

Addressing Common Geriatric Syndromes Associated with Diabetes



Preface



This learning collaborative focused on areas of concern for older adults with diabetes, including cognitive impairment, depression, polypharmacy, and falls as well as on screening for and treatment of these conditions.

The session discussions considered the unique characteristics of older adults with diabetes in goal setting, risk of hypoglycemia and its complications, geriatric syndromes, and effective strategies, including how to simplify complex insulin regimens.

The primary objectives of this curriculum are for health centers to:

- gain knowledge on key components of managing diabetes in the population of older adults with other medical comorbidities, and improve their glycemic control while maintaining quality of life;
- understand how to address the unique challenges of older adult patients managing diabetes and its complications;
- equip staff and older diabetic patients with resources on better diabetes self-management.

About the featured presenter

The learning collaborative was developed and led by Medha Munshi, MD. Dr. Munshi is an associate professor at Harvard Medical School and she serves as the director of the Joslin Geriatric Diabetes Program and is a staff geriatrician at Beth Israel Lahey Health.

Dr. Munshi is board-certified in Internal Medicine, Geriatric Medicine, and Endocrinology and Metabolism. She developed the Geriatric Diabetes Program at Joslin Diabetes Center, an interdisciplinary model of care that considers clinical, functional, and psychosocial barriers faced by older adults before formulating individualized treatment strategies.



Graphics from the Standards of Medical Care in Diabetes—2019 were reprinted with permission from The American Diabetes Association. Copyright 2019 by the American Diabetes Association

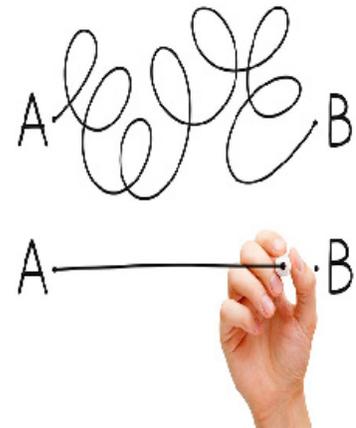
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Note: All bolded terms are included in a glossary on page 92.

Session 1: Unique Challenges and Clinical Characteristics of Older Adults with Diabetes



Speaker notes:

This session will examine the unique characteristics of older adults living with diabetes.

Learning objectives:

- Discuss heterogeneity of the older adult population with diabetes.
- Discuss challenges of managing diabetes in different settings, such as home, assisted care facilities, and nursing homes.
- Discuss why A1C should not be used as the sole parameter to develop glycemic goals in older adults.
- Discuss importance of avoiding hypoglycemia.
- Discuss how to establish goals for older adults with diabetes.

Who is an older adult?



Speaker notes:

Consider the pictures above, each of an older adult. Two 85-year-old patients with diabetes can look pretty different from one another and may need to be treated differently, including having different treatment goals.

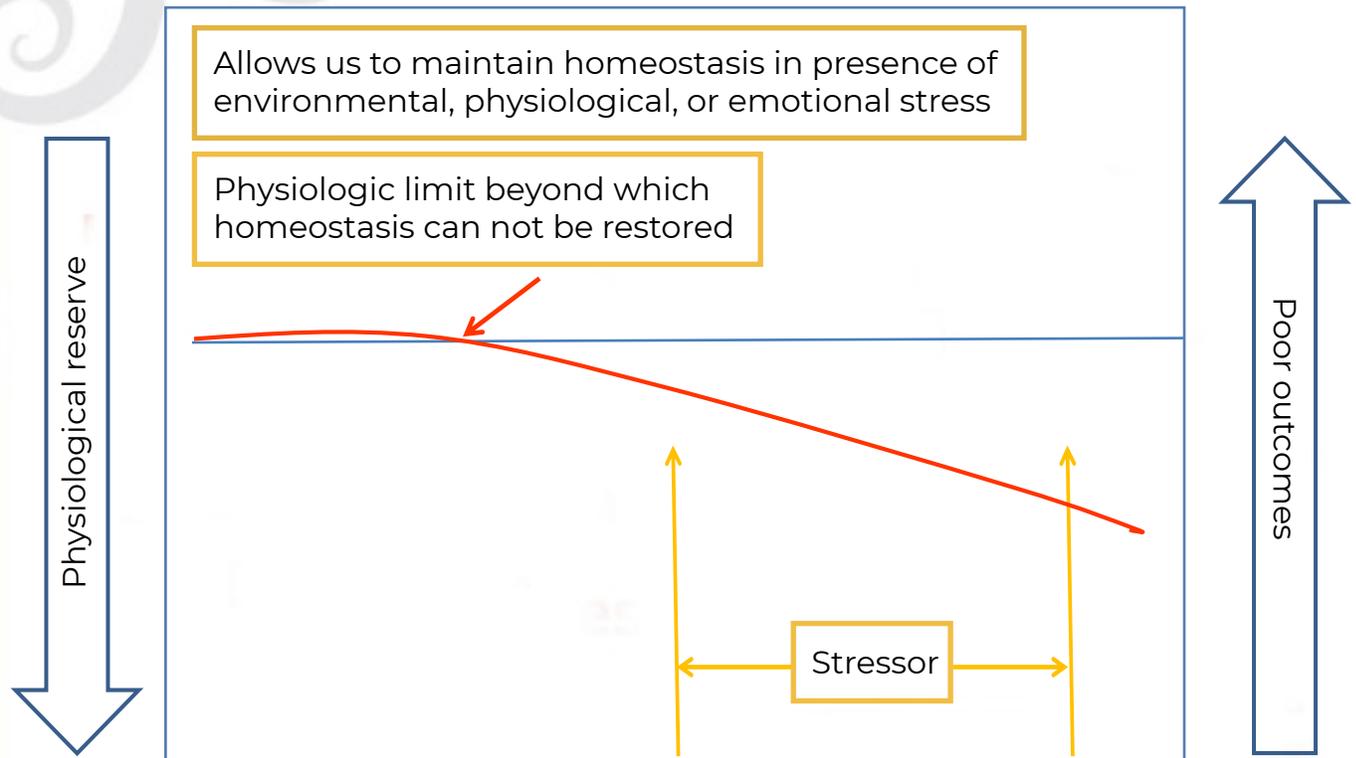
Where do you treat an older patient?



Speaker notes:

It is important to understand the various places where you could find an older adult patient. Many are still very active, living a full life within their community. Others could be in assisted living, hospital, rehabilitation, or nursing home/long-term care facilities. Depending on where an older adult is residing, their ability to care for themselves would be different, as would their goals for diabetes management.

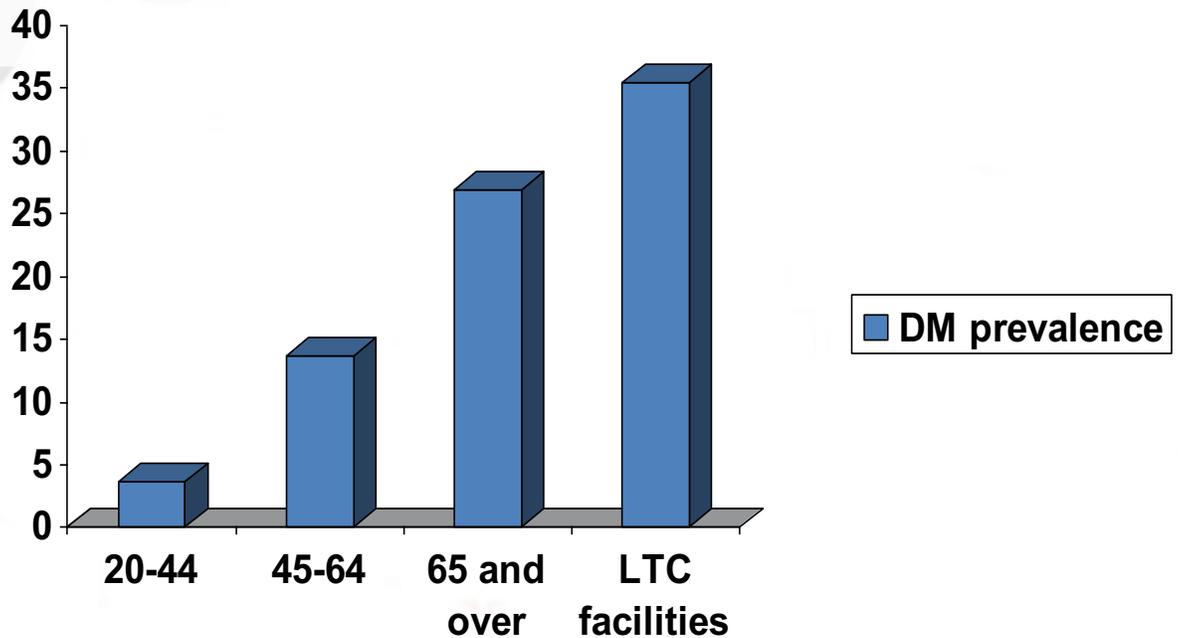
Frailty in Older Adults: *Homeostenosis*



Speaker notes:

As we age, there is a decline in the **physiological reserve** of each organ system. When there is stress on the body, the reserve is what helps to maintain homeostasis. Homeostasis is the self-regulation of a biological system to maintain stability. Younger adults have an easier time recovering from something like trauma or pneumonia, but an older adult with the same condition may have a harder time going back to baseline and may ultimately experience a poorer health outcome. This decreased ability to maintain homeostasis is called homeostenosis. The limit beyond where homeostasis can be restored progressively narrows over time.

Scope of the Problem: Diabetes



2005-2008 NHANES: National diabetes fact sheet. 2011; CDC.
Zarowitz et al. 2011–2012 Omnicare senior health outcomes data. Postgrad Med. 2015.

Speaker notes:

This is older data, but we know in general that adults age 65+ have a higher prevalence of diabetes, and the percentage is even higher for those in long-term care (LTC) facilities (40%).

DM: diabetes mellitus

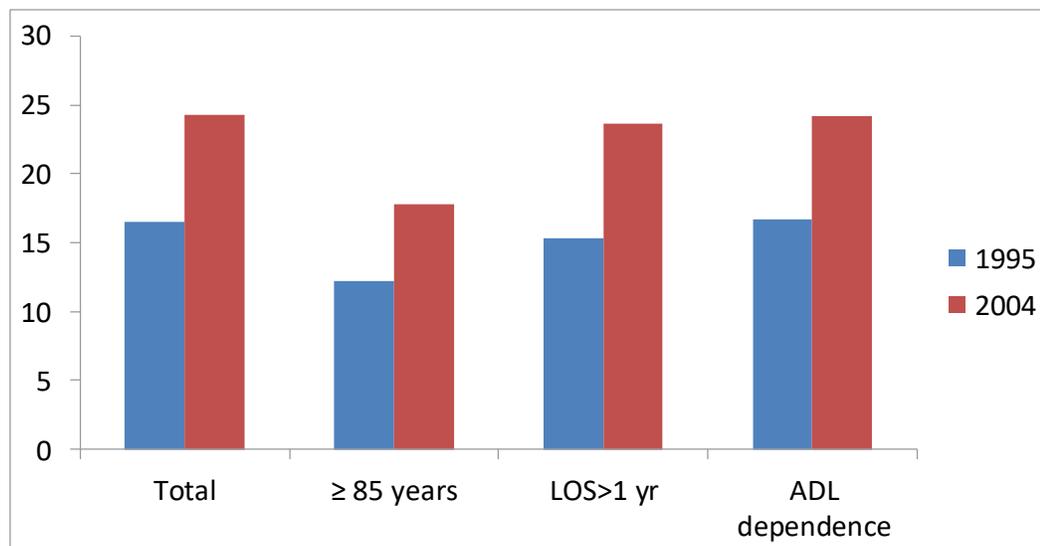
LTC: long-term care

Further reading:

Management of Diabetes in Long-term Care and Skilled Nursing Facilities: A Position Statement of the American Diabetes Association

<https://care.diabetesjournals.org/content/39/2/308>

Characteristics of People with DM in NH (1995 – 2004)



Zhang X et al. *JAGS*. 2010; 58; 724-30.

Speaker Notes:

The characteristics of individuals with diabetes are changing, especially in LTC/nursing home facilities. This study considered trends in the prevalence of diabetes along with comorbidities among nursing home residents over a 10 - year period. By 2004, there were more nursing home residents with diabetes, and there was an increase in individuals who were older, frailer, and more dependent on staff for their activities of daily living.

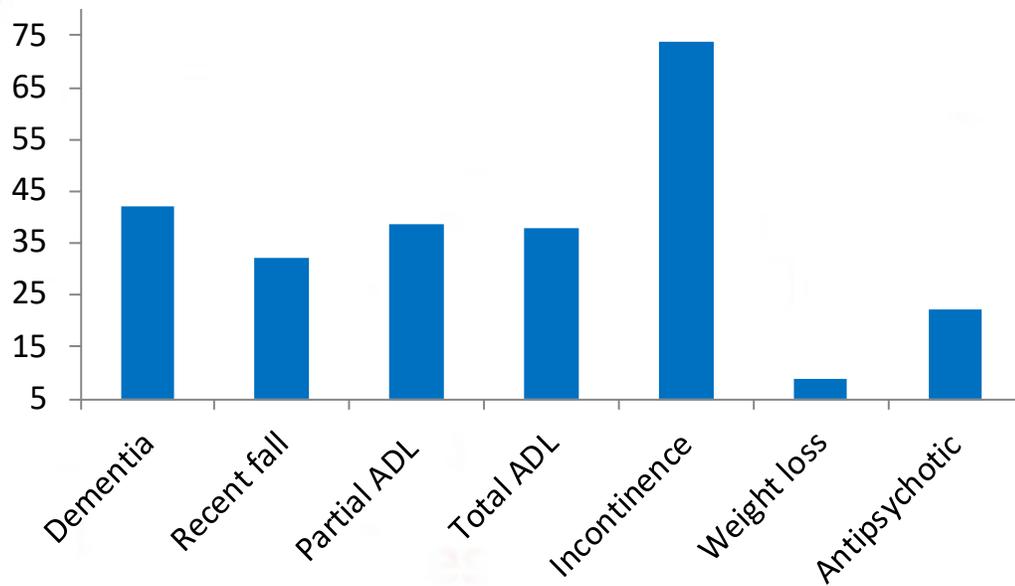
DM: diabetes mellitus
NH: nursing home
LOS: length of stay
ADL: activities of daily living

Further reading:

Trends in the Prevalence and Comorbidities of Diabetes Mellitus in Nursing Home Residents in the United States: 1995–2004

<https://onlinelibrary.wiley.com/doi/full/10.1111/j.1532-5415.2010.02786.x>

DM Patient Characteristics: Geriatric Syndromes in LTC (2008 – 2010)



Zullo AR et al. *JAMDA*. 2016; 17: 602-08.

Speaker notes:

Geriatric syndromes are health problems that usually have more than one cause and involve many parts of the body. In this particular study, they found that there were a significant number of comorbidities with the diagnosis of diabetes for those living in long-term care facilities. These individuals were frailer than those living in the community.

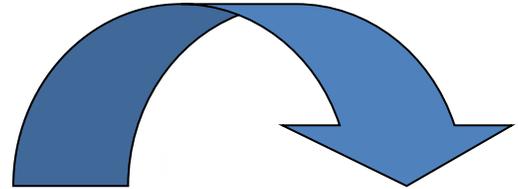
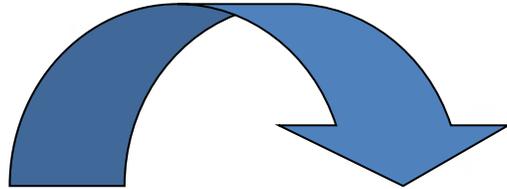
DM: diabetes mellitus
LTC: long-term care
ADL: activities of daily living

Further reading:

National Trends in Treatment Initiation for Nursing Home Residents With Diabetes Mellitus, 2008 to 2010.

<https://www.ncbi.nlm.nih.gov/pubmed/27052559>

Older Population is Heterogeneous: Varying Needs for Diabetes Management



Independent Living

- Higher functioning
- Medically stable
- Need to perform self-care
- May or may not need caregivers

Assisted Care

- High functioning
- Partial assistance in ADL/IADL
- More caregiving needs

Nursing Home

- Low functioning
- Assistance or dependence with ADL and IADL
- Limited life expectancy
- High burden of comorbidities

Speaker notes:

How is diabetes management different across these groups of older adults?

Independent living: These older adults need to manage on their own. Clinicians should not overwhelm them with a treatment plan that is not doable or realistic. When they have an acute illness, they may not be able to do everything they usually do at baseline and therefore could be vulnerable to complications.

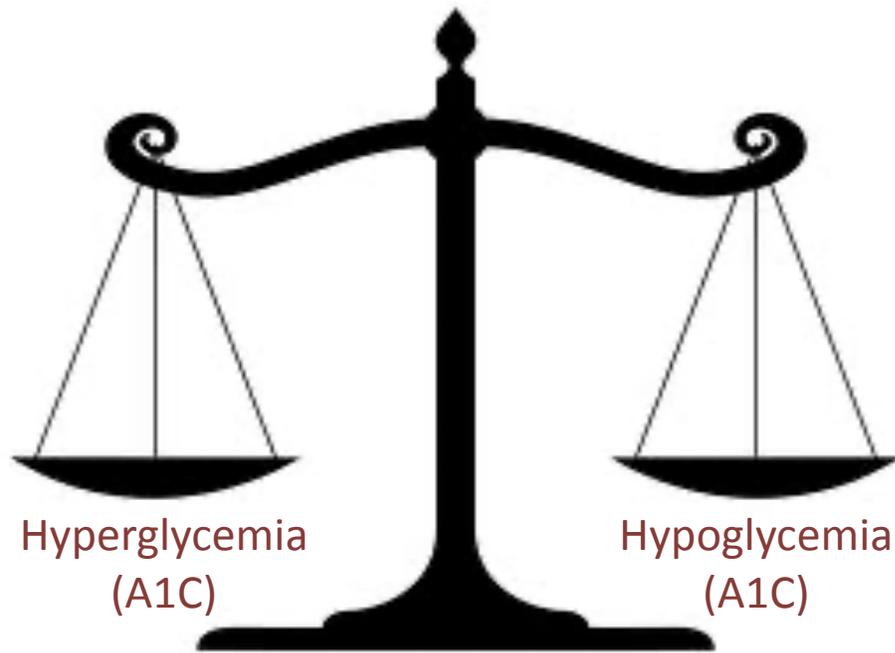
Assisted living: When these older adults are sick or something changes with their health, it may be hard to integrate changes into their care plan since they are more dependent on caregivers. For example, they may not have direct control over their meals, such as timing or the type of food provided.

Nursing home: In the context of diabetes, these older adults have more contraindications to oral medications, and may require insulin more often. But if the staff are well-educated, the nursing home should be able to handle complex regimens.

ADL: activities of daily living

IADL: instrumental activities of daily living

Glycemic Goal for All Older Adults: Optimize Benefits and Minimize Harm



Speaker notes:

What should be the goals for these different groups of people? The overarching goal of diabetes management is to optimize benefits while minimizing harm. This is true of any chronic condition, but is critical for the management of diabetes, particularly in older adults. While it is important to avoid **hyperglycemia**, this population can be at risk for experiencing adverse events related to overtreatment (**hypoglycemia**). Striking a balance in care is important.

Is A1C a Dependable Marker of Glycemic Control in Older Adults?

