Finding the sweet spot:
Individualized targets for older adults with Type 2 DM

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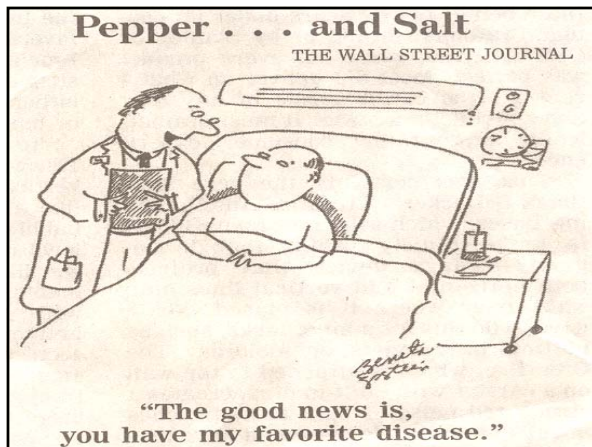

No relevant financial relationships

Pepper . . . and Salt

THE WALL STREET JOURNAL

"The good news is, you have my favorite disease."

Objectives

Prioritize major risks for older adults with Type 2 DM

Evaluate health status and preferences

Individualize glucose, blood pressure and lipid targets

Diabetes mellitus risks

- Volume depletion and dehydration
- Poor wound healing
- Fatigue and weight loss
- MI and death; $\geq$ 20 % over 10 years
- Foot ulcer and amputation
- Blindness; risk < 5% over 10 years
- End stage renal failure < 2% over 10 years

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Geriatric conditions

- 50% older adults have $\geq$ 3 chronic diseases
- Falls: 30% per year; 10% injurious
- Dementia: 10% prevalence; 30% after age 85
- Urinary incontinence: 15 30% prevalence
- Polypharmacy: 40% use $\geq$ 5 meds per week
- Persistent pain: 25 50%
- Depression: 15% in primary care setting

Risks of therapy

- Burden (e.g., insulin, diet restrictions)
- Hypoglycemia (e.g., insulin, sulfonylureas)
- Polypharmacy side effects and costs
- Muscle pain and myopathy with statins
- Orthostatic hypotension

Huang, et al Diabetes Care 2006
Budnitz, et al JAMA 2006
Skyler, et al. J Am Coll Cardiol 2009

Special considerations

- Erratic eating or dependency on being fed
- Care transitions increase medication error
- Inability to report symptoms
- BP goals adults age $\geq$ 85 are uncertain
- Benefits from statins and aspirin in those > 80 years of age are uncertain

Van Bemmel, et al: J Hypertension 2006
Cayea, Boyd, Durso: Drugs & Aging 2007
Cayea, Durso: Ann Long-term Care 2007

NNT to prevent one event
(in person years/event)

	DM Endpoints	CVD Events	All cause Mortality
Glucose Control[1,2]	74 196		141 1000 (NS)
HTN Treatment[3 8]	11	12 38	19 31
Lipid Management [9 12]		7 47	57

UKPDS 33; UKPDS 34; UKPDS 38; Tuomilehto, 1999; Lievre, 2000; Estacio, 2000; microHOPE, 2000; Estacio, 2000; Sacks, 1996; Elkeles, 1998; Rubins, 1999; Heart Protection Study (CHF/AGS AGS Symposium, May 2003)

Time needed to benefit

	Microvascular Complications (Median Years)	Macrovascular Complications (Median Years)
Control of:		
Glucose	8	
Blood Pressure	2-3	3
Lipids		3 to 6

(CHF/AGS AGS Symposium, May 2003)

Comprehensive assessment

- Careful assessment of vascular risks and co morbid diseases
- Thorough review of medications
- Assess functional status
- Screen for geriatric syndromes

Blaum, GRS 8 in press

Blood pressure and lipid targets

- Blood pressure < 140/80
- LDL < 100 mg/dl or 70 with CVD
- HDL > 40 mg/dl
- Triglycerides < 150 mg/dl

