

# DIABETES IN OLDER ADULTS

NW GWEC – SPRING GERIATRIC HEALTHCARE SERIES 2023

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## DISCLOSURES

- Nothing to disclose.
- No identified conflicts of interest.

*Thank you to Peggy Odegard for her assistance in development of this presentation*

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## OBJECTIVES

1. Identify potentially inappropriate medications for blood sugar management in older adults
2. Assist in overcoming barriers to diabetes self management in older adults
3. Identify opportunities for deprescribing medications for diabetes in older adults

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## OUTLINE

1. Background: Diabetes in Older Adults
2. Geriatric Syndromes and Diabetes  
*polypharmacy, UI, Falls, Pain, Depression, Cognitive Impairment*
3. Blood Glucose Control  
*goals, hypoglycemia*
4. Medication considerations  
*drug classes, simplification of regimens*
5. Barriers to Self-Care
6. Patient Cases

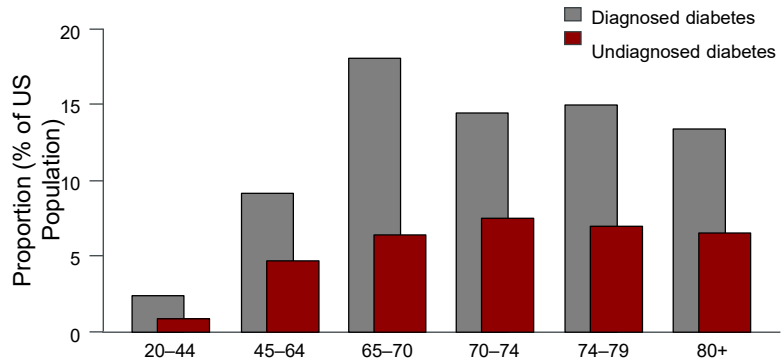
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## DIABETES IN OLDER ADULTS

- Older adults are at greater risk for type 2 diabetes than younger adults
  - Close to 1 in 3 older adults (age 65+) has diabetes
    - (diagnosed or undiagnosed)

NHANES = National Health and Nutrition Examination Survey.  
 Selvin E et al. *Diabetes Care*. 2006;29(11):2415–2419.  
<https://www.cdc.gov/diabetes/data/statistics-report/index.html>

- 2006:



- 2019:

- ~29.2% of adults 65+ had diabetes

- 2022:

- CDC reported >48% of adults 65+ had pre-diabetes

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## DIAGNOSIS OF DIABETES IN OLDER ADULTS

- Diagnosis of type 2 diabetes in older adults is not always straightforward
  - Up to 50% of people may not experience symptoms
  - Symptoms often nonspecific
    - E.g. fatigue
  - Many symptoms may also be associated with aging
    - E.g. blurry vision, increased urination, unintentional weight loss

<https://diabetesjournals.org/spectrum/article/33/3/217/32346/Challenges-and-Strategies-for-Diabetes-Management?searchresult=1>

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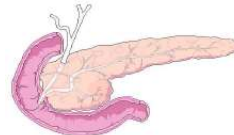
## DIABETES IN OLDER ADULTS PATHOPHYSIOLOGY OF T2DM – 2 PRIMARY CONTRIBUTORS

### Increasing Insulin Resistance

- Low physical activity
- Sarcopenia
- Decreased insulin action
- Visceral adiposity

### Impaired Pancreatic Islet Functioning Associated with Aging

- Beta cell function declines with age
  - ~1.1% per year












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## DON'T FORGET TYPE I DIABETES!

- Focus in older adults has often been type 2 diabetes
- With advancements in technology, pharmacology (specifically insulin therapy and insulin delivery devices), people with type I diabetes are living much longer

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**Clinical Frailty Scale**

 <p><b>1. Very fit</b> – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.</p>	 <p><b>7. Severely frail</b> – Completely dependent for personal care, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).</p>
 <p><b>2. Well</b> – People who have no active disease symptoms but are less fit than category 1. Often, they exercise or are very active occasionally, e.g. seasonally.</p>	 <p><b>8. Very severely frail</b> – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness.</p>
 <p><b>3. Managing well</b> – People whose medical problems are well controlled, but are not regularly active beyond routine walking.</p>	 <p><b>9. Terminally ill</b> – Approaching the end of life. This category applies to people with a life expectancy &lt;6 months, who are not otherwise evidently frail.</p>
 <p><b>4. Vulnerable</b> – While not dependent on others for daily help, often symptoms limit activities. A common complaint is being "slowed up", and/or being tired during the day.</p>	
 <p><b>5. Mildly frail</b> – These people often have more evident slowing, and need help in high order IADLs (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.</p>	
 <p><b>6. Moderately frail</b> – People need help with all outside activities and with keeping house. Inside, they often have problems with stairs and need help with bathing and might need minimal assistance (cuing, standby) with dressing.</p>	

**Scoring frailty in people with dementia**

The degree of frailty corresponds to the degree of dementia. Common **symptoms in mild dementia** include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In **moderate dementia**, recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In **severe dementia**, they cannot do personal care without help.

