

Joslin Diabetes Center
Advances in Diabetes and Thyroid Disease 2013
Diabetes Mellitus in Older Adults



Slide 1 features a dark blue background with three logos at the top: the Joslin Diabetes Center logo (a red circle with a white 'J'), the Harvard Medical School crest (a red shield with a white figure), and a circular logo with a white figure. The title *Diabetes Mellitus in Older Adults* is written in yellow cursive. Below the title, the presenter's name and affiliation are listed in white text: Medha Munshi, M.D., Joslin Diabetes Center, Beth Israel Deaconess Medical Center, and Harvard Medical School.



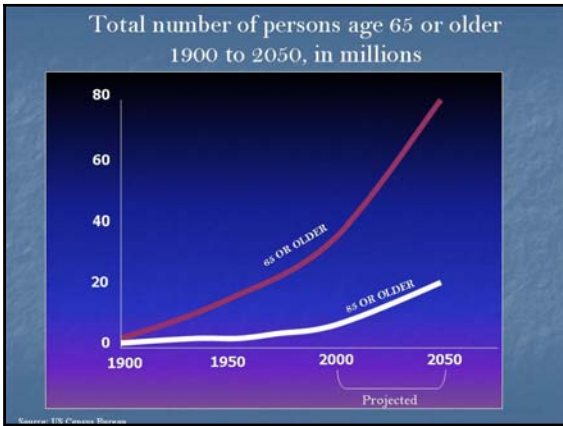
Slide 2 features a dark blue background. The title **Presenter Disclosure Information** is written in yellow. Below the title, the presenter's name and a disclosure statement are listed in white text: Medha Munshi and Research grant from Sanofi.

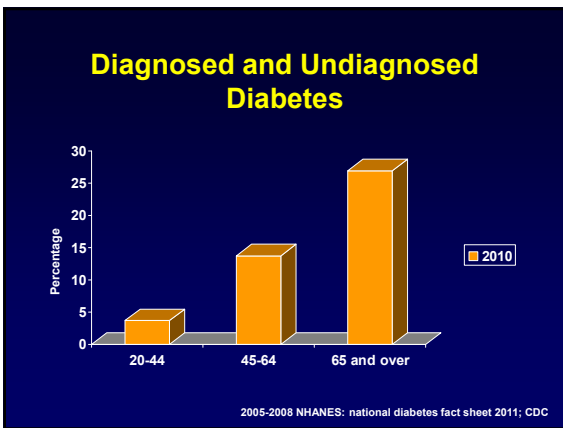


Slide 3 features a dark blue background. The title **Goals and Objectives** is written in yellow. Below the title, three bullet points are listed in white text: Older patients vs younger adults, Goals of treatment, and Management strategy.

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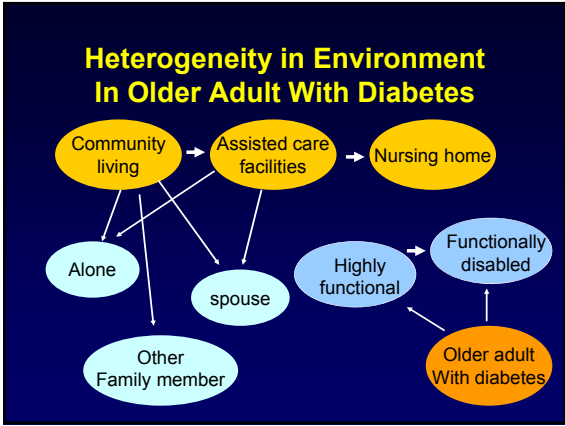
Case History

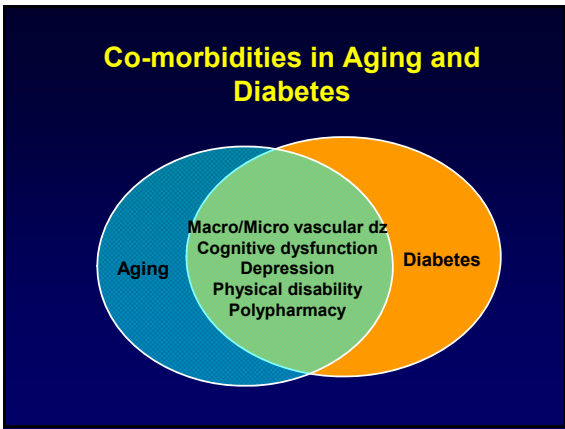
- 85 years old patient with diabetes

Questions:

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

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Cognitive Dysfunction Executive Dysfunction

- Frontal lobe mediated higher functions
 - Insight in to the problem
 - Planning and judgment
 - Problem solving
 - Starting, changing or stopping behavior