Conditions commonly seen in elderly that may affect A1C levels

Conditions	Possible Mechanisms	Change in A1C
Age	Unknown	↑
Race – AA / Hispanic	Unknown	↑
Iron Deficiency Anemia	↓ RBC Turnover	↑
Recent infection	Insulin Resistance	↑
Transfusion	↑ RBC Turnover	↑
Hemodialysis	↓ RBC Lifespan	↓
Erythropoietin Therapy	↑ Young RBC	↓
Metabolic Acidosis/Uremia	Carbamylation of Hemoglobin	↓ ↔ ↑
Anemia of Chronic Diseases	Unknown	↑ ↔ ↓

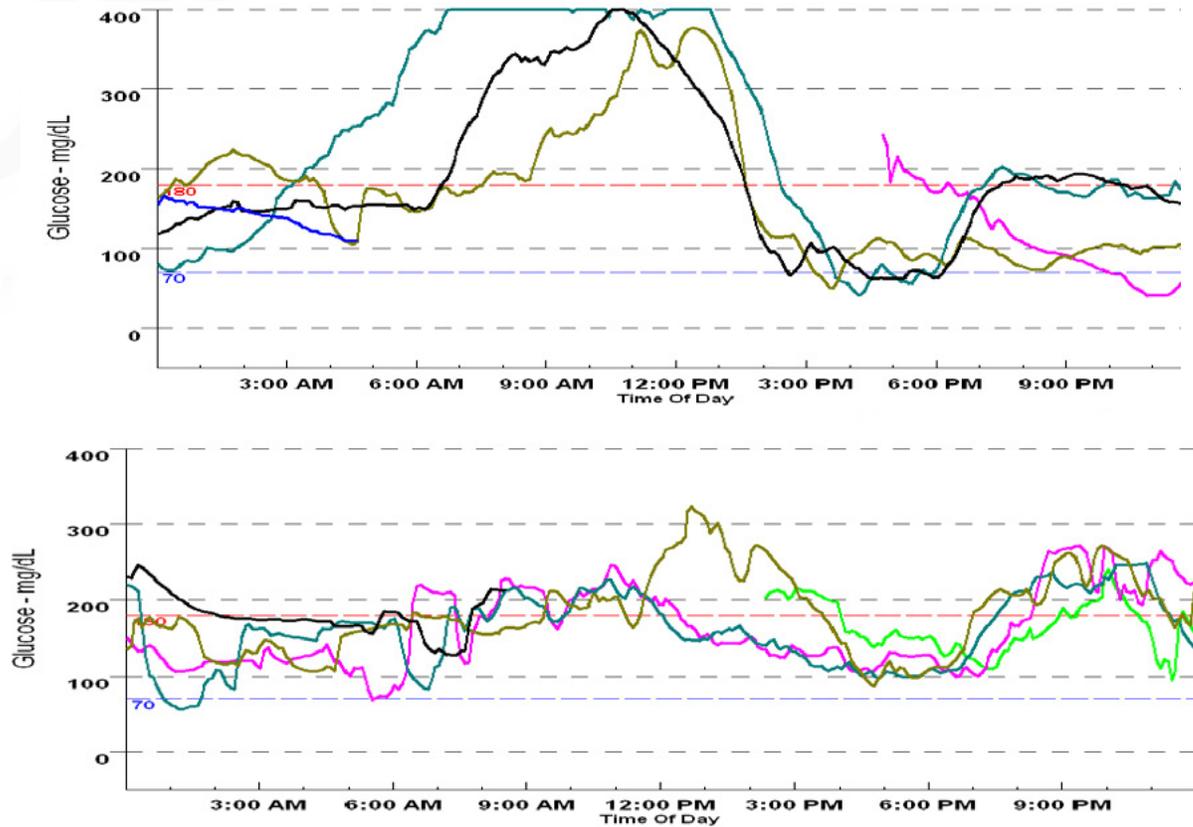
Speaker notes:

A1C measures the amount of hemoglobin in the blood that has glucose attached to it. Is A1C a dependable marker?

What we are measuring is the interaction between a glucose molecule with a red blood cell. The red blood cell lives for 90 days, and the test tells us the average glucose over the past three months. However, if there are changes in red blood cell life span or turnover (if not normal), the hemoglobin A1C will not be reflective of what we would expect. This is true across all age groups, but for older adults it becomes more of a problem- even in non-diabetic patients. We do not have different acceptable ranges for different ages.

A variety of factors can change an individual's insulin resistance, such as lifestyle and family history. A significant concern is that an effect on A1C can be in different directions, and the changes can be influenced by more than one condition.

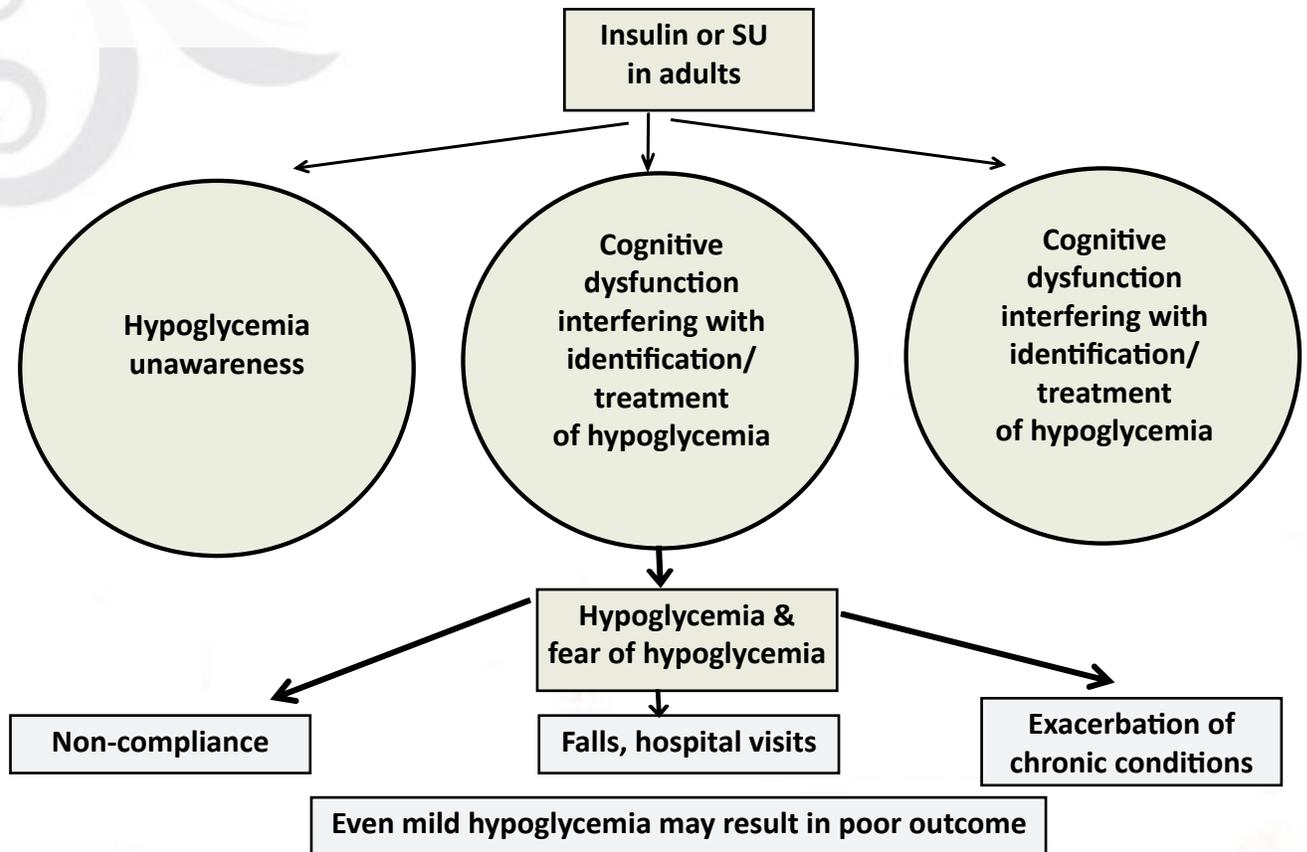
Patient Blood Glucose Level Charts



Speaker notes:

While A1C levels can be very similar between two patients (mean levels of 8.2% and 8.3% on the slide), you can see the top chart has much greater variability in glucose levels over time. Only looking at A1C levels alone can give a false sense of how a patient is doing overall.

Hypoglycemia in Older Adults



Speaker notes:

Evaluating for hypoglycemia in older adults can be complex, especially with those on an insulin-only regimen. An individual may be unaware that a hypoglycemic event is happening, as they may not feel changes in their blood sugar. Instead of presenting with typical symptoms like tremors, they may instead seem confused/dizzy/weak and not recognize these symptoms as hypoglycemia. Cognitive dysfunction may interfere with proper identification because a patient has to remember their symptoms in addition to relaying that information to their provider. Comorbidities that mimic hypoglycemic symptoms may be things like hypertension, a transient ischemic attack (TIA), and weak spells.

An older adult may not take their medicines as prescribed because they are afraid of falling or being found after passing out. Unfortunately, even mild hypoglycemia can increase the risk of falls and lead to poor health outcomes.

SU: sulfonylurea

Frequent Hypoglycemic Episodes Detected by Continuous Glucose Monitoring (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 M. et al. *Arch Intern Med* 2011. 171(4);362-4.

Speaker notes:

Continuous glucose monitoring uses a sensor under the skin to automatically track blood glucose levels, allowing a provider or patient to see changes/trends over time. This 2011 study helps to explain how hypoglycemic episodes are common in older adults with poor glycemic control.

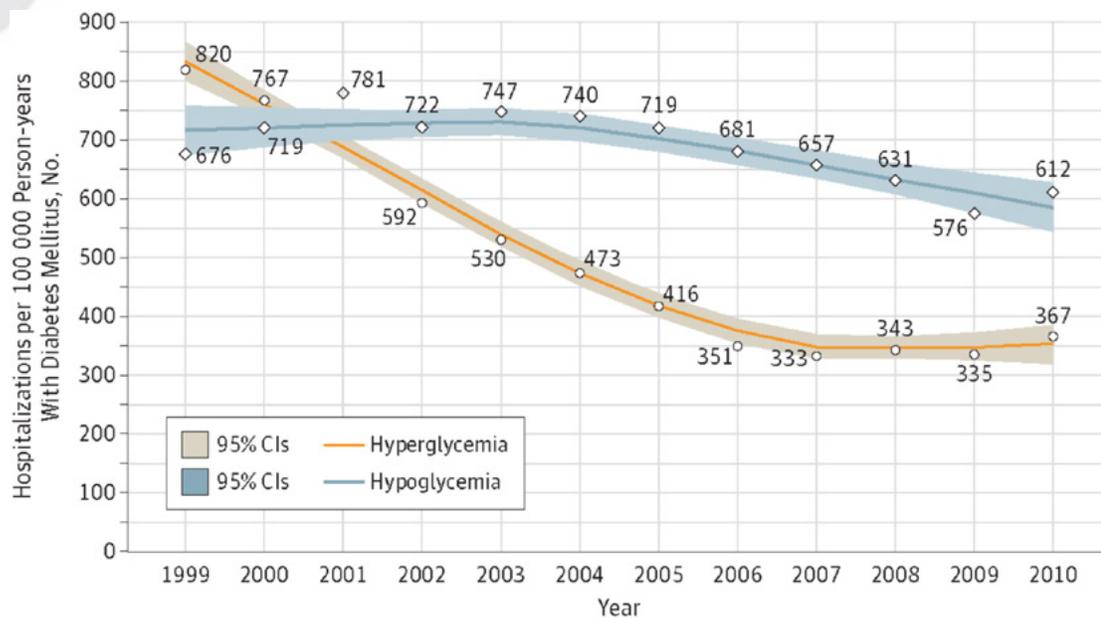
Further reading:

Frequent hypoglycemia among elderly patients with poor glycemic control.

<https://www.ncbi.nlm.nih.gov/pubmed/21357814>

National Trends in US Hospital Admissions for Hyper/Hypoglycemia

(Medicare Beneficiaries 1999 – 2011)



Lipska K. et al. *JAMA Intern Med.* 2014; 174:1116–24.

Speaker notes:

According to this 12-year study of national trends for hospital admissions, rates for hypoglycemia surpassed those for hyperglycemia among older adults. This highlights the complication of treating a chronic disease, and suggests opportunities for improvement for those with diabetes.

Further Reading:

National trends in US hospital admissions for hyperglycemia and hypoglycemia among Medicare beneficiaries, 1999 to 2011.

<https://www.ncbi.nlm.nih.gov/pubmed/24838229>

Interpretation After Multiple Trials with Intensive Therapy

Who benefits?

- Younger patients
- Short duration of disease
- Those with:
 - No macro/microvascular disease
 - Low comorbidity burden
 - Better overall health
 - Longer life expectancy

Who is at risk?

- Old and frail adults
- Long duration of diabetes
- Those with:
 - Presence of macro/microvascular disease
 - Multiple comorbidities
 - Shorter life expectancy
- Those unable to follow given regimen safely

Speaker notes:

There were multiple trials after the previously-mentioned national trend study, and from those came a consensus around who benefits from intensive therapy and who is at risk of harm by tight control.

Rationale for Diabetes Management in Long-Term Care Facilities

Hyperglycemia

- Macro/microvascular complications
- Frequent infections
- Dehydration
- Vision problems
- Foot ulcers
- Geriatric syndrome

Hypoglycemia

- Falls, fracture
- Confusion, delirium
- CV events
- Fatigue/weakness

Speaker notes:

In long-term care, we want to control hyperglycemia because it causes complications over time. Geriatric syndromes are health problems that usually have more than one cause and involve many parts of the body, like incontinence. If hypoglycemia occurs in the same patient, other concerns may arise related to physical or cognitive dysfunction.

CV: cardiovascular

Goals of Diabetes Treatment in Long-Term Care Facilities

Short-Term Care

- Promote healing
- Prevent long-term complications
- Reduce length of stay
- Educate for self-care

Long-Term Care

- Recognize and treat hypoglycemia and hyperglycemia early
- Prevent hypoglycemia and severe hyperglycemia
- Improve quality of life

Speaker notes:

These are goals of diabetes treatment for patients in rehabilitation facilities (short-term) or nursing home (long-term) settings.

Consensus Report

Diabetes in Older Adults

M. Sue Kirkman, MD¹, Vanessa Jones Briscoe, PHD, NP, CDE², Nathaniel Clark, MD, MS, RD³, Hermes Florez, MD, MPH, PHD⁴, Linda B. Haas, PHC, RN, CDE⁵, Jeffrey B. Halter, MD⁶, Elbert S. Huang, MD, MPH⁷, Mary T. Korytkowski, MD⁸, Medha N. Munshi, MD⁹, Peggy Soule Odegard, BS, PHARMD, CDE¹⁰, Richard E. Pratley, MD¹¹ and Carrie S. Swift, MS, RD, BC-ADM, CDE¹²

Diabetes Care. 2012 Dec; **35(12):2650-64.**

J Am Geriatr Soc. 2012 Dec; **60(12):2342-56.**

Speaker notes:

Following a series of scientific presentations by experts in the field, the writing group independently developed this consensus report to address the following questions:

- What is the epidemiology and the biologic mechanism of diabetes in older adults?
- What is the evidence for preventing and treating diabetes and its common comorbidities in older adults?
- What current guidelines exist for treating diabetes in older adults?
- What issues need to be considered in individualizing treatment recommendations for older adults?
- What are consensus recommendations for treating older adults with or at risk for diabetes?
- How can gaps in the evidence best be filled?

Further reading:

Diabetes in Older Adults: A Consensus Report.

<https://care.diabetesjournals.org/content/35/12/2650>



Management of Diabetes in Long-term Care and Skilled Nursing Facilities: A Position Statement of the American Diabetes Association

Diabetes Care 2016;39:308–318 | DOI: 10.2337/dc15-2512

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Elbert S. Huang,³ Rita R. Kalyani,⁴
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Naushira Pandya,⁶ Carrie S. Swift,⁷
Tracey H. Taveira,⁸ and Linda B. Haas⁹

Speaker notes:

This position statement from the American Diabetes Association was developed to increase clinicians' understanding of the older adult population living in or transitioning to long-term care (LTC) facilities and how to address barriers to diabetes management while minimizing the risk for adverse events. An inter-professional team approach can support the integration of individualized diabetes management plans and improve the overall quality of life for older adults in these settings.

Further reading:

Management of Diabetes in Long-term Care and Skilled Nursing Facilities: A Position Statement of the American Diabetes Association

<https://care.diabetesjournals.org/content/39/2/308>

A Framework for Goals (Consensus Report: ADA)

Patient Characteristics/Health status	Rationale	A1C	BP	Lipids
Healthy <ul style="list-style-type: none"> - few co-existing illnesses - intact cognitive status - intact functional status 	Longer life expectancy	<7.5%	<140/80	Statins unless not tolerated
Complex/Intermediate <ul style="list-style-type: none"> - Multiple co-existing illnesses - Mild-moderate cognitive impairment - 2+ IADL dependency 	<ul style="list-style-type: none"> - Intermediate life expectancy - High treatment burden - Hypo vulnerability - Fall risk 	<8%	<140/80	Statins unless not tolerated
Very Complex/Poor Health <ul style="list-style-type: none"> - LTC care residents - end-stage chronic illnesses - Moderate-severe cognitive impairment - 2+ ADL dependencies 	<ul style="list-style-type: none"> - 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 .

Speaker notes:

This framework from the 2012 Consensus Report can assist clinicians in treating older adults with or at risk for diabetes by identifying patient characteristics related to the presence or number of comorbidities or impairments. It is important to consider how other illnesses may interfere with self-care, as well as the impact of a patient's cognitive and functional status. These categories correspond to increasing levels of risk for mortality- for those with the most complex and poor health, it is more important to consider the risks and benefits of treatments before defining a treatment goal.

ADA: American Diabetes Association

ADL: activities of daily living, including bathing, dressing, grooming, walking, eating.

BP: blood pressure

IADL: instrumental activities of daily living, including shopping, cooking, managing medications, housework, transportation.

LTC: long-term care

Further reading:

Diabetes in Older Adults

<https://care.diabetesjournals.org/content/35/12/2650.long>

Goals in LTC Facilities (Position Statement: ADA)

Patient Characteristics	Rationale	A1C	BG range mg/dl	BG monitoring
SNF (Rehab) - Rehab potential - Goals to discharge home	- Need optimal blood sugar control for after acute illness	Avoid A1C reliance	100-200	Based on complexity of regimen
Nursing home - Limited life expectancy - Frequent fluctuations in health status impacting BG	- Limited benefits of tight control - Focus on better quality of life	<8.5% - A1C may not be reliable due to comorbidities	100-200	Based on complexity and risk of hypoglycemia
End-of-life care - Avoid invasive diagnostic or therapeutic procedures	- No benefits of glycemic control - Avoid symptomatic hyperglycemia	- No role of A1C	Avoid severe hypo- and hyperglycemia	Periodically to avoid severe hypoglycemia or hyperglycemia

Munshi MN et al; *Diabetes Care*. 2016 Feb; 39:308-318.

Speaker notes:

The integration of diabetes management into LTC facilities is important and requires an interprofessional team approach. To facilitate this approach, acceptance by administrative personnel is needed, as are protocols and possibly system changes.

For that last group in the goal framework on the previous slide, Very complex/Poor health, we can divide them into three separate groups: Rehab, Nursing home, and End of life. For each of these groups, we want to be sure there is not too much dependence on hemoglobin A1C (and not at all for end-of-life care).

