

What's Different About Diabetes in Older Adults?



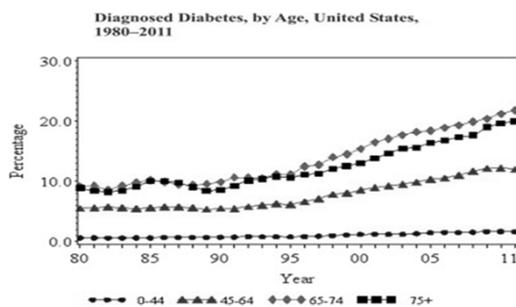
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WADE Annual Conference March 21, 2015

Learning Objectives

- Describe the epidemiology and pathophysiology of diabetes in older adults.
- Identify key considerations for individualizing diabetes treatment in older adults
- Suggest and discuss management of type 2 DM in older adults using case patients

Diabetes in the Elderly

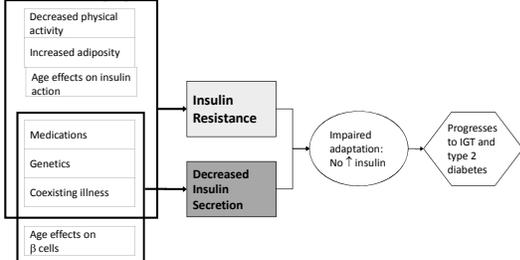


Prevalence and Incidence of Diabetes in Older Populations

- Adult diabetes prevalence doubles with every 15 years of age until age 65.
- Prevalence in older adults has doubled in the past 15 years.
- Incidence and prevalence is increasing most rapidly in absolute terms among older adults.
- Increasing incidence and detection, decreasing mortality, and movement of the baby-boom generation into the high-incidence age is expected to drive large increases in diabetes prevalence over the next 20 years.

Model for Age-Related Hyperglycemia

Diabetes Risk Factors in Aging



*Chang & Halter. AJP 284:E7-E12, 2003

Highest Rates of Complications

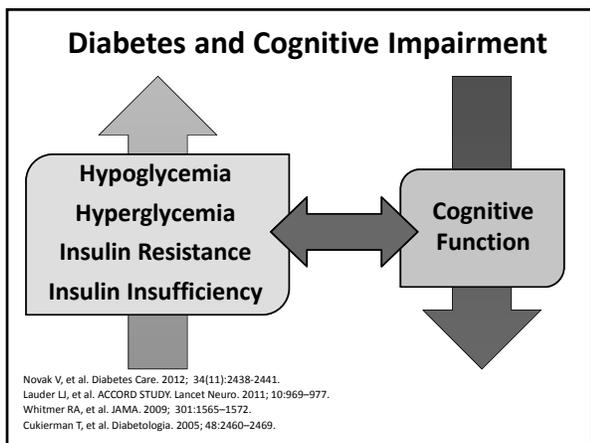
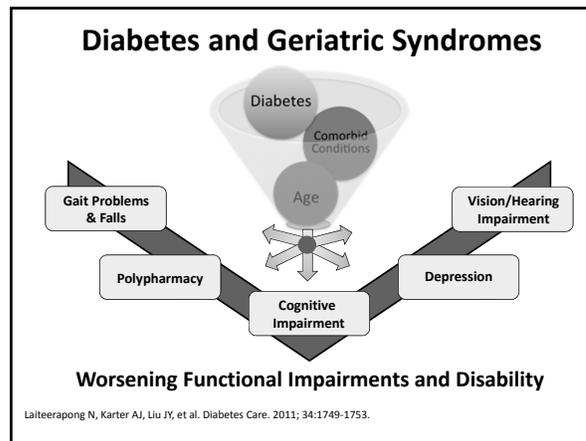
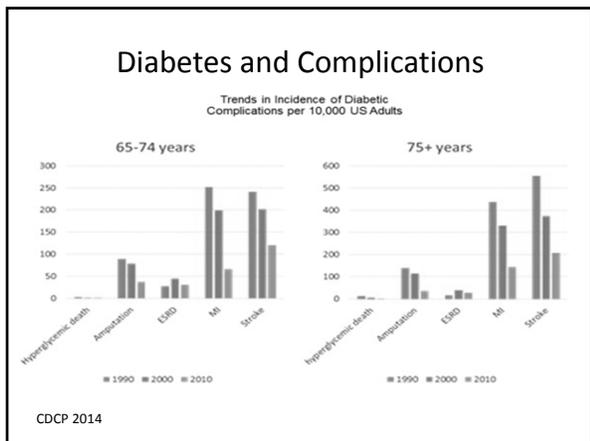
Age 65 – 74

- 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

Li Y, et al. Diabetes Care. 2012; 35:273-277.
 Centers for Disease Control and Prevention. Diabetes Public Health Resource.