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## OLDER ADULTS WITH DIABETES - CONSIDERATIONS

- Regularly assess:
  - Medical status
  - Psychological status
  - Functional status
  - Social status/support
- Other considerations:
  - Duration of diabetes
    - Impacts goals of care
  - Complications
    - Impacts priorities, therapy considerations
- Older adults with diabetes have higher rates of:
  - Premature death
  - Functional disability
  - Accelerated muscle loss
  - Coexisting illnesses
  - **Geriatric syndromes**

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## GERIATRIC SYNDROMES IN OLDER ADULTS WITH DIABETES

- Higher Risk of:
  - Polypharmacy
  - Urinary incontinence
  - Falls
  - Pain
  - Depression
  - Cognitive impairment

Whalen KL, Mansour H. Pharmacotherapy of Diabetes in the Elderly. US Pharm. 2009; 43(7): 44-48. [uspharmacist.com/article/pharmacotherapy-of-diabetes-in-the-elderly](http://uspharmacist.com/article/pharmacotherapy-of-diabetes-in-the-elderly)

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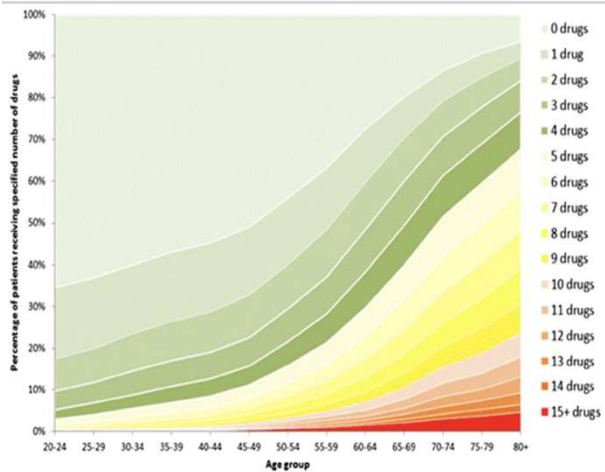
## GERIATRIC SYNDROMES AND DIABETES

- Geriatric syndromes can lead to an increase in functional impairment and disability in older adults with diabetes
- May impact:
  - Independence
  - Quality of life
  - Vulnerability to other comorbidities
- Slight improvements to diabetes control or condition and significantly impact quality of life

Laiterapong N, Karter AJ, Liu JY, et al. Correlates of quality of life in older adults with diabetes: the Diabetes & Aging Study. Diabetes Care 2011;34:1749-1753

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## MEDICATION CONSUMPTION / POLYPHARMACY

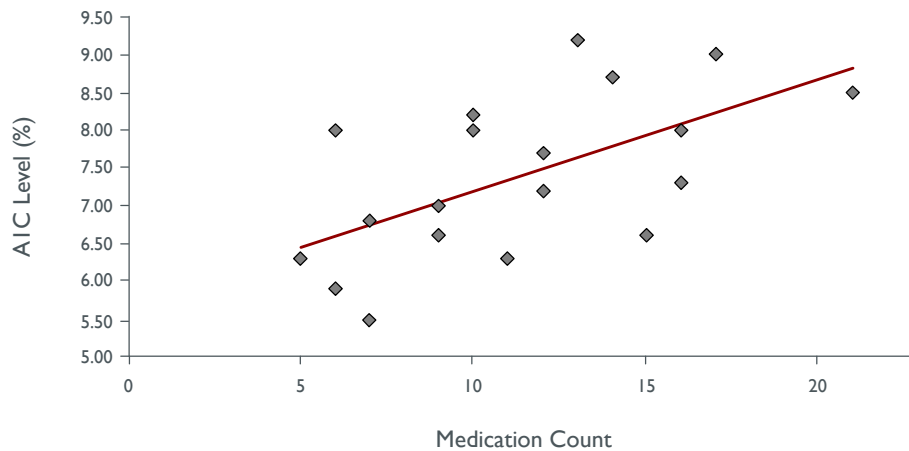


- Older adults are the highest consumers of medications
- **90%** of people aged 65+ reported using **one or more prescription drugs** in the past 30 days
  - **40%** = **5 or more** medications
  - **20%** = **10 or more** medications
- 42% take at least one Over-The-Counter (OTC) medication
- 49% take at least one supplement
- **“Polypharmacy” = 5 or more medications daily**