ADA: American Diabetes Association

BG: blood glucose

LTC: long-term care

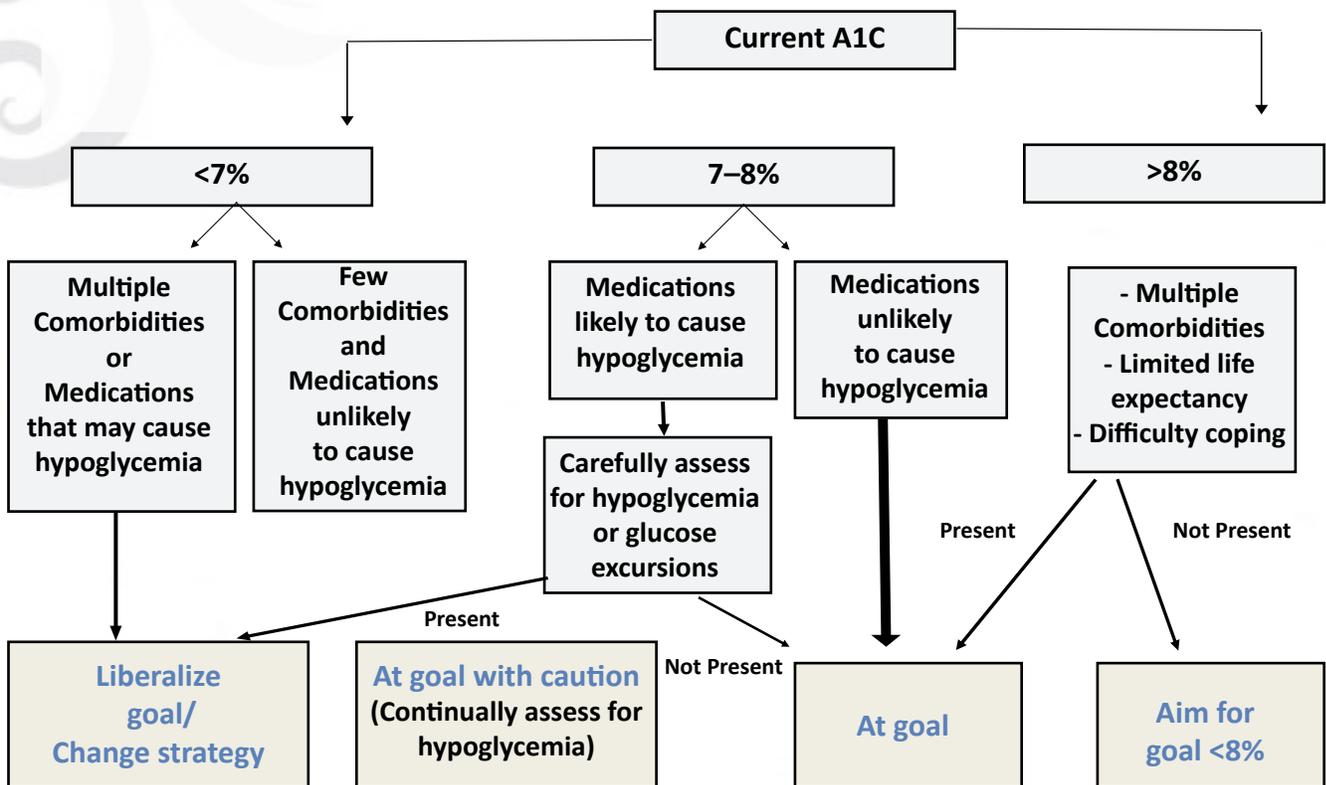
SNF: skilled nursing facility

Further reading:

Management of Diabetes in Long-term Care and Skilled Nursing Facilities: A Position Statement of the American Diabetes Association

<https://care.diabetesjournals.org/content/39/2/308>

Goal-setting Algorithm for Older Adults



Speaker notes:

This slide provides a goal-setting algorithm for clinicians treating diabetes in their older adult patients. When we do set goals for older adults to manage their diabetes, we should understand HOW they can get there and what challenges they may face along the way. When there is a significant risk for hypoglycemia, changing strategies or liberalizing the goal may be necessary.

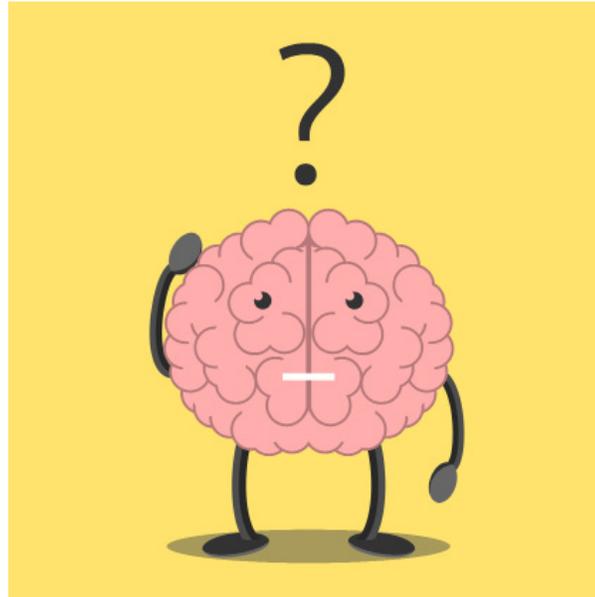
Take-home Points

- Older Adults are a heterogeneous population
 - Remember homeostenosis
- Challenges of diabetes management vary across settings
 - Goals and support systems are very different
- A1C not always a reliable marker in assessing glycemic goal
 - Should not be sole parameter
- Important to avoid hypoglycemia
 - Hypoglycemia may have worse outcome in older age as opposed to hyperglycemia
- Establish goals for diabetes management
 - Consider comorbidities, functional, and cognitive status
 - Consider life expectancy and personal choices in LTC

Speaker notes:

To summarize Session 1, an older adult could look healthy and highly functional, but could have limited capacity to compensate when something goes wrong (homeostenosis). We don't want to expose this population to a highly complicated management regimen. We want to match treatment strategies to what is realistically available to the older adult patient. Clinicians should not follow A1C blindly in setting diabetes management goals.

Session 2: Managing Diabetes in Older Adults with Cognitive Dysfunction



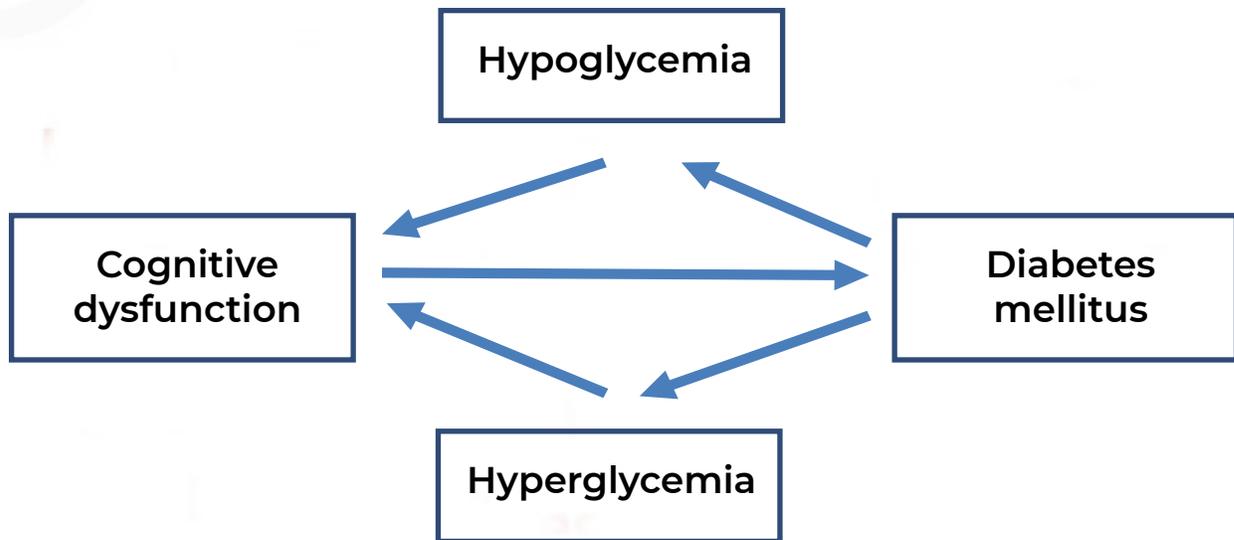
Speaker notes:

This session will focus on managing diabetes in older adult patients experiencing cognitive dysfunction.

Learning objectives:

- Discuss clinical presentation of older adults with coexisting diabetes and cognitive dysfunction.
- Discuss screening tools that can be used in clinical settings.
- Discuss strategies to improve care in older adults with coexisting diabetes and cognitive dysfunction.

Cognitive Dysfunction with Diabetes: Bi-directional Relationship



Speaker notes:

Which comes first, the cognitive dysfunction or the diabetes? It is important to remember that there is a bi-directional relationship between the two conditions. Many epidemiological studies have shown that cognitive dysfunction increases the risk for developing diabetes. Additionally, those older adult patients who are experiencing hyperglycemia or hypoglycemia are at a higher risk for developing cognitive dysfunction.

Clinical Presentation of Diabetes and Cognitive Dysfunction

- Depends on the domain of the brain affected
- Behaviors that can be affected:
 - Memory
 - Attention and orientation
 - Language
 - Visual perception of spatial relationships
 - Executive function

Speaker notes:

What do the two conditions typically look like in the clinic? This will depend on which area of the brain is affected, as it has many domains (frontal lobe, temporal lobe, etc.) Various behaviors can be affected by diabetes; memory is most often cited, but there are several other areas that could individually or collectively be influenced.

Memory Loss: Mr. JB

Date	GLUCOSE TEST RESULTS					INSULIN						Comments		
	Before Break- fast	Before Noon Meal	Before Supper 1 cc	At Bedtime 2 cc	Other	Before Breakfast		Before Lunch		Before Supper			Bedtime	
						Reg.	Long/ Inter.	Reg.	Long/ Inter.	Reg.	Long/ Inter.		Reg.	Long/ Inter.
6/16/06	187	168	364			17		15		17			49	8:30 AM 10:20 PM
6/17	165	7	195			17		X		17			49	10:17 AM 8:15 PM 10:40
6/18/06	210			327		17				X		17	49	9:40 AM 10:30 PM
6/19/06	213	187	141			17				17			49	7:37 AM 1:23 PM 7:48 PM
6/20/06	162	192		242		17		15			17	49	7:40 AM 11:30 AM 10:20 PM	
6/21/06	159	150		266		17		15			17	49	8:20 AM 1:50 PM 1:10 PM	
6/22/06	271			250		17					17	49	8:25 AM 9:30 PM	
6/23/06	282		236	290		17		15			17	49	6:38 AM 5:22 PM 10:55 PM	
6/24	188		161	177		17				17		15	49	11:06 AM 7:40 PM
6/25	201	400		376		17		15			17	49	8:20 AM 3:35 PM 10:00 PM	
6/24/06	271	436	202	273		17		17	1F		17	49	9 AM 2:10 PM 6:26 PM 9:45 PM	
6/25/06	241	364		366		17		17			17	49	8:05 AM 12:15 PM 10:15 PM	
6/28/06	227		312			17					17	49	8:42 AM 8:35 PM	
6/29/06	237		482	448		17				17		49	8:25 AM 5:15 PM 8:55 PM	
6/30/06	244					17								6:35 AM

Speaker notes:

This example helps illustrate the complexity of cognitive dysfunction and diabetes. When looking at Mr. JB's glucose test results, the numbers at mealtimes are all over the place, and it may be difficult to sense a pattern. But the insulin log helps us to better understand that while he takes a long-acting insulin before breakfast and before bed, there are gaps in insulin during the day- this can help to explain why the glucose levels varied so widely. Mr. JB's case can be defined as simple memory loss, which allows us to more easily interpret data with the context of a straightforward cause.

Executive Dysfunction

Frontal lobe-mediated: higher function:

- Insight into the problem
- Planning and judgment
- Problem solving
- Starting, changing, or stopping behavior



Speaker notes:

Beyond memory loss, a cognitive dysfunction that can be overlooked in patients with diabetes is executive dysfunction. This goes beyond the older adult forgetting where they parked their car, and to more complex problem solving that can be easy to miss when discussing treatment plans and goals with the patient.

Case Example: Mr. D

- 82 year old male
- Engineer; computer savvy
- DM duration: 17 years
- Glargine BID and Lispro before meals
- A1C: 6.5%

Speaker notes:

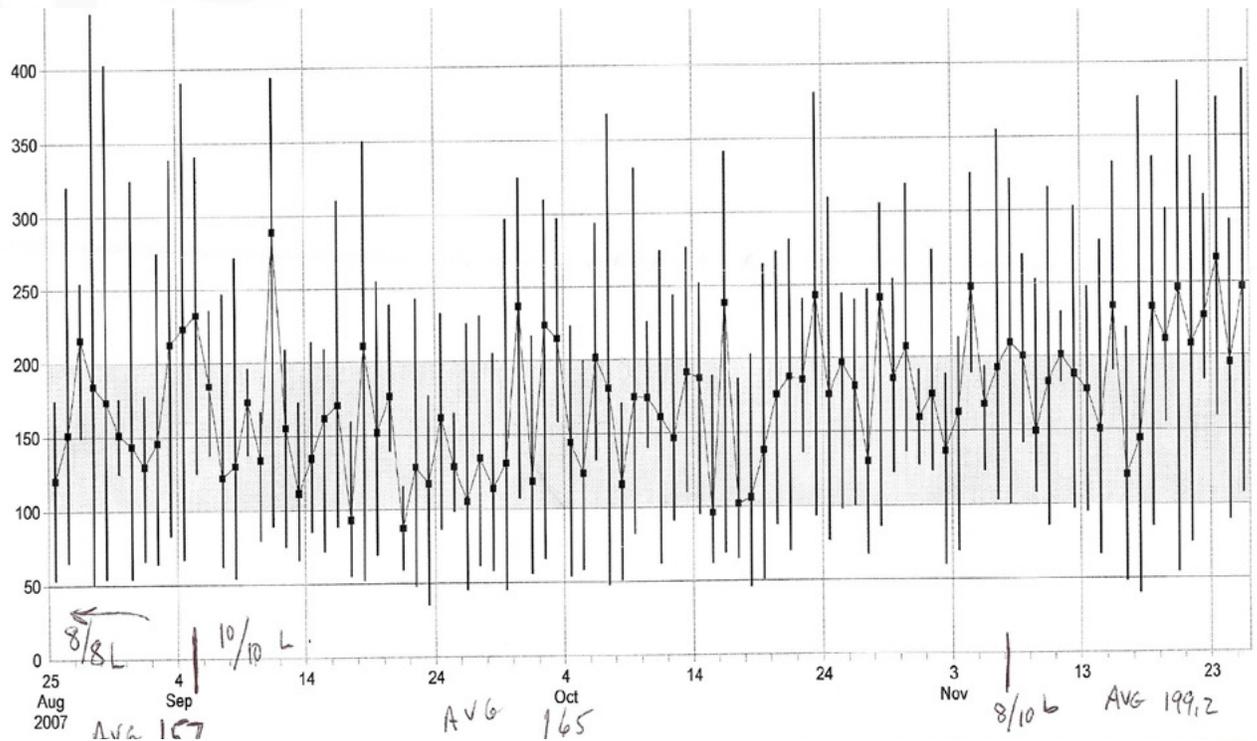
Mr. D takes his medications twice a day, and appears to be doing great. He is very technologically savvy and drives a significant distance to come to his appointments.

BID: twice-a-day insulin

DM: diabetes mellitus

Lispro: insulin injection

Error in Problem Solving: Mr. D



Speaker notes:

This is Mr. D's homemade log book. You can see that there is a wide variation in glucose levels. While he understood that his blood sugar lowers when he takes insulin, he was not able to problem solve around his levels being too low. Unless a provider is carefully assessing for these abilities, it can be easy to miss.

Modified Clock-in-the-Box (CIB)

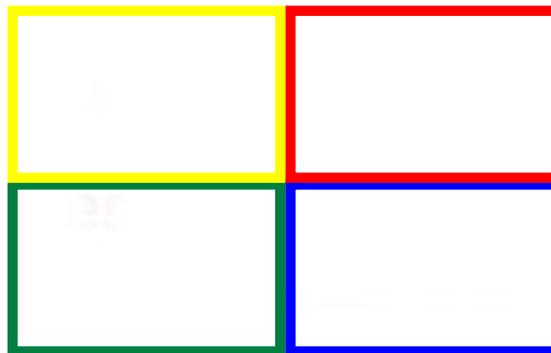
Please read and do the following carefully:

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:



A response form consisting of four empty boxes arranged in a 2x2 grid. The top-left box has a yellow border, the top-right box has a red border, the bottom-left box has a green border, and the bottom-right box has a blue border.

Speaker notes:

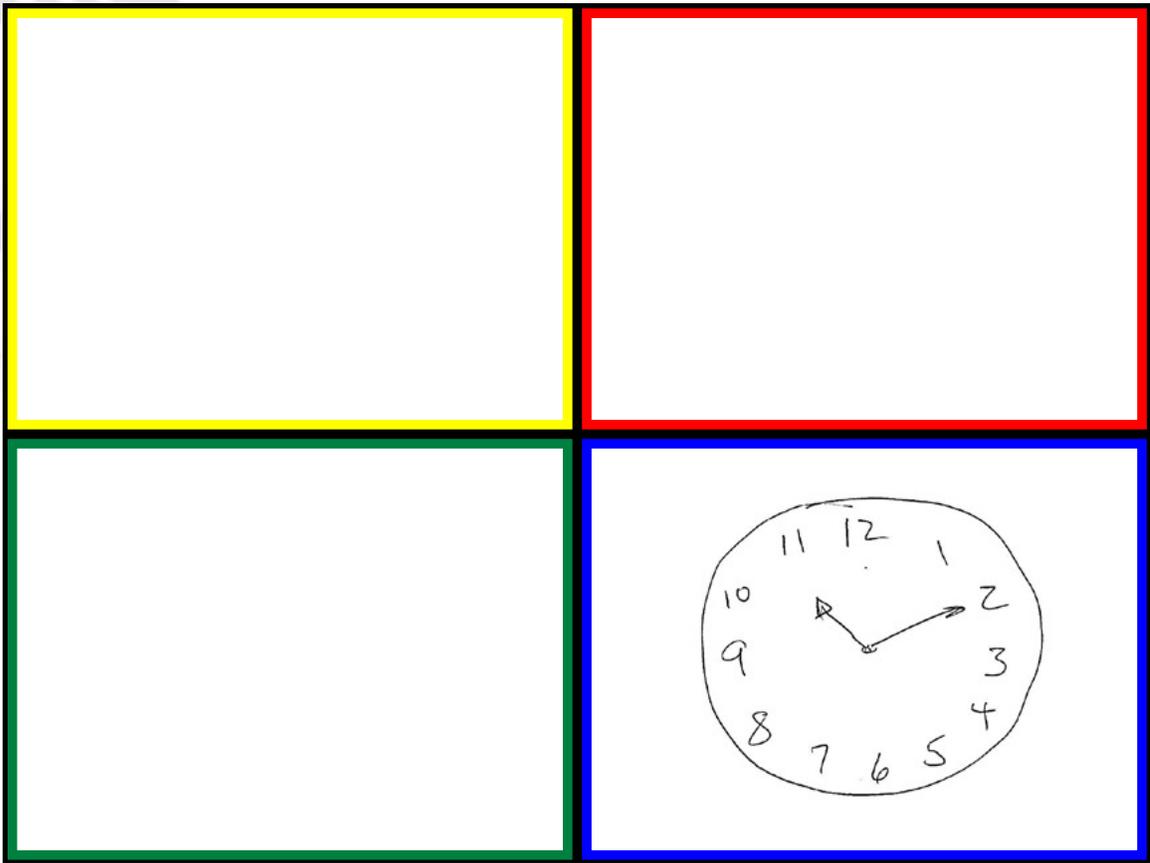
One tool that providers can use to identify cognitive dysfunction is the Clock-in-the-Box screening, originally developed by Bill Millberg from the Boston VA Hospital to assess working memory and executive function. It can help clinics to identify patients with both cognitive or functional deficits. The Clock-in-the-Box tool has two parts. First, there is a page of brief instructions to remember (see steps on slide). When the test taker is ready, they are given a response form (on slide), on which they try to follow the instructions to the best of their ability.

Please note: The Clock-in-the-Box is a cognitive screening instrument and should not be used as the sole factor in identifying patients with cognitive disorders, such as Alzheimer's disease, dementia, or delirium.

