Diabetes Mellitus in Older Adults

Medha Munshi, M.D.
Joslin Diabetes Center
Beth Israel Deaconess Medical Center
Harvard Medical School

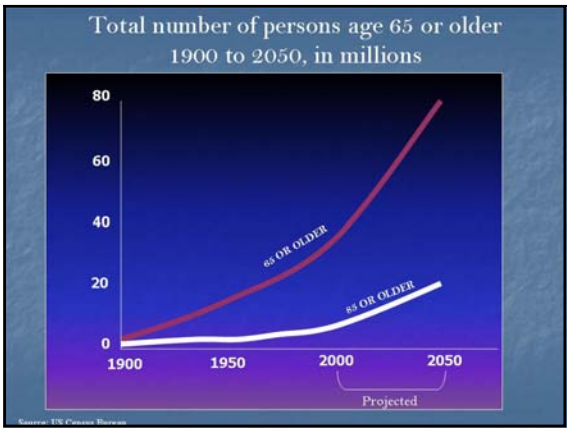
Presenter Disclosure Information

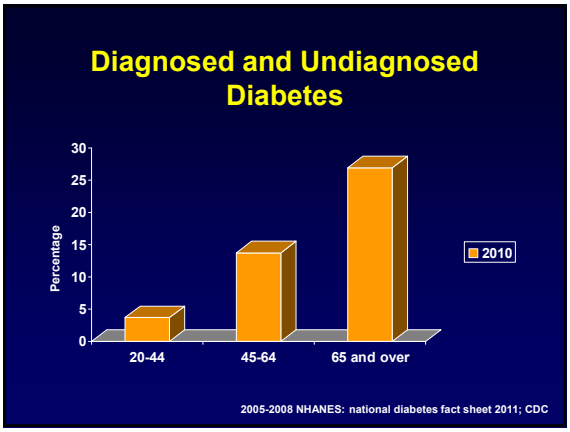
Medha Munshi

Research grant from Sanofi

Goals and Objectives

- Older patients vs younger adults
- Goals of treatment
- Management strategy

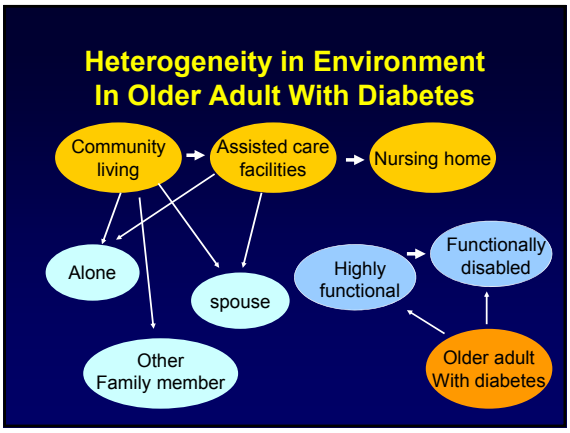


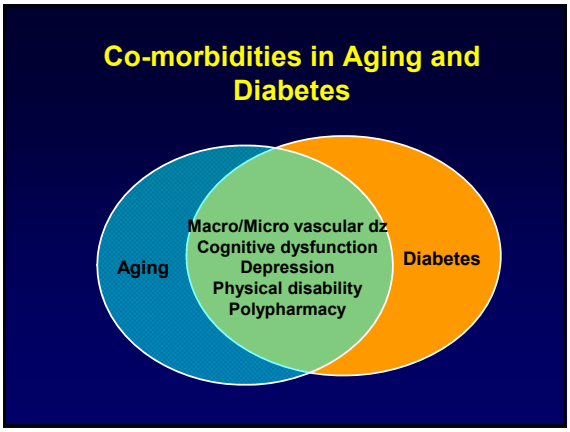


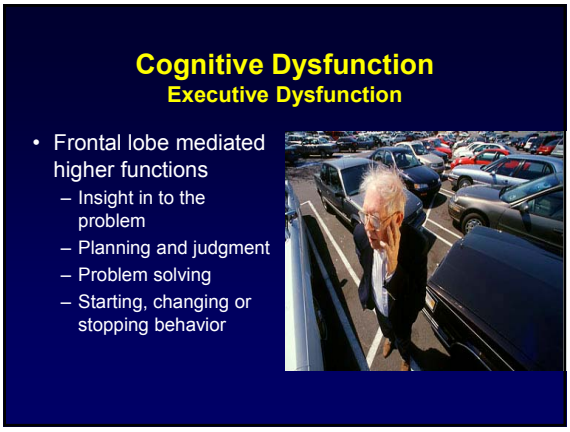
Case History

- 85 years old patient with diabetes

Questions:
- what is different in presentation?
- when does this patient need treatment?
- what is the best treatment for this patient?