Guthrie et al. BMC Medicine 2015;13:74. National Center for Health Statistics. Health, US 2013: With Special Feature on Prescription Drugs. Hyattsville, MD. 2014. CDC.gov

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## INCREASED RISK OF POOR GLYCEMIC CONTROL AS MEDICATION COUNT INCREASES



Joslin Diabetes Center. <http://www.joslin.org/CMEWeb/Activity/Uploads/Outpatient%20Diabetes%20Care%20for%20Older%20Adults.pdf>.

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## GERIATRIC SYNDROMES

### URINARY INCONTINENCE

- Older adults with diabetes, particularly cis-women, are at a higher risk of urinary incontinence
  - Polyuria and neurogenic bladder common in patients with diabetes

### FALLS

- Risk increases due to:
  - Hypoglycemia causing confusion or dizziness
    - And unawareness possibility
  - Neuropathy / pain causing instability
  - Loss of vision
    - Blurry vision with blood glucose extremes
  - Possible gait problems due to age

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## GERIATRIC SYNDROMES

### PAIN

- Patients with diabetes have an increased risk of developing neuropathy (peripheral neuropathy)
  - Often undertreated

### DEPRESSION

- A common comorbidity in patients with diabetes
  - Reports show older adults with diabetes are twice as likely to have depression than those without diabetes
  - Untreated or undertreated pain can also worsen depression
  - Being diagnosed with multiple chronic conditions can increase risk of depression
  - Other complications from diabetes (loss of vision, inability to adequately control blood sugar, etc.) may also worsen depression

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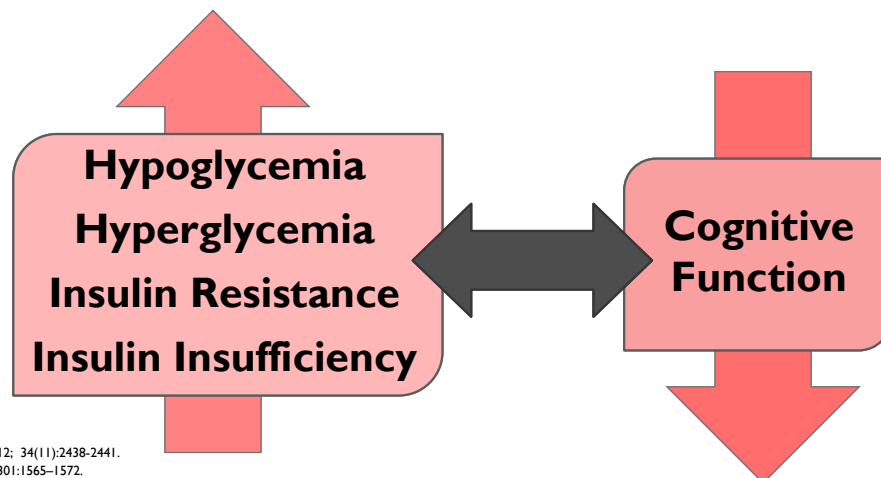
## DIABETES AND COGNITIVE IMPAIRMENT

- Older adults with diabetes are at a higher risk of cognitive impairment, hospitalization
  - Severe hypoglycemia (stemming from T2DM treatment) is associated with an increased risk of dementia
- Older adults who develop dementia have a higher risk of hypoglycemia
  
- Older adults with cognitive impairment may have difficulty:
  - Performing complex self-care tasks
    - Glucose monitoring, injections
  - Maintaining appropriate timing and content of meals
    - Could lead to trouble maintaining appropriate blood glucose levels,

Graydon S. Menelly, Daniel M. Tessier, Diabetes, Dementia and Hypoglycemia, Canadian Journal of Diabetes, Volume 40, Issue 1, 2016, Pages 73-76, ISSN 1499-2671, <https://doi.org/10.1016/j.cjcd.2015.09.006>.