Further reading:

Performance on the Clock-in-the-Box in Elders: Normative Performance, Comparison to Cognitive Tests, and Relationship to Functional Performance

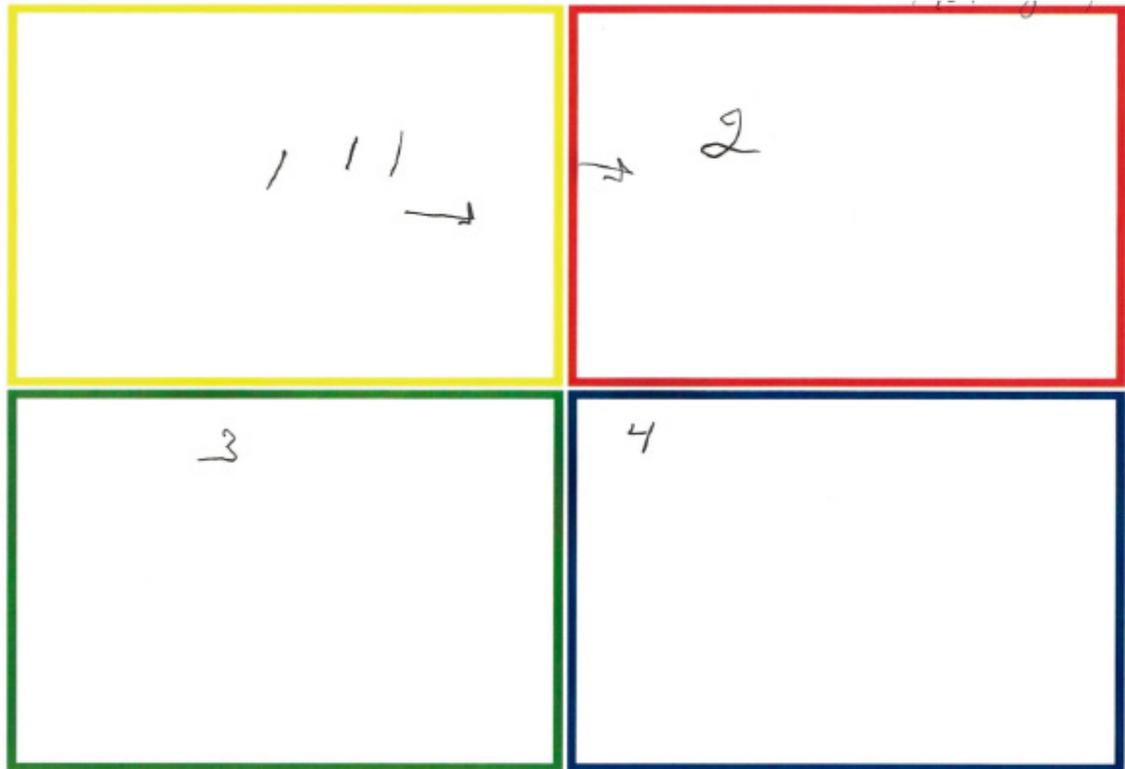
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3128995>



Speaker notes:

Example of an accurate Clock-in-the-Box response.

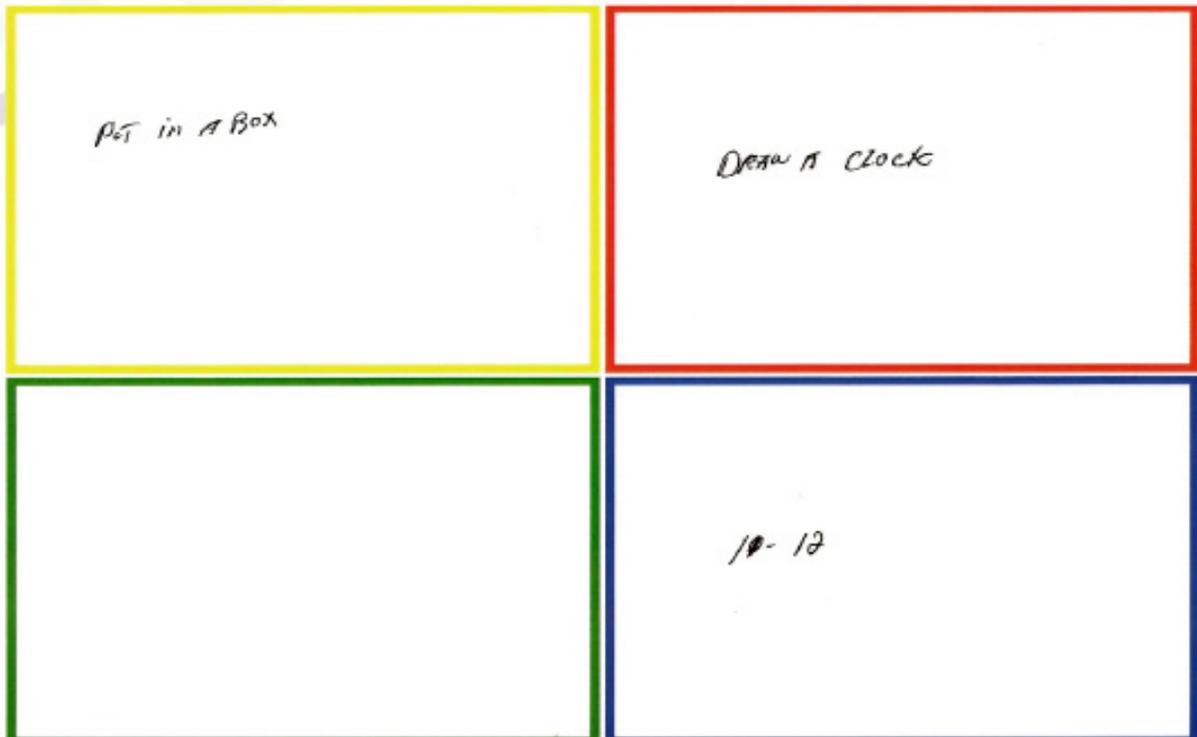
Example: Mrs. MB



Speaker notes:

Example of a Clock-in-the-Box response where the individual (Mrs. B) experienced a significant challenge in understanding the task.

Example: Mr. JW



Speaker notes:

Another example of a Clock-in-the-Box response. While the patient's (Mr. JW) working memory is fairly good, he was not able to put it all together. These are typically individuals who are not trying to be difficult when they don't follow through with a new or complicated treatment regimen, but rather are finding it difficult to put new changes into place.

Caregiver Support is Needed

Date	Before breakfast	Glucose before meal	Monitoring before supper	1-2 hours Bed-time	Other	
6/16/2009	116	6 ¹⁰	118	4 ³⁵	164	10 ³⁰
6/17/2009	102	6 ³⁵	140	3 ¹⁰	122	8 ³⁰
6/18/2009	112	7 ¹⁵	131		156	11 ³⁰
6/19/	107	8 ²⁵	118	1 ³⁰	147	9 ³⁰
6/20/	112	7 ¹⁵		5 ¹⁰	151	8 ³⁰
6/21/	104	7 ³⁰	130	6 ³⁰	131	10 ³⁰
6/22/	108	8 ¹⁰	130	12 ⁴⁵	141	11 ³⁰
6/23/	117	8 ²⁵		11 ²⁵	134	10 ⁴⁵
6/24/	102	8 ¹⁵		7 ¹⁵	128	10 ²⁵
6/25/	118	7 ³⁰	101	12 ⁴⁵	111	9 ⁴⁵
6/26/	110	7 ²⁵	98	12 ⁵⁰	139	10 ³⁰
6/27/	114	7 ⁴⁵			131	11 ³⁰
6/28/	127	7 ¹⁵		5 ¹⁰	141	10 ²⁰
6/29/	121	8 ²⁰	120	12 ⁴⁵	148	9 ⁴⁵
7/1/	111	8 ³⁰		6 ¹⁰	128	10 ³⁰
7/2/	111	9 ³⁰		1 ²⁰	121	9 ³⁰
7/3/	122	8 ⁴⁵	103	2 ¹⁰	116	8 ³⁰
7/4/	103	9 ³⁰	121	1 ³⁰	122	9 ³⁰
7/5/	124	9 ³⁰		3 ²⁰	125	10 ³⁰
7/6/	116	8 ²⁰		6 ³⁰	143	11 ³⁰
7/7/	136	8 ³⁰	120	10 ⁴⁵	130	7 ³⁰
7/8/	136	9 ³⁰		6 ¹⁰	148	9 ¹⁵
7/9/	116	9 ¹⁵		6 ³⁰	122	8 ¹⁰
7/10/	106	7 ³⁰	121	12 ⁴⁵	143	9 ³⁰
7/11/	124	8 ³⁰	106	1 ³⁰	141	8 ³⁰
7/12/	115	8 ¹⁰				

Speaker notes:

An older adult patient with cognitive dysfunction was able to provide these complete monitoring records because his wife was able to keep track of the numbers/treatments. Any part of a geriatric syndrome (comorbidities that are associated with diabetes) can be individually overcome if there are enough support systems in place.

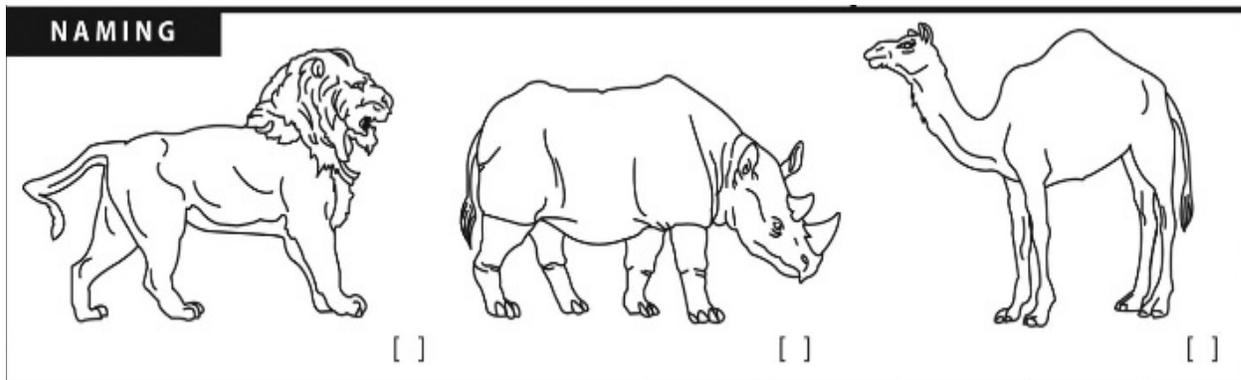
Further reading:

Cognitive dysfunction is associated with poor diabetes control in older adults.

<https://www.ncbi.nlm.nih.gov/pubmed/16873782>

Screening Tests for Cognitive Dysfunction

- Mini-Cog: three-item recall + clock drawing test
- Mini-Mental State Examination (MMSE)
- Montreal Cognitive Assessment (MoCA)



From the Montreal Cognitive Assessment (MoCA)

Speaker notes:

While these additional screening tests are not specifically validated for this population or those with diabetes specifically, they can be useful as options for primary care practices, along with the Clock-in-a-Box.

Many clinics use the Mini-Cog, which uses a three-item recall test for memory and a simply scored clock-drawing test (CDT). The clock-drawing is used as an “informative distractor,” helping to clarify scores when the memory recall score is intermediate. The mini-mental examination does not test for executive dysfunction, so some patients might test better, but that aspect will not be captured. The **MoCA** takes longer, but is very comprehensive in order to detect mild cognitive impairment and Alzheimer’s disease.

Further reading:

American Academy of Family Physicians: Cognitive Evaluation

<https://www.aafp.org/patient-care/public-health/cognitive-care/cognitive-evaluation.html>

What Can We Do?

- Adjust glycemic goals.
- Reassess treatment strategies and simplify if possible.
- Assess support system and involve caregivers.
- Simplify self-care.



Speaker notes:

It is certainly not easy to manage this population and their clinical care- so we might ask ourselves. What can we do? It is important to adjust goals based on individual patient barriers, simplifying treatments as plans are reassessed. When instructions are overly specific, it may limit the patient's ability to successfully complete their self-care. As soon as a cognitive deficiency is identified, caregivers should be informed and involved in the treatment plan. If a caregiver is not living with the patient, they might not be initially aware of signs or symptoms to monitor.

A Framework for Goals (Consensus Report: ADA)

Patient Characteristics/Health Status	Rationale	A1C	BP	Lipids
Healthy <ul style="list-style-type: none"> - Few co-existing illnesses - Intact cognitive status - Intact functional status 	- Longer life expectancy	<7.5%	<140/80	Statins unless not tolerated
Complex/Intermediate <ul style="list-style-type: none"> - Multiple co-existing illnesses - Mild-moderate cognitive impairment - 2+ IADL dependency 	<ul style="list-style-type: none"> - Intermediate life expectancy - High treatment burden - Hypo vulnerability - Fall risk 	<8%	<140/80	Statins unless not tolerated
Very Complex/Poor Health <ul style="list-style-type: none"> - LTC care residents - End-stage chronic illnesses - Moderate-severe cognitive impairment - 2+ ADL dependencies 	<ul style="list-style-type: none"> - 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 .

Speaker notes:

As a review from Session 1, this framework for goals from the 2012 Consensus Report places patients in categories by what other co-existing conditions they have, and what their cognitive and functional status is. It is important to consider the IADL and ADL dependencies a patient might have, particularly if cognitive impairment is declining.

ADA: American Diabetes Association

ADL: activities of daily living, including bathing, dressing, grooming, walking, eating.

BP: blood pressure

IADL: instrumental activities of daily living, including shopping, cooking, managing medications, housework, transportation.

LTC: long-term care

Further reading:

Diabetes in Older Adults

<https://care.diabetesjournals.org/content/35/12/2650.long>

Cognitive Dysfunction Associated with Hypoglycemia in Older Veterans

- Increased incidence of dementia and cognitive impairment with age
 - 13.1% in ages 65-74
 - 24.2% ages >75
- Diabetes was managed more intensively in older veterans with dementia and cognitive impairment
 - Insulin use 30% vs 24% (mean A1C 6.9% vs 7%)
- All participants on insulin; those with dementia/cognitive dysfunction had more hypoglycemia
 - 26.5% (dementia) / 19.5% (cognitive dysfunction) vs 14.4%

Feil DG et al. *JAGS*. 2011; 59;12;2266.

Speaker notes:

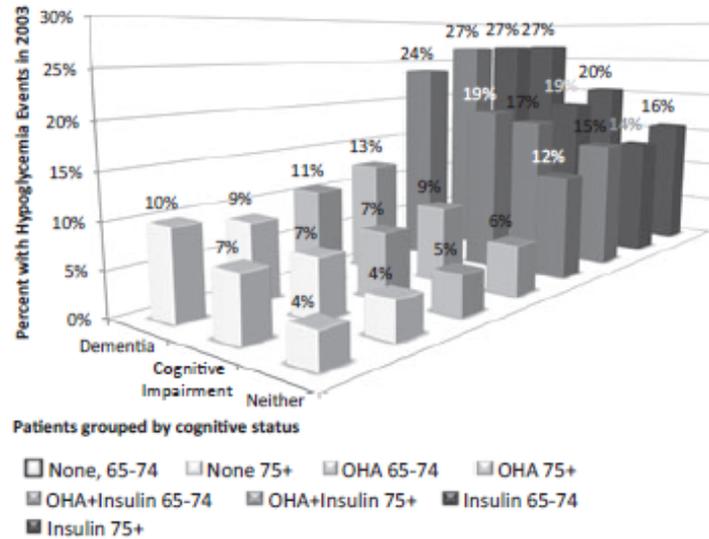
This slide summarizes findings from a cross-sectional analysis of veterans over 65 years old with diabetes. Those older than age 75 had higher rates of dementia and cognitive impairment. Participants with cognitive dysfunction, particularly dementia, also experienced more hypoglycemia than those without this impairment.

Further reading:

Risk of Hypoglycemia in Older Veterans with Dementia and Cognitive Impairment: Implications for Practice and Policy

<https://onlinelibrary.wiley.com/doi/full/10.1111/j.1532-5415.2011.03726.x>

Higher Risk of Hypoglycemia with Cognitive Impairment and Increased Complexity of Regimen



Feil DG et al, *JAGS*. 2011; 59;12;2266.

Speaker notes:

This analysis also showed that when there is a high complexity of the regimen and dementia, there is a higher risk of hypoglycemia. This indicates the need to consider the substantial burden of a self-management regimen on patients who have cognitive dysfunction.

Challenges for Older Adults with Diabetes and Cognitive Dysfunction

Behavior	Impact	Strategies
Memory loss	<ul style="list-style-type: none"> - Forget monitoring, meds, insulin, eating on time - Forget to account for exercise - Missed clinic visits 	<ul style="list-style-type: none"> - Adapt monitoring schedule - Pillboxes, alarms - Extended release medications - Simplify insulin regimen - Involve caregiver - Frequent reminders, written notes
Difficulty problem-solving	<ul style="list-style-type: none"> - Remember instructions but unable to integrate into self-care - Unable to recognize, prevent, or treat hypoglycemia 	<ul style="list-style-type: none"> - Repeated education and instructions at each visit - Avoid labels such as “non-compliant” - Avoid complex regimen - Make small changes

Munshi MN et al; *Diabetes Care*. 2017 April; 40:461-467.

Speaker notes:

When you think about clinical challenges in an individual way, what does cognitive dysfunction do to a patient? What impact does it have on diabetes care? And what strategies can we implement to address these concerns?

For memory loss, it is important to assess what is feasible for a monitoring schedule. Taking medications every day is ultimately more important than strict timing of doses. There are many modification strategies that caregivers especially can help with, including using written notes or charts on the refrigerator or other frequently used areas at home.

For issues with problem solving, a significant challenge is that it becomes difficult to recognize, prevent, or treat hypoglycemia. Important safety instructions should be consistently given, as this population needs repeated instructions. Families and caregivers should be reminded that the patient is not just being stubborn, but may be having a difficult time putting things together. It might be tempting to change multiple aspects of a treatment plan at a time, but that might not lead to achievable behavior change that sticks over time. Making small changes and avoiding complexity when possible will lead to better results.

Further reading:

Cognitive Dysfunction in Older Adults With Diabetes: What a Clinician Needs to Know
<https://care.diabetesjournals.org/content/40/4/461>

A Framework for Goals (Consensus Report: ADA)

Behavior	Impact	Strategies
Stopping old behavior Starting new behavior	<ul style="list-style-type: none"> - Seems to be stubborn - Refuses new therapy - Errors occur when old habits are changed 	<ul style="list-style-type: none"> - Avoid changes if possible - Caregiver supervision if possible - May need to restrict insulin access (especially type 1) if more than needed doses are taken by error
Mental Flexibility	<ul style="list-style-type: none"> - Feeling anxious regarding “failing” therapy - Too much focus on diabetes management 	<ul style="list-style-type: none"> - Avoid difficult tasks such as sliding scale - Simplify - Decrease need for frequent snacks or monitoring

Munshi MN et al; *Diabetes Care*. 2017 April; 40:461-467.

Speaker notes:

When habits change, there is a lot of room for errors to occur — especially when an older adult is experiencing cognitive dysfunction. While it may sound illogical, a patient may be afraid to stop their old therapy and begin something new because they are afraid it will not be possible to follow. It may appear that a patient is stubborn when they may just be in need of additional support, particularly from a caregiver. The presence of another person to supervise treatment will reduce the possibility of errors.

When mental flexibility is a challenge, we do not want patients to obsess over treatment items like sliding scale and feel anxious about not succeeding at their therapy. Simplification helps to maintain an overall focus on wellness.

Further reading:

Cognitive Dysfunction in Older Adults With Diabetes: What a Clinician Needs to Know
<https://care.diabetesjournals.org/content/40/4/461>

Confusion, Cognitive Dysfunction, Delirium

Challenge

- Irregular diet
- Skipped meals
- Refuse monitoring
- Refuse medicines or injections

Possible strategies

- Offer what patient likes
- Offer meal substitutes
- Give prandial insulin AFTER meal
- Block (pattern) testing
- Frequency based on acuity
- Use long-acting formulations

Munshi MN et al, *Diabetes Care*. 2016 Feb; 39:308-318.