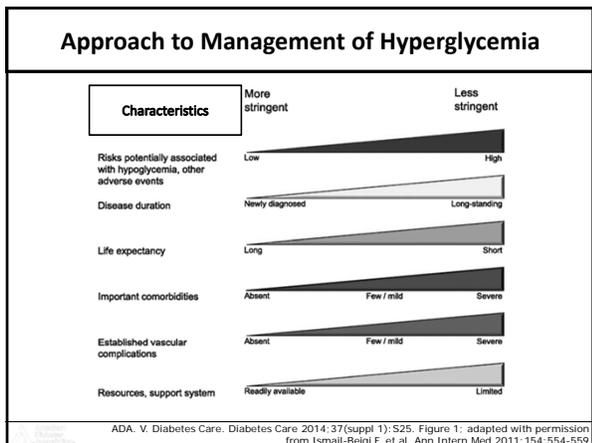
- ### Cognitive Status
- Screen for cognitive dysfunction at initial visit
 - Periodic screening at subsequent appointments
 - Use standardized cognitive assessments (<http://www.hospitalmedicine.org/geriresource/toolbox>)
 - Simplify self-care regimen
 - Interview and involve caregivers
- Whitmer RA, et al. JAMA. 2009; 301:1565-1572.
 Cukierman T, et al. Diabetologia. 2005; 48: 2460-2469

Assessments for Cognitive Function

NAME	CONTEXT	STRENGTHS	LIMITATIONS
Clock Drawing Test/ Mini Cog Assessment	Tests executive functioning	Easy/quick to administer (<5 mins.)	Not for patients with visual impairment or can't hold writing tool
Confusion Assessment Method (CAM)	Diagnoses delirium with altered mental status	Clearly defined clinical features	Does not identify the cause of delirium
Digit Span Test	Tests attention and immediate recall	Easy/quick to administer (<5 mins.)	Only tests attention and immediate recall
Folstein Mini-Mental State Exam (MMSE)	Tests multiple cognitive domains	Widely used; assesses several cognitive domains	Age, education, cultural background affect the score; insensitive to change over time
Modified Mini Mental Status Examination (3MS)	Tests multiple cognitive domains	Higher sensitivity, similar specificity, better predictor of functional outcome than MMSE	Requires ≥ 15 mins. to administer

Management

- Key considerations for individualizing diabetes management in older adults
 - Medications
 - Physical activity
 - Nutrition



Hypoglycemia in Persons with Diabetes ≥ 65 years old

- > 50% higher rates of severe hypoglycemia (requiring assistance)
- Earlier and more severe deterioration of psychomotor coordination
- Impaired awareness of autonomic warning symptoms even when educated
 - No 10–20 mg/dL plasma glucose difference between subjective awareness of hypoglycemia and onset of cognitive dysfunction
- Risk higher in cognitively impaired

Kirkman S, et al. J Am Ger Soc. 2012; 60(12):2342-2356; Diabetes Care. 2012; 35: 2650-2664.
Bremer JP, et al. Diabetes Care 2009; 32:1513-1517.

Risk Factors for Hypoglycemia in Elderly

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

Shorr RI, et al. Arch Intern Med 1997; 157:1681-1686.
Zammit NN & Friar BM. Diabetes Care 2005; 28: 2948-2961.

Management Considerations in Aging

Physiology

- Post-prandial hyperglycemia
- Insulin resistance
- Increased risk of hypoglycemia
- Age-related PK and PD changes

Self-management ability

- Competing priorities
- Polypharmacy
- Depression
- Physical limitations

Environment

- Meal planning
- Physical activity
- Safety

DM Management

- Hyperglycemia affects cognition
- Hypoglycemia affects cognition
- Benefit over lifespan
- Risks