Case History – Mr. D

- 82 yo male
- Engineer—computer savvy
- DM duration 17 yrs
- Glargine BID and lispro before meals
- A1C 6.5%

Modified Clock-In-a-Box(CIB)

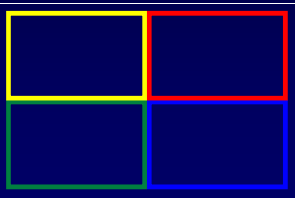
Instruction Form:

Please read and do the following carefully:

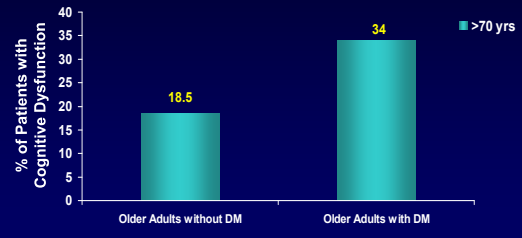
- In the blue box on the next page:
- Draw a picture of a clock
- Put in all the numbers
- Set the time to ten after eleven.

Hand this sheet back and go to the next page

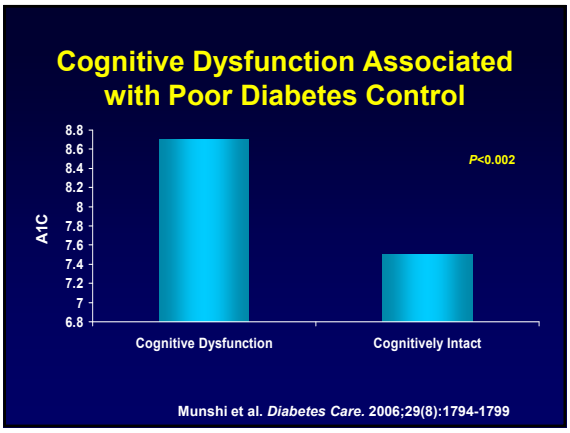
Response Form:

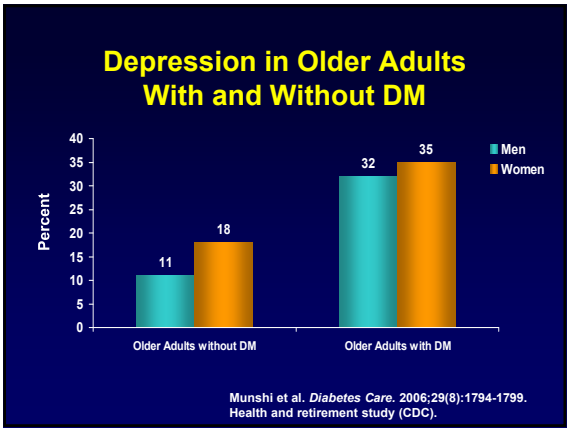


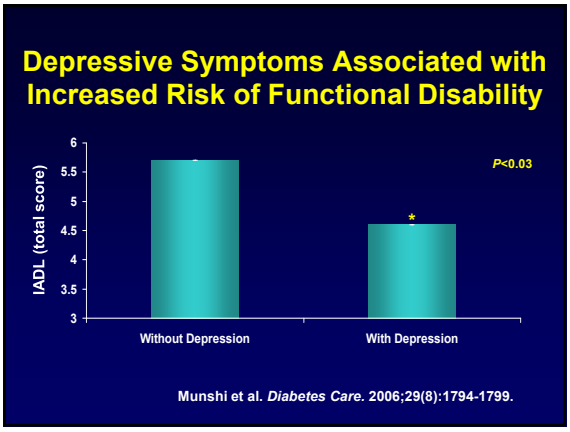
Cognitive Dysfunction in Older Adults With and Without DM

