Diabetic Management in the Frail Older Patient

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Outline

- Some definitions
- The approach of Geriatric Medicine
- BSL or other end point?
- Diabetes as an industry
- What's the evidence
- Particular settings
- Balancing risk

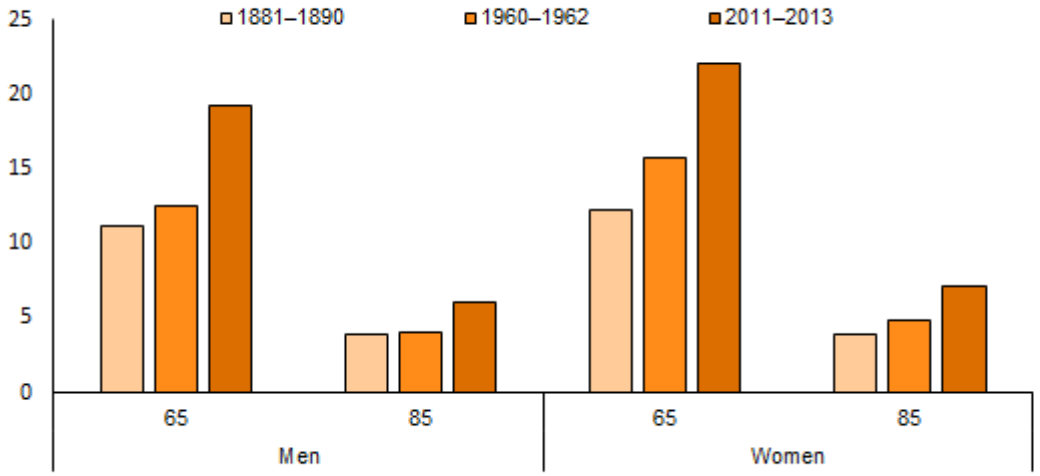
What is Old?

- Older than 65 years
  - This is used by QH and the UN for planning purposes
- Older than 70
  - This is used by the Commonwealth for planning purposes
- Older than 75 years
  - More realistic in terms of when frailty becomes an issue
- Older than me? (maybe)
  - Can't use that forever.

Young Old	65-74
Old	75-84
Old Old	85+

Life expectancy

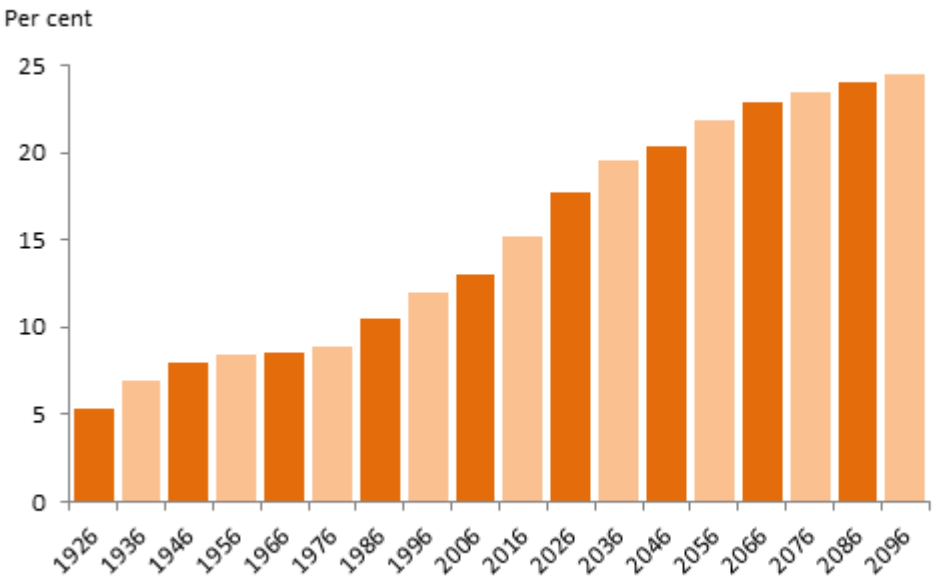
Figure 1: Life expectancy at age 65 and 85 years by sex, 1881–1890, 1960–1962 and 2011–13



Source: AIHW [2].

Percent Population over 65 years

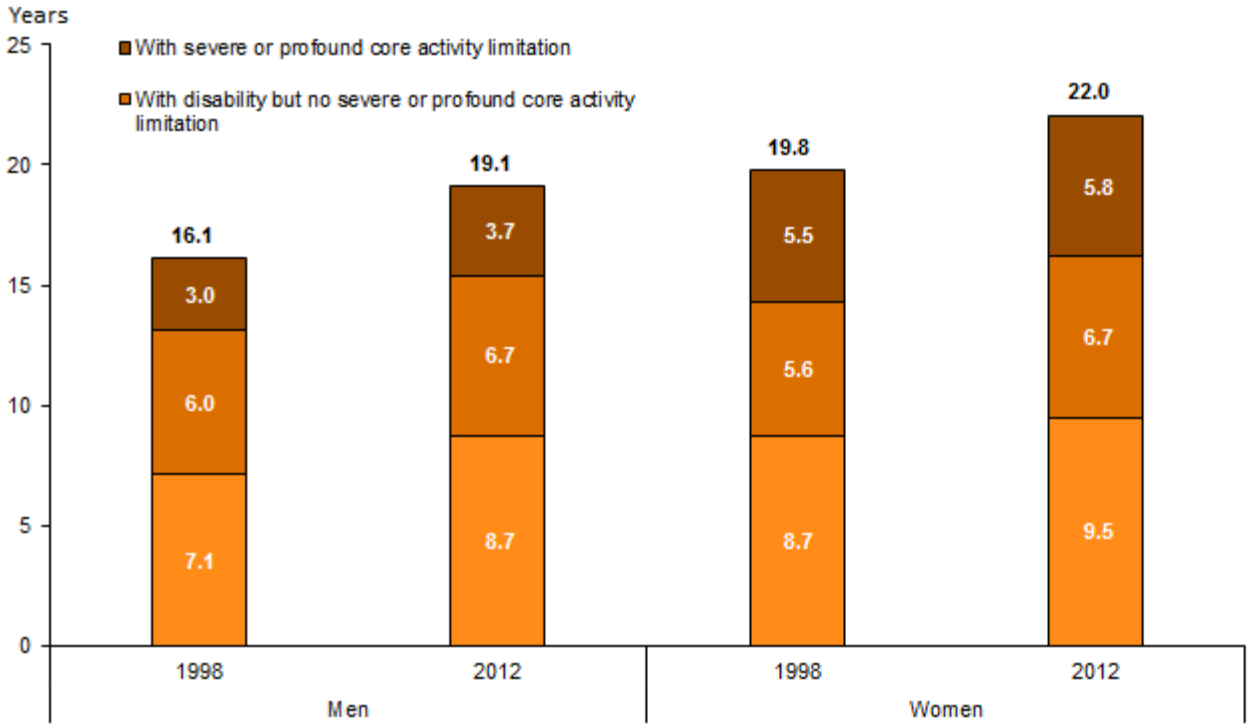
Figure 1: Australian population aged 65 and over, at 30 June, over time (per cent)