Consensus Panel Framework

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

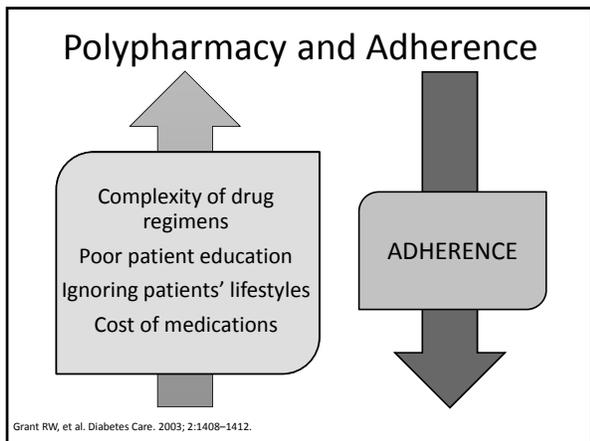
Healthy - Few coexisting chronic illnesses, intact cognitive & functional status
Complex/Intermediate Health - Multiple coexisting chronic illnesses, or 2+ instrumental ADL impairments, or mild to moderate cognitive impairment
Very Complex/Poor Health - Long-term care or end-stage chronic illnesses or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

Kirkman S, et al. J Am Ger Soc. 2012; 60(12):2342-2356; Diabetes Care. 2012; 35: 2650-2664.

Polypharmacy

- ≥ 4 prescriptions associated with an increased risk of falls and increased fear of falling
- ≥ 4 prescriptions associated with a 9-fold risk of cognitive impairment among adult diabetes patients
- May be multiple prescribers - risk of duplicate therapies can be high
- Increases risk of adverse effects, drug interactions, geriatric syndromes
- Increases risk of prescribing and dispensing errors

Huang ES & Ahmed AT. J Gen Int Med. 2010; 25(2):141-146.
Fulton MM, Allen ER. J Am Acad Nurse Pract 2005;17:123-132



Consensus Recommendations for Older Adults with Diabetes: Pharmacotherapy

- Carefully choose anti-hyperglycemic therapies, considering polypharmacy.
- Consider age-related changes impacting med choice: Avoid glyburide*.
- Consider the age-related shift in prandial insulin secretion when evaluating needs for therapy.
- Metformin is the preferred initial therapy in many older adults with type 2 diabetes. Use reduced dose in those with stage 3 CKD; avoid in those with stage 4 CKD or worse.
- Assess the management burden on older adult patients (caregivers), consider patient/caregiver preferences, and attempt to reduce treatment complexity.

*Contraindicated in elderly, Beers Criteria; Kirkman S, et al. J Am Ger Soc. 2012; 60(12):2342-2356; Diabetes Care. 2012; 35: 2650-2664

Summary of Management Considerations

- Consider the polypharmacy potential
 - co-morbidities and geriatric syndromes may be more prevalent
 - increased chances of adverse drug reactions and drug interactions, falls, and cognitive decline
 - periodic medication regimen review for the benefit/risk of each agent is critical to minimize unnecessary polypharmacy

Summary of Management Considerations

- Individualize tx plan
 - reduced renal function a potential factor influencing safety of certain medications
 - glyburide has the highest hypoglycemia risk of the SFUs
 - Primary prevention of CV events using antiplatelet agents should be considered individually based on benefit/risk
 - BP, lipid, and glucose control important



Nutrition Concerns in Older Adults

- Energy needs decline with age - need 20-30% fewer calories
- Macronutrient needs remain similar throughout adulthood
- Vitamin and mineral deficiencies are more common, especially –
 - B₁₂, folate, Vit D, Vit C, Calcium, Iron

Factors Affecting Nutrition Status – Older Adults

- Poor appetite
- Altered taste sensation
- Decreased sense of smell
- Swallowing difficulties
- Oral/Dental issues
- Impaired thirst mechanism
- Functional impairment
- Constipation or diarrhea
- Cognitive impairment
- Depression
- Polypharmacy
- Nutritionally inadequate food and/or beverage choices

Healthy Eating: Hydration

- Gradual loss of thirst sensation
- Dehydration contributes to:
 - Hyperglycemia
 - Volume depletion
 - Orthostatic hypotension
- Prescribe fluid intake



Nutrition Screening – Mini-Nutritional Assessment Short Form (MNA®-SF)

- Designed for adults ≥ 65 years - malnutrition risk
- Six questions assess:
 - Weight loss
 - Mobility
 - Psychological stress or acute disease
 - Presence of dementia or depression
 - Body Mass Index (BM)

mna-elderly.com/forms/mini/mna_mini_english.pdf

Kirkman S, et al. J Am Ger Soc. 2012; 60(12):2342-2356; Diabetes Care. 2012; 35: 2650-2664.
Kaiser MJ. JAGS. 2011; 59(11):2124-2128

Food Insecurity -

- Among older adults, associated with age, poverty level, race, presence of grandchildren in the household, and geography
- Older adults with diabetes - extra burden of increased medical expenses
- Resources
 - Meals on Wheels
 - United States Department of Agriculture Older Americans Nutrition Program
 - Senior Centers
 - Other local programs

Ziliak and Gundersen, 2011.