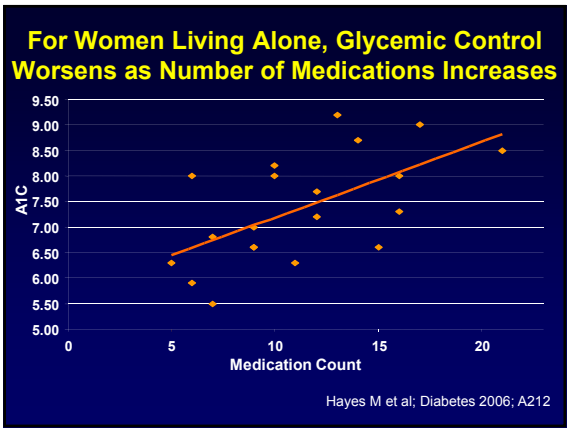


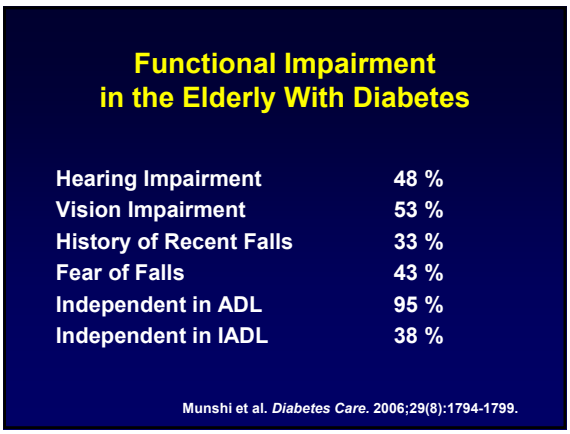
Munshi et al. *Diabetes Care.* 2006;29(8):1794-1799.
Health and retirement study (CDC).