Sources: ABS [1, 2].

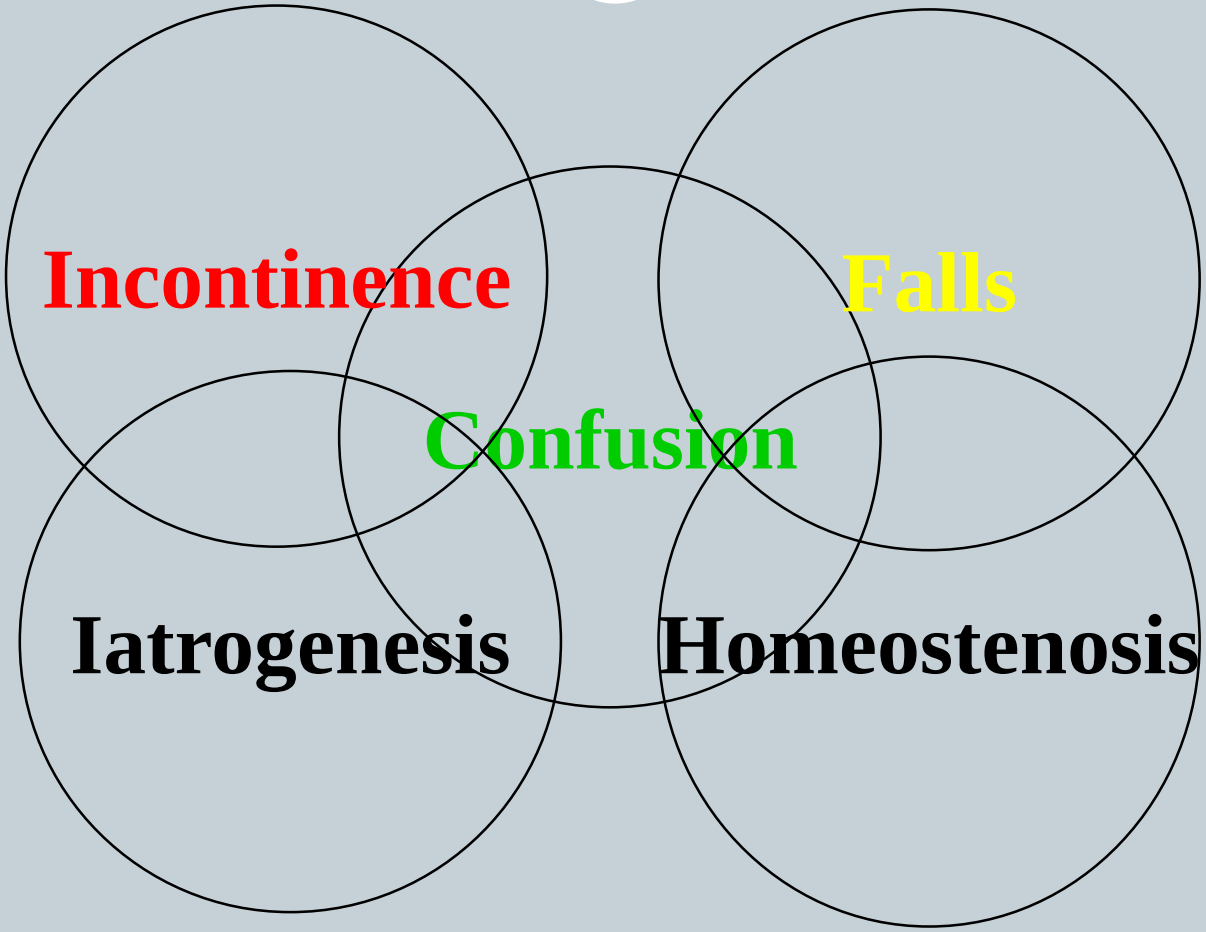
Disability and age

Figure 2: Expected years of life at age 65, without disability, with disability but no severe or profound core activity limitation, and with severe or profound core activity limitation, by sex, 1998 and 2012