ADA Standards   2011

Glycemic targets

- Hemoglobin A1C $\leq$ 7
  - Mean plasma glucose 154 mg/dl (2 3 months)
    Healthy adults with > 10 year life expectancy
- Hemoglobin A1C between 7 – 8.5
  - Mean plasma glucose 180 mg/dl (2 3 months)
    Adults with limited life expectancy, history of severe hypoglycemia, or advanced microvascular or macrovascular disease

ADA Standards   2011

Hypoglycemic Drugs

| Medication	Side effects/Properties	Other Considerations
Metformin	20 – 30% GI; 5% required to stop	Lactic acidosis rare; no weight gain
Sulfonylureas (glypizide, glyburide, glimepiride)	High risk of hypoglycemia	Glyburide highest risk; all cause weight gain
Meglitinides (nateglinide, repaglinide)	Short acting; option for erratic eating	Hypoglycemia risk less severe; caution in liver or renal disease
Thiazolidinediones	Contraindicated in CHF	Not associated with hypoglycemia; monitor liver enzymes
Alpha-glucosidase inhibitors	GI side effects limits use	Avoid with renal impairment

Average life expectancy for older women

Years

Age

Top quartile
Middle quartiles
Lowest quartile

Walters & Covinsky, JAMA 2001
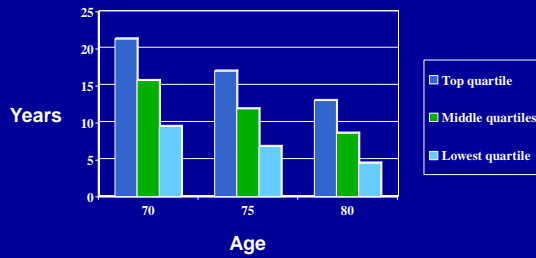
Patient 1

- 80 year old woman with DM for 15 years admitted to skilled unit after ORIF of hip fracture
    - Difficulty managing finances and walking 2 blocks
    - 40% mortality in 4 years; average life expectancy < 10 years
    - Erratic eating and activity during rehab

Lee, et al: JAMA 2006

Walters, et al. JAMA 2001

Patients 1 (continued)

- Short term during rehabilitation
  - Lower or eliminate insulin or oral hypoglycemic
- Long term after recovery
  - Resume moderate control consistent with patient's goals (target A1C between 7 – 8.5)
  - Review and reduce medications that might increase serum glucose

Skyler, et al. J Am Coll Cardiol 2009
Brown, et al. J Am Geriatr Soc 2003

Patients 2

- 70 year old man with Type 2 DM with newly diagnosed diabetes, no known CAD
  - Robust health, enjoys vigorous physical activities
  - Average life expectancy > 20 years; 15% mortality in 4 years
  - Understands risks of recommended targets for BP, lipids, and blood glucose

Lee, et al: JAMA 2006
Walters, et al. JAMA 2001

Patients 2 (continued)

- Options for long term risk reduction of micro and macrovascular disease
  - Considerations: relative longevity; high function; engaged in health maintenance
  - BP to target
  - CV risk reduction and lipids to target
  - Target A1C < 7 depending on patient's preference and ability to manage and monitor glucose

Patients 3

- 69 year old female with Type 2 DM, CAD and CHF with ejection fraction 25%
  - Dependent in bathing, difficulty with executive functions and cognition; 42% mortality in 4 years, average life expectancy < 10 years
  - Occasional episodes of hypoglycemia

  Lee, et al: JAMA 2006

  Walters, et al. JAMA 2001

Patients 3 (continued)

- Options
  - Thiazolidinediones contraindicated
  - Metformin relatively contraindicated
  - Shorter half life sulfonylureas as single agent preferable
  - If insulin needed, glargine insulin to minimize injections and avoid peaks
  - Target A1C between 7 – 8.5

Summary

- Tailor goals in keeping with preferences, longevity, and function
- Relative impact of control: BP > Lipids > Glucose
- Screen and treat common geriatrics syndromes
- For most, moderate glycemic control may reduce fatigue, symptoms of polyuria, improve wound healing and cognition (target hemoglobin A1C ≈ 8)
- For a motivated few, target hemoglobin A1C ≈ 7 may reduce microvascular disease, though increases risk of hypoglycemia and cardiovascular mortality