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Case History – Mr. D

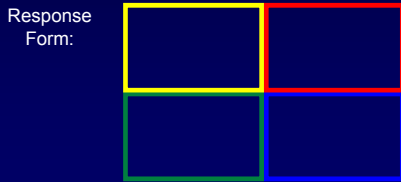
- 82 yo male
- Engineer—computer savvy
- DM duration 17 yrs
- Glargine BID and lispro before meals
- A1C 6.5%

Modified Clock-In-a-Box(CIB)

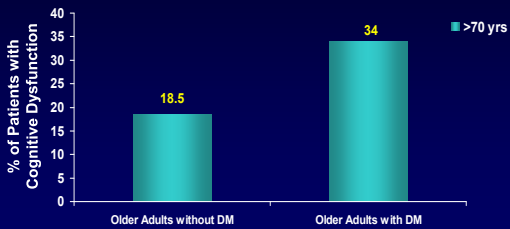
Instruction Form: *Please read and do the following carefully:*

- 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



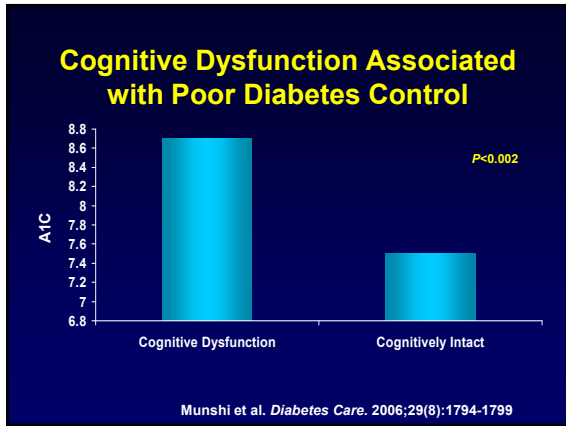
Cognitive Dysfunction in Older Adults With and Without DM

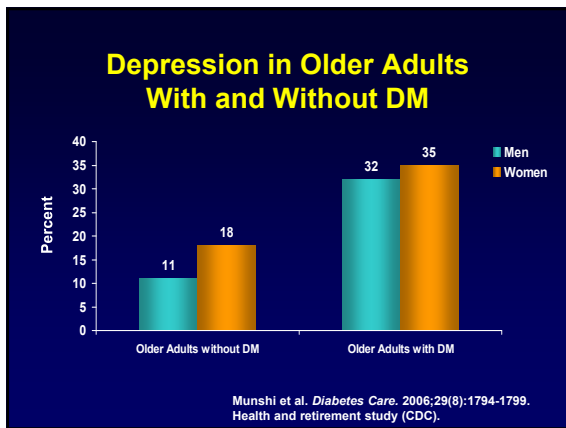


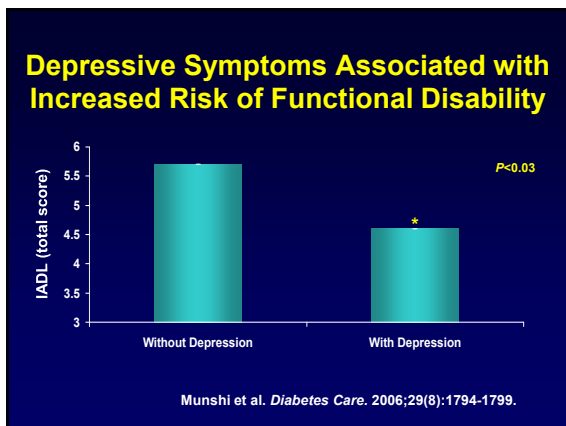
Munshi et al. *Diabetes Care*. 2006;29(8):1794-1799. Health and retirement study (CDC).

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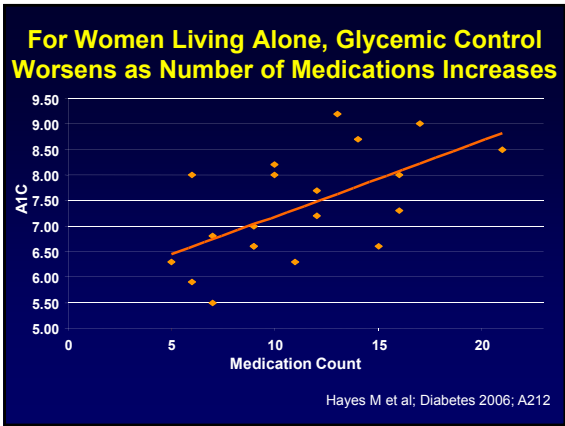






