Managing Diabetes in the Oldest Old in Primary Care

Ross E.G. Upshur BA (Hons),MA, MD, MSc, CCFP, FRCPC
Head, Division of Clinical Public Health, Dalla Lana School of Public Health
Scientific Director, Bridgepoint Collaboratory for Research and Innovation
Staff Physician, Complexity Services , Bridgepoint Health
Professor, Department of Family and Community Medicine and DLSPH
University of Toronto

Disclaimer

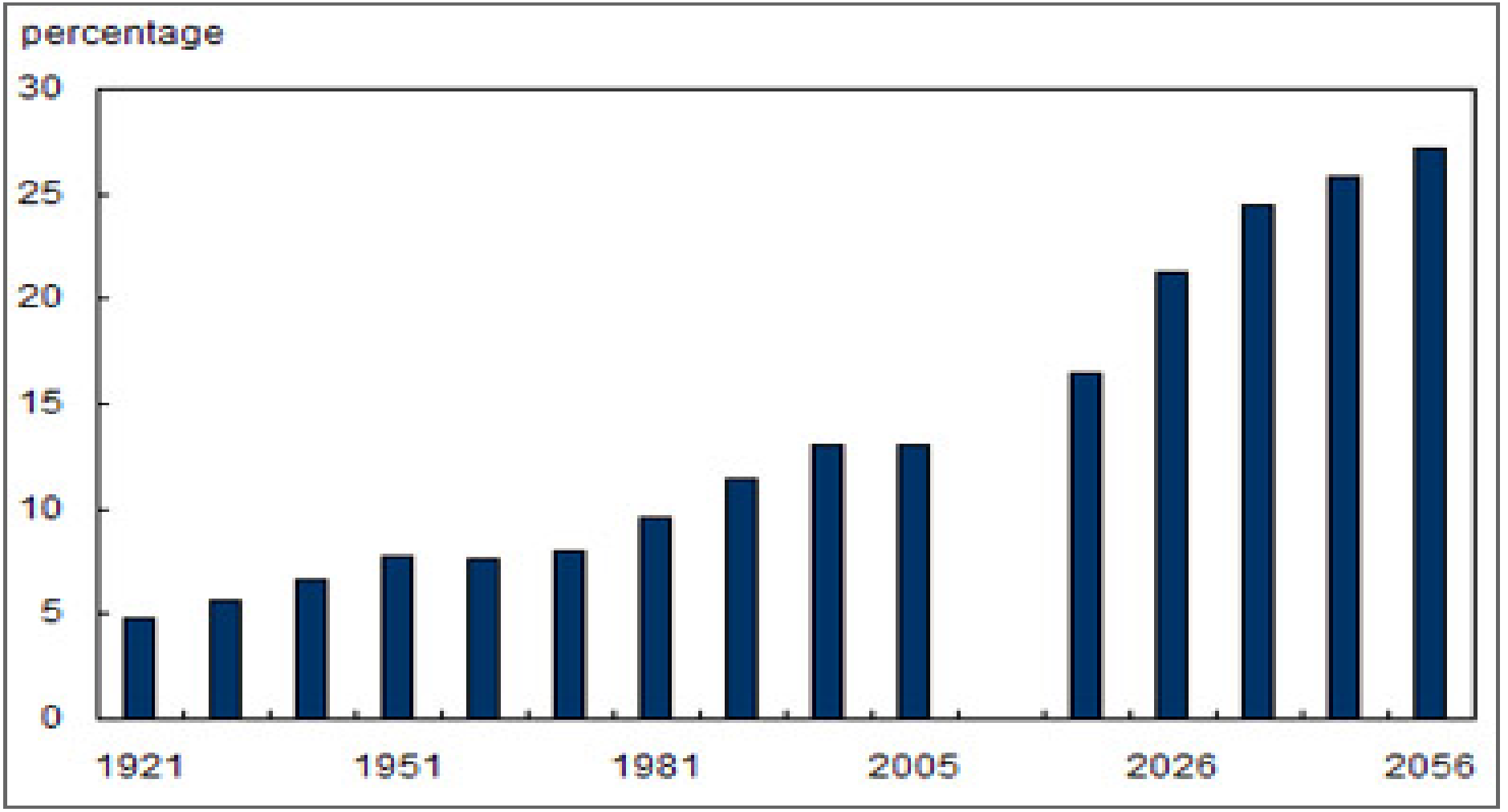
- I claim no specific expertise
- I am not an endocrinologist
- I am not a diabetic specialist
- I have no financial conflicts of interest
- I have no allegiance to any specific diseases, they can all be equally problematic for older adults

Objectives

- To review the epidemiology of health services utilization and type 2 diabetes in older adults
- To review the evidence base for setting blood sugar targets in this population
- To examine approaches to negotiating trade-offs between risk factor management and symptomatic or functionally limiting co-morbidities in this population
- To learn to better acknowledge and manage uncertainty in this population

Optimal glycemic control is fundamental to the management of diabetes because:

1. It reduces mortality from macrovasuclar and microvascular causes
2. It reduces morbidity from macrovascular causes
3. It reduces morbidity from microvascular causes
4. It improves quality of life
5. All of the above
6. None of the above



Percentage of Canadian population comprised of persons aged 65 or older, 1921 to 2005 and projections to 2056 (Sources: Statistics Canada, Censuses of Canada; Population projections for Canada, provinces and territories.)

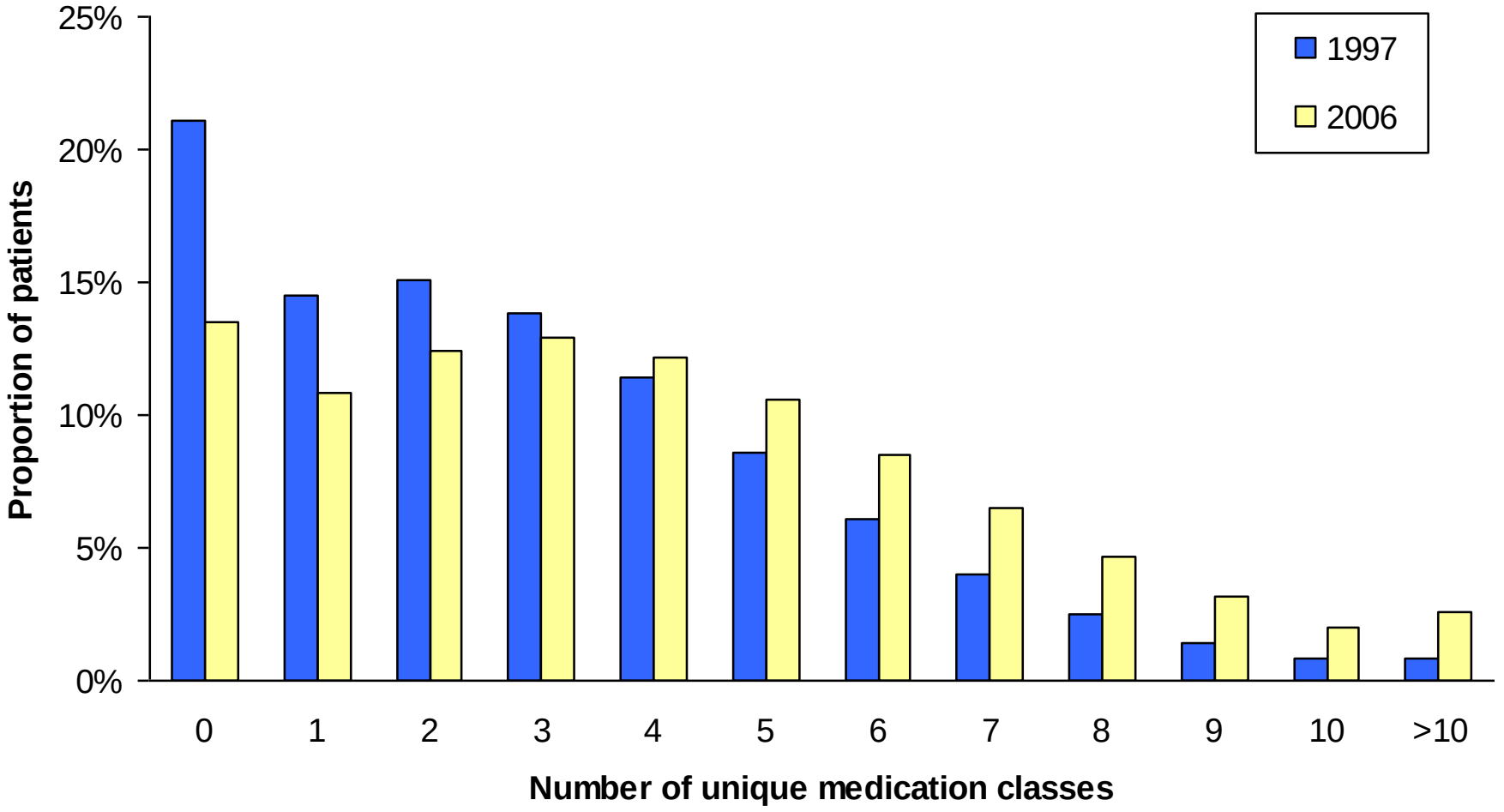
Chronic Health Conditions
Denton and Spencer 2010
Canadian Journal on Aging