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## DIABETES AND COGNITIVE IMPAIRMENT



Novak V, et al. Diabetes Care. 2012; 34(11):2438-2441.  
 Whitmer RA, et al. JAMA. 2009; 301:1565-1572.  
 Cukierman T, et al. Diabetologia. 2005; 48:2460-2469.  
 Lauder LJ, et al. ACCORD STUDY. Lancet Neuro. 2011; 10:969-977.

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## DIABETES AND COGNITIVE IMPAIRMENT

- **Contributing factors:**
  - Patients with DM have increased risk for microvascular complications and stroke
    - Can contribute to vascular or mixed dementia
  - Chronic hyperglycemia is associated with poorer cognition in patients with DM
  - Correlation between risk for dementia and:
    - Postprandial hyperglycemia
    - Severe hypoglycemia
  - Association between insulin resistance, hyperinsulinemia, and cognitive impairment

Graydon S. Menelly, Daniel M. Tessier, Diabetes, Dementia and Hypoglycemia, Canadian Journal of Diabetes, Volume 40, Issue 1, 2016, Pages 73-76, ISSN 1499-2671, <https://doi.org/10.1016/j.cjcd.2015.09.006>.


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## DIABETES AND COGNITIVE IMPAIRMENT

- **Stress the importance of:**
  - Simplifying regimens
  - Less stringent glycemc goals
  - Involving caregivers (and the patient)
    - In decision making and education

Graydon S. Menelly, Daniel M. Tessier, Diabetes, Dementia and Hypoglycemia, Canadian Journal of Diabetes, Volume 40, Issue 1, 2016, Pages 73-76, ISSN 1499-2671, <https://doi.org/10.1016/j.cjcd.2015.09.006>.

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- What are the patient's thoughts and/or willingness to do or handle the following:
  - Self monitoring blood glucose
  - Injections
  - Number of medications (medication burden)
  - Complexity of regimen
  - Cost / affordability
  - Access to medications and treatment
    - Insurance coverage, transportation for regular monitoring and follow up, etc.
- Include caregiver in the discussion if appropriate, too

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## CONSIDER AND DISCUSS PATIENT PREFERENCES

- What are the patient's thoughts and/or willingness to do or handle the following:
  - Self monitoring blood glucose
  - Injections
  - Number of medications (medication burden)
  - Complexity of regimen
  - Cost / affordability
  - Access to medications and treatment
    - Insurance coverage, transportation for regular monitoring and follow up, etc.
- Include caregiver in the discussion if appropriate, too



Triantafylidis LK, Phillips SC, Hawley CE, Schwartz AW. Finding the Sweet Spot: An Interactive Workshop for Diabetes Management in Older Adults. MedEdPORTAL, The Journal of Teaching and Learning Resources. 18 Oct 2019. [https://doi.org/10.15766/mep\\_2374-8265.10845](https://doi.org/10.15766/mep_2374-8265.10845)

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## WHAT IS FEASIBLE?

- Consider what is feasible for your individual patient before determining a treatment plan and/or therapeutic goals
  - Can we de-intensify a patient's drug or treatment regimen?
  - Are there contraindications to certain medications or classes of medications?
    - Due to the patient's age? Due to the patient's abilities? Due to the patient's other health concerns?
  - Are there safer alternatives?
    - Consider renal function, drug interactions, risks associated with treatment, etc.
  - Can the patient appropriately follow instructions?
  - Does the patient have support at home?

Triantafylidis LK, Phillips SC, Hawley CE, Schwartz AW. Finding the Sweet Spot: An Interactive Workshop for Diabetes Management in Older Adults. MedEdPORTAL, The Journal of Teaching and Learning Resources. 18 Oct 2019;. [https://doi.org/10.15766/mep\\_2374-8265.10845](https://doi.org/10.15766/mep_2374-8265.10845)

