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

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No relevant financial relationships
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; > 20 % over 10 years
- Foot ulcer and amputation
- Blindness; risk < 5% over 10 years
- End stage renal failure < 2% over 10 years
Diabetes mellitus risks

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Geriatric conditions

- 50% older adults have ≥ 3 chronic diseases
- Falls: 30% per year; 10% injurious
- Dementia: 10% prevalence; 30% after age 85
- Urinary incontinence: 15-30% prevalence
- Polypharmacy: 40% use ≥ 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
Special considerations

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

Cayea, Boyd, Durso: Drugs & Aging 2007
Cayea, Durso: Ann Long-term Care 2007

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

<table>
<thead>
<tr>
<th></th>
<th>DM Endpoints</th>
<th>CVD Events</th>
<th>All cause Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glucose Control 1,2</td>
<td>74 196</td>
<td>141 1000 (NS)</td>
<td></td>
</tr>
<tr>
<td>HTN Treatment 3-8</td>
<td>11 12 38</td>
<td>19 31</td>
<td></td>
</tr>
<tr>
<td>Lipid Management 8,12</td>
<td>7 47 57</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

UKPDS 30; UKPDS 34; UKPDS 50; Tuomilehto, 1998; Lawen, 2000; Estacio, 2000; microHOPE, 2000; Estacio, 2000; Sacks, 1996; Rubins, 1996; Heart Protection Study (CHF/AGS AGS Symposium, May 2003)

Time needed to benefit

<table>
<thead>
<tr>
<th></th>
<th>Microvascular Complications (Median Years)</th>
<th>Macrovascular Complications (Median Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control of: Glucose</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>2-3</td>
<td>3</td>
</tr>
<tr>
<td>Lipids</td>
<td>3 to 6</td>
<td></td>
</tr>
</tbody>
</table>

(CHF/AGS AGS Symposium, May 2003)
Comprehensive assessment

- Careful assessment of vascular risks and comorbid 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 ≤ 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**

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

**Average life expectancy for older women**

![Graph showing average life expectancy for older women](image)

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

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


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

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

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