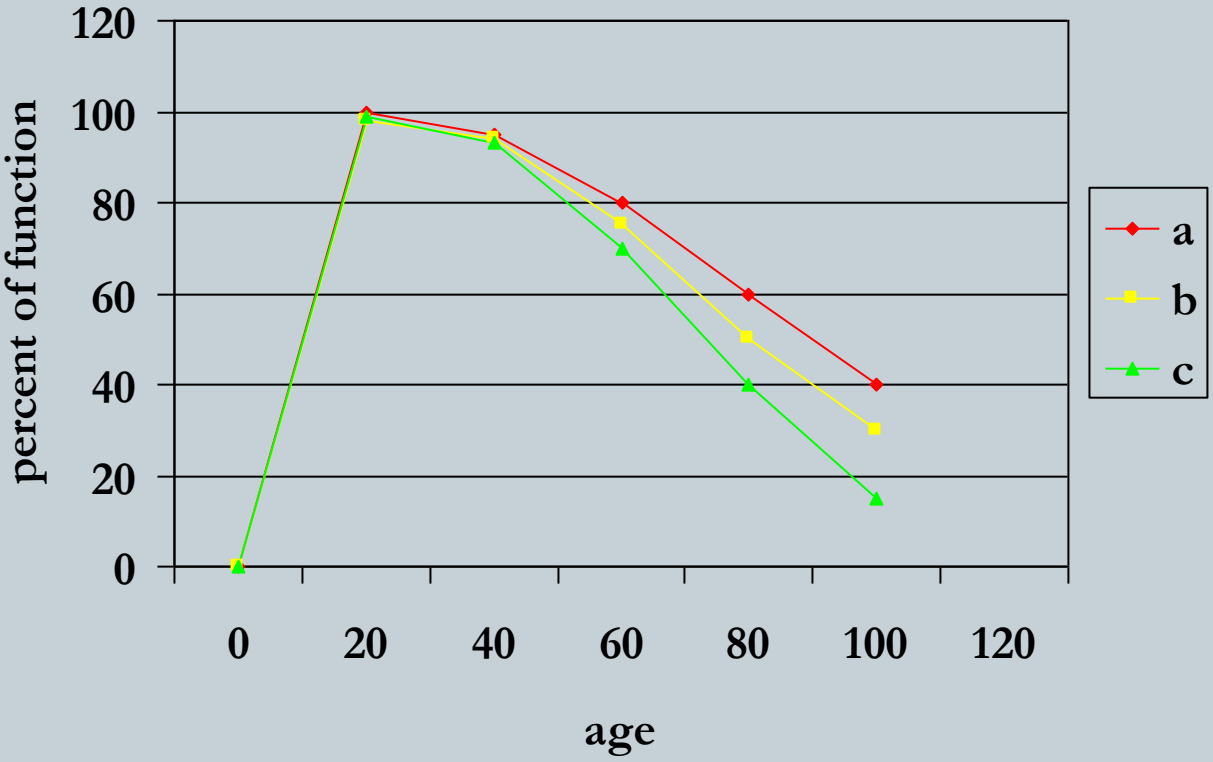


Source: AIHW [2].

GERIATRIC SYNDROMES



Physiological decline with age



HOMEOSTENOSIS (Frailty)

- reduced homeostasis
- reduced organ reserve
  - Age related changes
- organ damage
  - disease related changes
- Precarious cerebral function
  - cerebrovascular disease
  - degenerative diseases
  - age related changes ??
- Decreased adaptive responses

GERIATRIC Thinking

- Not as DISEASE Focused as General Internal Medicine – whole of person focus
- BIO/PSYCHO/SOCIAL Model
- Recognizes the variability of the individual organism and functional consequences of this
- Focus on geriatric syndromes
  - delirium
  - dementia
  - ADL deficits
  - mobility problems
  - incontinence
  - falls
  - rehabilitation

Geriatric Medicine

- Takes a broad approach to assessment and treatment
- Deals with physical and mental frailty
- Recognises the complexity of the individual
- Operates across the care spectrum
  - Acute, post acute, community, palliative
- Considers risks and benefits of interventions
- Holistic approach.(before this became a fashionable term)

Geriatric Medicine and Diabetes

- Largely Type 2 diabetes
- Occasional “Graduate Type 1” who has aged
- Usually associated with
  - Obesity
  - Hypertension
  - Physical Inactivity
  - Drugs-Steroid use
  - Other disease states causing/associated with weight gain
    - OA
    - Antidepressant or antipsychotic use, anticonvulsant use

Challenging Sites for Diabetic Management

- Acute care
- Post acute care
  - Rehabilitation
  - GEM
- Community supported care
- Residential Care
- Palliative care

Specific Geriatric issues

- Polypharmacy
- Cognitive impairment
- Compliance
- Disease/disease interactions
- Falls risk
- Incontinence
  - Urinary (SGLT2 inhibitors)
  - Faecal (metformin)

Diabetes is Not Just About the BSL

- BSL is a marker of a complex disease
- Immunological factors
- Genetic factors
- Metabolic syndrome
- Type 2 as a disease of lifestyle
  - Dietary excess
  - Physical inactivity

Diabetic Pharma as a Big industry

- Huge and growing industry
- Explosion in new agents
- Significant percent of health budget
  - Global cost estimated at $850 Billion
- Long acting Insulin
  - 2016 Federal Gov costs - AU
  - 146 million for 367,253 scripts
- Metformin is the 7th common PBS drug

FDA drug approval

- Criteria for licensing is around reduction in HbA1c
- Other useful end points not considered
  - Quality of life
  - Life expectancy
  - Functional capacity
  - Societal cost

Multiple drugs available

- History - Egyptian Manuscript 1500BC
- Insulin
  - Defined 1910, (first protein to be sequenced – F Sanger 1951)
  - used in dogs 1921,
  - first patient 23 jan 1922 on a 14 year old boy . NPH marketed 1940s
- Sulphoylureas 1942 Tolbutamide 1955
- Biguanides –
  - Phenformin late 1950s withdrawn 1977
  - Metformin developed 1922, Marketed 1979
- Thiazolidinediones 1990s
- GLP-1 receptor agonists 2005
- DPP4 inhibitors
- Alpha Glucosidase inhibitors
- SGLT2 agents