Table 4:

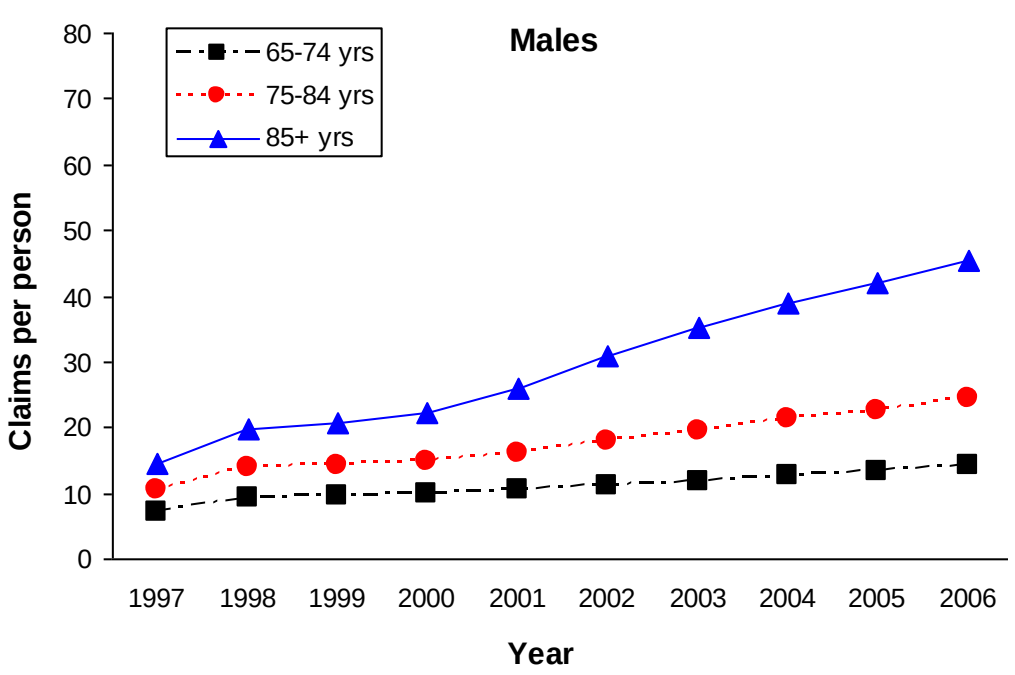
Percentage of distribution of the population by number of chronic conditions and age group, 2005

Age Group	Number of Chronic Conditions							
	0	1	2	3	4	5	6	7+
	- percentage distribution -							
12–29	45.5	27.7	15.0	6.4	3.0	1.3	0.5	0.6
30–49	35.2	28.4	16.6	8.9	5.0	2.7	1.2	1.9
50–64	20.7	24.7	20.3	13.5	8.6	5.0	2.9	4.4
65–79	10.0	18.6	20.3	17.4	13.0	8.8	4.6	7.3
80+	6.7	14.9	18.1	18.2	14.9	10.4	6.9	9.9
All ages	31.3	25.9	17.4	10.4	6.4	3.7	2.0	2.9

Frequency distribution of number of unique medication classes for older adults aged 65+ in Ontario, Canada, 1997-2006



Age differences in prescription claims per person for older adults aged 65+ in Ontario, Canada, 1997-2006



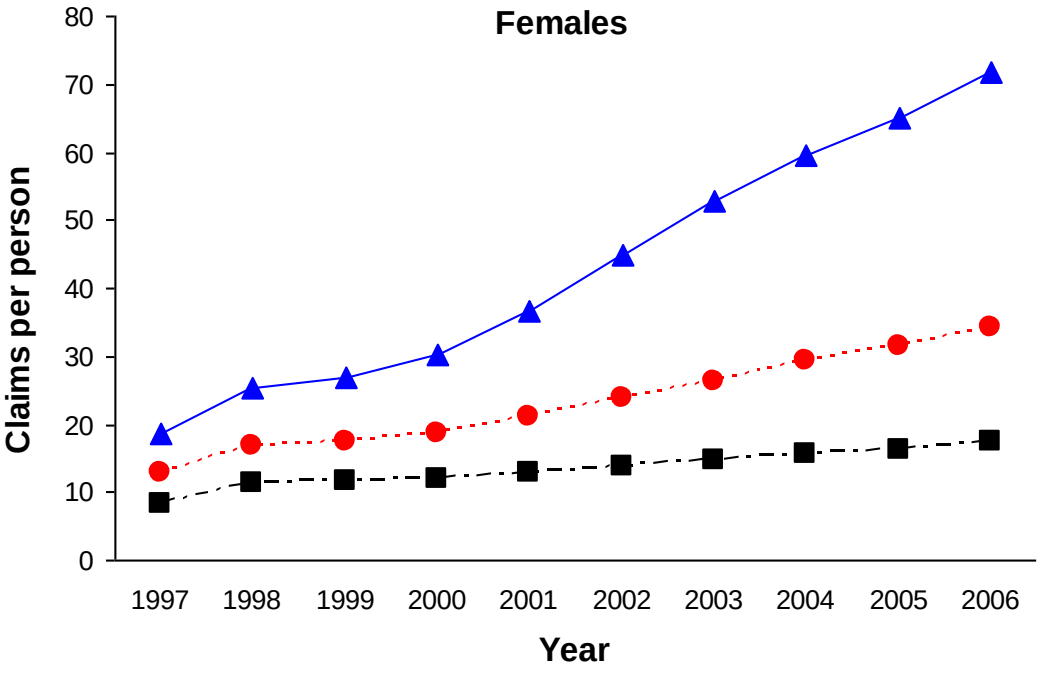


Figure 1: Prescription drug claims per person by age group and sex, Ontario, 2008

