A Geriatrician’s Perspective on the Challenge of Aging with Multiple Chronic Diseases

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Learning Objectives

By end of session participants will:

- understand the impact of Chronic Disease on complexity and challenge of responding to illness in the elderly
- appreciate the need for a customization of Chronic Disease Management Guidelines in the Elderly

Chronic Disease Management in Ontario

- Ontario faces increasing challenges in meeting the needs of people with chronic diseases.
Prevalence of Chronic Disease with Age

Chronic Disease Management in Ontario
- Ontario faces increasing challenges in meeting the needs of people with chronic diseases.
- The aging population means that illnesses such as cardiovascular disease, diabetes, and arthritis are becoming more prevalent and demands for care are rising.
- To address these needs, Ontario is collaborating on a number of chronic disease management initiatives in areas such as:
  - diabetes,
  - heart disease,
  - stroke,
  - cancer,
  - osteoporosis,
  - asthma,
  - Alzheimer’s dementia,
  - mental health and
  - Arthritis
- However, bulk of existing “best practice and care plans” based on limited application to frail elderly with multiple Chronic Diseases

Examples of Specific Chronic Diseases
- Arthritis or rheumatism is the most frequently reported chronic condition among seniors. In 2003, 44% of 65- to 74-year-olds and 51% of those 75 and over reported having arthritis or rheumatism, with higher proportion of women affected than men.
- High blood pressure was the second most common chronic condition among seniors. In 2003, more than 40% of seniors were affected by this disease. Women were particularly at risk; half of women aged 75 and over reported that they had been diagnosed with high blood pressure, compared with 37% for men in the same age group.
- Not all chronic conditions have the same repercussions on health; for the senior population, the diseases with the most serious impact on health-related quality of life were Alzheimer’s disease, stroke, bowel disorders and urinary incontinence
- Depression and Cognitive Problems amplify morbidity
Chronic Disease and Age

Frequency of Chronic Disease with Age

- No Diseases
- One Disease
- Two Diseases
- Three Diseases
- Four + Diseases

Age in years

Percent of population

The Chief Public Health Officer's Report on the State of Public Health in Canada 2010: Growing Older – Adding Life to Years

Diabetes and Co-morbidities

- Falls: 31% per year
- Dementia: 10% prevalence
- Polypharmacy: 23% on > 5 medications
- Persistent pain: 25-50% prevalence
- Depression: 15% per year

Impact of Co-morbidity on Hospitalization:
Hospitalization for Ambulatory Care Sensitive Condition by Number of Chronic Conditions

Wolff, J. NIA Comorbidity Conference, 2005
Co-morbidity: Effects of Two or more Diseases

- Increased risk of other diseases
- Increased likelihood of functional impact
  - Risk of problems with mobility
    - Heart Disease Only: OR = 2.3
    - Arthritis Only: OR = 4.3
    - Both Heart Disease + Arthritis: OR = 13.6

Impact of multimorbidity on 3-year mortality

Chronic Illness Drives Medical Care Costs

Segments within the total population
- Those with multiple chronic conditions
- Those with chronic conditions
- Those with no chronic conditions

Costs associated with each segment
- Those with multiple chronic conditions: 30%
- Those with chronic conditions: 31%
- Those with no chronic conditions: 33%

Source: Kaiser Permanente Northern California commercial membership, DxCG methodology, 2001
Impact of Co-morbidity within healthcare system

- Increased likelihood impact of a disease on “function”, mood, ability to cope
- Increased likelihood of hospitalization, prolonged LOS and ALC designation
- Increased costs and worsening of outcomes
- Increased challenges to health care providers to “provide good care”
  - Care Gaps (under treatment)

The Care Gap for Seniors with Chronic Disease

- AMI - 50% receive Beta Blocker
- CHF – 65% receive ACE on discharge
- CVA – 57% of AF on anticoagulant
- DM – 50% have eye examination
- Fallers in ER – less than 15% have fall reduction strategy initiated

Undertreatment of Osteoporosis Post Fracture in Women¹

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>No diagnosis or treatment for osteoporosis</td>
<td>15.4%</td>
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<tr>
<td>Diagnosis of osteoporosis only</td>
<td>5.5%</td>
</tr>
<tr>
<td>Prescribed treatment for osteoporosis</td>
<td>79.0%</td>
</tr>
</tbody>
</table>
Therapeutic Care Gap: Most Men Do Not Receive Treatment for Osteoporosis after Fracture

Impact of Co-morbidity within healthcare system
- Increased likelihood impact of a disease on "function", mood, ability to cope
- Increased likelihood of hospitalization, prolonged LOS and ALC designation
- Increased costs and worsening of outcomes
- Increased challenges to health care providers to "provide good care"
  - Care Gaps (under treatment)
  - Polypharmacy (aggressive application guidelines)