Ease of use of long acting insulin

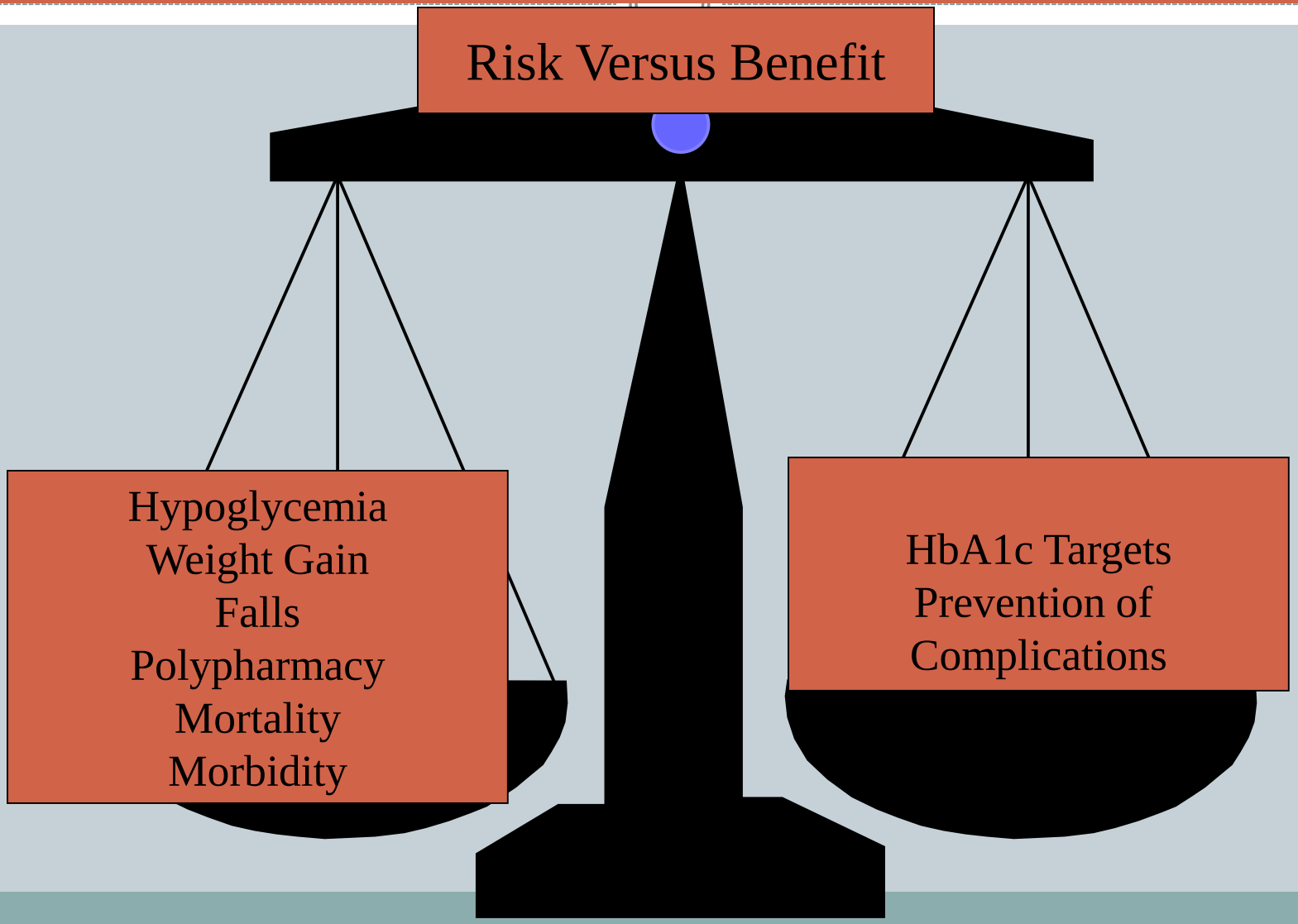
- Multiple agents with simple delivery systems
  - Lowered threshold for commencing treatment
  - Simple to use
  - Well tolerated
  - Reduce HbA1c
- But….
  - All are associated with increased weight gain
  - Weight gain is the primary causative problem

Primum non nocere

- First, do no harm[1]
- "The physician must…have two special objects in view with regard to disease, namely, to do good or to do no harm[2]"

1 Thomas Sydenham (1624–1689)
2 (Hippocratic Corpus *Epidemics*: Bk. I, Sect. 5, trans. Adams, Greek: ἀσκέειν, περὶ τὰ νουσήματα, δύο, ὠφελέειν, ἢ μὴ βλάπτειν).