Senior Farm Direct Nutrition Program

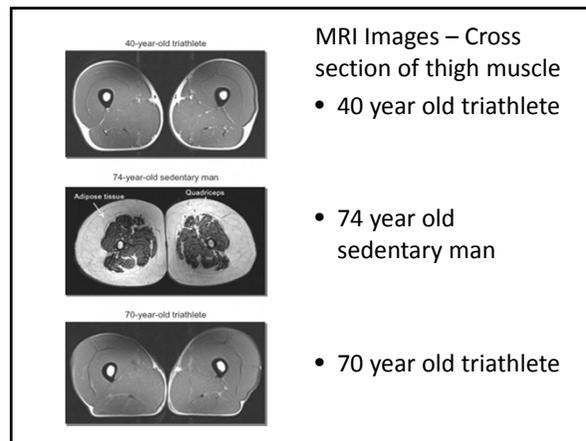
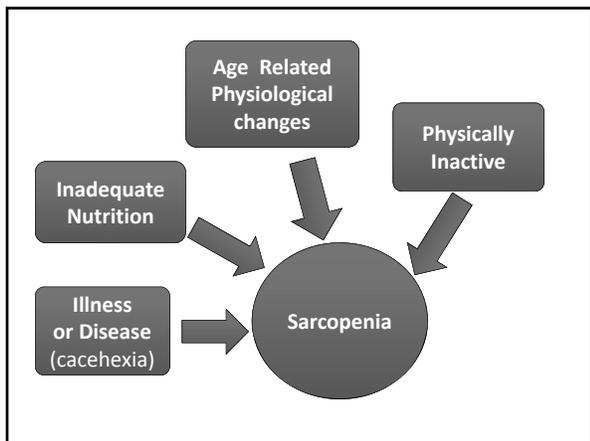


USDA – Oregon (photo)

Provides low income eligible seniors with funds to purchase locally grown fruit, vegetables, and herbs at farmers markets

Diabetes Meal Planning Considerations – Older Adults

- Personal goals
- Personal food preferences (cultural or ethnic food preferences)
- Functional and cognitive abilities
- Those with long-standing diabetes may follow sucrose restrictive eating pattern
- Meal planning options –
 - Healthy Diabetes Plate
 - Choose My Plate (www.choosemyplate.gov)
 - Two fists or hand portions



Weight Management in Obese Older Adults with Diabetes

- Overweight and obesity are prevalent among older adults with diabetes
- BMI may not be accurate predictor of degree of adiposity in older adults due to changes in body composition with aging.
- Sarcopenic obesity - further limits function in older adults “fat frail”

Kirkman S, et al. J Am Ger Soc. 2012; 60(12):2342-2356; Diabetes Care. 2012; 35: 2650-2664.
Villareal et al, Obes Res 2004, 12:913-920.

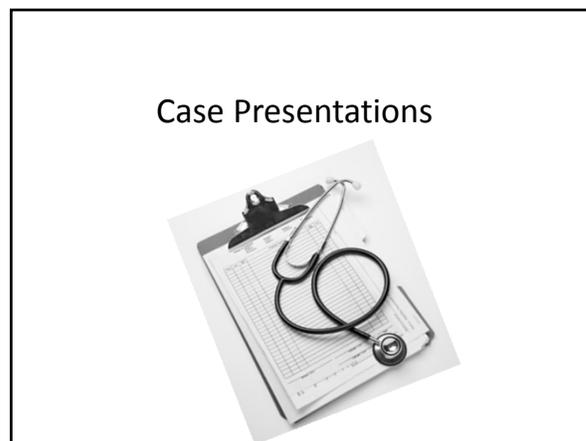
Weight Management in Obese Older Adults with Diabetes

- Evidence in support of intentional weight loss growing – but remains controversial due to potential worsening of
 - Sarcopenia
 - Bone loss
 - Nutrition deficits
- Findings from wt loss studies suggest physical activity and meal planning interventions *combined* result in improved functional status.

Kirkman S, et al. J Am Ger Soc. 2012; 60(12):2342-2356; Diabetes Care. 2012; 35: 2650-2664.
Miller & Wolfe J Nutr Health Aging 2008; 12:487-491 Shapses & Riedt, J Nutr 2006; 136:1453-1456

Being Active

- Activity programs should address:
 - Aerobic capacity
 - Strength/resistance training
 - Balance
 - Flexibility
 - Moving more throughout the day



Case Study 1: Mrs. S

Mrs. S., 82 year old female (5'4" tall, 166 pounds). She was diagnosed with type 2 diabetes mellitus today in clinic (fasting glucose 187 mg/dL today and 162 mg/dL last month).