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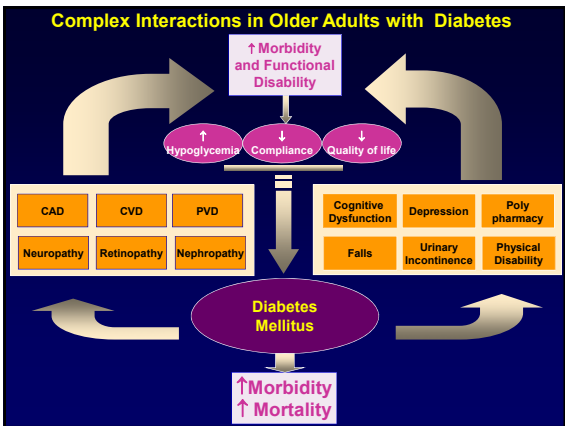
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Functional Impairment in the Elderly With Diabetes

Hearing Impairment	48 %
Vision Impairment	53 %
History of Recent Falls	33 %
Fear of Falls	43 %
Independent in ADL	95 %
Independent in IADL	38 %

Munshi et al. *Diabetes Care*. 2006;29(8):1794-1799.



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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



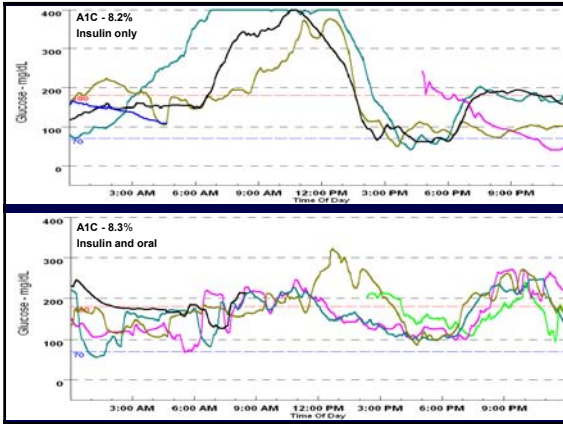
Glycemic Goal

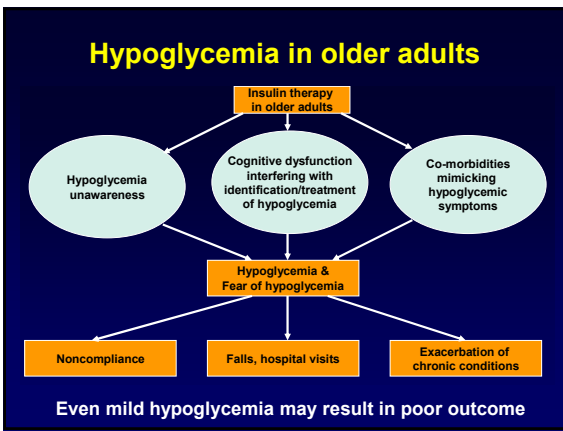
Hypoglycemia
Social support and Living situation
Financial issues
Life expectancy
Physical abilities

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

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Frequent Hypoglycemic Episodes Detected by CGM
age >70 yrs; A1C >8%; n=40

Patients with hypoglycemia n = 26 (65 %)

Patients with A1C 8-9 %	14 (54 %)
Patients with A1C > 9 %	12 (46 %)

Severity of hypoglycemic episodes

60-69 mg/dl	100 %
50-59 mg/dl	73 %
< 50 mg/dl	46 %

Munshi et al; Arch Intern Med. 2011;171(4):362-364

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CONSENSUS REPORT

Diabetes in Older Adults

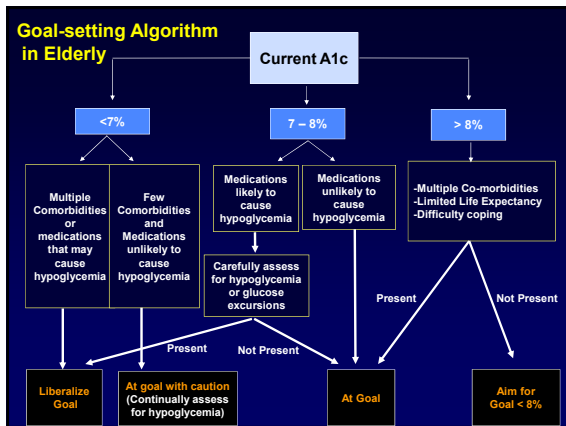
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Diabetes Care. 2012 Dec;35(12):2650-64
 J Am Geriatr Soc. 2012 Dec;60(12):2342-56

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 benefits

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



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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