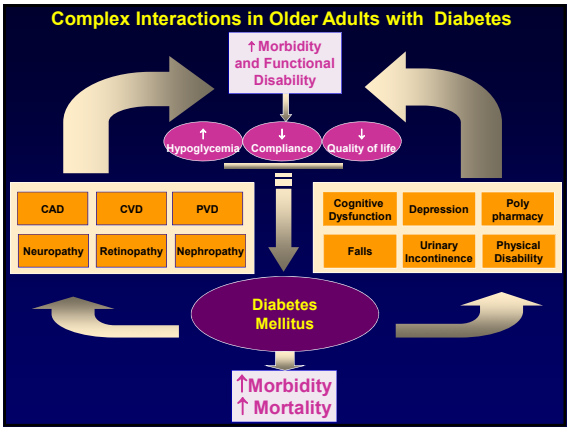












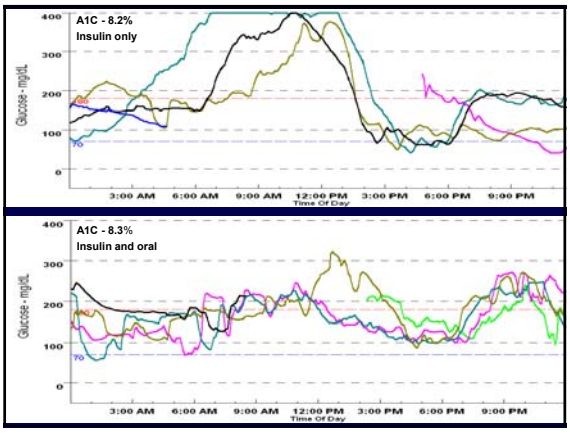
Management of Diabetes in Older Adults

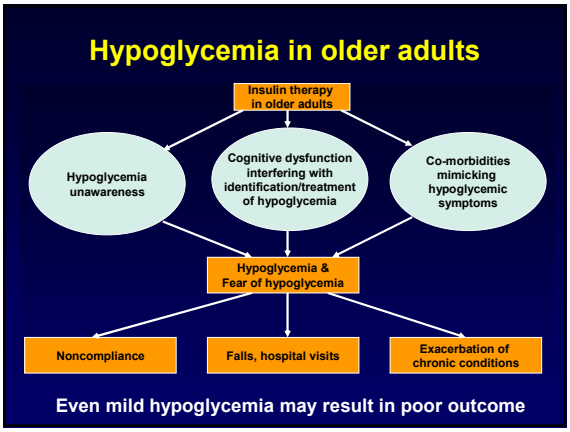
- Screening for barriers
  - Clinical / Functional / Psychosocial
- Management of hyperglycemia
  - Medications
  - Diet
  - Exercise/Physical activity
- Management of risk factors
  - BP control <130/80 mm Hg
  - LDL cholesterol <100 mg/dl
  - Cessation of cigarette smoking
  - Low dose aspirin therapy
  - Yearly screening for microalbuminuria (ACE inhibitors), retinopathy, foot examination

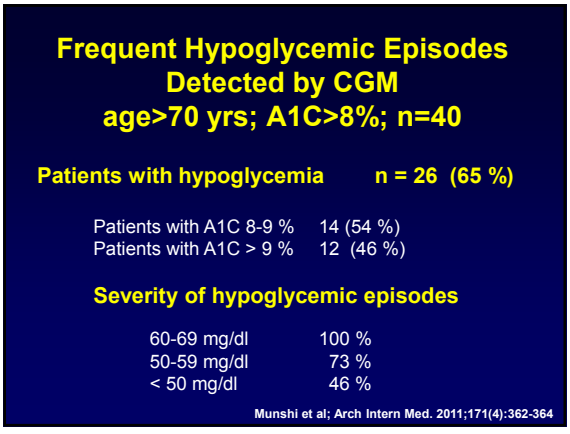
Goal- Setting

A1C: Marker of Glycemic Control

- Increases with increasing age
- Affected by red cell life span
- Role of renal dysfunction and anemia of chronic diseases not known
- Reflects average glucose – miss BG fluctuations







CONSENSUS REPORT

Diabetes in Older Adults

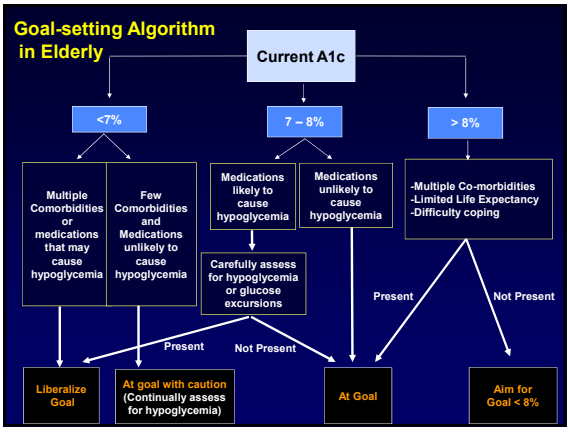
M. Sue Kirkman, MD[1]
Vanessa Jones Briscoe, PhD, NP, CDE[2]
Nathaniel Clark, MD, MS, RD[3]
Hermes Florez, MD, MPH, PhD[4]
Linda B. Haas, PhD, RN, CDE[5]
Jeffrey B. Halter, MD[6]
Elbert S. Huang, MD, MPH[7]
Mary T. Korytkowski, MD[8]
Medha N. Munshi, MD[9]
Peggy Soule Odegard, BS, PharmD, CDE[10]
Richard E. Pratley, MD[11]
Carrie S. Swift, MS, RD, BC-ADM, CDE[12]

Diabetes Care. 2012 Dec;35(12):2650-64
J Am Geriatr Soc. 2012 Dec;60(12):2342-56

A Framework for Treatment Goals

Patient characteristics /health status	Rational	A1C	BP	Lipids
Healthy - few co-existing illnesses - intact cognitive status - intact functional status	Longer life expectancy	<7.5%	<140/80	Statins unless not tolerated
Complex/Intermediate - Multiple co-existing illnesses - Mild-moderate cognitive impairment - 2+ instrumental ADL	Intermediate life expectancy High treatment burden Hypo vulnerability Fall risk	<8%	<140/80	Statins unless not tolerated
Very Complex/Poor Health - LTC care residents - end-stage chronic illnesses - Moderate-severe cognitive impairment - 2+ ADL dependencies	Limited life expectancy Benefits uncertain	<8.5%	<150/90	Consider risks and beneftis