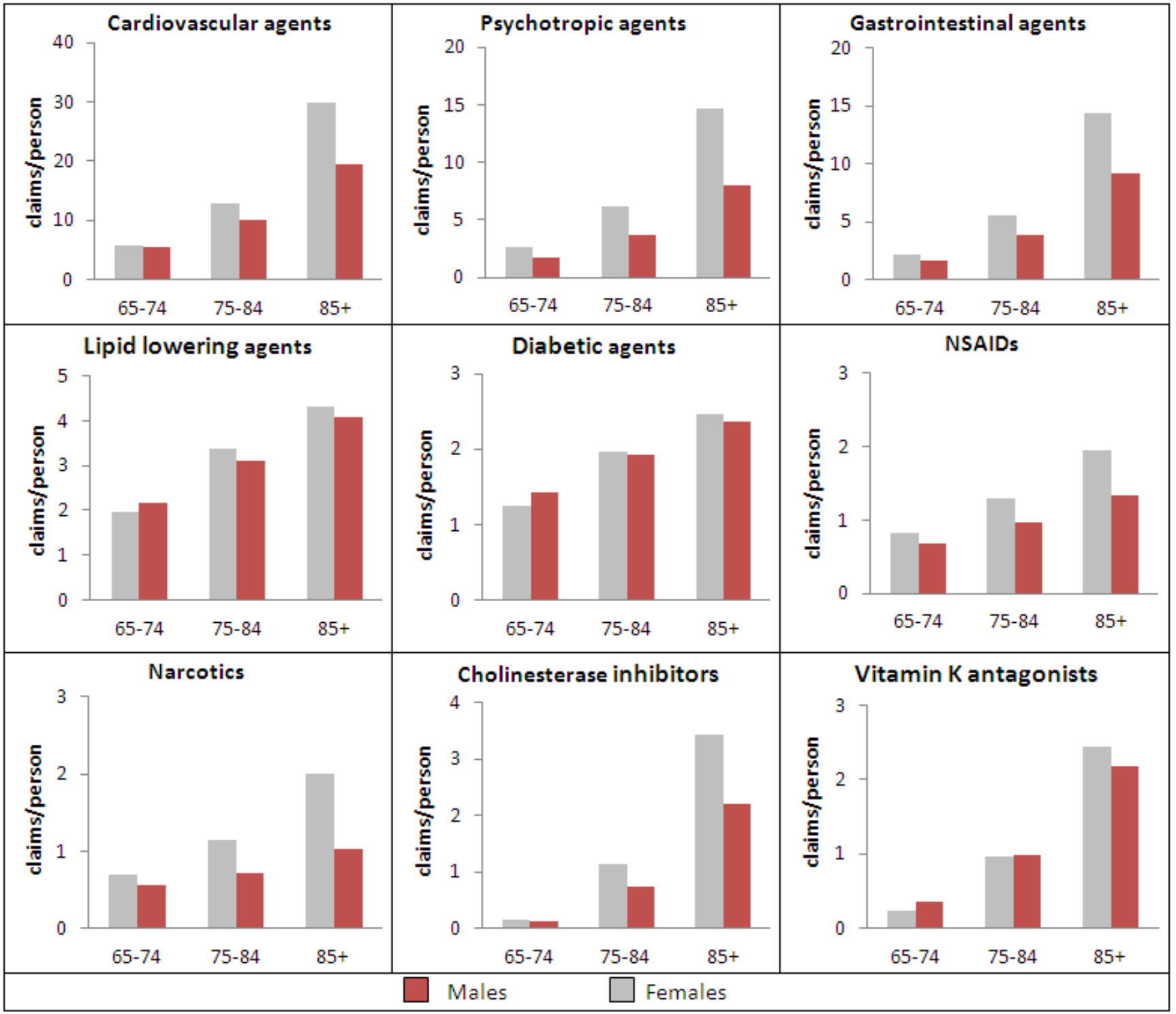
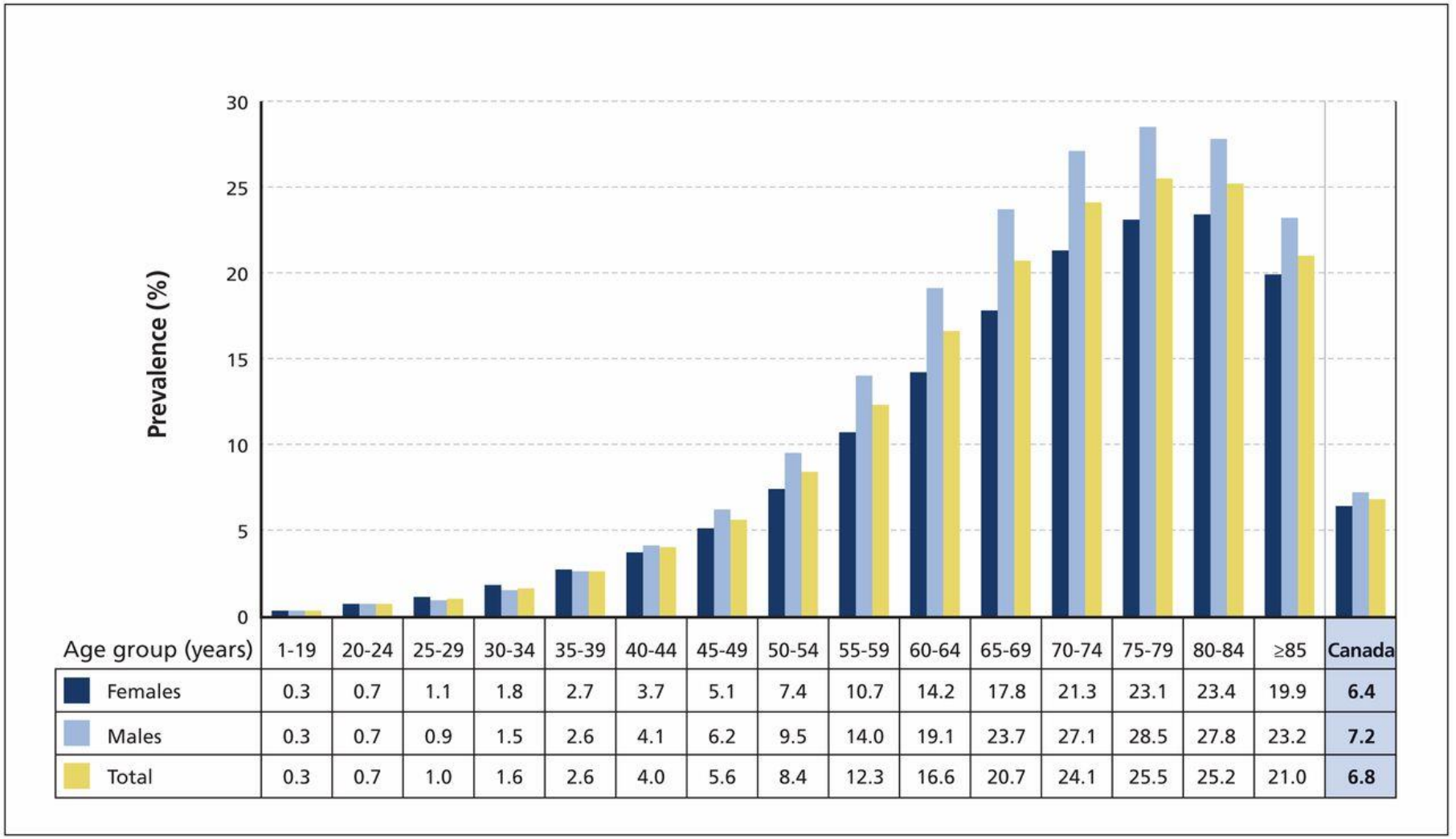


Table 1. Age and gender distribution of the elderly population, Ontario, 2005

Age group	Female	Male	Total
65-69	237,673	218,295	455,968
70-74	212,267	187,524	399,791
75-79	187,206	146,614	333,820
80-84	147,749	94,118	241,867
85+	121,766	55,486	177,252
Total	906,661	702,037	1,608,698

Prevalence of diagnosed diabetes among individuals aged 1 year and older, by age group and sex, Canada, 2008/09.



Age group (years)	1-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	≥85	Canada
Females	0.3	0.7	1.1	1.8	2.7	3.7	5.1	7.4	10.7	14.2	17.8	21.3	23.1	23.4	19.9	**6.4**
Males	0.3	0.7	0.9	1.5	2.6	4.1	6.2	9.5	14.0	19.1	23.7	27.1	28.5	27.8	23.2	**7.2**
Total	0.3	0.7	1.0	1.6	2.6	4.0	5.6	8.4	12.3	16.6	20.7	24.1	25.5	25.2	21.0	**6.8**

Canadian Task Force on Preventive Health Care CMAJ 2012;184:1687-1696

CMAJ·JAMC

Issues and Controversies

- Lack of applicability of CPG's
- Absence of evidence of benefit of diabetes management in older adults particularly for clinically relevant outcomes
- How aggressive AIC target?
- How aggressive management of complications?

How applicable are clinical practice guidelines to elderly patients with comorbidities?

Donatus R. Mutasingwa MD MPhil PhD CCFP **Hong Ge** MD MHSc CCFP **Ross E.G. Upshur** MD MSc CCFP FRCPC

Abstract

Objective To examine the applicability of 10 common clinical practice guidelines (CPGs) to elderly patients with multiple comorbidities.

Design Content analysis of published Canadian CPGs for the following chronic diseases: diabetes, dyslipidemia, dementia, congestive heart failure, depression, osteoporosis, hypertension, gastroesophageal reflux disease, chronic obstructive pulmonary disease, and osteoarthritis.

Main outcome measures Presence or absence of 4 key indicators of applicability of CPGs to elderly patients with multiple comorbidities. These indicators include any mention of older adults or people with comorbidities, time needed to treat to benefit in the context of life expectancy, and barriers to implementation of the CPG.

Results Out of the 10 CPGs reviewed, 7 mentioned treatment of the elderly, 8 mentioned people with comorbidities, 4 indicated the time needed to treat to benefit in the context of life expectancy, 5 discussed barriers to implementation, and 7 discussed the quality of evidence.

Conclusion This study shows that although most CPGs discuss the elderly population, only a handful of them adequately address issues related to elderly patients with comorbidities. In order to make CPGs more patient centred rather than disease driven, guideline developers should include information on elderly patients with comorbidities.

Underrepresentation of individuals 80 years of age and older in chronic disease clinical practice guidelines

Lizebeth Cox **Marita Kloseck** PhD **Richard Crilly** MD FRCPC **Carol McWilliam** PhD **Laura Diachun** MD FRCPC

Abstract

Objective To determine whether Canadian clinical practice guidelines (CPGs), and the evidence used to create CPGs, include individuals 80 years of age and older.

Design Descriptive analysis of 14 CPGs for 5 dominant chronic conditions (diabetes, hypertension, heart failure, osteoporosis, stroke) and descriptive analysis of all research-based references with human participants in the 14 guidelines.

Main outcome measures To identify recommendations for individuals 65 years of age and older or 80 years of age and older and for those with multiple chronic conditions.

Results Although 12 of 14 guidelines provided specific recommendations for individuals 65 years of age and older, only 5 provided recommendations for frail older individuals (≥80 years). A total of 2559 studies were used as evidence to support the recommendations in the 14 CPGs; 2272 studies provided the mean age of participants, of which only 31 (1.4%) reported a mean age of 80 years of age and older.

Conclusion There is very low representation of individuals in advanced old age in CPGs and in the studies upon which these guidelines are based, calling into question the applicability of current chronic disease CPGs to older individuals. The variety of medical and functional issues occurring in the elderly raises the concern of whether or not evidence-based disease-specific CPGs are appropriate for such a diverse population.

EDITOR'S KEY POINTS

- As the population ages, older individuals with chronic diseases are consuming a large portion of health care costs and services; however, clinical practice guidelines (CPGs) developed to manage these conditions are not always applicable to this population, as the studies upon which recommendations are based rarely include older participants.

- Individuals in advanced old age in particular are likely to have multiple chronic conditions; therefore, they might be the recipients of multiple evidence-based recommendations and treatments without consideration of comorbidity, conflicting management strategies, and polypharmacy.