Balancing Risk

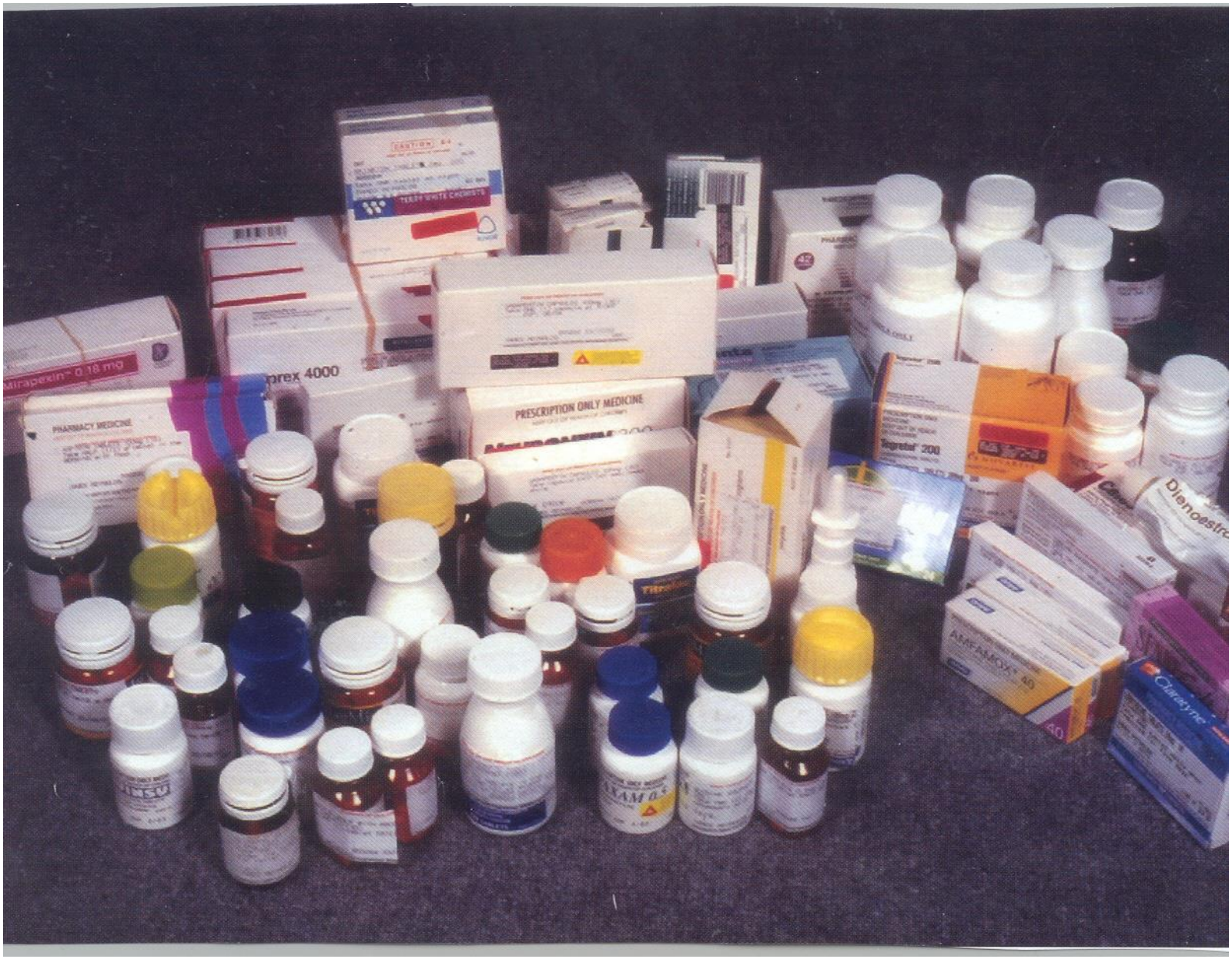


Drugs and Co-Morbid diseases

- Dominant medical condition Paradigm
  - Flawed concept in the elderly
  - Many diseases competing for dominance
- Concordant diseases
  - Eg BP control for HT and diabetes
- Discordant diseases
  - Eg Osteoporotic Therapy and GORD
  - Eg Urinary incontinence and Diuretics
- Symptomatic versus asymptomatic diseases (prevention)

Diabetes Guidelines

- Most patients on up to 6 medications
- ACE or ARB
- Statin
- Fibrate
- Plus
  - OHGs
    - Sulponylureas
    - Biguanides
    - Gliptins
    - Thiozoledinediones
  - Insulin


PRESCRIPTION ONLY MEDICINE
PHARMACY MEDICINE
Dienoestrol


MAKE HIM TAKE 15 OF THESE A DAY UNTIL WE FEEL BETTER ABOUT WHAT WE'RE DOING TO HIM!
FRAN

Mortality and survival

- Need to know the predicted survival
  - Judgement on Benefit
  - Judgement on Risk
- Most studies exclude the frail aged
  - Benefits of interventions demonstrated in select populations
- Most studies use composite end points
  - Can't make a judgement about which is better
    - Eg Stroke versus AMI versus death

Geriatric Targets Vs Guideline targets

- BP
  - Target adherence can result in symptomatic hypotension, falls, confusion
- Cholesterol
  - Little or no evidence in the old old
- BSL
  - Recognised need for relaxed targets
- Weight
  - Higher than “normal” BMI is protective

Short term goals where life expectancy is short

- Symptom control
  - Polyuria
  - Polydipsia
- Avoidance of hypoglycemia
- Avoiding falls
- Functional independence
  - Avoid insulin if possible
  - Avoid point of care testing
  - Simplest drug regime