Speaker notes:

When it comes to concerns around confusion, cognitive dysfunction, and delirium, it is best to adapt to the behavior instead of trying to fix it. This position statement reviews commonly found comorbidities in long-term care facilities and strategies to improve diabetes care for this population. This is a situation that is likely not reversible. Providers should weigh the risk and benefit of a behavior being asked of a patient, eg., instead of telling them to absolutely not eat something, could you suggest a change in portion size? A strained relationship may not be worth the absolute adherence to a perfect care plan. Depending on when appointments are held, alternates to daily testing can be explored.

Further reading:

Management of Diabetes in Long-term Care and Skilled Nursing Facilities: A Position Statement of the American Diabetes Association

<https://care.diabetesjournals.org/content/39/2/308>

Challenging Scenario

- Mr. G, 81 years old, type 2 diabetes for 21 years, lives alone
- Brought to the clinic by a son with complaints of frequent highs and lows in SMBG (40 – 300 at different times)
- Recently found on the floor unconscious, paramedics found finger stick at 45 mg/dl
- Another episode of hospitalization 1 month ago due to fall – found to have BS of 52 mg/dl in ER. A1C: 8.3%
- On premixed insulin BID. Asked to count carbs and eat three meals and snacks between meals to avoid hypoglycemia.

Speaker notes:

What would be your thoughts on this challenging scenario? Does Mr. G have a cognitive impairment? Are there any red flags?

- Low blood sugar with falls? (Falls are almost always multi-factorial; might not know exact reason, but could be a sign of delirium)
- Frequent high/lows?
- Over-correcting A1C?
- Living alone?
- Potential cognitive decline?

What approach would you take with Mr. G?

- Work on menu planning and help to plan for him so he can grab & go.
- Current regimen is too complex. Determine who cooks and how ready-made meals can be put together.
- Determine further levels of family involvement and follow-up with appropriate caregivers.
- Premixed insulin contains short-acting insulin and **Neutral protamine Hagedorn (NPH)**. The problem is that many individuals eat dinner too early, so 10-12 hours of NPH would last until the middle of the night instead of the morning.

BS: blood sugar

BID: twice daily

Take-home Points

- Screen for cognitive dysfunction when there is:
 - Change in behavior without reason
 - Sudden decline in glycemic control
 - Sudden increase in hypoglycemia
- Avoid hypoglycemia carefully due to difficulty with recognition, prevention, and treatment.
- Repeat important education points at every visit.
- Keep regimen simple.
- Involve caregivers.

Speaker notes:

To summarize Session 2, there are several instances where older adult patients with diabetes should be screened for cognitive dysfunction. Providers must be careful to avoid hypoglycemia and remain aware of how difficult it can be to identify and treat. For patients experiencing some degree of cognitive dysfunction, they should be given simple regimens with repeated education and instructions and caregivers should be engaged in their treatment plan as much as possible.

Session 3: Managing Diabetes in Older Adults with Depression, Polypharmacy, and Functional Impairment



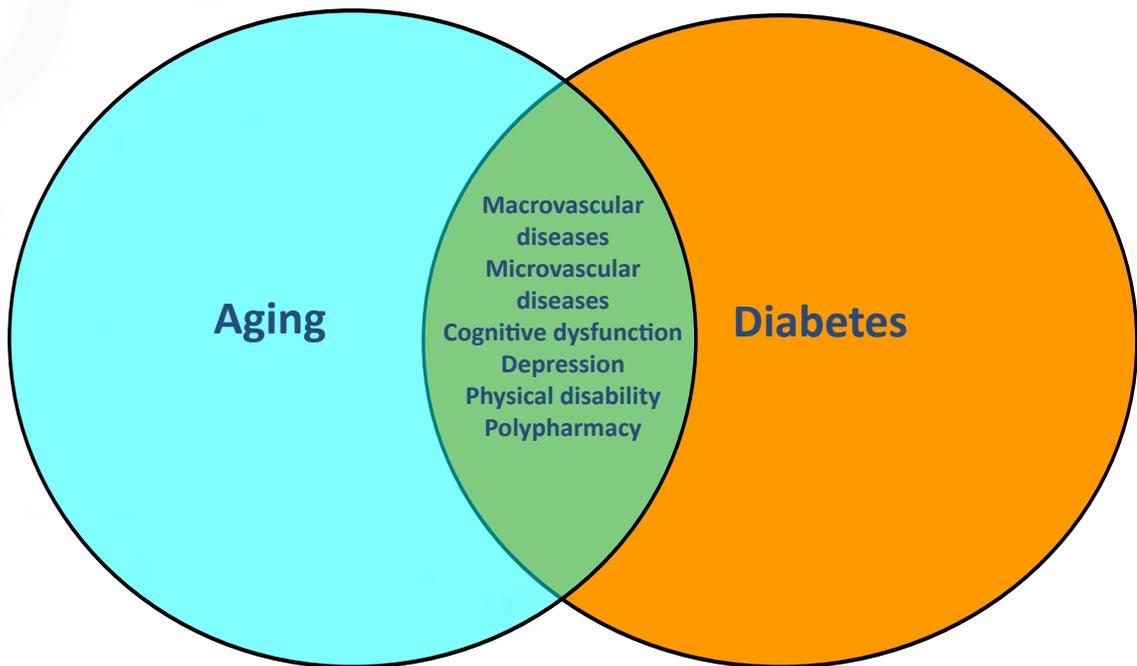
Speaker notes:

This session will explore managing diabetes in older adults with depression, **polypharmacy**, and functional impairment.

Learning objectives:

- Discuss clinical presentation of the older adult with diabetes and co-existing geriatric syndrome conditions.
- Provide screening tools that can be used to identify at-risk patients.
- Discuss strategies to manage diabetes in older adults with geriatric syndrome.

Comorbidities in Aging and Diabetes



Speaker notes:

The first session discussed how both aging and diabetes increase the risk of several conditions. We generally have a good understanding of how to look for both macrovascular and microvascular diseases, such as eye disease, heart disease, and kidney disease. We know why we should be looking for these diseases and how to best manage them.

Some of these other conditions—cognitive dysfunction, depression, disability, and polypharmacy— fall under geriatric syndromes: health problems that can involve many different parts of the body. These conditions do seem to occur at a higher frequency in the older adult population and those with diabetes. This session will look at a few of these comorbidities in more detail.

Case Example: Depression

- Mrs. B is a 78-year-old patient with excellent control of diabetes for 14 years managed on oral agents.
- She was a primary caregiver for her husband. Mr. B, who was recently institutionalized for dementia. She is found to have deteriorating blood sugar control at the next visit.
- While testing for depression, the patient became tearful. She mentioned that she has stopped watching her diet, skips meals-hates to cook for herself, does not exercise and avoids getting out of the house.

Speaker notes:

Here is a case to consider around depression. Usually Mrs. B and her husband would come to the clinic together, but recently she has been going by herself. Her finger stick numbers have been all over the place and typically end up being quite high.

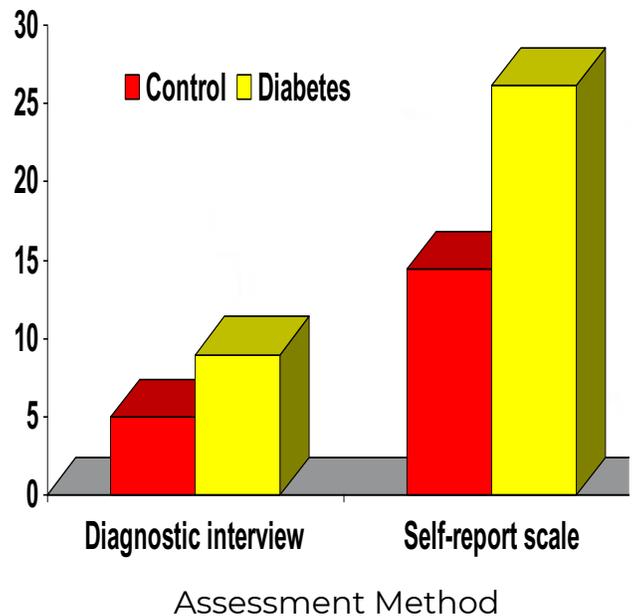
While a provider might at first want to adjust medications because the patient's blood sugar is too high, there is an underlying cause for this problem, which is depression and stress. If the low mood is correctly identified and addressed, numbers could improve.

Depression

In aging

- 3-5% of community elders
- 15-20% of nursing home patients
- Highest rate in elderly, medically ill, inpatient population: 40%

In diabetes



Anderson et al. *Diabetes Care*; June 2001.

Speaker notes:

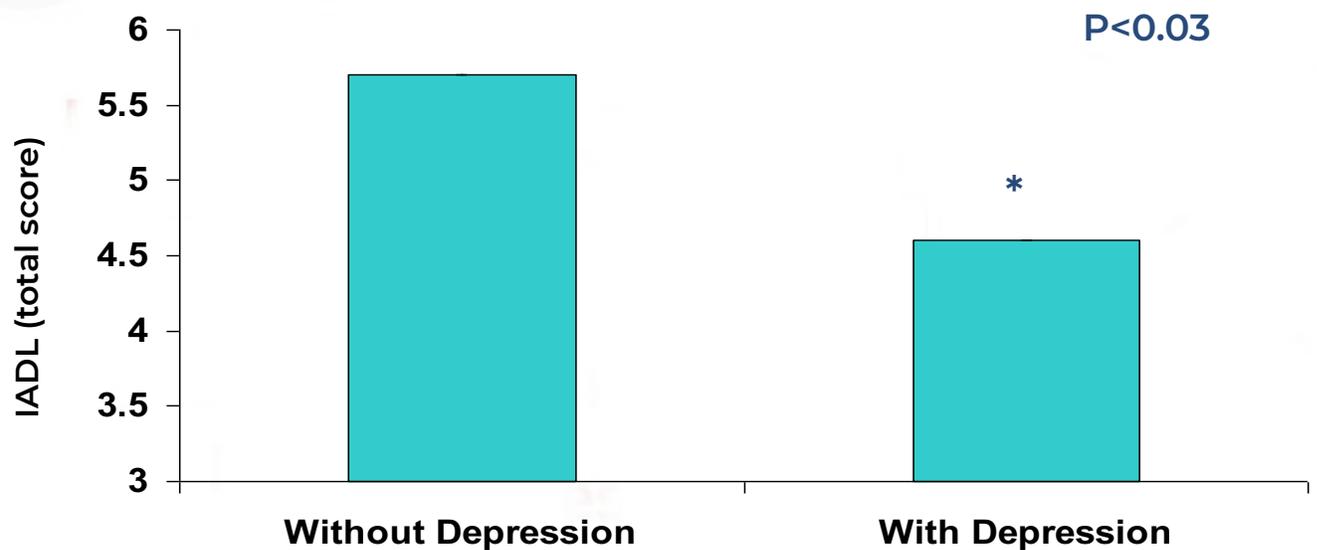
This slide depicts data from a meta-analysis that revealed two methods of depression assessment (interview and self-report) indicated higher rates of depression in individuals living with diabetes. Nursing home residents are more likely to have depression than community-dwelling older adults.

Further reading:

The prevalence of comorbid depression in adults with diabetes: a meta-analysis.

<https://www.ncbi.nlm.nih.gov/pubmed/11375373>

Depressive Symptoms Associated with Increased Risk of Functional Disability



Munshi M, et al. *Diabetes Care*. 2006; 29:1794-9.

Speaker notes:

Patients who have depression have more difficulty performing instrumental activities of daily living (IADL). These activities include cooking, shopping, finances, and medication management. IADLs are related to independent living and can indicate a level of early-stage disease and determine the patient's ability to care for themselves. When we ask a patient to perform the behaviors of diabetes care, exercise, and medication management, are we considering whether they are able to complete other day-to-day activities? It is important to know this before developing a strategy around diabetes management.

Further reading:

Cognitive dysfunction is associated with poor diabetes control in older adults.

<https://www.ncbi.nlm.nih.gov/pubmed/16873782>

Case Example: Polypharmacy

Mrs. M
Age: 92
Legally blind,
14 meds/day



Speaker notes:

Mrs. M takes 14 medications a day, all in monthly blister packs. When she does not feel well she typically picks out a pill, but rather than throwing it away she puts it into the peanut butter jar pictured above. This meant that although Mrs. M's care provider could see which pills Mrs. M had not taken, she did not know which pills she had not taken on any specific day. If Mrs. M's blood pressure is high, the first thought might be to increase her prescription. But the reality of the situation is that she is not adhering to her regimen, and if she takes more, she is at risk for being over medicated and could feel much worse.

Medications

In aging

- Older adults take about three times as many prescription medications as younger adults.
- Change in pharmacokinetics
 - increase in the volume of distribution
 - reduction in drug clearance
- Change in pharmacodynamics
 - increased sensitivity to the effect of certain drugs

In diabetes

- Hypoglycemic agents
- Anti-hypertensive agents
- Cholesterol-lowering agent
- Aspirin
- Medications associated with comorbidities

Speaker notes:

Not only do older adults take more medications than younger adults, but the medications they take affect their bodies differently as **pharmacokinetics** change with the aging process. This refers to how our bodies interact with a medicine, including absorption, and excretion. Aging affects the overall metabolism of a medication. Older adults are also affected by how their bodies respond to a medication, often seeing changes in sensitivity to side effects and negative interactions.

For patients with diabetes, they may need to take multiple glucose-lowering medications and blood pressure-lowering medications. Diabetes is often not the only condition they have, and the treatments taken are often associated with other comorbidities.

Further reading:

Physiological Changes in Older Adults and Their Effect on Diabetes Treatment
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4522898/>

Polypharmacy at the Geriatric Diabetes Clinic

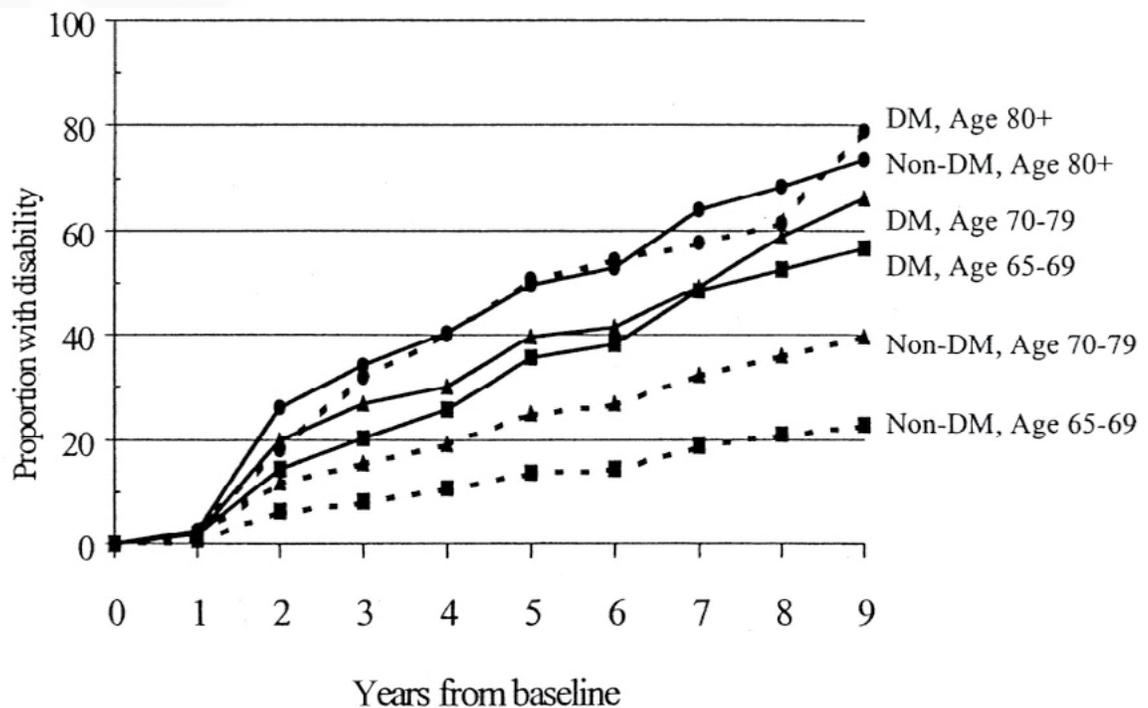
	<5 meds/day	>10 meds/day
Age	78.6	77.7
Duration of diabetes (years)	17	19
A1c	7.6	7.5
With hypoglycemia (%)*	44	69
With depression (%)*	19	53
With cognitive dysfunction (%)*	25	53
With high nutrition risk (%)*	14	42

* p<0.0

Speaker Notes:

In the geriatric diabetes clinic referenced above, older adult patients with diabetes are on a large number of medications. A higher number of medications is associated with higher rates of comorbidities. There is a bi-directional relationship with frail or sick individuals needing more medications, but additional medicine increases the risk for some of their chronic conditions.

Inability to Perform Physical Tasks



Gregg et al. Diabetes Care, 2002.

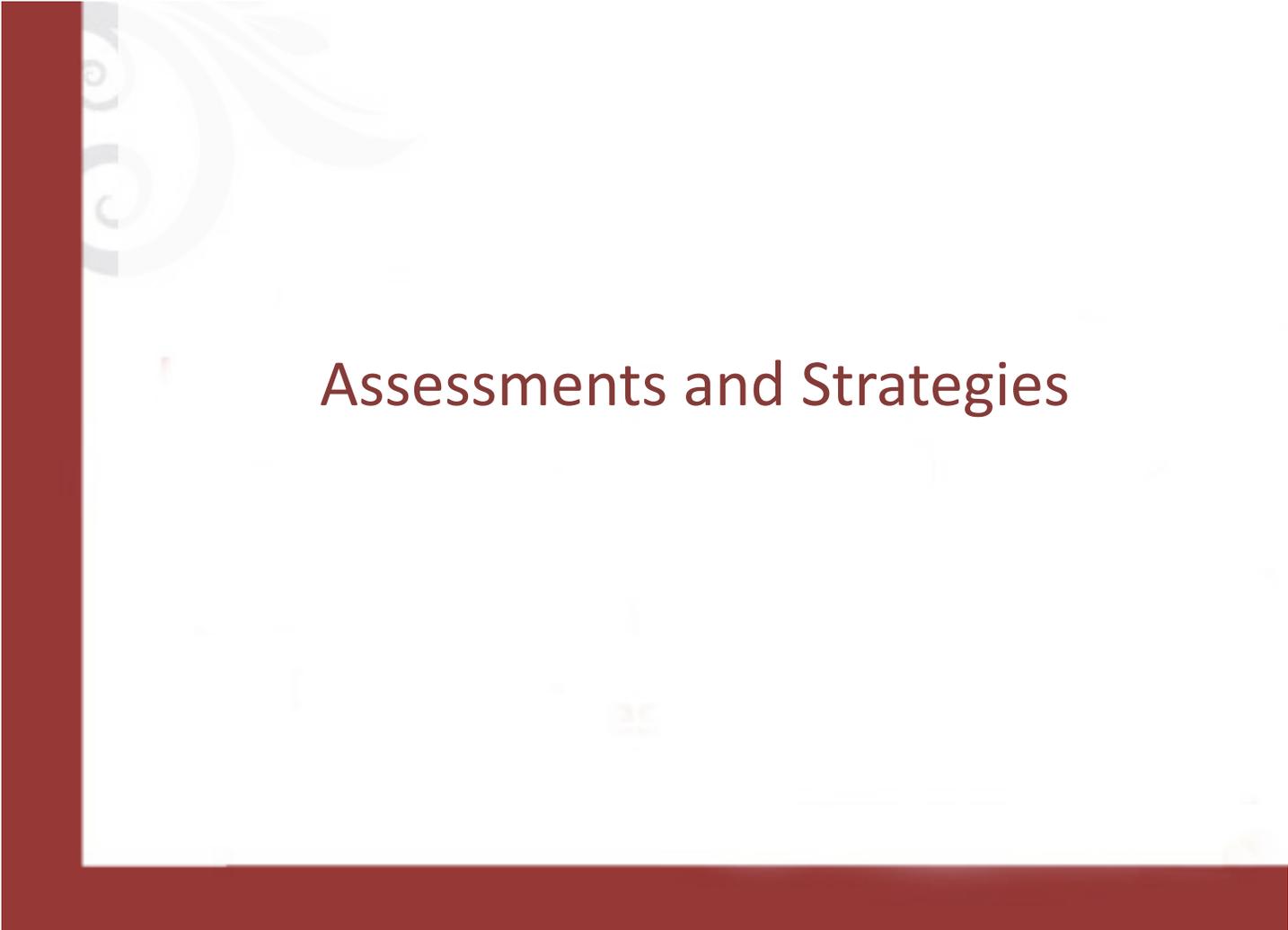
Speaker notes:

Individuals with diabetes typically have more difficulty performing physical tasks, particularly between ages 65 and 80 (as seen on this chart). Providers should keep physical impairments in mind when developing diabetes management strategies. Patients that are not very active or high functioning should not be given complicated medication regimens or monitoring schedules.