American Geriatrics Society Identifies Five Things That Healthcare Providers and Patients Should Question

AGS Choosing Wisely Workgroup

Given the American Geriatrics Society's (AGS) commitment to improving health care for older adults by, among other means, educating older people and their caregivers about their health and healthcare choices, the AGS was delighted when, in late 2011, the American Board of Internal Medicine Foundation invited the Society to join its "Choosing Wisely®" campaign. Choosing Wisely is designed to engage patients, healthcare professionals, and family caregivers in discussions about the safety and appropriateness of medical tests, medications, and procedures. Ideally, these discussions should examine whether the tests and procedures are evidence-based, whether any risks they pose might overshadow their potential benefits, whether they are redundant, and whether they are truly necessary. In addition to improving the quality of care, the initiative aims to rein in unneeded healthcare spending. According to a 2008 Congressional Budget Office report, as much as 30% of healthcare spending in the United States may be unnecessary. **J Am Geriatr Soc 2013.**

Key words: geriatrics; special article; patient-centered care

Treating older adults can be challenging. Because t
have age-related anatomical and physiological chan
older adults may respond differently to medications
other interventions than younger individuals. Because o
people—particularly those with multiple conditions—
underrepresented in clinical trials, judging the appropri
ness of diagnostic and treatment approaches for ag
adults can be difficult.[3]

Further complicating care for the more than 50%
older adults with multimorbidity, current clinical prac
guidelines tend to focus on the treatment of *individual*
orders and, consequently, may not be applicable to i
viduals with multiple disorders. According to a sem
2005 study, following all of the individual clinical gu
lines applicable to a hypothetical, 71-year-old woman w
chronic obstructive pulmonary disease, type 2 diab
mellitus, osteoporosis, hypertension, and osteoarth
would result in her taking a list of medications that wo
put her at significant risk of multiple drug side effects
drug–drug interactions.[4]

Concerns about inappropriate care for older adults
not limited to the overprescribing of medications. In 20
Donald M. Berwick, MD, former Administrator of

Table 1. (Contd.)

Recommendation	Rationale	Citations
Avoid using medications to achieve hemoglobin A1c <7.5% in most adults age 65 and older; moderate control is generally better.	There is no evidence that using medications to achieve tight glycemic control in older adults with type 2 diabetes is beneficial. Among non-older adults, except for long-term reductions in myocardial infarction and mortality with metformin, using medications to achieve glycated hemoglobin levels less than 7% is associated with harms, including higher mortality rates. Tight control has been consistently shown to produce higher rates of hypoglycemia in older adults. Given the long time frame to achieve theorized microvascular benefits of tight control, glycemic targets should reflect patient goals, health status, and life expectancy. Reasonable glycemic targets would be 7.0–7.5% in healthy older adults with long life expectancy, 7.5–8.0% in those with moderate comorbidity and a life expectancy <10 years, and 8.0–9.0% in those with multiple morbidities and shorter life expectancy.	The Action to Control Cardiovascular Risk in Diabetes Study Group. Effects of intensive glucose lowering in type 2 diabetes. N Eng J Med 2008;258:2545–2559. The Action to Control Cardiovascular Risk in Diabetes Study Group. Long-term effects of intensive glucose lowering on cardiovascular outcomes. N Eng J Med 2011;364:818–828.Duckworth W, Abraira C, Moritz T et al. Glucose control and vascular complications in veterans with type 2 diabetes. N Eng J Med 2009;360:129–139. ADVANCE Collaborative Group. Intensive blood glucose control and vascular outcomes in patients with type 2 diabetes. N Engl J Med 2008;358: 2560–2572. UK Prospective Diabetes Study (UKPDS) Group. Effect of intensive blood-glucose control with metformin on complications in overweight patients with type 2 diabetes (UKPDS 34). Lancet 1998;352:854–865. Montori VM, Fernández-Balsells M. Glycemic control in type 2 diabetes: Time for an evidence-based about-face? Ann Intern Med 2009;150:803–808. Erratum in: Ann Intern Med 2009;151:144. Finucane TE. "Tight control" in geriatrics: The emperor wears a thong. J Am Geriatr Soc 2012;60:1571–1575. Kirkman MS, Briscoe VJ, Clark N et al. Diabetes in older adults: A consensus report. J Am Geriatr Soc 2012;60:2342–2356.

Diabetes in the Elderly

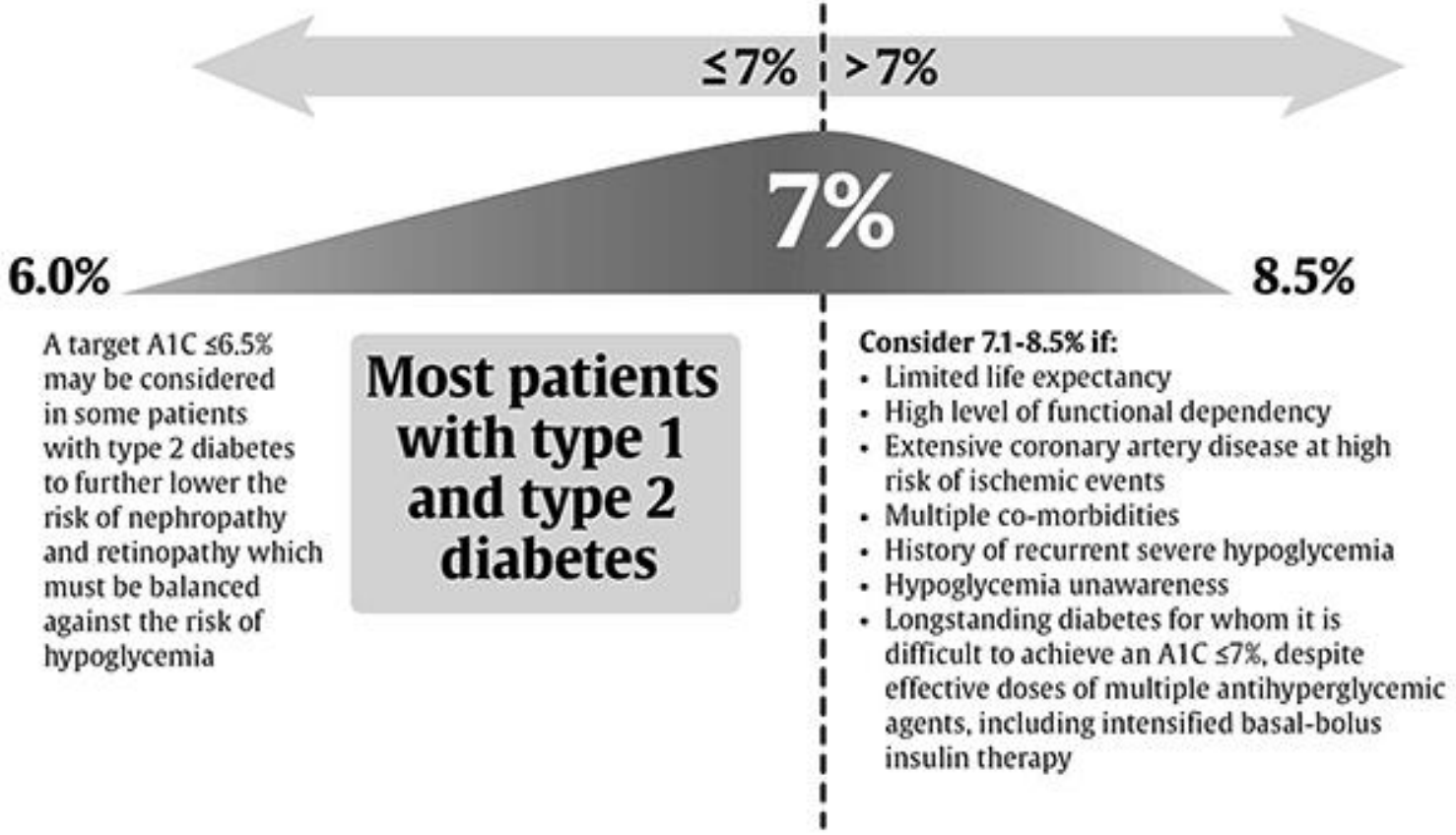
Canadian Diabetes Association Clinical Practice Guidelines Expert Committee

Graydon S. Meneilly MD, FRCPC, FACP Aileen Knip RN, MN, CDE Daniel Tessier MD, MSc, FRCPC