Testing whether laughter IS the best medicine

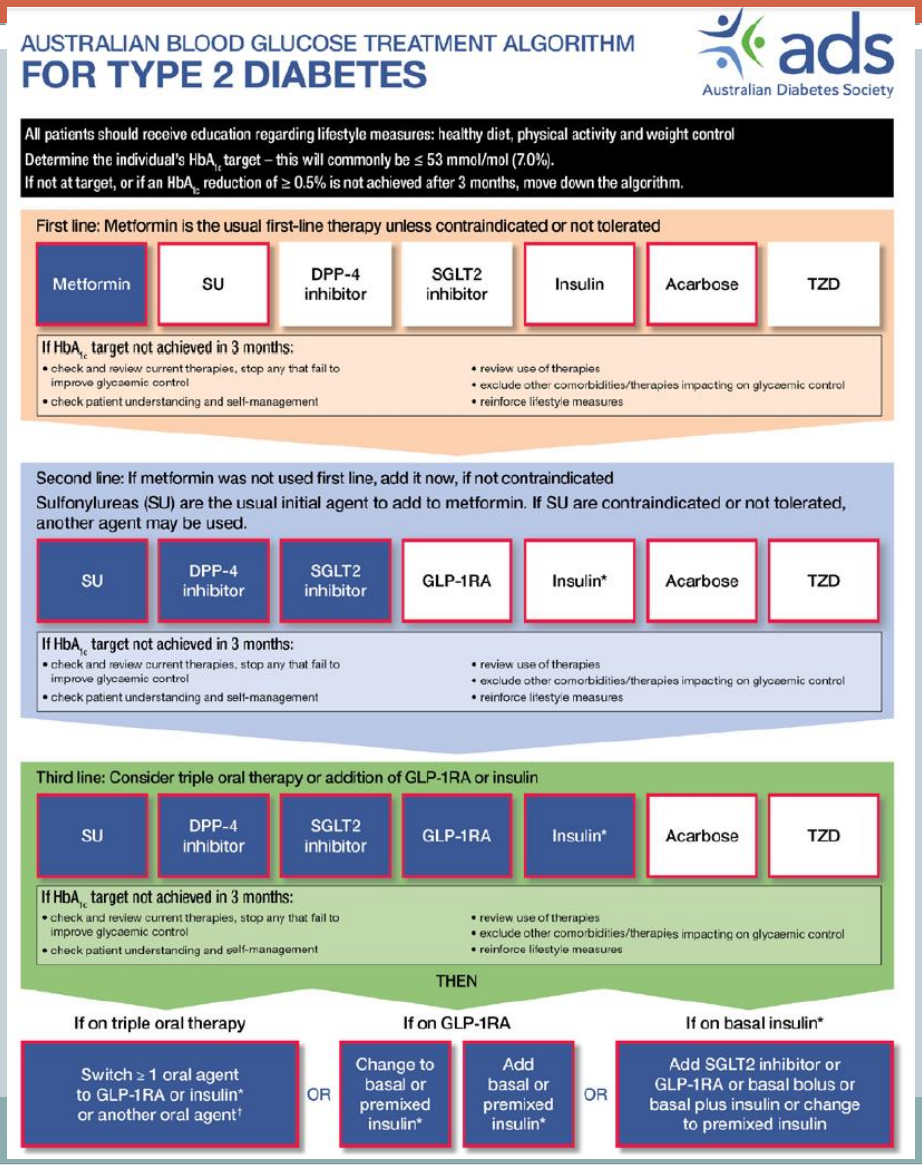
What is evidence?

- Prevention of Complications
  - Proteinuria and CKD
  - Retinopathy
  - Neuropathy
  - Macrovascular disease
- Potential for harm
  - CVS disease
  - MI
  - Mortality
  - Hypos and Falls

Trials

- UGDP trial
  - Excess mortality with sulphonulyureas (older classes)
- UKPDS
  - 1977 to 1997 in UK
  - Decreased risk of retinopathy, nephropathy, neuropathy and macrovascular disease
    - 7.0% versus 7.9 % over 10 years reduced end point
    - 3% reduction per 1% HbA1c reduction
    - Increased hypoglycemia and weight gain
- Accord
  - Higher mortality in tight control (<6 HbA1c)
  - Trial stopped early

Australian Diabetes Society Guidelines

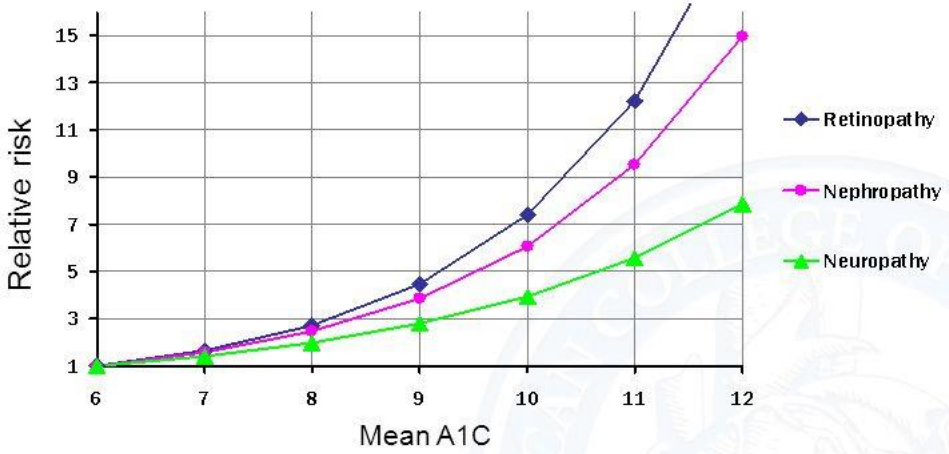


The Party Line

Diabetes Mellitus (Type I): Effect of Intensive Glycemic Control

Diabetes Control and Complications Trial (DCCT)

1,441 patients with DM randomized to intensive (mean HbA_{1C} 7%) or conventional (mean HbA_{1C} 9%) insulin therapy



Intensive glycemic control in diabetic patients reduces the risk of microvascular complications

Helping Cardiovascular Professionals Learn. Advance. Heal.

DM=Diabetes mellitus, HbA_{1C}=Glycosylated hemoglobin

The Diabetes Control and Complications Trial Research Group. *NEJM* 1993;329:977-986