Further reading:

Diabetes and Incidence of Functional Disability in Older Women

<https://care.diabetesjournals.org/content/25/1/61>



Assessments and Strategies

Speaker notes:

This next section will review assessment tools and treatment strategies for health literacy, depression, functional impairment, and polypharmacy.

Health Literacy Screening

- How often do you need to have someone help you when you read instructions, pamphlets, or other written material from your doctor or pharmacy?
 - Never
 - Sometimes
 - Always
- How confident are you filling out medical forms by yourself?
 - Not at all
 - Slightly confident
 - Very confident

Speaker notes:

A health literacy screening can be used in the clinic to help providers determine which patients will be able to understand detailed materials or instructions. Many screenings are available online, some of which also screen for depression and cognitive function. It can be hard to adopt new screenings when providers are overwhelmed with patients (who often have multiple conditions), but even asking these two brief questions can assist in understanding whether important health information or instructions should be given directly to the patient or to their caregiver. If a patient is not comfortable completing forms or reading through materials, the provider may need to determine another individual with whom they could share this information.

Further reading:

Health Literacy and Older Adults

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5119904/>

Health Literacy Management Strategy

- Adjust education to patient's ability to understand.
- Involve caregiver.
- Avoid too many instructions.
- Avoid instructions on the phone or in letters.

Speaker notes:

For patients with lower health literacy, providers should adjust their questions and health education to ensure easy understanding. Some good questions to consider:

- Do you know what low glucose feels like?
- What do you do when you feel that way?
- Do you carry glucose tablets with you?

Limit changes made to the care plan to one per visit, and provide documentation for caregivers/primary driver of the care plan. New instructions over the phone or in letters may be difficult to convert into practice, so in-person instructions should also be provided. Safety instructions should always come first. If a caregiver does not live with the patient, they may need additional context to better understand the patient's limitations or challenges.

Depression Screening: Patient Health Questionnaire (PHQ-2)

Over the last two weeks, how often were you bothered by the following:

1. Little interest or pleasure in doing things
2. Feeling down, depressed, or hopeless
 - Not at all
 - Several days
 - More than half the days
 - Nearly everyday

PHQ-9 or **Geriatric Depression Scale (GDS)** are good tests if PHQ-2 is positive

Speaker notes:

The Patient Health Questionnaire is a very brief screening tool that asks patients to reflect on their mood over the last two weeks. Providers can explain to patients that this is not a diagnostic tool, but a way to understand how they feel. If the response to either item is anything beyond “not at all,” additional testing is needed. The PHQ-9 is more involved, but a caregiver could potentially complete it for a patient. These tools can be helpful in identifying concerns, but a geriatrician or psychiatrist is best suited to formally diagnosing depression so they can put a treatment plan in place.

Further reading:

Depression: Screening and Diagnosis

<https://www.aafp.org/afp/2018/1015/p508.html>

Depression Management Strategies

- Screen for depression periodically.
- Consider depression when there is change in self-care behavior without apparent reason.
- Treat or refer to appropriate specialist.

Speaker notes:

Depression is common, but it often presents in a subtle way—particularly in an older generation that may not verbalize their feelings or outwardly identify as being depressed. They may put on a “show” for a clinician, not wanting to bother someone else with what they are experiencing. Screening for depression periodically will help to catch new symptoms as they develop. There are many effective treatments for depression available to patients, but there may still be barriers to the acceptance of assistance and the acknowledgment that a patient cannot fix things themselves.

If a patient is uncomfortable with the idea of seeing a specialist or receiving treatment, the provider could remind them that the brain is just an organ—if someone’s heart sometimes needs help with a medication, their brain might also need it. A short-term commitment to trying a medication may be helpful for a patient, and a follow-up conversation after an initial six weeks could allow them a chance to feel the difference treatment can make.

Functional Assessment

- Activities of daily living (**ADLs**)
 - Eating, bathing, transferring, dressing, toileting
- Instrumental activities of daily living (**IADLs**)
 - Managing medication, using telephone, shopping, household work, transportation, cooking

Speaker notes:

When assessing for functional impairment, we can look at two different sets of activities: The activities of daily living (ADLs) are the basic tasks of self-care, and the instrumental activities of daily living (IADLs) are associated with living independently in a community. A screening question for either category can be as simple as: “Do you have difficulty or require assistance with any of the following?”

If a patient is not able to complete ADLs on their own, there is significant impairment. For patients having difficulty with one or multiple IADLs, they may benefit from services to maintain their independence. Careful consideration must be given to the degree of impairment before implementing a complex diabetes regimen. We want established goals to be appropriate for the patient’s functional abilities.

Further reading:

Geriatric Functional Assessment

<https://www.med.umich.edu/lrc/coursepages/m1/HGD/GeriatricFunctionalAssess.pdf>

Functional Impairment Management Strategies

- Avoid complicated regimens that are beyond patient's coping abilities.
- Develop exercise regimen that fits patient's ability and environment
- Start exercise at a level patient can do.
- Identify fears (e.g, fear of falls) and designate safe way to exercise.
- Identify community resources that can be used.

Speaker notes:

The focus of a management regimen for functional impairment should be on what the patient is experiencing, and what exercises fit the patient's ability and environment. After the type of impairment is recognized, a provider can help a patient to improve by asking the right questions around community resources: Where do you live? Where is the senior center? Who can pick you up/drop you off?

Starting an exercise program at the patient's level can help to break a large goal into more achievable steps. If a patient is using a step counter, a provider can suggest increasing the previous week's goal and continuing to gradually increase each week. Finding a long hallway to go back and forth before meals can be a start. Even if the patient is in a wheelchair or has a hard time walking, it doesn't mean they can't exercise! There are many online resources for exercise regimens with modifications, including:

11 Chair Exercises for Seniors:

<https://www.verywellfit.com/chair-exercises-for-seniors-4161267>

Exercise Programs That Promote Senior Fitness:

<https://www.ncoa.org/center-for-healthy-aging/basics-of-evidence-based-programs/physical-activity-programs-for-older-adults>

Addressing Polypharmacy

- Ask patient to keep list of current medications with current doses.
- Check medication list at each visit.
- Discontinue medications that are unnecessary and not helpful.
- Carefully look for drug side effects.
- Assess OTC, supplements, herbs.
- Consider patient preferences.

Speaker notes:

The majority of older adult patients experience polypharmacy, and as they continue to age, they will likely continue to receive more medications. Keeping a current list of medications and sharing the list with other providers should always be a priority; if other specialists or hospitals are not communicating, they are at risk for harming a patient with negative interactions of old and new medications. Any changes to medications or dosing should be noted on the medication list. A provider may not always know when a medication is not working for a patient, but checking in periodically can help to determine which medications are not necessary, particularly if they were being used only to treat side effects.

Providers should discuss over-the-counter drugs with their patients, as some commonly used treatments are not safe for older adults (like Benadryl). Supplements may present strange symptoms when they interact with other drugs, and if there is a concern providers can suggest stopping for a month to determine whether there has been a change. Providers should keep notes on a patient's comfort level around taking medications and make changes based on preference when appropriate.

OTC: over-the-counter

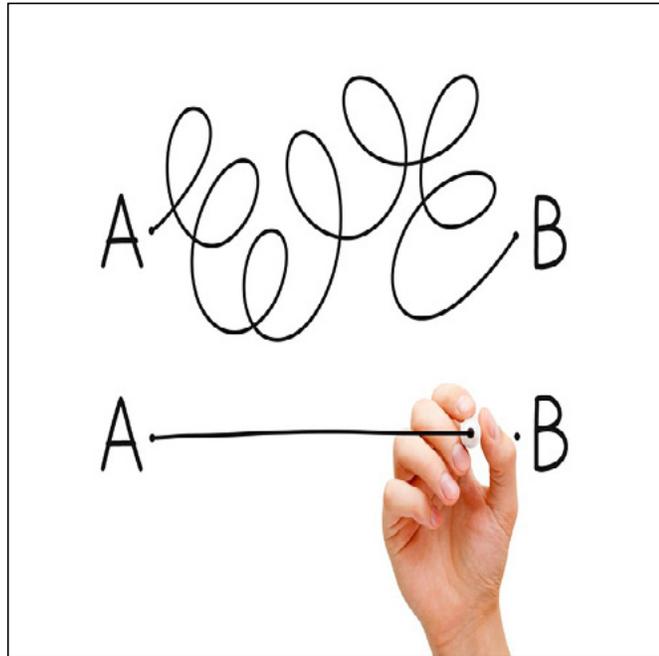
Take-home Points

- Depression
 - Common in older adults, but presents in different ways
 - Should be further assessed and treated when identified
- Physical disabilities
 - Important to identify before developing treatment plans
- Polypharmacy
 - Medications should be carefully reconciled at every visit

Speaker notes:

To summarize Session 3, depression is a common concern for older adults, but can look different from patient to patient. Once identified, further assessment and treatment are needed, often by a geriatrician or psychiatrist. Providers should be aware of any functional impairments before developing a treatment plan for their older adult patients. Polypharmacy poses a huge risk for this population, and medications should always be reviewed and reconciled at each visit. In the geriatric diabetes clinic, the first three problems to look for in every new patient are: medication, medication, and medication!

Session 4: Effective Strategies for Simplification of Regimens in Older Adults with Diabetes



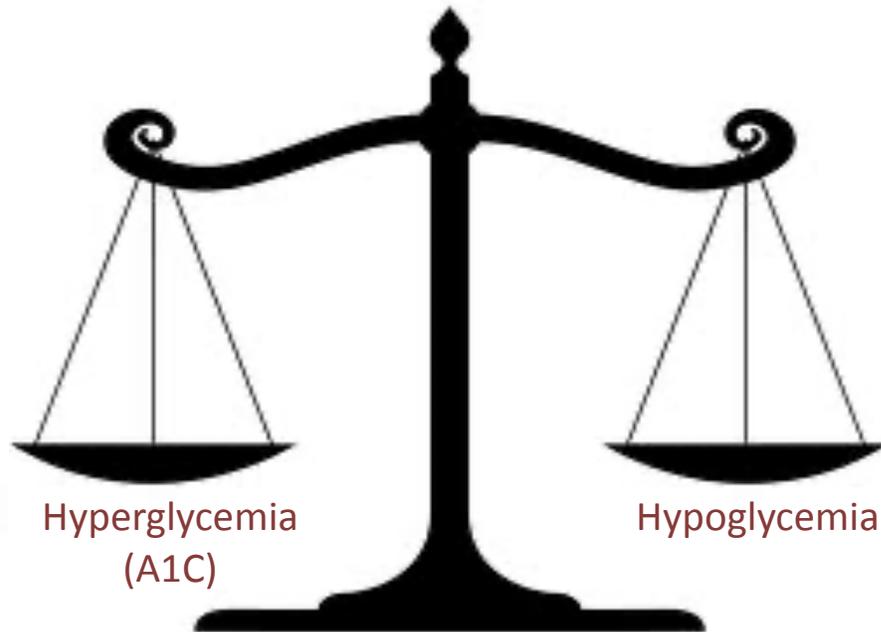
Speaker notes:

This session will provide effective strategies for the simplification of treatment regimens for older adults with diabetes.

Learning objectives:

- Discuss how to manage older adults with worsening glycemic control.
- Discuss how to manage older adults who are unable to cope with a complex insulin regimen.
- Provide tools and algorithm to simplify complex treatment so that patients can cope with their regimen.

Glycemic Goal: Optimize Benefits and Minimize Harm



Speaker notes:

As noted in the previous sessions, establishing appropriate glycemic goals is important for patients with diabetes. If the patient's expectations are not appropriate, treatment will not be successful.

One study explored the barriers to diabetes care and finding coping strategies that optimize a patient's environment. When an educator was aware of barriers and could address access to medication and transportation, glycemic control was improved. If goals were not appropriately set, there were lower frequencies of self-care and higher rates of distress in this population. The goal for all older adult patients is to optimize benefits and minimize harm.

Further reading:

Assessment of Barriers to Improve Diabetes Management in Older Adults

<https://care.diabetesjournals.org/content/diacare/36/3/543.full.pdf>

A Framework for Goals (Consensus report: ADA)

Patient Characteristics/Health Status	Rationale	A1C	BP	Lipids
Healthy <ul style="list-style-type: none"> - Few co-existing illnesses - Intact cognitive status - Intact functional status 	Longer life expectancy	<7.5%	<140/80	Statins unless not tolerated
Complex/Intermediate <ul style="list-style-type: none"> - Multiple co-existing illnesses - Mild-moderate cognitive impairment - 2+ IADL dependency 	<ul style="list-style-type: none"> - Intermediate life expectancy - High treatment burden - Hypo vulnerability - Fall risk 	<8%	<140/80	Statins unless not tolerated
Very Complex/Poor Health <ul style="list-style-type: none"> - LTC care residents - End-stage chronic illnesses - Moderate-severe cognitive impairment - 2+ ADL dependencies 	<ul style="list-style-type: none"> - Limited life expectancy - Benefits uncertain 	<8.5%	<150/90	Consider risks and benefits

Speaker notes:

As a review from the previous sessions, this framework can be used to consider treatment goals for older adult patients. Where does the patient fit within this framework? For those with the most complex characteristics and poor health status, it is more important to consider the risks and benefits of treatments before defining a treatment goal.

ADA: American Diabetes Association

ADL: activities of daily living, including bathing, dressing, grooming, walking, eating.

BP: blood pressure

IADL: instrumental activities of daily living, including shopping, cooking, managing medications, housework, transportation.

LTC: long-term care

Further reading:

Diabetes in Older Adults

<https://care.diabetesjournals.org/content/35/12/2650.long>

Goals in LTC Facilities (Position Statement: ADA)

Patient Characteristics	Rationale	A1C	BG range mg/dl	BG monitoring
SNF (Rehab) - Rehab potential - Goals to discharge home	- Need optimal BS control for after acute illness	Avoid A1C reliance	100-200	Based on complexity of regimen
Nursing home - Limited life expectancy - Frequent fluctuations in health status impacting BG	- Limited benefits of tight control - Focus on better quality of life	<8.5% - A1C may not be reliable due to comorbidities	100-200	Based on complexity and risk of hypoglycemia
End-of-life care - Avoid invasive diagnostic or therapeutic procedures	- No benefits of glycemic control - Avoid symptomatic hyperglycemia	- No role of A1C	Avoid severe hypo- and hyperglycemia	Periodically to avoid severe hypoglycemia or hyperglycemia

Munshi MN et al. *Diabetes Care*. 2016 Feb; 39:308-318,

Speaker notes:

This is a continued review of goals for the three sub-groups under “Very complex/ Poor health” in the last slide’s framework. For patients in a skilled nursing facility (SNF), hemoglobin A1C levels could be high after a hospital stay. If there is too much reliance on A1C levels, this could guide a provider to overcorrect and make too many changes for the patient. There should be a focus on glucose levels while avoiding overly tight control. In thinking about caring for the most vulnerable older adult patients, comorbidities must be considered when checking A1C levels for nursing home residents, and there should be no dependence on A1C for end-of-life care.

BG: blood glucose

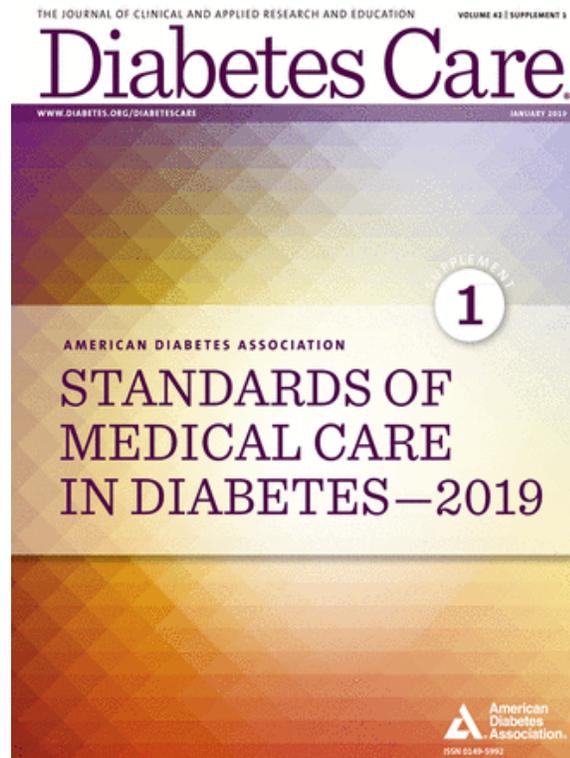
BS: blood sugar

Further reading:

Management of Diabetes in Long-term Care and Skilled Nursing Facilities: A Position Statement of the American Diabetes Association

<https://care.diabetesjournals.org/content/39/2/308>

How to Choose Hypoglycemic Medications



Speaker notes:

Once goals are established and the provider knows where they are trying to take the patient, how do they choose the medication/strategy to improve the glycemic goal?

The American Diabetes Association publishes its *Standards of Medical Care in Diabetes* every January, which ensures that the recommendations are up to date and evidence based.

Further reading:

Standards of Medical Care in Diabetes—2020

https://care.diabetesjournals.org/content/43/Supplement_1

(Note: Because this publication is updated annually, to ensure you are viewing the most recent version, visit the the American Diabetes Association's Diabetes Care website at <https://care.diabetesjournals.org>.)

Take-home Points

Goals of Care

- Prevent complications
- Prioritize quality of life



- Assess key patient characteristics.
- Consider specific factors that impact choice of treatment.
- Use shared decision making to create a management plan.
- Agree on management plan.
- Implement management plan
- Ensure ongoing monitoring and support.
- Review and agree on management plan.

http://care.diabetesjournals.org/content/42/Supplement_1/S34

Speaker notes:

These take-home points summarize a decision cycle graphic within the Standards of Care that shifts the focus to patient-centered diabetes management for patients of all ages. This is a concept that primary care doctors have understood for some time. Many points in the decision cycle are common sense, but it is important to have plans well documented and a management plan defined using SMART (Specific, Measurable, Achievable, Realistic, Time-limited) goals. This new approach is more comprehensive in involving the patient than previous guidance.

Further reading:

(Figure 4.1, Page S35) Comprehensive Medical Evaluation and Assessment of Comorbidities: Standards of Medical Care in Diabetes—2019

https://care.diabetesjournals.org/content/42/Supplement_1/S34

Glucose-Lowering Agents	Efficacy	Hypoglycemia	Weight change
Metformin	High	-	Neutral / loss
Sulfonylurea/Meglitides (SU) Glipizide, glimepiride, (glyburide) Repaglinide, Nateglinide	High	+	Gain
Thiazolidinediones (TZD) Pioglitazone (Actos), Rosiglitazone (Avandia)	High	-	Gain
DPP4 inhibitors (DPPi) Sitagliptin (Januvia), Saxagliptin (Onglyza), Linagliptin (Tradjenta), Alogliptin (Nesina)	Medium	-	Neutral
GLP-1 Receptor agonist (GLP1-RA) Exenatide (Byetta), Exenatide ER (Bydureon), Liraglutide (Victoza, Saxenda), Albiglutide (Tanzeum), Lixisenatide (Lyxumia), dulaglutide (Trulicity), Semaglutide (Ozempic)	High	-	Loss
SGLT-2 inhibitors (SGLT2i) Canagliflozin (Invokana), Dapagliflozin (Farxiga), Empagliflozin (Jardiance)	Medium	-	Loss
Insulin	Highest	+	Gain

Adapted from ADA standard of care. 2019 Jan: 42 (Supplement 1) S93.