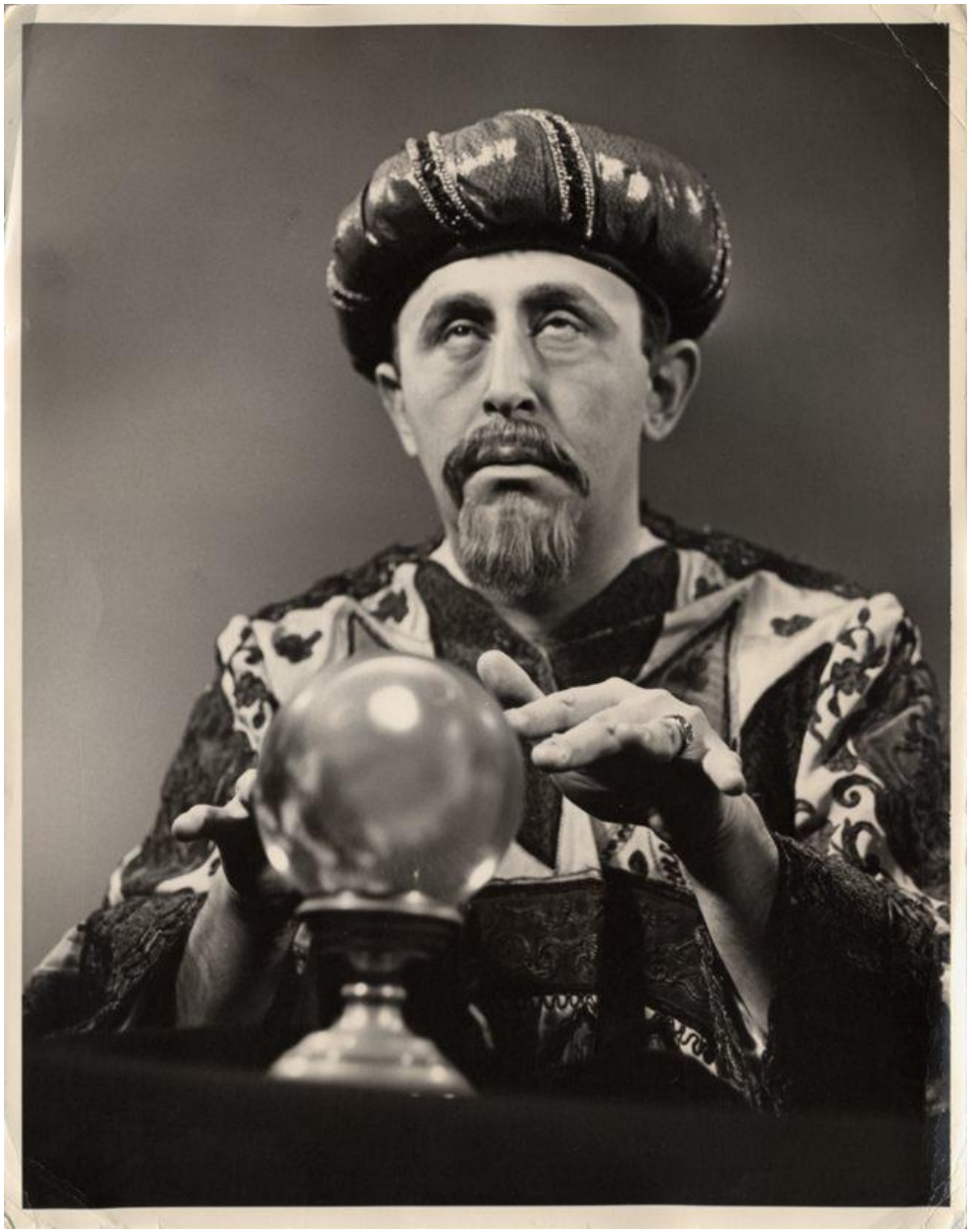
Key Messages

- Diabetes in the elderly is metabolically distinct from diabetes in younger people and the approach to therapy should be different.
- Sulphonylureas should be used with caution because the risk of hypoglycemia increases exponentially with age.
- Long-acting basal analogues are associated with a lower frequency of hypoglycemia than conventional insulins in this age group.
- In elderly people, if mixture of insulin is required, the use of premixed insulins as an alternative to mixing insulins minimizes dose errors.

Figure 1
Recommended targets for glycemic control.



Conclusions

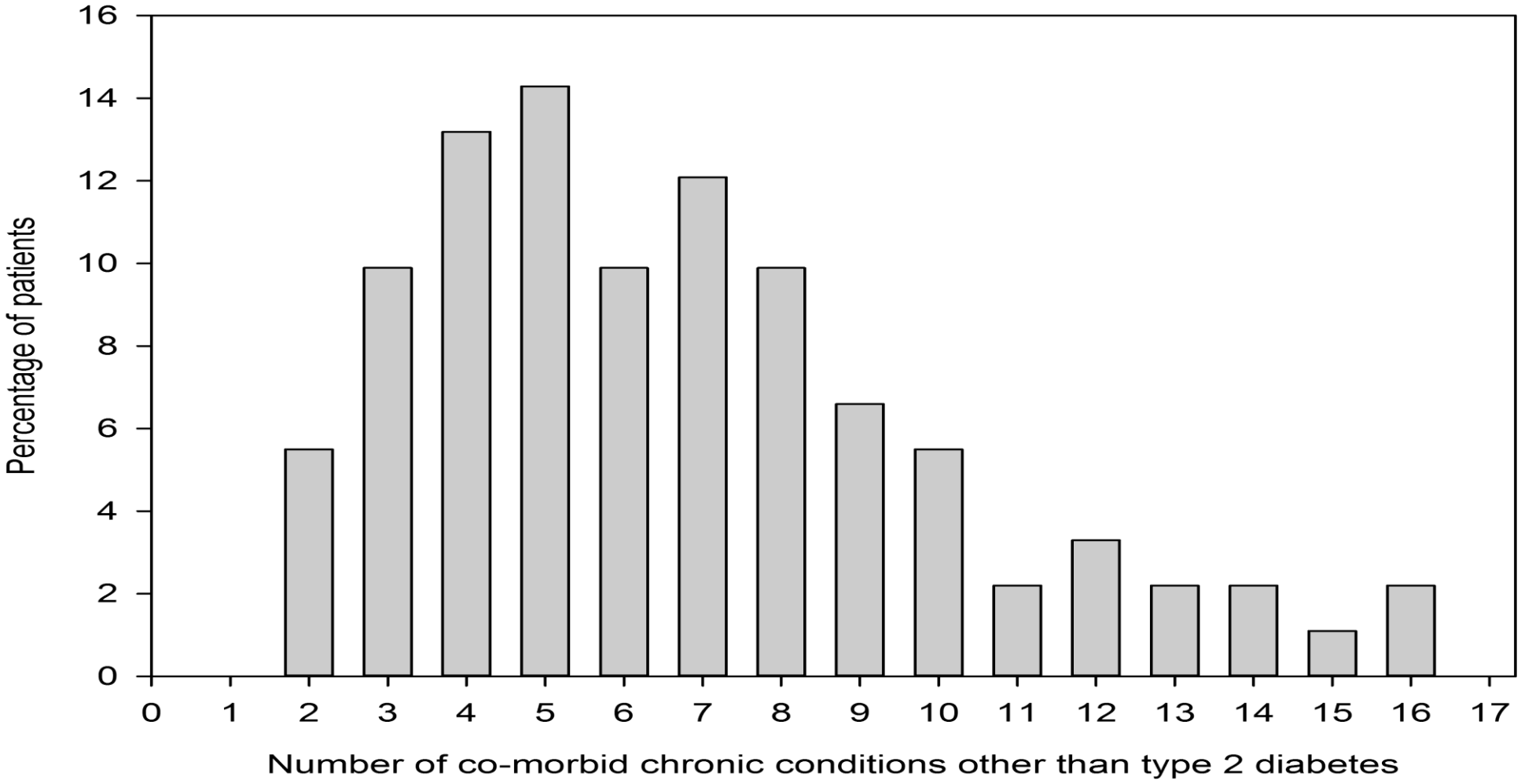


Analysis of older diabetics in an academic family practice

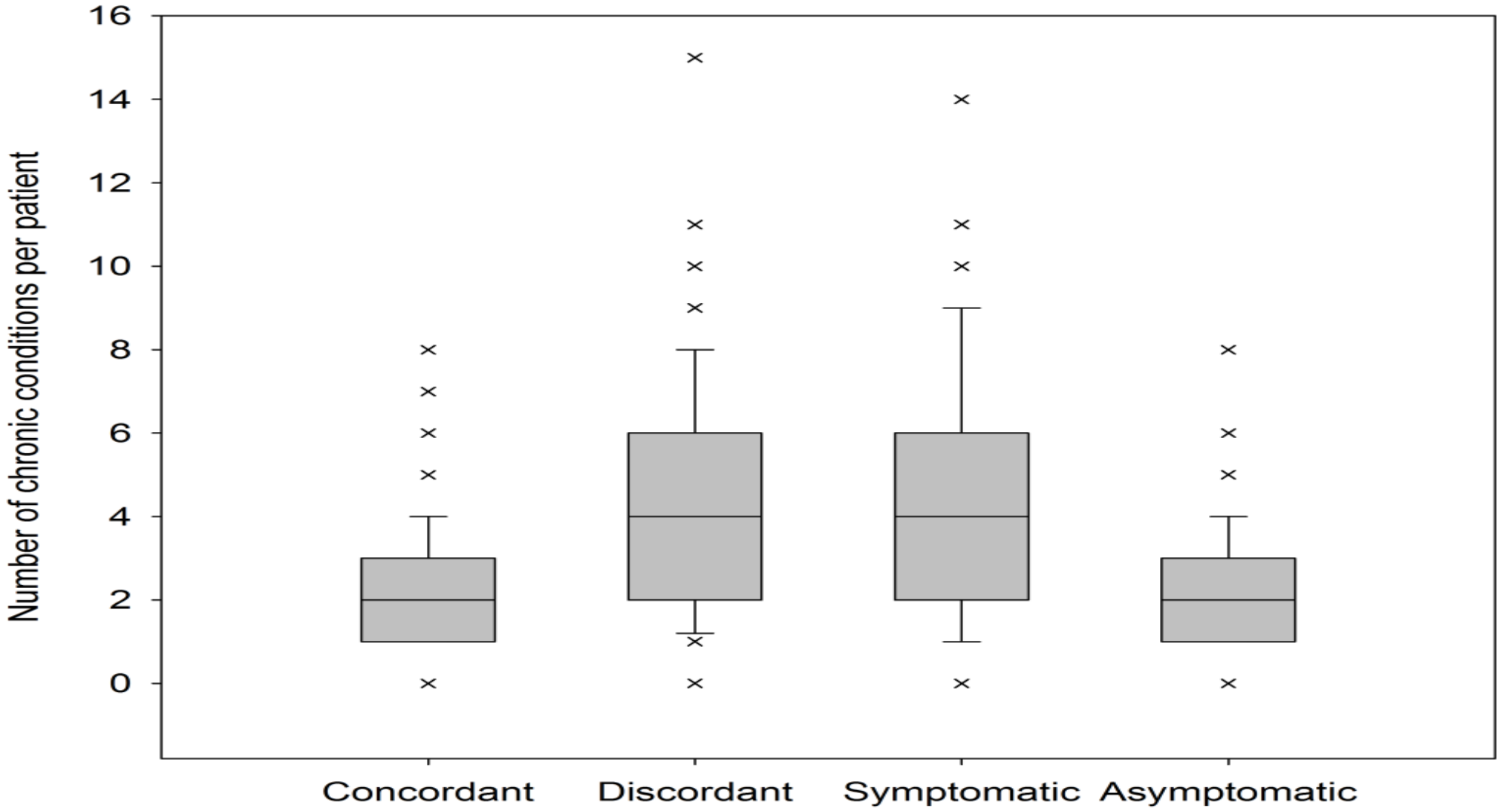
Table I: Population demographics of 85+-year-old type 2 diabetic patients.