Kirkman MS et al; Diabetes Care. 2012 Dec;35(12):2650-64



15 Classes of Antidiabetes Medications

Class	A1C Reduction	Fasting vs PPG	Hypo-glycemia	Weight Gain	Dosing (times/day)	Other Safety Issues
Metformin	1.5	Fasting	No	Neutral/ Loss	2	GI, lactic acidosis
Insulin (long-acting)	1.5–2.5	Fasting	Yes	Gain	1, Injected	
Insulin (rapid-acting)	1.5–2.5	PPG	Yes	Gain	1–4, Injected	
Sulfonylureas	1.5	Fasting	Yes	Gain	1	Allergies, secondary failure
Thiazolidinediones	0.5–1.4	Fasting	No	Gain	1	Edema, CHF, bone fractures
GLP-1 agonist (short-acting)	0.5–1.0	PPG	No	Loss	2, Injected	GI, ARF, ?pancreatitis
Repaglinide	1.0–1.5	Both	Yes	Gain	3	
Nateglinide	0.5–0.8	PPG	Rare	Gain	3	

ARF = acute renal failure; GI = gastrointestinal; GLP = glucagon-like peptide

Adapted from Nathan DM et al. *Diabetes Care*. 2007;30:753-759. | Nathan DM et al. *Diabetes Care*. 2006;29:1963-1972. | Nathan DM et al. *Diabetes Care*. 2009;32:193-203. | ADA. *Diabetes Care*. 2008;31:S12-S54. I WelChol PI. 1/2008. Cycloset PI. 5/2009. | Buse JB et al. *Lancet*. 2009;374:39-47.

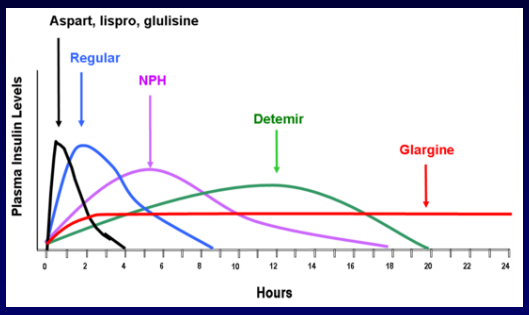
15 Classes of Antidiabetes Medications

Class	A1C Reduction	Fasting vs PPG	Hypo-glycemia	Weight Gain	Dosing (times/day)	Other Safety Issues
α-Glucosidase inhibitor	0.5–0.8	PPG	No	Neutral	3	GI
Amylin mimetics	0.5–1.0	PPG	No	Loss	3, Injected	GI
DPP-4 inhibitors	0.6–0.8	Both	No	Neutral	1	?pancreatitis
Bile-acid sequestrant	0.5	Fasting	No	Neutral	1–2	GI
Bromocriptine	0.7	PPG	No	Neutral	1	GI
GLP-1 agonist (long-acting)	1.0–1.5	Both	No	Loss	≤1, Injected	GI, ?pancreatitis, ?MTC, ?ARF
(SGLT-2 inhibitors)	<1	Both	No	Loss	1	??

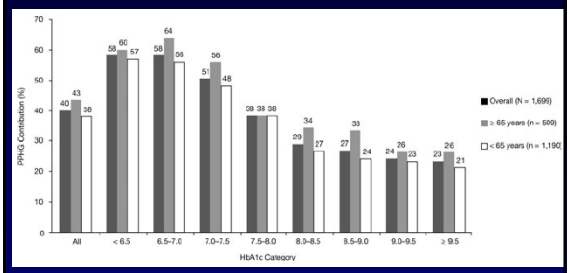
ARF = acute renal failure; DPP-4 = dipeptidylpeptidase-4; GI = gastrointestinal; GLP = glucagon-like peptide; MTC = medullary thyroid cancer; SGLT-2 = sodium-glucose transporter-2

Adapted from Nathan DM et al. *Diabetes Care*. 2007;30:753-759. | Nathan DM et al. *Diabetes Care*. 2006;29:1963-1972. | Nathan DM et al. *Diabetes Care*. 2009;32:193-203. | ADA. *Diabetes Care*. 2008;31:S12-S54. I WelChol PI. 1/2008. Cycloset PI. 5/2009. | Buse JB et al. *Lancet*. 2009;374:39-47.

