Diabetes Care for Older Adults: Recommendations and Challenges

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Disclosure

• None
• Acknowledgement to American Diabetes Association for slides.
Case Study: Mrs A: age 78 with low vision

- c/o: gradual visual decline, arthritis pain
- PMH: DM, CAD, hyperlipidemia, TIA’s, HTN, OA, macular degeneration
- A1C: 8.7%
- SMBG: not doing
- Hypoglyc: none
- BP: 142/80
- LDL-C: 140
- BMI: 29, wt stable

Current Treatment:
- Humulin N 60 u q am
- Atenolol 50 qd
- HCTZ 25 qd
- Atorvastatin 10 qHS
- ASA 81 qd
- Ibuprofen 200 prn
- MOM prn

Func’l Status: MMSE 30/30
ADL’s indep but limited by low vision

Social: Retired teacher, widow, no children, neighbor helpful

The Care Plan for Mrs A

Hyperglycemia:
SMBG w/ low vision aids, RD eval, even out insulin peaks

HTN:
add ACE, reduce atenolol to 25

Lipids:
Increase atorvastatin to 20 qHS

Macular degeneration:
Low vision clinic, Rehab for the blind, SW evaluation

OA:
PT, acetaminophen, D/C ibuprofen
Results within 3 to 6 months

• A1C down to 7% without severe hypoglycemia
• LDL 104
• BP 126/78
• Healthier meal plan (RD, neighbor helps shop)
• Improved home safety & mobility (PT, OT)
• Reported improved quality of life despite low vision (SW and nursing interventions)
• No vascular events

Learning Objectives

• Review the epidemiology of diabetes and its complications in older adults
• Present ADA consensus recommendations for treating the heterogeneous population of older adults with or at risk for diabetes
• Review issues which need to be considered to individualize treatment recommendations for older adults
• Review best practices to involve patients in decisions related to diabetes care
Diagnosis of Diabetes in All Adults

- Criteria do not change with age
- Diagnosis based exclusively on hyperglycemia
- Three methods used to determine dysglycemia

<table>
<thead>
<tr>
<th>HbA1c</th>
<th>Fasting Glucose</th>
<th>OGGT (2 hr. glucose)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIABETIC</td>
<td>&lt;6.5%</td>
<td>≥ 126 mg/dL (7 mmol/L)</td>
</tr>
<tr>
<td>PREDIABETIC</td>
<td>5.7%–6.4%</td>
<td>≥ 100-125 mg/dL (5.6 - 6.9 mmol/L)</td>
</tr>
<tr>
<td>NORMAL</td>
<td>5.6%</td>
<td>&lt; 99 mg/dL (5.5 mmol/L)</td>
</tr>
</tbody>
</table>


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Diabetes in Adults ≥ 65 Years

- T2DM major public health problem in elderly
- 2030 ⇒ Prevalence will double
- 2050 ⇒ Prevalence will increase five-fold
- Greatest increase in ≥ 75 years regardless of race; elderly blacks especially at risk

CDC. National diabetes fact sheet. 2011
CDC. MMWR. Nov. 2012
Age & Rates of AMI by Diabetes Status

Booth et al. The Lancet; Jul 1-Jul 7, 2006; 368:9529

Incidence (per 1,000) of major diabetes complications among adults with diabetes, by age, 2009.


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Highest Rates of Complications

Age 65 – 74
- Lower extremity amputation
- Myocardial infarction
- Non-retinopathy visual impairment
- End-stage renal disease
- Hyperglycemic crisis ⇒ death

Age 75+ also experience
- More complications
- 2 X rate of ER visits due to hypoglycemia

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Know Your Patient Population

Race and Gender

CDC. Percent US Population with Diagnosed Diabetes, by Age, Race and Sex. 2011

ADA Consensus Panel Members

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Clinical recommendations and recommendations for a research agenda in this report are solely the opinion of the authors, and do not represent the official position of the American Diabetes Association.

Consensus Panel Framework

- Panel considered three profiles of older adults with diabetes:
  1. Those relatively good health
  2. Those with complex medical histories that might make self-care difficult
  3. Those with significant comorbid illness and functional impairment

- Recognized patient care must be individualized
- Made distinct recommendations for the screening and treatment for each group
### Consensus Panel Framework

<table>
<thead>
<tr>
<th>HEALTH STATUS</th>
<th>RATIONALE</th>
<th>REASONABLE A1C GOAL</th>
<th>FASTING OR PREPRANDIAL GLUCOSE (mg/dl)</th>
<th>BEDTIME GLUCOSE (mg/dl)</th>
<th>BLOOD PRESSURE (mmHg)</th>
<th>LIPIDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>Longer life expectancy</td>
<td>&lt;7.5%</td>
<td>90 – 130</td>
<td>90 – 150</td>
<td>&lt;140/80</td>
<td>Statin (unless contraindicated or not tolerated)</td>
</tr>
<tr>
<td>Complex Intermediate</td>
<td>Intermediate life expectancy; high treatment burden; hypoglycemia vulnerability; fall risk</td>
<td>&lt;8.0%</td>
<td>90 – 150</td>
<td>100 – 180</td>
<td>&lt;140/80</td>
<td>Statin (unless contraindicated or not tolerated)</td>
</tr>
<tr>
<td>Very Complex/Poor Health</td>
<td>Limited life expectancy; treatment benefit uncertain</td>
<td>&lt;8.5%</td>
<td>100 – 180</td>
<td>110 – 200</td>
<td>&lt;150/90</td>
<td>Consider benefit with statin; (secondary prevention &gt; primary)</td>
</tr>
</tbody>
</table>