Gender	Age group (years)			
	85-89 n (%)	90-94 n (%)	95+ n (%)	Total n (%)
Female	33 (53)	14 (52)	2 (100)	49 (54)
Male	29 (47)	13 (48)	0 (0)	42 (46)
Total	**62 (100)**	**27 (100)**	**2 (100)**	**91 (100)**

Co-morbidity of chronic health conditions in elderly type 2 diabetic patients.The numbers of co-morbid chronic conditions other than type 2 diabetes are shown on the horizontal axis.



Box-and-whisker plot of co-morbid chronic conditions in elderly type 2 diabetic patients. Top and bottom whiskers indicate 95th and 5th percentiles, respectively. Outliers are denoted as small x's.



Suggested Approach

1. What are the patient's expectations and stated preferential outcomes/goals?
2. Determine treatment burden (may use complexity score)
3. Is there a clinically dominant co-morbidity? (yes/no)
4. How much co-morbidity is concordant/discordant with diabetes?
5. How much co-morbidity is symptomatic/asymptomatic?
6. What is the estimated life expectancy?
7. What is the frailty level?
8. Be honest about the uncertainty regarding benefit and harm!

Patient Preferences and Values

BMJ

BMJ 2012;345:e8572 doi: 10.1136/bmj.e8572 (Published 8 November 2012)

ANALYSIS

Stop the silent misdiagnosis: patients' preferences matter

Correct treatment recommendations require accurate diagnosis not only of the medical condition but of patients' treatment preferences. **Al Mulley**, **Chris Trimble**, and **Glyn Elwyn** outline how to ensure that preferences are not misdiagnosed

Albert G Mulley *director*, Chris Trimble *adjunct professor*, Glyn Elwyn *visiting professor*

Dartmouth Center for Health Care Delivery Science, Dartmouth College, Hanover, New Hampshire, USA

BMJ open
accessible medical research

Too complex and time-consuming to fit in! Physicians' experiences of elderly patients and their participation in medical decision making: a grounded theory study

Anne Wissendorff Ekdahl,[1,2] Ingrid Hellström,[1,2] Lars Andersson,[3] Maria Friedrichsen[2,4]

To cite: Ekdahl AW

ABSTRACT

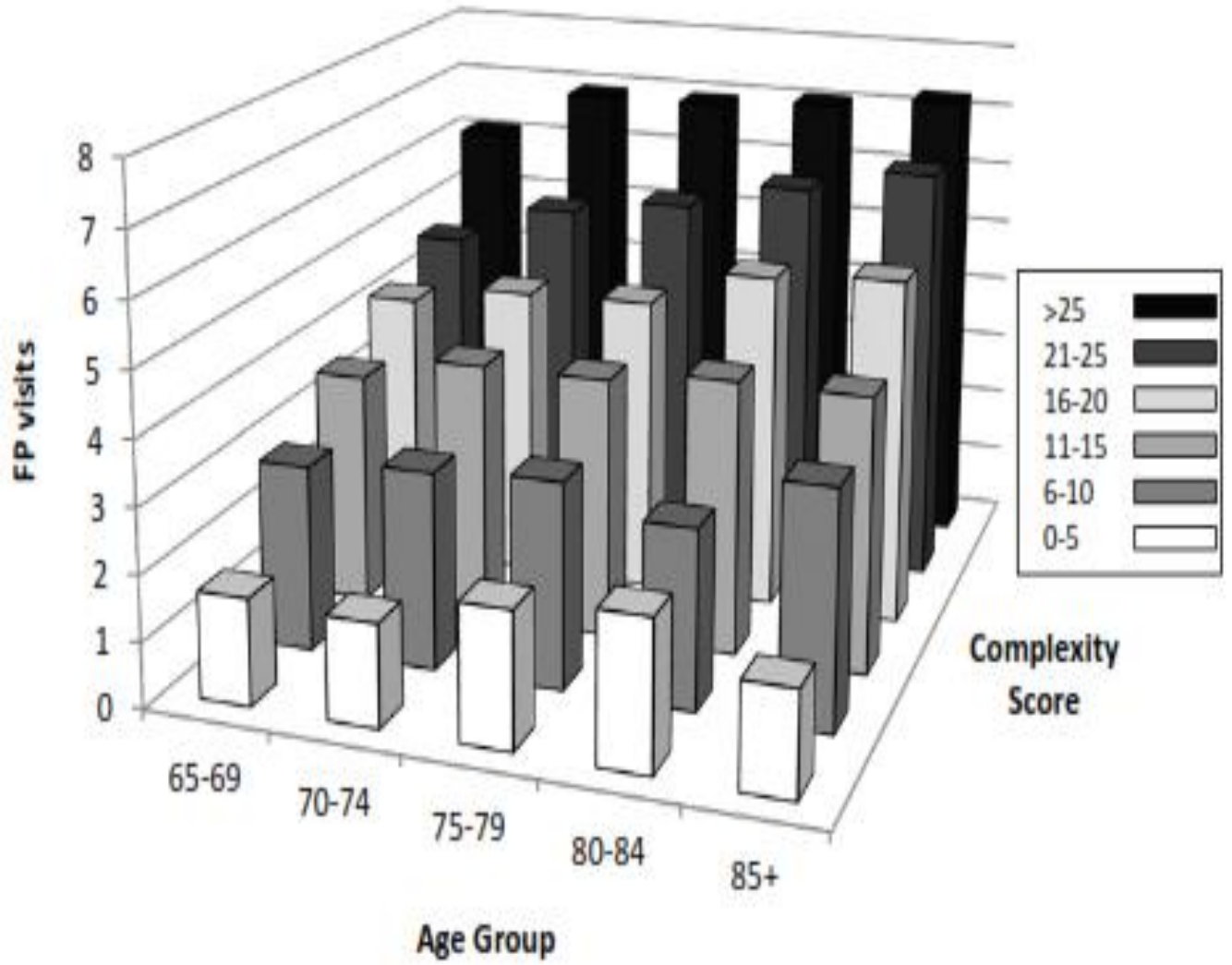
Patient Preferences and Values

- Poorly done in routine care
- Absence of valid tools to aid clinicians particularly in context of multiple concurrent chronic diseases and advanced age
- Lack of clarity regarding “outcomes”
- Suggested template: Longevity, symptom control , independence, optimal function
- Need to weigh uncertainties between managing future risks and optimizing present well being

Treatment Burden: Complexity Score

- Add number of medications and chronic conditions
- Highly predictive of hospitalization, ER visit and family practice visit
- Higher the score higher the risk

Figure 2 Annualized sex-adjusted rates of FP visits per person by age group and complexity score



Clinically Dominant Condition

Definition:

A co-morbid condition so complex or serious that it eclipses the management of other health conditions in the short or long term

Examples:

- End stage disease (cancer, renal failure, dementia)
- Severe symptoms (CHF, Depression)
- New onset diagnosis (Breast Cancer, Rheumatoid Arthritis)

Concordant vs Discordant Co-morbidity

Definition

Concordant: part of the same pathophysiologic or risk profile as diabetes and so likely same or similar risk management and self management plan

Discordant: Not directly related to diabetes in pathopysiology and management plan

Examples:

Concordant: coronary artery disease, peripheral vascular disease, hypertension

Discordant: benign prostatic hypertrophy, back pain, reflux esophagitis

Symptomatic/Asymptomatic

Definition:

Symptomatic conditions impair function and well being and management plans are devoted to ameliorating these

Asymptomatic conditions are associated with longer term risk reduction and prevention of morbidity and mortality in longer term