Polypharmacy and ADRs
- 6 or more meds (15-20% of seniors)
  - 35% experience ADR
    - 95% were predictable
    - 63% required MD intervention
    - 10% required ER visit
    - 11% required hospitalization

(Hanlon TJ et al JAGS 1997 45:945-948)
The significance of Adverse Drug Reactions

- Between 19 – 28% of hospital admissions for those over 50 are due to medication-related problems. It is suggested that as many as 25% of these admissions could have been avoided if medications had been used appropriately (reviewed in Gallagher et al, 2007).
- 60% of MRP-related admissions are due to adverse drug reactions (ADRs).
- 40% of MRP-related admissions are due to non-compliance.
- In USA, the number of deaths per year due to MRPs is equivalent of three (3) jumbo jet crashes every two days!
- If MRPs were ranked as a disease by cause of death, it would be the 5th leading cause of death in USA (Laszlo et al. Incidence of adverse drug reactions in hospitalized patients: a meta-analysis of prospective studies. JAMA, 1998 280(20):1741-44).

The new patient from St Elsewhere

Ms. Marian Chen

79 year old widow
Retired teacher, lives alone
Modest income:
Daughter, lives 10 miles away with three teenagers

Five chronic conditions
Eight medications

In 2009, Mrs. Chen had...

- 22 scripts
- 8 meds
- 19 outpatient visits
- 3 hospital admissions
- 6 weeks sub-acute care
- 2 nursing homes
- 6 weeks sub-acute care
- 5 months homecare
- 2 home care agencies
- 6 community volunteers
- 79 volunteer hours
Help! Where do I start!

Mrs. Chen
Confused by care
Poor adherence to meds
Often sad

Daughter Stressed
Reduced work to half-time
Considering nursing homes

Seven steps approach to Aging with Co-morbidities

1. Need for targeting to high-risk
   - Physical
     - Extreme age
     - Visual loss
     - Limb weakness
     - Abnormalities of gait and balance
   - Socio-economic
     - Isolation
     - Caregiver gaps
     - Poverty; gender and immigration status
     - Poor nutrition and/or recent weight loss
   - Co-morbidity factors
     - Impaired cognition/mood
     - Polypharmacy especially sedative use
     - Multiple chronic diseases
Seven steps approach to Aging with Co-morbidities

1. Need for targeting to high-risk

Demographics of Frailty

Chronic Disease Management Guidelines appropriate to Elderly

- Diabetes Mellitus
- Osteoporosis
- Alzheimer’s Disease
- Depression
- Hypertension

Diabetes in the Elderly: 2008 CPG

1. In elderly individuals with impaired glucose tolerance, a structured program of lifestyle modification that includes moderate weight loss and regular physical activity should be considered to reduce the risk of type 2 diabetes

2. Otherwise healthy elderly people with diabetes should be treated to achieve the same targets as younger people with diabetes. In people with multiple comorbidities, functional dependency or limited life expectancy, the goals should be less stringent.

3. Elderly people with diabetes living in the community should be referred for interventions involving education and support

4. Aerobic exercise and/or resistance training may benefit elderly people with type 2 diabetes and should be recommended for those individuals in whom it is not contraindicated
Diabetes in the Elderly

5. In elderly people with type 2 diabetes, **sulfonylureas should be used with caution** because the risk of hypoglycemia increases exponentially with age.
6. In general, initial doses of sulfonylureas in the elderly should be half those used for younger people, and doses should be increased more slowly.
7. Gliclazide and gliclazide MR and glimepiride are the preferred sulfonylureas, as they are associated with a reduced frequency of hypoglycemic events.
8. Meglitinides (repaglinide and nateglinide) should be considered in patients with irregular eating habits.

Seven steps approach to Aging with Co-morbidities

① Need for targeting to high-risk
② Chronic Disease Management Guidelines appropriate to Elderly
③ Need to customize “best practices”

Customizing Guidelines for Seniors with Co-morbidities

- 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)
Potential Benefits of Treatment
- Treatment reduces overall mortality, CVD events, heart failure, and stroke
- Treatment effect is greatest in men, patients older than 70 years, and patients with greater pulse pressure

Time till Benefit:
- Treatment effect is delayed about 5 years

Hypertension in Elderly
- Drug therapy may not be advisable for those with life expectancy of less than 5 years
  - HTN affects about 33% to 66% of residents of long-term care (LTC) facilities
  - No well-designed trials have studied antihypertensive treatment in the LTC setting, so risk-benefit ratio of treatment is unclear
  - Life expectancy for most less 5 years
- Postural hypotension
  - Affects about 33% of residents
  - Independent risk factor for falls, syncope, stroke, mortality

Example: Hypertension in Elderly

Potential Benefits
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Time till Benefit:
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Customizing Guidelines for Seniors with Co-morbidities
- Potential Benefits of Treatment
- Time Until Benefit
- Remaining Life Expectancy
- Treatment Targets
- Potential impact on function
- Associated other co-morbidities
Treatment Target for Hypertension in Elderly