**Healthy** - Few coexisting chronic illnesses, intact cognitive & functional status  
**Complex/Intermediate Health** - Multiple coexisting chronic illnesses, or 2+ instrumental ADL impairments, or mild to moderate cognitive impairment  
**Very Complex/Poor Health** - Long-term care or end-stage chronic illnesses or moderate to severe cognitive impairment or 2+ ADL dependencies  


### Heterogeneity of Older Diabetics

<table>
<thead>
<tr>
<th>RELATIVELY HEALTHY</th>
<th>DIFFICULT TO IMPLEMENT</th>
<th>LIMITED BENEFIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>• &lt; 3 chronic diseases</td>
<td>• ≥ 3 chronic diseases</td>
<td>• End-stage illness</td>
</tr>
<tr>
<td>• No cognitive or significant visual impairment</td>
<td>• Mild cognitive impairment</td>
<td>• Moderate to severe cognitive impairment</td>
</tr>
<tr>
<td>• 0 or 1 instrumental activities of daily living (IADL) dependencies</td>
<td>• Severe vision impairment</td>
<td>• ≥ 2 ADL dependencies</td>
</tr>
<tr>
<td></td>
<td>• ≥ 2 IADL dependencies</td>
<td>• Residence in a long-term nursing facility</td>
</tr>
</tbody>
</table>

Heterogeneity in health status among patients with diabetes, based on data from the Health and Retirement Study of people over age 50


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From: Potential Overtreatment of Diabetes Mellitus in Older Adults With Tight Glycemic Control

Achieved Glycemic Control Among Older US Adults With Diabetes Mellitus
Across 3 Health Status Categories

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Diabetes and Geriatric Syndromes

Worsening Functional Impairments and Disability


Diabetes and Functional Impairment

Peripheral Neuropathy

50–70% of older patients with diabetes have PN

Postural Instability
Balance Problems
Muscle Atrophy

Limits Activity
Deconditions
Increases Falls

Diabetes and Physical Disability

- Diabetes accelerates other aging-related processes in developing disability
- Diabetes-disability relationship worse for women, African Americans, those with lower education
- Increased disability of elderly diabetics due to comorbidities (i.e. HBP, HD, Arthritis)
- Reduce comorbidities → reduce disability in these populations


Incident diabetes and mortality by level of disability in U.S. nondiabetic adults aged ≥51 years in the HRS from 1998–2010.

Bardenheier B H et al. Diabetes Care 2014;37:1032-1038
Polypharmacy

<table>
<thead>
<tr>
<th>Common Comorbidities Requiring Daily Multiple-drug Regimens</th>
<th>Common Comorbidities Requiring Occasional Multiple-drug Regimens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>Glaucoma</td>
</tr>
<tr>
<td>Dyslipidemia</td>
<td>Peripheral Vascular Disease</td>
</tr>
<tr>
<td>Coronary artery disease</td>
<td>Lower-extremity Ulcers</td>
</tr>
<tr>
<td>Renal disease</td>
<td>Obesity</td>
</tr>
<tr>
<td>Congestive heart failure</td>
<td>Diabetes Medications</td>
</tr>
<tr>
<td>Neuropathy</td>
<td>• 6 classes of oral agents</td>
</tr>
<tr>
<td>Cognitive Dysfunction</td>
<td>• 3 rapid-acting insulin analogs</td>
</tr>
<tr>
<td>Depression</td>
<td>• 2 long-acting analogs</td>
</tr>
<tr>
<td></td>
<td>• Traditional insulins</td>
</tr>
</tbody>
</table>

Polypharmacy and Adherence

Complexity of drug regimens
Poor patient education
Ignoring patients’ lifestyles
Cost of medications

ADHERENCE

Diabetes and Cognitive Impairment

- Approximately 20% diabetic elderly have undiagnosed CI
- Alzheimer’s-type and multi-infarct dementia 2 to 3 times as likely in diabetic elderly
- T2DM associated with medial temporal lobe atrophy and poor performance on tests of executive function, speed, memory and attention, language and praxis


Diabetes and Cognitive Impairment

Hypoglycemia
Hyperglycemia
Insulin Resistance
Insulin Insufficiency

Cognitive Function

COGNITIVE STATUS

- Screen for cognitive dysfunction at initial work-up
- Periodic screening at subsequent appointments
- Use standardized cognitive assessments ([http://www.hospitalmedicine.org/geriresource/toolbox](http://www.hospitalmedicine.org/geriresource/toolbox))
- Simplify self-care regimen
- Interview and involve caregivers