Examples

Symptomatic: osteoarthritis, angina, depression

Asymptomatic: hypertension, hyperlipidemia, mild elevation of glucose

10 year mortality score

- Ages 60-64 years: 1 point
- Ages 65-69 years: 2 points
- Ages 70-74 years: 3 points
- Ages 75-79 years: 4 points
- Ages 80-84 years: 5 points
- Ages ≥ 85 years: 7 points

- Male sex: 2 points
- Current tobacco use: 2 points
- Body mass index <25: 1 point
- Diabetes: 1 point
- Nonskin Cancers, Chronic Lung Disease, Heart Failure: 2 points
- Difficulty bathing, managing finances or walking several blocks: 2 points
- Difficulty pushing/pulling heavy objects: 1 point

From: **Predicting 10-Year Mortality for Older Adults**

JAMA. 2013;309(9):874-876. doi:10.1001/jama.2013.1184

Table. Validation of the Lee Index for 10-Year Mortality

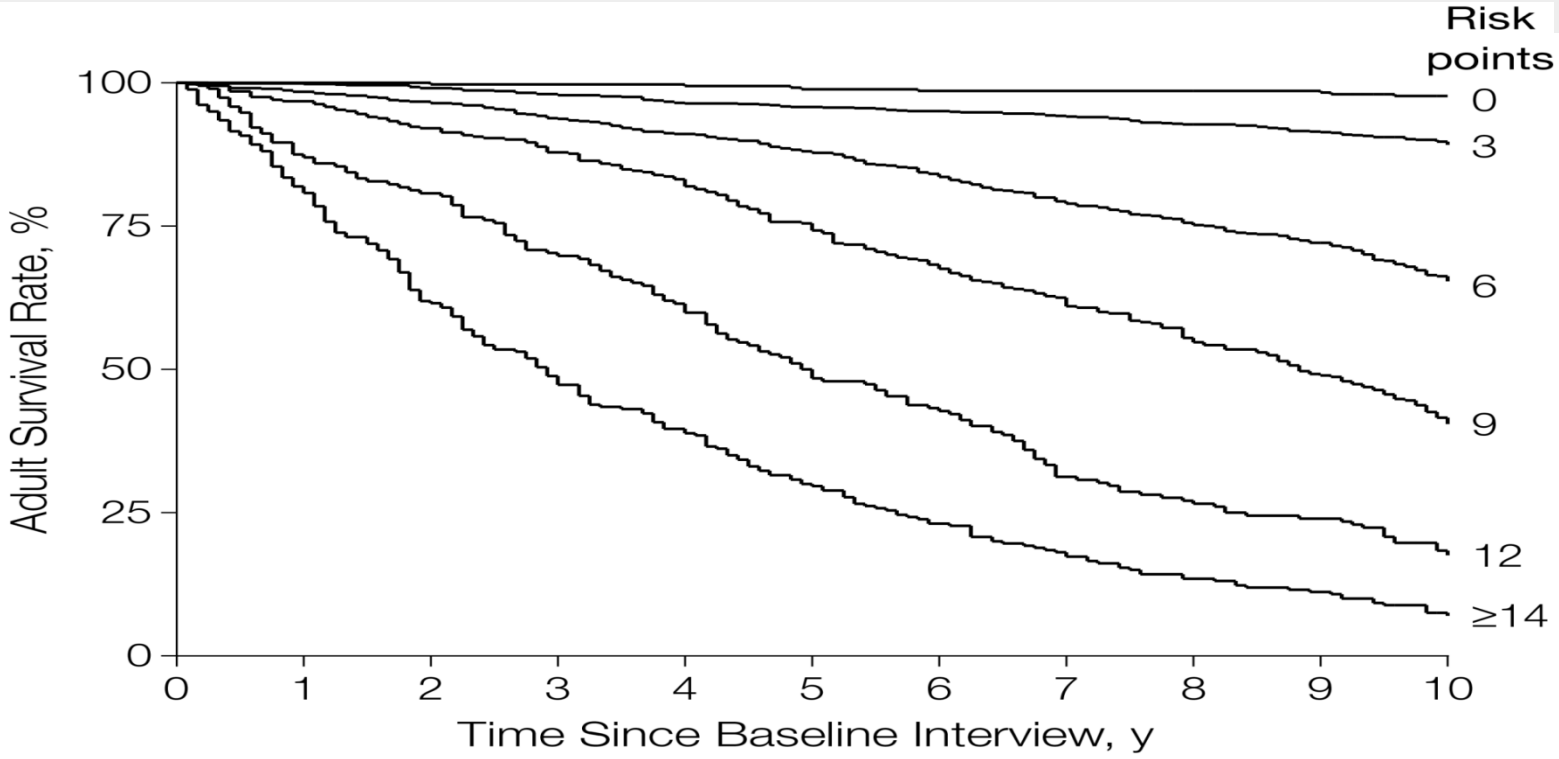
		Observed[b]			
		Development Cohort (n = 11 701)		Validation Cohort (n = 8009)	
	Predicted Mortality (95% CI), %[a]	No. Died/ No. at Risk	Mortality (95% CI), %	No. Died/ No. at Risk	Mortality (95% CI), %
Point score					
0	2.8 (1.3-4.2)	12/486	2.5 (1.1-3.9)	8/354	2.3 (0.7-3.8)
1	4.0 (2.6-5.4)	22/739	3.0 (1.8-4.2)	25/489	5.1 (3.2-7.1)
2	6.0 (4.8-7.3)	67/1366	4.9 (3.8-6.1)	62/889	7.0 (5.3-8.6)
3	9.1 (7.6-11)	151/1474	10 (8.7-12)	100/971	10 (8.4-12)
4	14 (12-16)	214/1445	15 (13-17)	147/986	15 (13-17)
5	21 (19-23)	275/1330	21 (19-23)	195/842	23 (20-26)
6	30 (27-33)	368/1162	32 (29-34)	258/758	34 (31-37)
7	40 (36-43)	346/886	39 (36-42)	272/637	43 (39-47)
8	52 (48-55)	387/758	51 (48-55)	260/498	52 (48-57)
9	62 (58-66)	334/551	61 (57-65)	234/401	58 (54-63)
10	71 (67-76)	286/407	70 (66-75)	216/308	70 (65-75)
11	81 (76-85)	268/320	84 (80-88)	189/232	82 (77-87)
12	85 (81-90)	206/244	84 (80-89)	159/192	83 (78-88)
13	89 (85-94)	150/174	86 (81-91)	144/159	91 (86-95)
≥14	95 (93-98)	298/310	96 (94-98)	239/257	93 (90-96)
C statistic	0.847 (0.839-0.854)		0.838 (0.830-0.846)		0.834 (0.824-0.843)

[a] Calculated from the model with 12 risk factors.
[b] Calculated from a model with only risk points, with the 12 risk factors contributing to the risk point total.

Figure Legend:

From: **Predicting 10-Year Mortality for Older Adults**

JAMA. 2013;309(9):874-876. doi:10.1001/jama.2013.1184



No. at risk

Risk points						
0	355	355	354	349	345	180
3	973	964	939	919	884	476
6	762	737	694	640	566	295
9	404	372	336	275	221	113
12	192	155	118	83	52	23
≥14	260	161	103	60	35	14

Fi

Clinical Frailty Scale

1 Very Fit – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.

2 Well – People who have no active disease symptoms but are less fit than category 1. Often, they exercise or are very active occasionally, e.g. seasonally.

3 Managing Well – People whose medical problems are well controlled, but are not regularly active beyond routine walking.

4 Vulnerable – While not dependent on others for daily help, often symptoms limit activities. A common complaint is being "slowed up", and/or being tired during the day.

5 Mildly Frail – These people often have more evident slowing, and need help in high order IADLs (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.

6 Moderately Frail – People need help with all outside activities and with keeping house. Inside, they often have problems with stairs and need help with bathing and might need minimal assistance (cuing, standby) with dressing.

7 Severely Frail – Completely dependent for personal care, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).

8 Very Severely Frail – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness.

9 Terminally Ill – Approaching the end of life. This category applies to people with a life expectancy <6 months, who are not otherwise evidently frail.

Scoring frailty in people with dementia

The degree of frailty corresponds to the degree of dementia. Common **symptoms in mild dementia** include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In **moderate dementia,** recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In **severe dementia,** they cannot do personal care without help.