DCCT and hypoglycemia

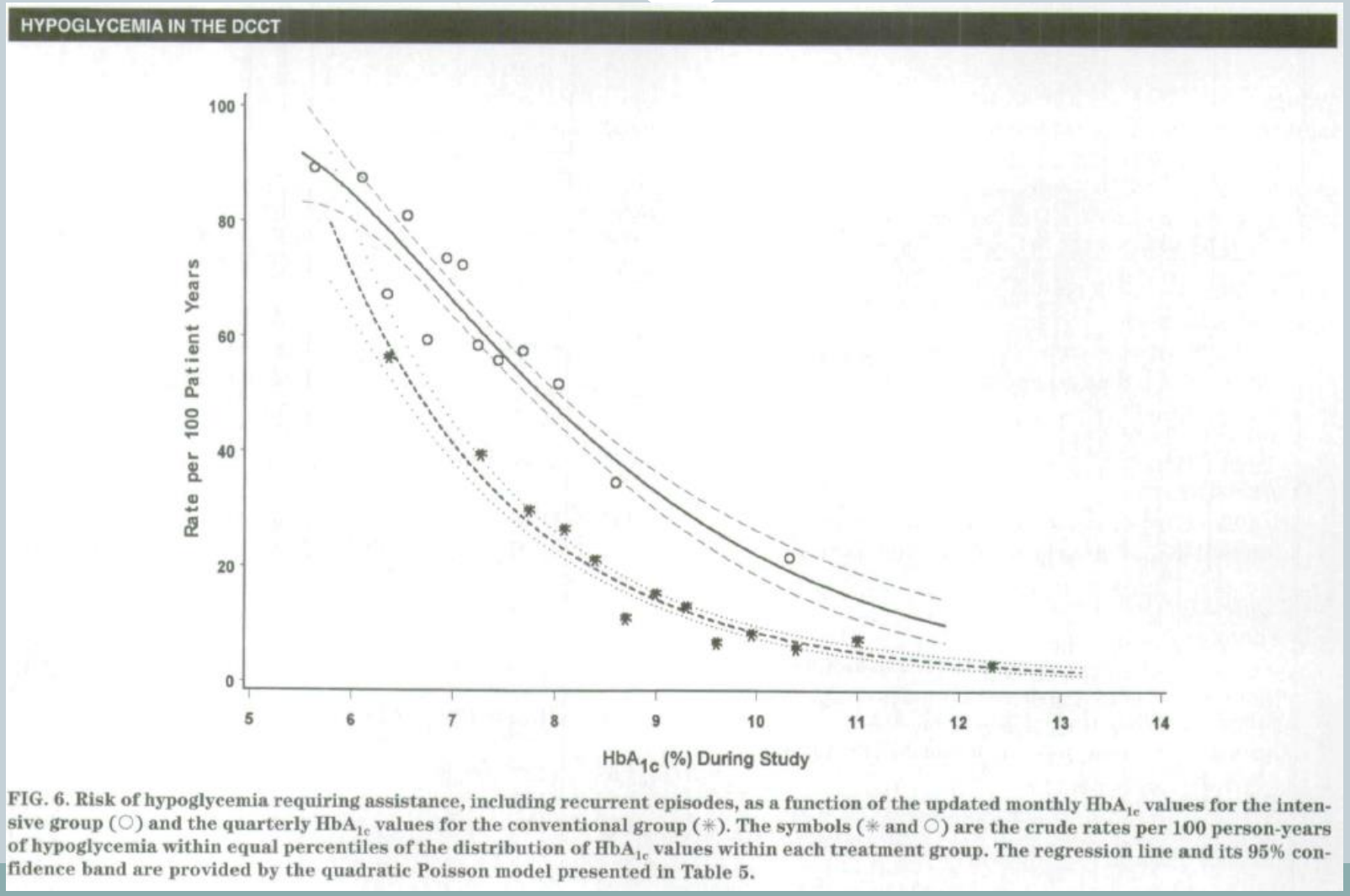
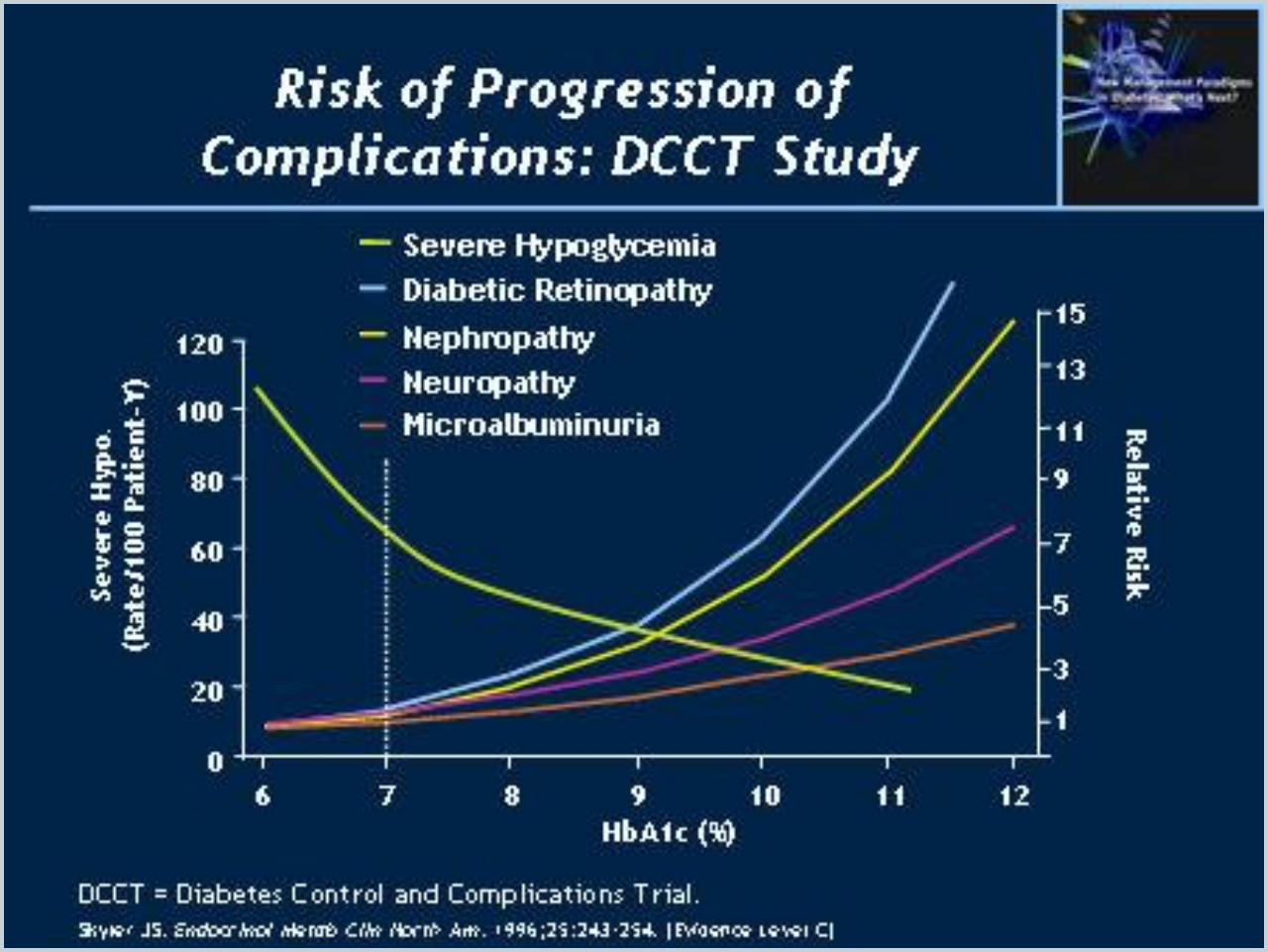