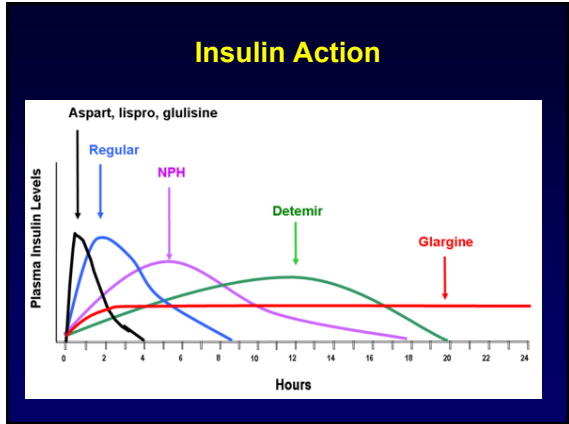
Adapted from Nathan DM et al. *Diabetes Care*. 2007;30:753-759. | Nathan DM et al. *Diabetes Care*. 2006;29:1963-1972. | Nathan DM et al. *Diabetes Care*. 2009;32:193-203. | ADA. *Diabetes Care*. 2008;31:S12-S54. | WeiChoi PI. 1/2008. Cycloset PI. 5/2009. | Buse JB et al. *Lancet*. 2009;374:39-47.

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	??

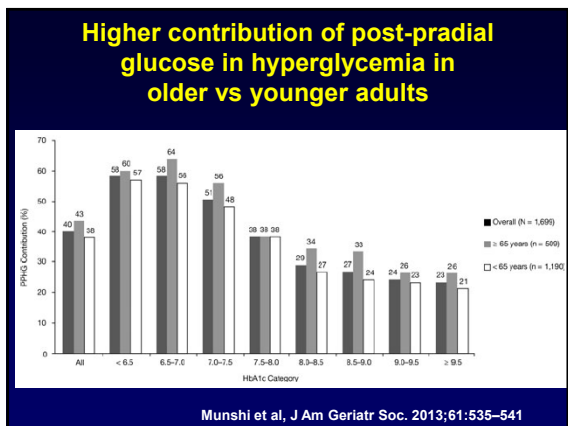
ARF = acute renal failure; DPP-4 = dipeptidylpeptidase-4; GI = gastrointestinal; GLP = glucagon-like peptide; MTC = medullary thyroid cancer; SGLT-2 = sodium-glucose transporter-2

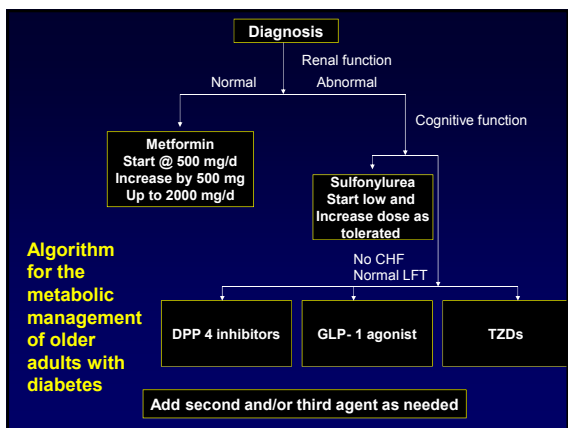
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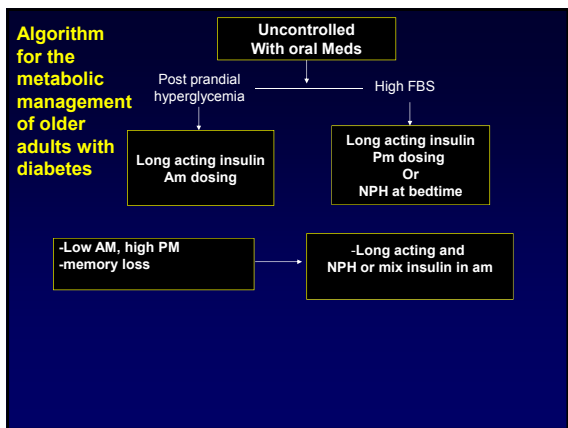


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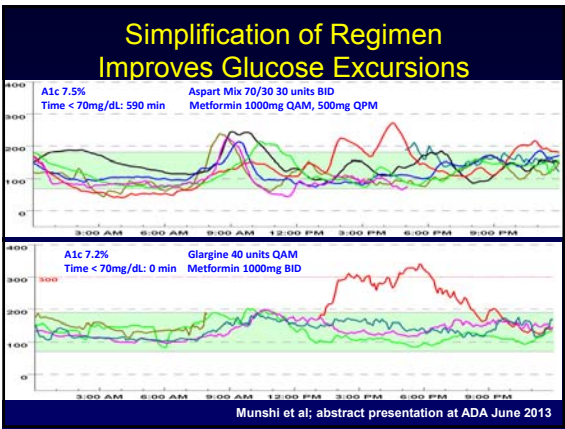


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Use of serum c-peptide to simplify regimen in older adults

- 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



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

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