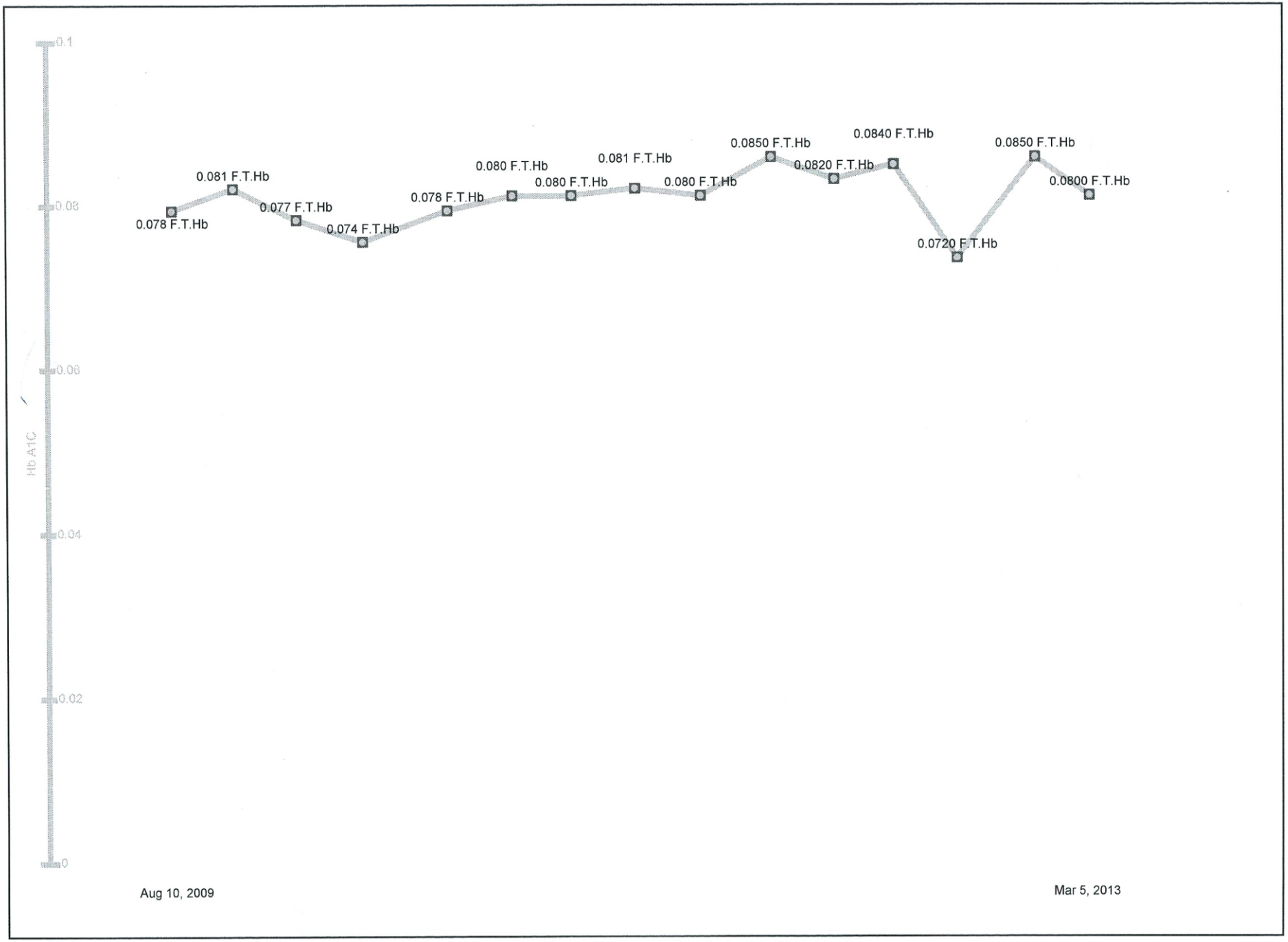
Case 1

- 81 y/o female, single lives alone, large network of friends, independent in ADL and finances
- Tired all the time
- Goal: remain independent in community as long as possible
- Type 2 diabetes x 15 years
- Concurrent chronic conditions: Peripheral vascular disease, Hypertension, Osteoarthritis, Mild COPD, Chronic right rotator cuff tear, Hypothyroidism, Reflux esophagitis, Chronic urticaria, Fatty liver,
- Daily Medications: Vitamin D and Calcium, Claritin 10 mg od, Gliclazide 80 mg 2 tabs hs, Omeprazole 40 mg od, Simvastatin 60 mg od, Ramipril 10 mg od, Levothyroxine 0.075 od, Metformin 500 mg 2 tabs bid, Voltaren gel , Acetaminophen 500 mg 2 tabs qid
- BMI 28

Case 1

- What are her treatment goals?
- What is her complexity score?
- Is there a clinically dominant condition?
- How many concordant chronic conditions?
- How many discordant conditions?
- How many symptomatic conditions?
- How many asymptomatic conditions?
- Estimated life expectancy?
- What is her frailty level?
- Target AIC=

Hb A1C



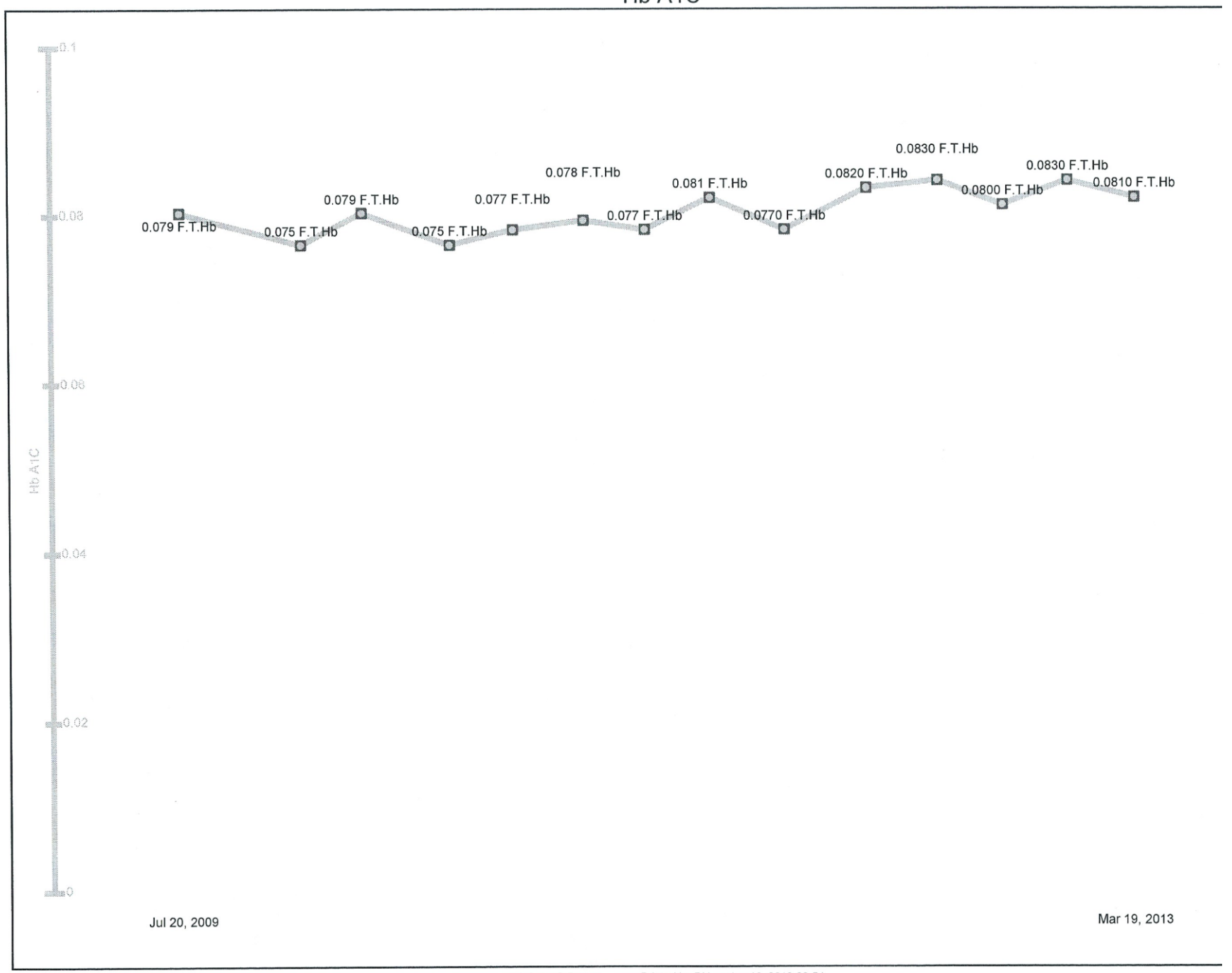
Case 2

- 84 y/o male
- Lives with wife in house. Wife moderate severe dementia. No children, limited social support, does not want additional help. Manages finances, still plays the market
- Goal: maintain function, philosophical: does not want anything aggressive, ready to go if it is his time
- Type 2 diabetes x 10 years, no complications
- Chronic Conditions: Benign Prostatic Hypertrophy, Atrial Fibrillation, Osteoarthritis, Venous Insufficiency and Lymphedema
- Medications: Warfarin as per INR, Ramipril 10 mg od, Metoprolol 50 mg bid, Hydrochlorothiazide 25 mg od, Metformin 500 mg 2 tabs bid
- BMI 24

Case 2

- What are his treatment goals?
- What is his complexity score?
- Is there a clinically dominant condition?
- How many concordant chronic conditions?
- How many discordant conditions?
- How many symptomatic conditions?
- How many asymptomatic conditions?
- Estimated life expectancy?
- What is his frailty level?
- Target AIC=

Hb A1C



Concluding thoughts

- Not much evidence to support aggressive AIC targets in oldest old
- Large range of uncertainty on benefits
- Limited number clinically relevant tools
- Need to include consideration of social vulnerability
- Appropriate care requires time
- Team based approach may be optimal
- Need for research

Optimal glycemic control is fundamental to the management of diabetes because:

1. It reduces mortality from macrovasuclar and microvascular causes
2. It reduces morbidity from macrovascular causes
3. It reduces morbidity from microvascular causes
4. It improves quality of life
5. All of the above
6. None of the above