FIG. 6. Risk of hypoglycemia requiring assistance, including recurrent episodes, as a function of the updated monthly HbA_{1c} values for the intensive group (○) and the quarterly HbA_{1c} values for the conventional group (✳). The symbols (✳ and ○) are the crude rates per 100 person-years of hypoglycemia within equal percentiles of the distribution of HbA_{1c} values within each treatment group. The regression line and its 95% confidence band are provided by the quadratic Poisson model presented in Table 5.

But what about the DCCT trial



ACP guidelines 2018

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CLINICAL GUIDELINE

Hemoglobin A_{1c} Targets for Glycemic Control With Pharmacologic Therapy for Nonpregnant Adults With Type 2 Diabetes Mellitus: A Guidance Statement Update From the American College of Physicians

Amir Qaseem, MD, PhD, MHA; Timothy J. Wilt, MD, MPH; Devan Kansagara, MD, MCR; Carrie Horwitch, MD, MPH; Michael J. Barry, MD; and Mary Ann Forciea, MD; for the Clinical Guidelines Committee of the American College of Physicians*

Description: The American College of Physicians developed this guidance statement to guide clinicians in selecting targets for pharmacologic treatment of type 2 diabetes.

Methods: The National Guideline Clearinghouse and the Guidelines International Network library were searched (May 2017) for national guidelines, published in English, that addressed hemoglobin A_{1c} (HbA_{1c}) targets for treating type 2 diabetes in nonpregnant outpatient adults. The authors identified guidelines from the National Institute for Health and Care Excellence and the Institute for Clinical Systems Improvement. In addition, 4 commonly used guidelines were reviewed, from the American Association of Clinical Endocrinologists and American College of Endocrinology, the American Diabetes Association, the Scottish Intercollegiate Guidelines Network, and the U.S. Department of Veterans Affairs and Department of Defense. The AGREE II (Appraisal of Guidelines for Research and Evaluation II) instrument was used to evaluate the guidelines.

Guidance Statement 1: *Clinicians should personalize goals for glycemic control in patients with type 2 diabetes on the basis of a discussion of benefits and harms of pharmacotherapy, patients' preferences, patients' general health and life expectancy, treatment burden, and costs of care.*

Guidance Statement 2: *Clinicians should aim to achieve an HbA_{1c} level between 7% and 8% in most patients with type 2 diabetes.*

Guidance Statement 3: *Clinicians should consider deintensifying pharmacologic therapy in patients with type 2 diabetes who achieve HbA_{1c} levels less than 6.5%.*

Guidance Statement 4: *Clinicians should treat patients with type 2 diabetes to minimize symptoms related to hyperglycemia and avoid targeting an HbA_{1c} level in patients with a life expectancy less than 10 years due to advanced age (80 years or older), residence in a nursing home, or chronic conditions (such as dementia, cancer, end-stage kidney disease, or severe chronic obstructive pulmonary disease or congestive heart failure) because the harms outweigh the benefits in this population.*

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For author affiliations, see end of text.
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Risks of tight control

- Higher mortality
- More heart disease events
- Increased risk of sudden death
- Symptomatic hypos
- Weight gain

Acute to Subacute

- Present to hospital on oral agents
- Decompensate in setting of acute illness
- Placed on complex insulin regime
  - Basal Bolus with added supplemental short acting
- Unable to be discharged on insulin

- Simplify regime to bd Mixtard regime
- Often get off insulin with use of Gliptin and Metformin.

Acute to Long term care

- From an ACAT perspective
- Insulin regime
  - May be difference between high needs care and Pensioner Unit or home discharge
  - May be the difference between Level 2 and Level 4 ACCP
- These decisions impact greatly on care needs and discharge destination.

Geriatric Rehabilitation Issues

- In recovery phase of illness
- Prolonged period of bed rest
- Starting to mobilise

- BSLs are likely to drop with increased activity
  - Permissive hyperglycemia in initial phase
  - Hypos are a major risk with rehabilitation
  - Excess weight an impediment to mobility

Diabetes in Long Term Care

- Few RNs in Residential care now
  - Not called “nursing homes” anymore
  - Residential facilities manned by Personal Carers
- Discharges (largely deaths)
  - 27.1% in first 12 months
  - 46.7% within 2 years
  - 61.1% Within 3 years
- Care should be symptomatic not HBA1c driven

Focus from prevention to symptom control

- Limited life expectancy
- High rates of co-morbidity
- Immediate side effects versus long term benefits
- Functional impact is key consideration

Geriatric issues

- Individualised Medical Care
  - Not guideline based care
- Simplicity
  - Cognitive issues
- Compliance
  - Care environment
- Self care or supervised care

What are the Geriatric Targets?

- Not based on a number
- Essentially
  - The level of control that can be managed in a given setting that reduces the risk of symptoms and acute adverse events.
- Highly individualised based on
  - Functional status
  - Life expectancy
  - Patient wishes and goals