- To achieve maximum mortality reduction in hypertensive persons over 75, the goal of therapy is typically a standing systolic pressure between 130 and 140, and no lower. (Oates, DJ et al, Journal of the American Geriatrics Society, 2007;55:383-388)
- 4,000 persons 80 and over with hypertension followed over 5 years. Lowest mortality if all diastolic pressures 80 to 89, and all systolic pressures 130 to 139. (J-shaped curve)
- Any diastolic <80, or systolic <130 associated with significant increase in mortality at 5 year follow-up

Treatment Choice for Hypertension in Elderly

Angiotensin converting enzyme (ACE) inhibitors, newer calcium channel blockers, and thiazide diuretics are the first and second-line drugs of choice for mortality reduction

Wright JM and Musini VM, Cochrane Database Syst Rev 2009 CD001841

Potential impact of function and Calcium Channel Blockers

- Amlodipine plus benazepril caused more edema (31 vs 13) than hydrochlorothiazide plus benazepril. But reduced cardiac events and deaths more (11.9 vs 9.6) in 11,000 pts over 3 yrs. (Jamerson K, et al, N Eng J Med 2008:359:2417-2428)
- Amlodipine/felodipine are good for urge incontinence (1/3 of all persons 75 and over), whereas HCTZ/chlorthalidone/indapamide tend to make it worse
Potential impacts on function of Centrally Acting ACEI*

- Reduce risk of cognitive decline (Sink KM et al Arch Int Med 2009;169:1195-1202)
- Reduce risk of mobility decline (Sumukadas D, et al, Effect of Perindopril on physical function in elderly people with functional impairment: a randomized controlled trial. CMAJ 2007; 177:867-874)

* (captopril, fosinopril, lisinopril, perindopril, ramipril, and trandolapril)

Associated Co-morbidities influence

- Meta blockers not advised unless CAD (MI within 5 years) or CHF present (Wysonge CS, et al, Cochrane Database Syst Rev 2007 CD002003)
- If a person over 75 has had an MI within 5 years, or has systolic CHF (EF <45):
  - Appropriate beta-blocker is MORE effective than other meds for hypertension at reducing mortality (Law MR, BMJ 2006;338:b1655).
  - Dose needed to reduce resting heart rate by 10 beats per minute is probably sufficient
  - Beta-blockers proven to reduce mortality for CAD (timolol, propranolol, metaprolol) or CHF (metaprolol, bisoprolol, carvedilol)
  - Atenolol not recommended as a cardioselective beta-blocker that doesn't reduce mortality (Psaty BM, JAMA;2006;295:1704-6)

Seven steps approach to Aging with Co-morbidities

1. Need for targeting to high-risk
2. Chronic Disease Management Guidelines appropriate to Elderly
3. Need to customize “best practices”
4. Need for case management to link effort and care between community, primary care, hospital, and specialized services
Seven steps approach to Aging with Co-morbidities

1. Need for targeting to high-risk
2. Chronic Disease Management Guidelines appropriate to Elderly
3. Need to customize “best practices”
4. Need for case management to link effort and care
5. Need for “system navigation” and knowledge of system opportunities
   - Emerging examples in SE Ontario:
     - Easier+
     - Home First
     - Home at Last
6. Multiple disciplines and individuals the rule so good communication pathways essential
7. Caregiver support is crucial!
Example: Guided Care Model

- GCN collaborate with Physicians in caring for 50-60 high-risk older patients
- Specific roles
  - Assess needs and preferences and create an evidence-based "care guide" and "action plan"
  - Monitor patients proactively
  - Support chronic disease self management
  - Smooth transitions between sites of care
  - Coordinate with providers in EDs, hospitals, specialty clinics, rehab facilities, home care agencies, hospice programs, and social service agencies in the community

Boult et al. J Gerontol 2008

Example: Guided Care Model

- Pilot of Guided Care Model for CHF associated with multiple chronic diseases
- High-risk older patients (n=904) of 49 community-based primary care physicians practicing in 14 teams
- Focus on personalized care plans, self-management training, system navigation guide and case management over 30 months

Leff et al. Am J Manag Care 2009

Effects on Costs of Care (per caseload, 55 patients)

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<th>Average Expenditure</th>
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<td>-115.6</td>
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<td>NET SAVINGS</td>
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Leff et al. Am J Manag Care 2009
Effects on Physician Satisfaction

Marsteller et al. Ann Fam Med 2010

Effects on Caregiver Strain

Wolff et al. J Gerontol 2009

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- High-risk older patients (n=904) of 49 community-based primary care physicians practicing in 14 teams
- Focus on personalized care plans, self-management training, system navigation guide and case management over 30 months
- Funded through net savings ($170,900-95,900)
- Improved MD satisfaction, reduced caregiver stress, reduced hospital and community care days and costs

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