PM	Ipratropium MDI			

Implications

Lower adherence:

- >40 % older persons: non-adherent to ≥ 1 drug Cooper 1982
- For each additional drug, OR nonadherence =1.16 Gray 2001
- Depression, cognitive impairment ↓adherence

Buist 2000, Gray 2001, Schmader 1998

Patient preferences

- decision analysis of warfarin use among older persons with atrial fibrillation -> poor agreement with CPG recommendations Protheroe 2000

Treatment Burden

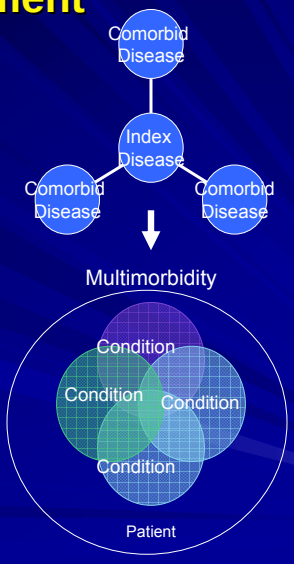
- For patients : Burden for one disease / collective

Walter 2001, Huang 2007, Vijan 2005, Townsend 2003

- For physicians : Enough time for prevention and chronic disease care Yarnall 2003, Ostbye 2005

Defining the Issue of Multiple Comorbid Management

- Competing demands of conditions: determining highest priorities for an individual patient
- Informed shared decision-making
  - How to communicate risks and benefits
- Managing Complex Co-morbid Conditions : More than conditions:
  - Caregiving
  - Coordination
  - Cost/Coverage
  - Psychosocial
  - Disability
  - Frailty
  - Age (heterogeneity)



Boyd et al

How might we prioritize?

- Life expectancy and time needed to treat in order to benefit Walter JAMA 2001, Braithwaite JGIM Supp 2007
- Heterogeneity of heath status Walter JAMA 2001
- American Geriatrics Society/California Healthcare Foundation Diabetes Guideline
  - Reviewed the evidence
  - For persons with < 10 year life expectancy, most benefit is achieved through aspirin therapy, blood pressure control, and possibly lipid control over tight glucose control Brown JAGS 2003
- Benefits of HgbA1c 7.3->6.9 vs. 10.0-> 8.5
  Kent, Hayward 2007
- Current Prioritization:
  - How physicians prioritize may not reflect evidence
    Hofer JGIM 2004
    Sellers JGIM Supp 2007

Prevalence of Major Chronic Disease Patterns Among Women Aged 65 or Older: NHANES, 1999-2004

Table 1. Prevalence of Major Chronic Disease Patterns Among Women Aged 65 or Older, NHANES, 1999-2004[a]

		Disease Pattern, No. of Diseases					
Prevalence, % (95% CI)	No. of Coincident Diseases	Arthritis	CHD	CLRT	Diabetes	CVA	Estimated Frequency (× 1000)[b]
27.9 (25.2-30.6)	1	x					5446.30
25.4 (22.8-27.9)	0						4956.30
7.3 (5.8-8.8)	2	x		x			1423.50
5.4 (4.4-6.3)	2	x			x		1049.70
4.3 (3.0-5.6)	2	x	x				842.01
3.7 (2.8-4.6)	1			x			729.29
3.0 (2.1-3.9)	1		x				586.72
3.0 (2.2-3.8)	1				x		585.28
2.3 (1.4-3.2)	3	x	x		x		454.63
2.3 (1.5-3.1)	2	x				x	446.64
1.9 (1.2-2.6)	3	x	x	x			371.29
1.9 (1.0-2.8)	3	x		x	x		369.87
1.3 (0.8-1.8)	1					x	255.28
0.98 (0.32-1.7)	4	x	x	x	x		192.38
0.82 (0.39-1.3)	4	x	x	x		x	160.46
0.75 (0.17-1.3)	2		x	x			145.62
0.70 (0.21-1.2)	3	x		x		x	137.19
0.69 (0.24-1.2)	2		x		x		135.54
0.63 (0.19-1.1)	4	x	x		x	x	123.31
0.62 (0.31-0.92)	3	x	x			x	120.33
0.50 (0.15-0.86)	3	x			x	x	98.59
0.50 (0.16-0.84)	2			x	x		97.48
Estimated disease frequency (× 1000)[c]		11 533	3444.6	3919.1	3426.5	1685.4	
Percentage with only 1 disease (95% CI)		47.2 (43.2-51.2)	17.0 (11.4-22.7)	18.6 (13.7-23.6)	17.1 (12.6-21.5)	15.2 (9.4-20.9)	

Abbreviations: CHD, coronary heart disease; CI, confidence interval; CLRT, chronic lower respiratory tract disease; CVA, cerebrovascular accident; NHANES, National Health and Nutrition Examination Survey.

[a] Each row is a distinct pattern: bold numbers and shaded background identify how many and which diseases comprise multimorbidity. Total prevalence is less than 100% and sums of disease frequencies are less than totals at bottom of each column because patterns seen in fewer than 5 observations or less than 0.5% of sample were omitted from detailed display but not calculations.

[b] Estimated number of individuals represented by NHANES through sample weights.

[c] Column totals are not mutually exclusive and can be used to compute rough prevalence of co-occurrence of diseases within 5%.

Weiss, Boyd, Wolff, Yu, Leff JAMA 2007;298:1160-1162.

JAMA

Typology of Comorbid Conditions

- **Clinically dominant comorbid conditions:** so complex or serious that they eclipse the management of other health problems
  - end-stage, severely symptomatic, recently diagnosed
- **Concordant conditions:**

  represent parts of the same overall pathophysiologic risk profile and are more likely to be the focus of the same disease management plan
- **Discordant conditions:**

  not directly related in either their pathogenesis or management and do not share an underlying predisposing factor
- **Symptomatic versus asymptomatic chronic comorbidities**

Piette JD and Kerr EA Diabetes Care 29:725-731, 2006

Recognition of Combinations of Conditions

Targeted Combinations

- Diabetes and depression (Kinder et al. JGIM 2006)
  - individualized stepped-care depression treatment
  - provided by nurse depression care managers in collaboration with primary care physisicans
  - people with multiple complications ? most benefit in depressive symptoms
- Substance abuse and HIV (Lucas et al. CID 2006)
  - Directly observed HAART in methadone clinics
  - More likely to achieve viral suppression
- Cardiovascular risk and diabetes (Vargas et al. JGIM 2007)
  - Collaborative Chronic Care Model Intervention
  - Reduced cardiovascular risk

Multimorbidity: Falls (Tinetti et al), Home Hospital (Leff et al), Prehabilitation (Gill et al), Appropriate Prescribing (Spinewine et al.)