Insulin Action

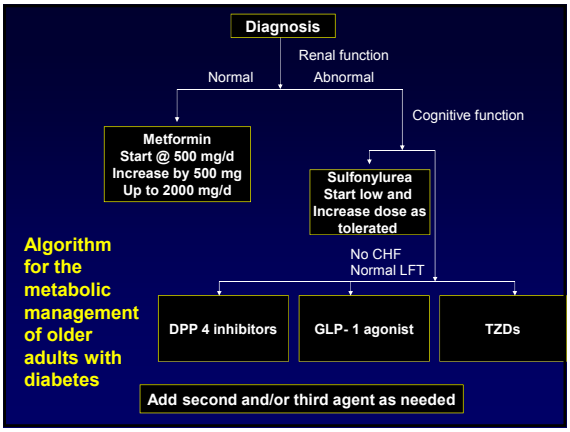


Higher contribution of post-pradial glucose in hyperglycemia in older vs younger adults



Munshi et al, J Am Geriatr Soc. 2013;61:535–541

Algorithm for the metabolic management of older adults with diabetes



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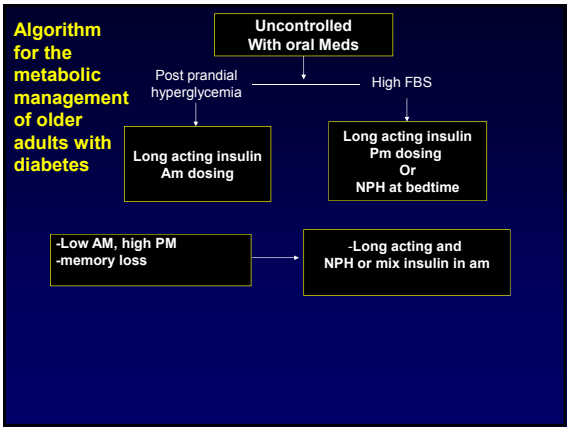


Use of serum c-peptide to simplify regimen in older adults

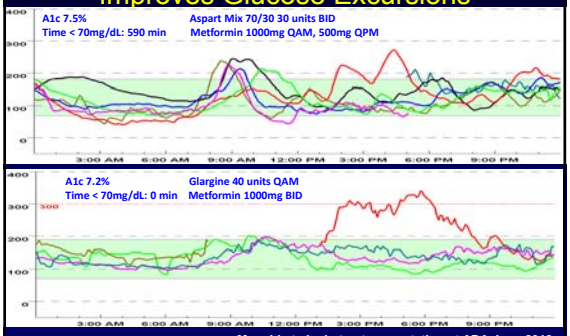
- Normal/high serum C-peptide: 65/100
- Age: 79±14 yrs, DM duration: 21±13 yrs
- Number of medications: 11 (range 4-18)

- Simplification completed in 35 patients
- In 19 patients, patients completely off insulin
- In 16 patients number of insulin injections were decreased significantly

- Number of hypoglycemic episodes decreased
- A1c improved from 8% to 7.4% (p<0.002)

Munshi et al; American Journal of Medicine 2009;122;395-97

Simplification of Regimen Improves Glucose Excursions



Munshi et al; abstract presentation at ADA June 2013

Summary

- Older patients vs younger adults
  - Clinical presentation is variable
- Goals of treatment
  - Consider co-existing conditions
  - Risks vs Benefit of treatment
  - A1c vs hypoglycemia - parameters for glycemic goals
- Management strategy
  - Matching patients' coping skills to the complexity of the treatment
  - KISS