PMH: hypertension, osteoporosis (history of vertebral fractures x2), chronic back pain, s/p DVT 5 years ago, depression, glaucoma, and macular degeneration with edema.

SH: Mrs. S lives alone (widowed x10 years) in an independent apartment in a retirement community.

Diet: Variable diet history with mention of appetite challenges, often grazes between meals. She reports a 24-hour food history of toast/coffee (breakfast), muffin midmorning, fruit/ half sandwich/soup (lunch), and fried chicken/potatoes/salad for dinner.

Activity: She helps with a rose garden at her retirement community because she always enjoyed gardening. Plays bridge and poker at the community center.

Case 1 Mrs. S. con't

Medications:

- Hydrochlorothiazide 12.5 mg daily
- Alendronate 70 mg weekly
- Calcium 500 mg TID
- Vitamin D 800 units daily
- Mirtazipine 30 mg daily
- Xalatan 0.005% 1 gtt in each eye daily in evening
- Aspirin 81 mg daily

Labs/PE today:

- BP 158/88 mmHg, P 82, Scr 1.1 mg/dL (eGFR 46 ml/min), BUN 16 mg/dL, A1c 8.1%, Total Cholesterol 208 mg/dL, LDL 128 mg/dL, HDL 48 mg/dL, other labs WNL, PHQ-9: 14; back pain 3/10 resting.

Panel Discussion and Audience Insights

- What are the goals for control of Mrs. S's diabetes?
- What individual parameters influence your choice treatment (medications, nutrition, physical activity), based on her case history?
- What is the most appropriate (safest and most effective) treatment plan for her diabetes given her age, physical status, and current personal goals?

Case Study 2 – Mr. H

Mr. H is an 83 year old Caucasian male here for his initial diabetes self-management education visit

- Type 2 DM x 9 yrs; Unintentional weight loss of 15 lbs in 4 months; Feels "woozy and dizzy" several times a week; he fell about two weeks ago, but did not go to the doctor.
- Mr. H states he has been on his current medicines "a long time" but the doses have recently been reduced.
- Mr. H's wife passed away a year ago and he recently moved from out of state to live with his adult son locally.
- He is alone during the day. Performs own ADLs. Short term memory deficit exhibited during session, no previous documentation in medical record.

Assessment Mr. H con't

- Food history - a large bowl of cereal in am; snacks dry cereal and dried or fresh fruit, sandwich or soup for lunch – both meals on his own, son prepares dinner - lean meat, chicken, or fish, salad, frozen vegetable mix. His son states he is eating better now that he is living with him.
- Walking on treadmill 10 minutes daily. Pain in his feet "pins and needles" prevent him from walking more, but he would like to increase his activity. Planning a trip to visit his sisters.
- Non-smoker; and rarely drinks alcohol - 1 to 2 drinks per year.
- Takes medications as prescribed – uses pill organizer.

Mr. H 83 year old Caucasian male

Past Medical History:

- Hypertension
- Dyslipidemia
- Osteoarthritis
- Neuropathy
- Stage 3 CKD

PE:

Wt: 136 lbs; Ht: 5' 10"; BMI 19.5;
BP 122/72; Pulse 63

Labs:

A1C 6%, Gluc 89, Creat 1.48, eGFR 42

Glucose:

Blood glucose logbook (14 days):
Pre-Meal range (N = 10) 74 to 105 mg/dL
2 hours after dinner (N=14): 70 to 150 mg/dL

Current Medications

- Glyburide 5 mg twice daily
- Metformin 500 mg twice daily
- Furosemide 20 mg one tablet every other day
- Metoprolol XL 100 mg daily
- Acetaminophen 500 mg PRN
- Multivitamin one tablet daily
- Fish Oil (Omega-3 Fatty Acids) two capsules twice daily

Other info -

- Wants to live to 100 yrs
- Exhibits hypoglycemic symptoms
- Short term memory deficit

Panel Discussion and Audience Insights

- What are the goals for control of Mr. H's diabetes?
- What individual parameters influence your choice treatment (medications, nutrition, physical activity), based on his case history?
- What frequency of hypoglycemia raises a red flag?
- What is the most appropriate next phase in the management plan for his diabetes given his age, physical status, and current personal goals?

Any Questions?



This presentation adapted from slides developed by the ADA Older Adults Writing Workgroup