Speaker notes:

Both patients and clinicians need simplification of algorithms for choosing a medication—not only for treating diabetes, but also for incorporating multiple conditions that need to be managed at the same time. Here is a simplified way to review the different classes of drugs available to lower glucose levels. After considering the efficacy of each agent, what are other considerations that need to be made for the patient? Which group of drugs would they be a good candidate for?

Further reading:

(Table 9.1, Page S93) Pharmacologic Approaches to Glycemic Treatment: Standards of Medical Care in Diabetes—2019

https://care.diabetesjournals.org/content/42/Supplement_1/S90

	Cardiovascular effects		Renal effects	
	ASCVD	CHF	Progression	Dose/use impact
Metformin	Potential benefit /neutral	Neutral	Neutral	contraindicated eGFR<30
Sulfonylurea	Neutral	Neutral	Neutral	Glyb –↑ risk hypo
TZD	Pio: potential benefit	Pio: ↑ risk	Neutral	No adjustment Risk of edema
DPP4i	Neutral	Saxa: potential risk Alo: potential risk	Neutral	Neutral /dose adjustment
GLP-1RA	Lira> sema > exena: benefit Lixi: neutral	Neutral	Lira: benefit	Exe eGFR<30 Lixi: not rec <30
SGLT-2i	Cana: benefit Empa: benefit	Cana: benefit Empa: benefit	Cana: benefit Empa: benefit	eGFR: Empa <30 Dana <60 and 30 Cana <45
Insulin	Neutral	Neutral	Neutral	Dose adjust

Adapted from ADA standard of care. 2019 Jan: 42 (Supplement 1) S93.

Speaker notes:

Different drugs affect cardiovascular disease and chronic kidney disease differently. Now we have two new groups of drugs that are potentially beneficial for patients who have atherosclerotic cardiovascular disease. This is not information you need to commit to memory, but having this chart as a reference can assist a provider in selecting the best agent for their patients, especially those with other co-morbid chronic conditions.

ASCVD: atherosclerotic cardiovascular disease
CHF: congestive heart failure

Further reading:

(Table 9.1, Page S93) Pharmacologic Approaches to Glycemic Treatment: Standards of Medical Care in Diabetes—2019

https://care.diabetesjournals.org/content/42/Supplement_1/S90

	Other Considerations in Aging Population	Cost
Metformin	- GI side effects, weight loss - B12 deficiency	Low
Sulfonylurea	- FDA warning: Older formulation had higher CVD mortality	Low
TZD	- FDA warning: CHF risk – fluid retention, edema - Benefit in NASH - Bone fracture, bladder cancer (Pio), ↑ LDL (Rosi)	Low
DPP4 inhibitors	- Potential risk of acute pancreatitis - Joint pain	Medium
GLP-1 RA (injectable)	- FDA warning: risk of thyroid c-cell tumors - GI side effects, injection site reactions, potential pancreatitis	High
SGLT-2 inhibitors	- FDA warning: risk of amputation (Cana), risk of fractures (Cana) - GU infection, volume depletion, hypotension, ↑ LDL - DKA (rare in type 2)	High
Insulin (injectable)	- High risk of hypoglycemia	Medium/ High

Adapted from ADA standard of care. 2019 Jan: 42 (Supplement 1) S93.

Speaker notes:

There are several other considerations to make around these glucose-lowering agents for older adults, including serious side effects and FDA warnings. In regard to cost, older adult patients may have limited finances, particularly in a health center setting. Agents that are lowest in cost are typically produced in pill form.

GI: gastrointestinal

CVD: atherosclerotic cardiovascular disease

CHF: congestive heart failure

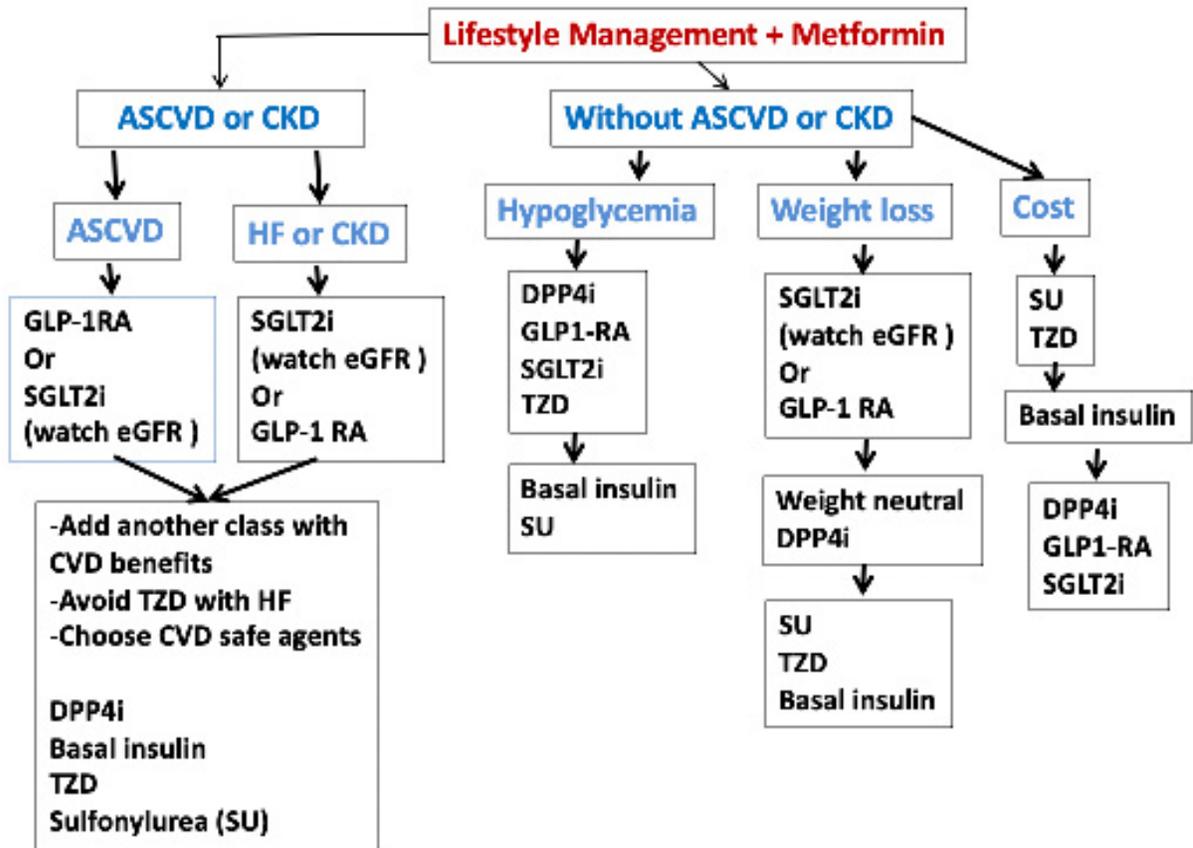
NASH: non-alcoholic steatohepatitis

DKA: diabetic ketoacidosis

Further reading:

(Table 9.1, Page S93) Pharmacologic Approaches to Glycemic Treatment: Standards of Medical Care in Diabetes—2019

https://care.diabetesjournals.org/content/42/Supplement_1/S90



Adapted from Standard of care 2019. *Diabetes Care*: Jan 2019; S94.

Speaker notes:

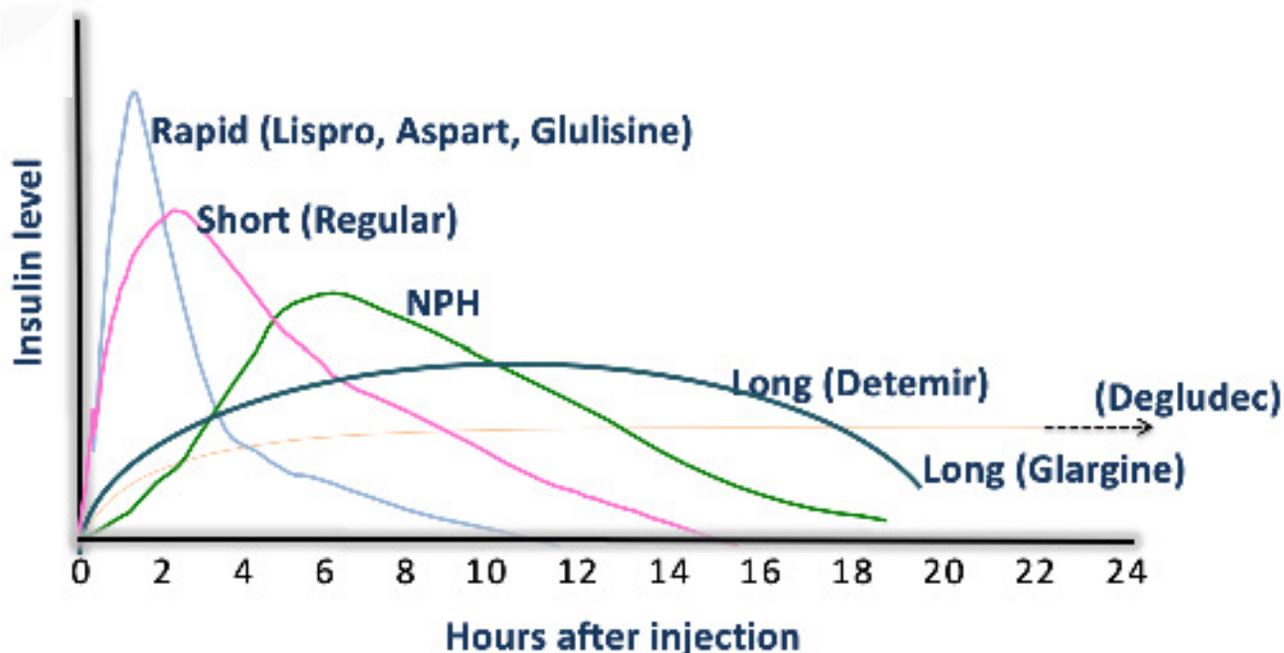
When algorithms are simplified, some of the nuances are taken away, but this is an overall algorithm that can be considered when choosing medications. As shown previously, there can be many complicated charts in diabetes care. Those can still be referenced for the finer details of care.

Lifestyle modification (good diet, exercise) is the basis of all Type 2 diabetes management, and the first medication of choice is metformin for those who can tolerate it. If that approach is not adequate, the next step is to consider whether the patient has either heart disease or chronic kidney disease. Medication order will be switched depending on the condition, as some lower the risk of heart disease. For patients without those conditions, but with a concern for hypoglycemia, avoid insulin or sulfonylurea (SU) until the end. We have seen previously that the costs of these medications can vary, and they do need to be taken into consideration. While sulfonylurea is currently the cheapest, that will hopefully change in the future.

Further reading:

(Figure 9.1, Page S94) Pharmacologic Approaches to Glycemic Treatment: Standards of Medical Care in Diabetes—2019

Pharmacokinetic Properties of Insulin Formulations



Diabetes Care. 2012; 35:1364-1379. *Diabetologia.* 2012; 55:1577-1596.
Diabetes Care. 2015; 38:140-149. *Diabetologia.* 2015; 10.1077/s00125-014-3460-0.

Speaker notes:

Here is a diagrammatic representation of the approximate pharmacokinetic properties of various insulin formulations. Understanding the onset, peak, and duration of action of insulin products is key for the successful management of patients with diabetes. It is important for providers to understand this chart because they can target when the patient has high or low glucose, and then change the dose of insulin. Monitoring over time can allow providers to bring blood sugar lower at specific times without causing hypoglycemia.

Further reading:

Position Statement of the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD)

<https://care.diabetesjournals.org/content/35/6/1364>

Management of hyperglycemia in type 2 diabetes: a patient-centered approach.

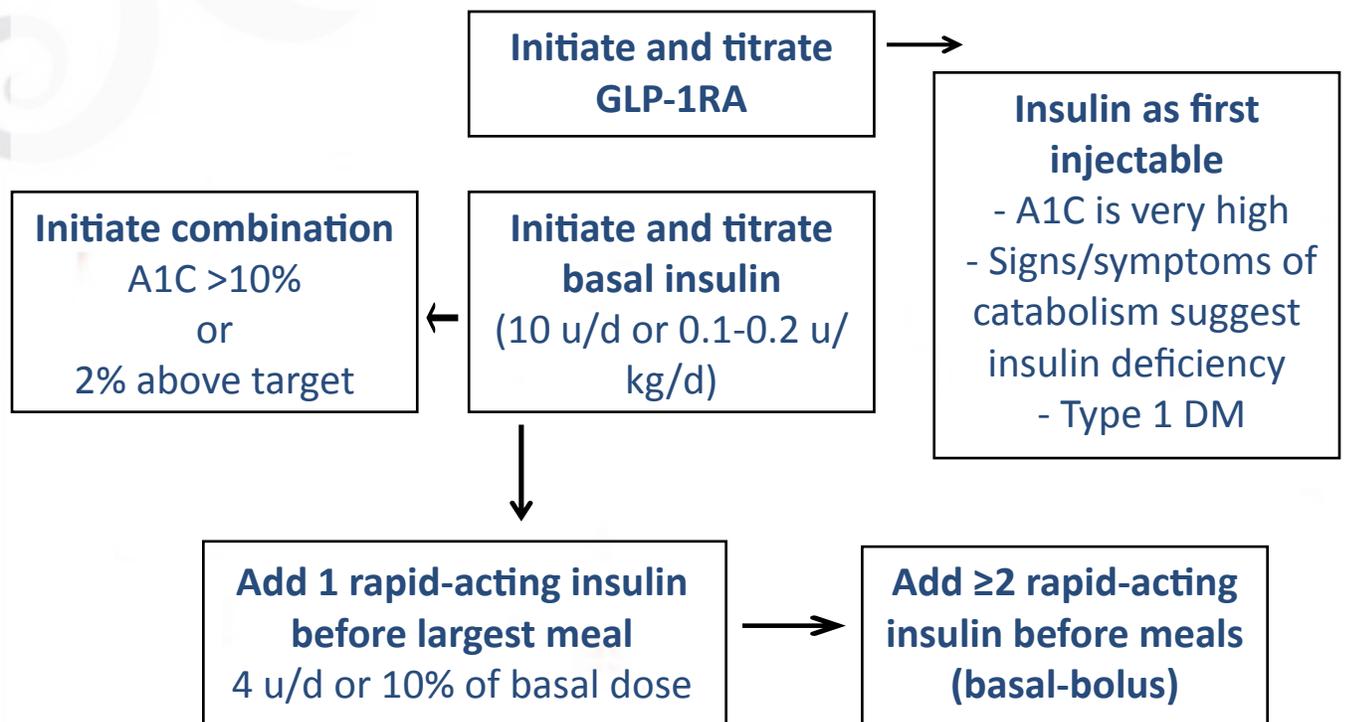
<https://www.ncbi.nlm.nih.gov/pubmed/22526604>

Management of Hyperglycemia in Type 2 Diabetes, 2015: A Patient-Centered Approach: Update to a Position Statement of the American Diabetes Association and the European Association for the Study of Diabetes

<https://care.diabetesjournals.org/content/38/1/140>

<https://www.ncbi.nlm.nih.gov/pubmed/25583541>

Injectable Therapy



Adapted from Standard of care 2019. *Diabetes Care*: Jan 2019; S95.

Speaker notes:

After you choose oral medications, it is recommended that the patient starts with GLP (glucagon-like peptide class of drugs) if they can afford it or are eligible. For long-acting basal insulin, the recommendation is for patients that have high glucose levels after other medications to start with 10 units a day. It can be increased once the patient is used to the new insulin. For older adult patients with diabetes, it is not recommended to start anyone on two medications at the same time. The best approach is to go slow! If glucose levels are still not under control after basal insulin, add a rapid-acting insulin before the patient's largest meal of the day. The provider can keep adding as needed.

Older patients may come to the clinic with high A1C because of insulin resistance, as it increases with age. Once their treatment has brought their levels more under control, they can eventually transition to oral medications.

Further reading:

(Figure 9.2, Page S95) Pharmacologic Approaches to Glycemic Treatment: Standards of Medical Care in Diabetes—2019

https://care.diabetesjournals.org/content/42/Supplement_1/S90

Starting and Adjusting Insulin in Type 2 Diabetes

- Start basal insulin in the morning.
- Titrate basal insulin till next day fasting glucose is controlled.
- Metformin, DPP-4i, GLP-1RA, SGLT-2i can be used to control postprandial numbers.
- May use metformin or sulfonylurea long-acting once a day.
- DPP-4 and SGLT-2 are once a day.
- GLP-1RA available once a week.
- Do not chase bedtime numbers.

Speaker notes:

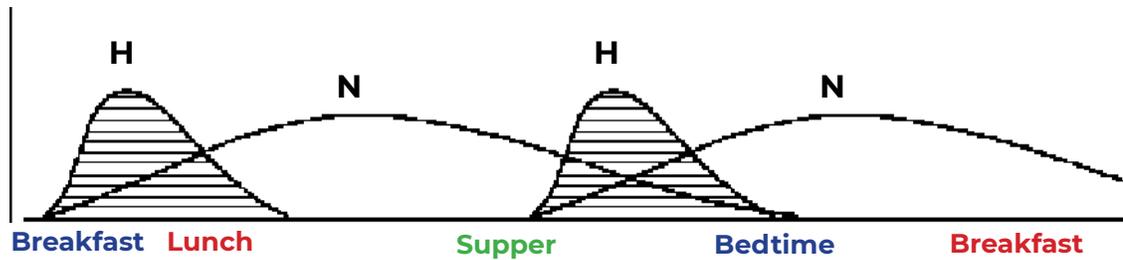
Here is a recommended approach to starting and adjusting insulin for older adult patients with diabetes. Start basal insulin in the morning, and then titrate to fasting glucose. It is strongly recommended not to chase bedtime glucose levels; these tend to run pretty high after a late afternoon meal, and numbers will fall overnight. Focusing too much on bedtime numbers could cause a patient to go too low overnight or in the morning. Even if a starting A1C is high, providers should consider de-escalation once there is better control.

DPP-4: dipeptidyl peptidase-4 inhibitor

GLP-1RA: glucagon-like peptide-1 receptor agonist

SGLT-2i: sodium-glucose co-transporter-2 inhibitor

Mix and Match



Speaker notes:

Here is an example of coverage provided by a split mix of insulin:
Lispro and NPH in the morning
Lispro and NPH at supper time

H: short-acting
N: long-acting

Providers should be careful with premixed insulin for older adults, as NPH can peak in the middle of the night. If the patient has an early dinner, there could be low blood sugar overnight. Premixed for morning doses is acceptable, but only longer-acting should be used at night.