Hypoglycemia in Diabetics ≥ 65 Years

Risk factors for hypoglycemia in elderly include:

- Use of insulin or insulin secretagogues
- Duration of diabetes
- Antecedent hypoglycemia
- Erratic meals
- Renal insufficiency
- Hospital discharge within the prior 30 days
- Advanced age
- Black race
- Use of ≥ 5 concomitant medications

Hypoglycemia and Risk for Dementia

Hypoglycemic Episodes and Risk of Dementia in Older Patients With Type 2 Diabetes Mellitus

A longitudinal cohort study from 1980-2007 of 16,667 patients with a mean age of 65 years and type 2 diabetes who are members of an integrated health care delivery system in northern California.

<table>
<thead>
<tr>
<th>Table 2. Frequency of Hypoglycemic Episodes by Dementia Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No. (%)</strong></td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>Any hypoglycemia</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No of hypoglycemic episodes</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3 or more</td>
</tr>
</tbody>
</table>

Abbreviation: CI, confidence interval.

*Attributable risk calculated as difference between rate in group and rate in reference group (0 hypoglycemic events).

Relationship between baseline cognitive function and risk for severe hypoglycemia in the ACCORD trial.

Whitmer et al. JAMA. 2009;301(15):1565-1572

Halter JB et al. Diabetes 2014;63:2578-2589

Punthakee Z Diabetes Care 2012;35:787–793

Copyright © 2014 American Diabetes Association, Inc.
Continuous subcutaneous insulin infusion vs multiple daily injections
Mean A1C by treatment group and time, \( n = 107 \geq 60 \) years


Additional Consensus Recommendations for Older Adults with Diabetes

Screening for and Prevention of Diabetes

- Screen older adults for prediabetes and diabetes according to ADA recommendations, if the patient will be likely to benefit from identification of the condition/disease and subsequent intervention.

- Implement lifestyle intervention for older adults with prediabetes who are able to participate and are likely to benefit from prevention of type 2 diabetes.

Additional Consensus Recommendations for Older Adults with Diabetes

Management of Diabetes

- Encourage physical activity, even if not to optimal levels, and implement medical nutrition therapy, using simple teaching strategies and community resources, considering patient safety and preferences.

- DSME/T in older adults should take into account sensory deficits, cognitive impairment, and different learning styles and teaching strategies, and should include caregivers.

- In order to develop and update an individualized treatment plan, screen older adults periodically for cognitive dysfunction, functional status, and fall risk, using simple tools such as those at http://www.hospitalmedicine.org/geriresource/toolbox

Pharmacotherapy

- Carefully choose anti-hyperglycemic therapies, considering polypharmacy. Avoid glyburide.

- Metformin is the preferred initial therapy in many older adults with type 2 diabetes, but at reduced dose in those with stage 3 CKD and avoid in those with stage 4 or worse.

- Assess patients for hypoglycemia regularly. In type 2 patients, hypoglycemia risk is linked more to treatment strategies than to achieved lower HbA1c.

- If recurrent or severe hypoglycemia occurs, strongly consider changing therapy and/or targets.

- Assess the burden of treatment on older adult patients (caregivers), consider patient/caregiver preferences, and attempt to reduce treatment complexity.

Additional Consensus Recommendations for Older Adults with Diabetes

Management in Settings Outside the Home

• The glycemic goals for hospitalized older adults with diabetes are usually similar to those for the general population.

• The use of sliding scale insulin alone for chronic glycemic management is discouraged in inpatient settings as well as in LTC facilities.

• Transitions of older adults with diabetes (e.g., from home or LTC facility to hospital to post-discharge setting) are periods of high risk.


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### Goals of Care and Their Barriers

**GOALS**
- Freedom from hypoglycemia
- No undesirable weight loss
- No vascular complications
- Detection of cognitive, psychological, functional impairment at early stages
- Achievement of normal life expectancy
- Adaption of lifestyle changes
- Personal independence; competent self care

**BARRIERS**
- Social isolation; loneliness
- High prevalence of depression
- High prevalence of cognitive impairment
- Nursing home residency
- Reliance on care givers
- Polypharmacy
- Frailty; limited life expectancy
- Significant comorbidities


### Shared Decision-making

- Key components of the shared decision-making approach, include
  1. Establishing ongoing partnership between patient and provider
  2. Information exchange
  3. Deliberation on choices
  4. Deciding and acting on decisions

- Congruence of your patient’s goals with your goals for management is important

Shared Decision-making

- Patients need to understand plan to see value
- Educating patients and care-givers critical for adherence
- Know your patient’s preferences regarding treatment plan, medications, management
- Accommodate patient preferences when feasible and in line with goals
- Caregivers/family will often relay patient’s preferences – check with patient directly