Caveats for Use of Insulin in Older Adult Patients

- Use premixed carefully, especially evening dose as NPH may peak in middle of the night.
- May use premixed in the morning and NPH at bedtime.
- In those who can only manage once-a-day insulin, premixed and basal both can be given in the morning.
 - Titrate basal for fasting glucose levels.
 - Titrate mixed for pre-lunch and pre-dinner glucose levels.
- Avoid problem solving: if multiple insulin injections are needed, use fixed dose, avoid scales.
- If scale is needed, use fixed scale short-acting insulin.
 - e.g. 2 units for BG>250, or 4 units for BG>350 (can be used for visiting nurses)

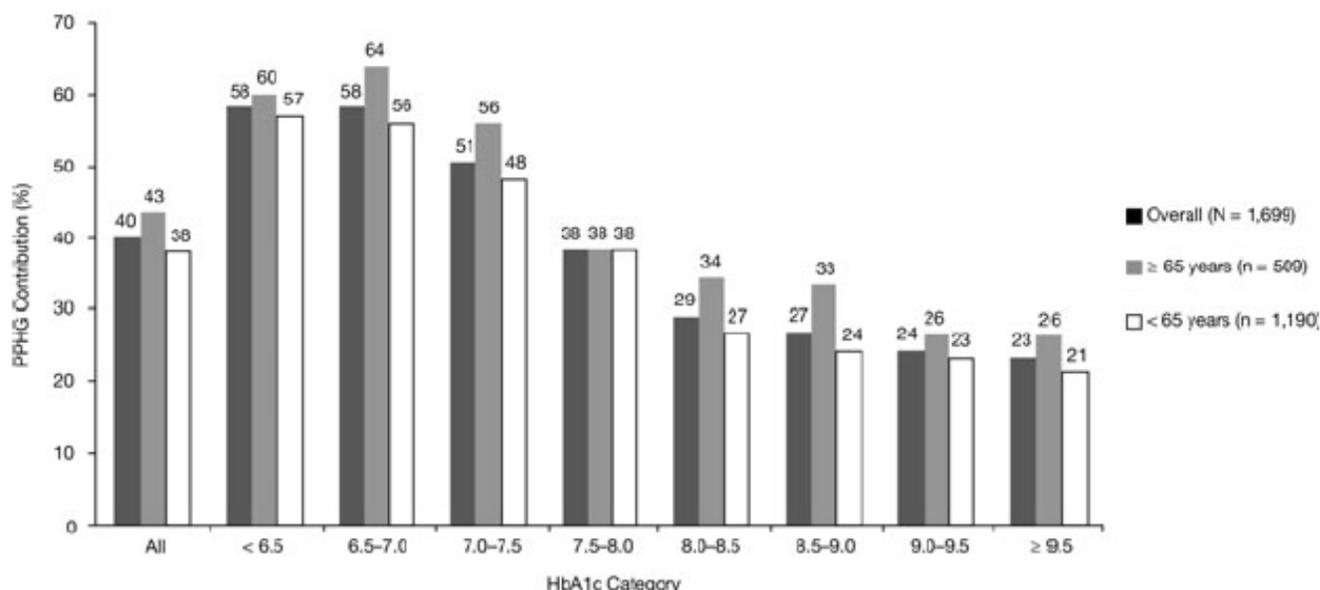
Speaker notes:

Problem solving can get very complicated for use of insulin within older adult patients. Using a fixed scale around blood glucose is not as detailed, but more easily implemented.

NPH: insulin NPH (an isophane suspension of human insulin)

BG: blood glucose

Higher Contribution of Postprandial Glucose in Hyperglycemia in Older vs. Younger Adults

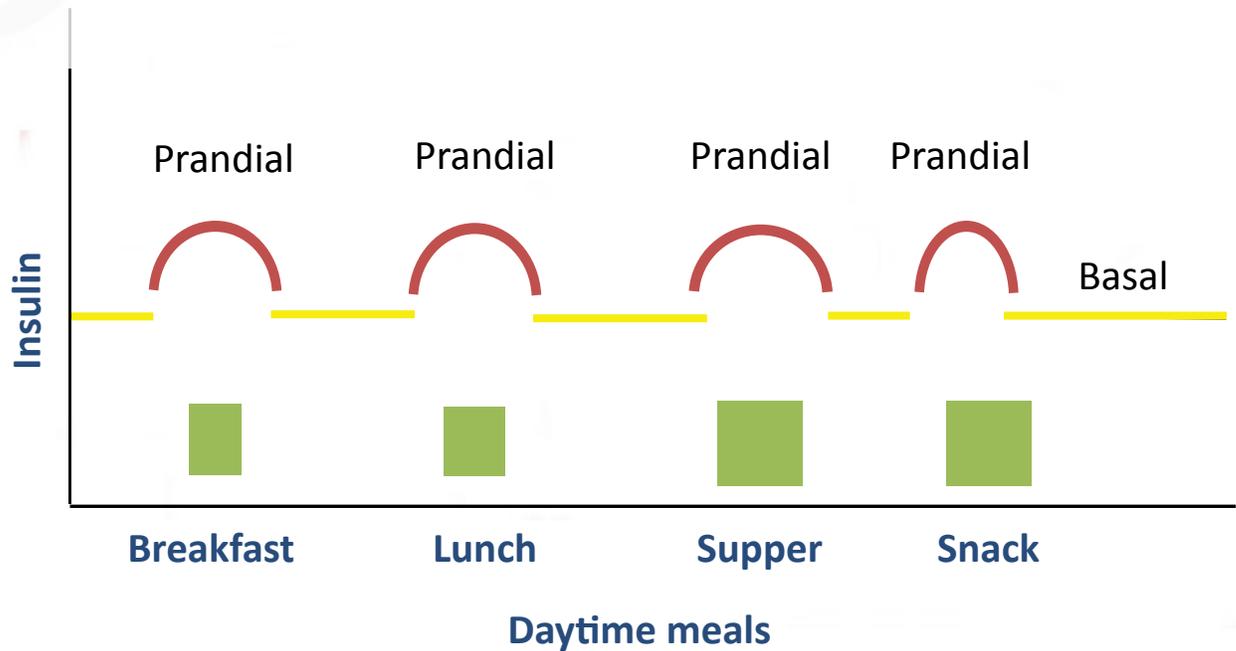


Munshi et al. *J Am Geriatr Soc.* 2013; 61:535-541.

Speaker notes:

What this study comparing younger and older adults' hyperglycemia showed is that at any A1C level, older patients had higher post-meal (postprandial) glucose levels. This suggests that different therapeutic approaches may be required to treat hyperglycemia effectively in these different age groups.

Sliding Scale Insulin: *Not a good strategy in the long-term*



Speaker notes:

It is important to note that insulin levels change during the day to match up with need and are never zero. A sliding scale is okay to use for short times when a patient is unsure, but if their levels are too high every day before lunch, there should be a change to the dosage at breakfast. This is a proactive fix to the correct dose, instead of having the patient constantly combatting high glucose levels.

This slide is a very simplified schematic of insulin release during the day.

- The yellow line reflects the background level of insulin during periods of fasting.
- The pink bumps reflect the increase in insulin release associated with meals.

Strategies to Replace Sliding Scale Insulin

- Basal + mealtime + SSI as correction dose
 - » If correction dose is needed frequently, add average correction dose to preceding mealtime dose.
 - » If correction dose needed before dinner frequently, increase the mealtime insulin dose before lunch.
- SSI short term (irregular eating or acute illness)
 - » Keep it short term.
 - » Stop SSI as health improves.
- Wide fluctuation, cognitive dysfunction, irregular eating
 - » Use scheduled doses if possible with goals to avoid hypo.
 - » May have simplified scale, e.g. if BS>250, give 4 units short-acting.
 - » Maintain hydration with high BS.

Munshi MN et al. *Diabetes Care*. 2016 Feb; 39:308-318 .

Speaker notes:

Several organizations have developed diabetes guidelines for patients living in long-term care settings. Simplified treatment regimens are always preferred, and the sole use of sliding scale insulin (SSI) should be avoided. There are multiple approaches depending on how SSI has been used for the patient.

Further reading:

Management of Diabetes in Long-term Care and Skilled Nursing Facilities: A Position Statement of the American Diabetes Association

<https://care.diabetesjournals.org/content/39/2/308>

Strategies to Replace Sliding Scale Insulin

- Only on SSI
 - » Calculate average dose/day over past 5–7 days.
 - » 50–75% of daily dose as basal (consider a.m. dose).
 - » Stop SSI, use non-insulin agent or fixed dose insulin for postprandial control.

- SSI + basal insulin
 - » Add 50–75% of average daily dose of SSI to basal dose. Use non-insulin agents/fixed dose insulin for postprandial control.

Munshi MN et al. *Diabetes Care*. 2016 Feb; 39:308-318.

Speaker notes:

This slide continues the examination of the multiple approaches to replacing sliding scale insulin. Simplified treatment regimens are always preferred.

Further reading:

Management of Diabetes in Long-term Care and Skilled Nursing Facilities: A Position Statement of the American Diabetes Association

<https://care.diabetesjournals.org/content/39/2/308>

Monitoring Issues

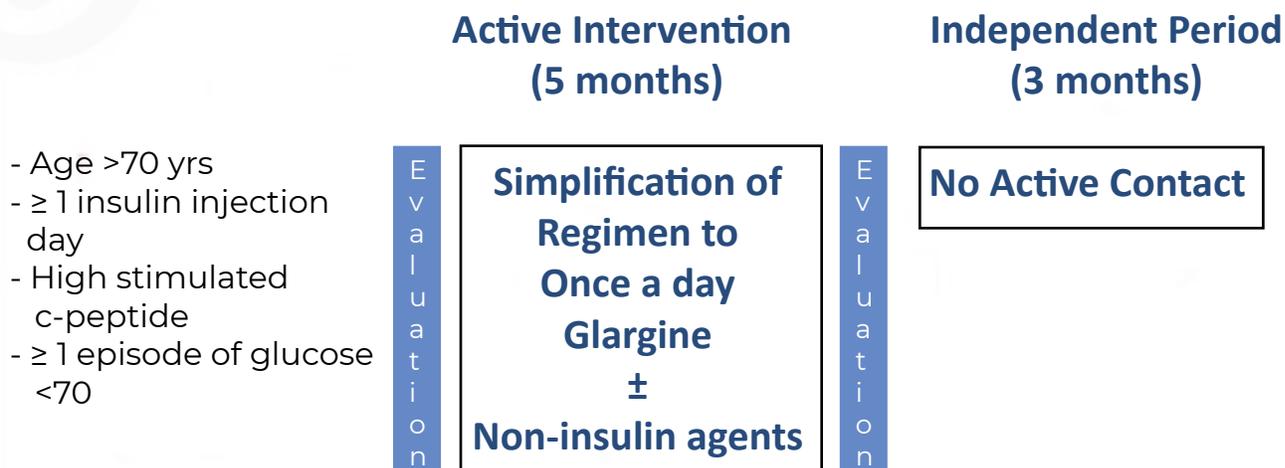
- How frequently to monitor?
 - Stability of diabetes
 - Type of medications used
 - Stability of overall health
 - Patient condition/preference

Speaker notes:

If a patient's diabetes has been stable for a long time, providers should not require monitoring more frequent than once a day. The patient's treatment plan is not changing anything based on the daily numbers. The question should always be asked: What are we doing with the numbers? Older adult patients often want to use finger pokes, but that is not necessarily helping their diabetes. It would only do so if their behavior or treatment changed from the results. Levels can be checked once a day at a different time each day (avoiding bedtime). If a patient is very stable, they could check every other day. If they are on insulin, patients will need to be a little more careful with the risk of hypoglycemia.

Advice to patients can be: When you are not feeling well or something does not feel right, check your numbers. For those in end-of-life care, they should not need to check frequently except for feelings in extreme directions.

SIMPLE Study: Simplification of Insulin Regimen



- Hypo duration ↓ from 277 min to 111 min at 5 months
- Further ↓ to 97 min at 8 months
- No significant change in A1C 7.7 % , 7.5 % , 7.7%

Munshi et al. *JAMA Intern Med.* 2016 July 1; 176(7):1023-5.

Speaker notes:

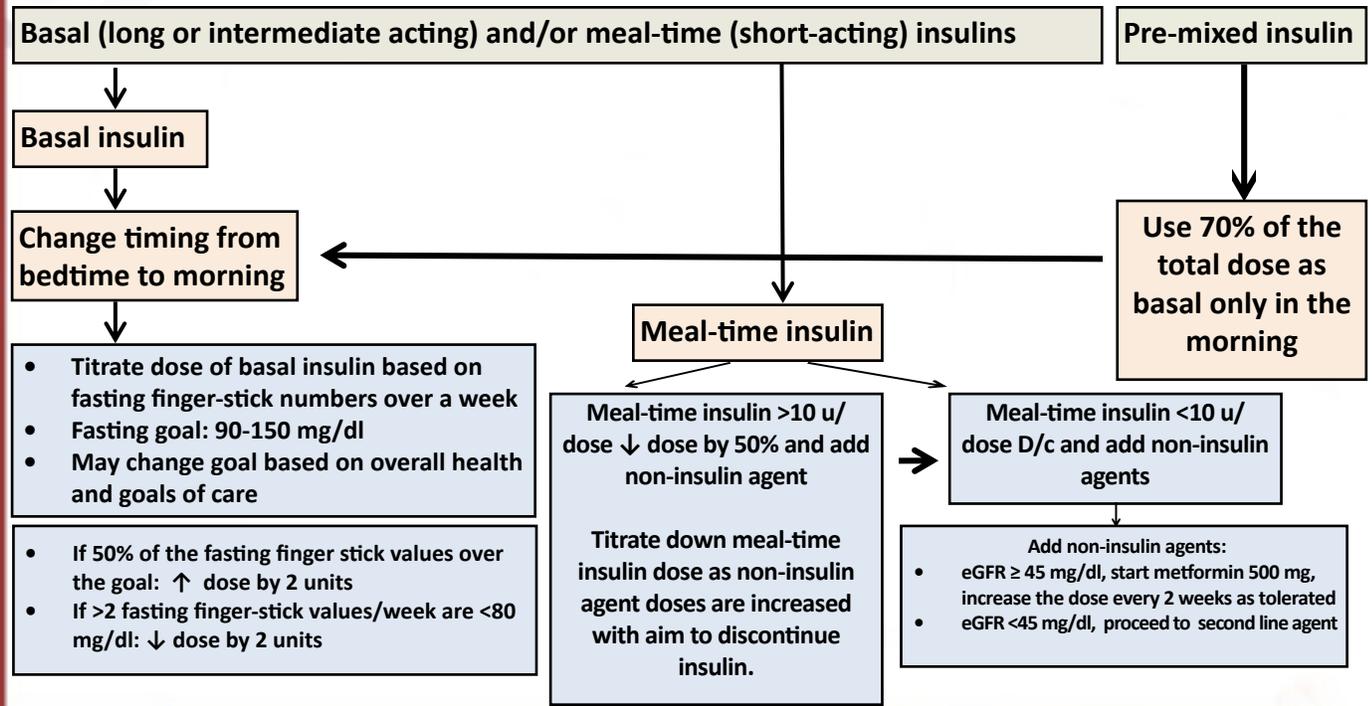
Diabetes treatment is typically all about adding things, but sometimes it becomes too much for an older adult to keep up with the regimen. This study looked at the simplification of insulin regimens and found that it resulted in an overall decrease of hypoglycemia in this population. These results were maintained over time, even with no active contact.

Further reading:

Simplification of Insulin Regimen in Older Adults and Risk of Hypoglycemia.

<https://www.ncbi.nlm.nih.gov/pubmed/27273335>

Algorithm for Simplification of Insulin Regimen: From multiple injections to once-a-day long-acting (basal) + non-insulin agents



Munshi et al. *JAMA Intern Med.* 2016 July 1; 176(7):1023-5.
SOC ADA 2019. *Diabetes Care.* Jan 2019; S143.

Speaker notes:

This algorithm illustrates what that regimen simplification could look like. Doses can go up or down gradually.

Further reading:

Simplification of Insulin Regimen in Older Adults and Risk of Hypoglycemia

<https://www.ncbi.nlm.nih.gov/pubmed/27273335>

Lifestyle Management: Standards of Medical Care in Diabetes—2019

https://care.diabetesjournals.org/content/42/Supplement_1/S46

Algorithm for Simplification of Insulin Regimen:

From multiple injections to once-a-day long-acting (basal) + non-insulin agents
(Metformin not adequate or not tolerated)

Based on patient and disease characteristics, follow ADA guidelines to select additional agents:

- Dose adjustment and addition of new agents should be done every 2 weeks, based on finger-stick readings performed before lunch and before dinner.
- Goal: 90-150 mg/dl before meals. May change goal based on overall health and goals of care.
- If 50% of pre-meal finger-stick values over 2 weeks are >goal, increase the dose or add another agent.
- If >2 pre-meal finger-stick values / week are <90 mg/dl, ↓ the dose of medication.

Munshi et al. *JAMA Intern Med.* 2016 July 1; 176(7):1023-5.
SOC ADA 2019. *Diabetes Care.* Jan 2019; S143.

Speaker notes:

Please keep in mind for older adults:

- While titrating down meal-time insulin, you may use a simplified sliding scale while adjusting to a new routine (stop when not needed daily).

Example: Pre-meal glucose >250, give 2 u of short-acting insulin

Pre-meal glucose >350, give 4 u of short-acting insulin

- Do not use short-acting insulin at bedtime. Once patient starts to achieve good control, short-acting insulin can be stopped altogether.

Further reading:

Simplification of Insulin Regimen in Older Adults and Risk of Hypoglycemia

<https://www.ncbi.nlm.nih.gov/pubmed/27273335>

Lifestyle Management: Standards of Medical Care in Diabetes—2019

https://care.diabetesjournals.org/content/42/Supplement_1/S46

Before Making a Decision

Ask:

- Cognitive function: is missing doses a problem?
- Glucose pattern: lows and highs - when?
- Support system: who lives with patient?
- Type of diabetes: oral meds an option?
- Eating pattern, weight loss, access to meals
- Insurance, financial issues
- Life expectancy, goals

Speaker notes:

Decision-making should rely on a patient-centered approach, which involves looking beyond the numbers and asking in-depth questions to better understand unique needs. The questions and topics included on this slide will help lead providers to the right insulin and oral medications and determine the best treatment strategy.

Take-home Points

- Goal-setting
 - Consider comorbidities, cognitive, and functional status.
 - Avoid dependence on A1C alone. Risk of hypoglycemia can be independent of A1C.
- Choosing medications
 - Consider patient and disease-related factors.
 - Consider presence of atherosclerotic cardiovascular disease, heart failure, and chronic kidney disease.
- Treatment strategies
 - The simpler, the better.
 - Match patient's coping abilities with complexity of the regimen.

Speaker notes:

To summarize Session 4, goal-setting should be patient centered and take into consideration an older adult's comorbidities, as well as their cognitive and functional status. The risk of hypoglycemia is not necessarily dependent on A1C, and as a general practice, A1C should not be used as a provider's only reference point. The best medications for an older adult patient may change depending on disease-related factors. And finally, when possible, simplified treatment strategies are best for older adults living with diabetes and other geriatric syndromes. Health center staff should aim to match the complexity of a treatment regimen with a patient's unique circumstances and coping abilities.

This concludes the curriculum for Addressing Common Geriatric Syndromes Associated with Diabetes.

Glossary

Hyperglycemia – Also known as high blood glucose. Occurs as a result of the body's lack of insulin or inability to use insulin properly. (From Cleveland [Cleveland Clinic](#)) (Page 12)

Hypoglycemia – Also known as low blood glucose. Occurs when there is more insulin than needed to regulate sugar levels. (From [Cleveland Clinic](#)) (Page 12)

Mini-Mental State Examination (MMSE) – Screening tool that assesses a wide range of domains, including attention, language, memory, orientation, and visuospatial proficiency. (From [American Family Physician](#)) (Page 39)

Montreal Cognitive Assessment (MoCA)– Screening tool that assesses attention, executive functioning, language, memory, and orientation. (From [American Family Physician](#)) (Page 39)

Neutral Protamine Hagedorn (NPH) – An intermediate-acting insulin with onset of action in 1 to 3 hours, duration of action up to 24 hours, and peak action from 6 to 8 hours. (From [StatPearls](#)) (Page 47)

Pharmacokinetics – The study of the bodily absorption, distribution, metabolism, and excretion of drugs. (From [Merriam-Webster](#)) (Page 55)

Physiological reserve – Excess capacity of biological system and organs to maintain their functions in response to stress. (From [Biogerontology](#)) (Page 7)

Polypharmacy – The concurrent administration of multiple medications to treat either a single disease or coexisting conditions. May result in adverse drug interactions. (From [Merriam-Webster](#)) (Page 49)

Sulfonylureas – Medications that lower the level of blood glucose. Taken by people with Type 2 diabetes. They increase the release of insulin from the pancreas. (From [Everyday Health](#)) (Page 15)