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## BLOOD GLUCOSE MANAGEMENT CONSIDERATIONS

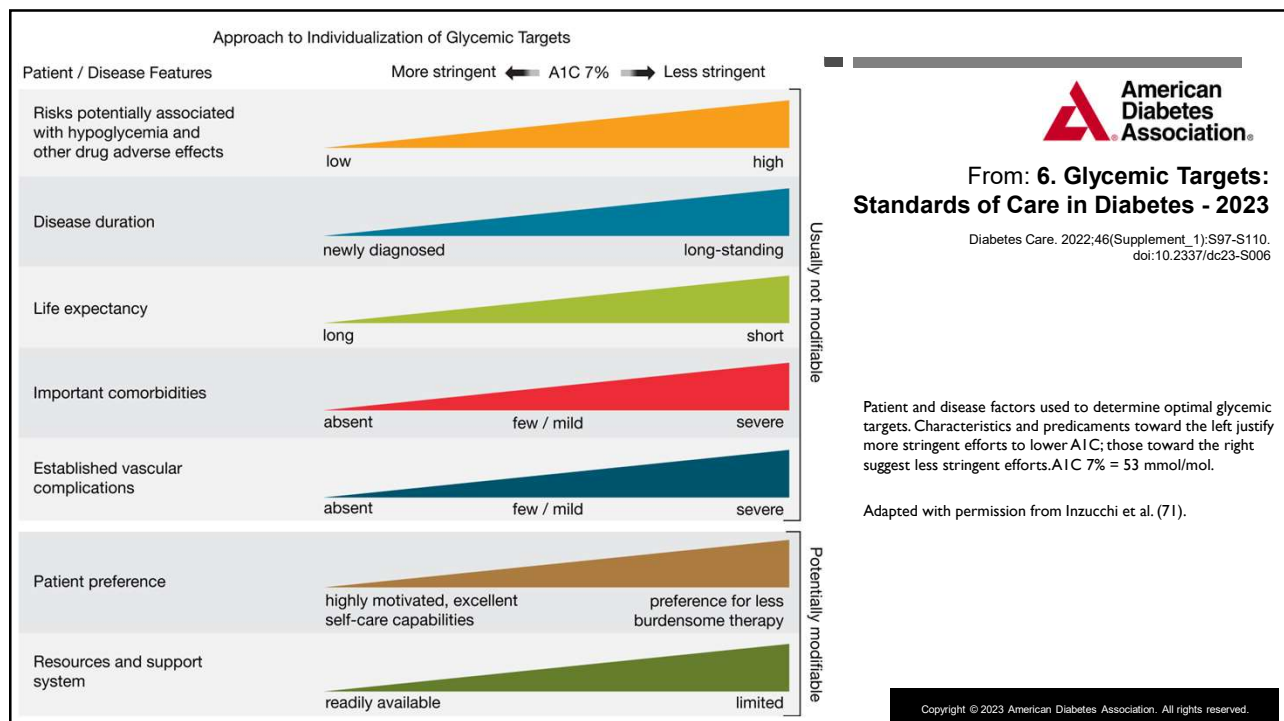
- **ADA Standards of Care 2023 – Recommendations:**
  - Glycemic goals might reasonably be relaxed, but symptomatic hyperglycemia leading to complications should be avoided
  - Focus on screening for complications that may lead to functional impairment

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## CONSIDERATIONS WHEN DETERMINING GLYCEMIC GOALS AND TREATMENT PLAN FOR OLDER ADULTS

- Comorbid conditions (number and severity)
- Renal dysfunction
- Ability to engage in self-care
- Nutritional status
- Social support
- Risk of falls
- Life expectancy

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## FRAMEWORK FOR CONSIDERING TREATMENT GOALS IN OLDER ADULTS WITH DIABETES

(TABLE 13.1 IN 2023 ADA STANDARDS OF CARE)

Patient health status	Rationale	Reasonable A1C Goal	Fasting / pre-prandial glucose	Bedtime glucose	Blood pressure	Lipids
Healthy	Longer remaining life expectancy	< 7–7.5%	80 – 130 mg/dL	80 – 180 mg/dL	< 140/90 mmHg	Statin – unless CI or not tolerated
Complex / Intermediate	Intermediate remaining life expectancy, high tx burden, hypoglycemia vulnerability, fall risk	< 8.0%	90 – 150 mg/dL	100 – 180 mg/dL	< 140/90 mmHg	Statin – unless CI or not tolerated
Very complex/ Poor Health	Limited remaining life expectancy makes benefit uncertain	Avoid reliance on A1C	100 – 180 mg/dL	110 – 200 mg/dL	< 150/90 mmHg	Consider likelihood of benefit with statin

- Healthy: few coexisting chronic illnesses, intact cognitive and functional status
- Complex: multiple coexisting chronic illnesses or 2+ iADL impairments or mild-mod cognitive impairment
- Very complex: LTC or end-stage chronic illness or mod-severe cognitive impairment or 2+ ADL impairments

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## CHANGE TO ADA STANDARDS OF CARE IN 2023

- “New language was added ... to outline that for those with frailty or at high risk of hypoglycemia, a target of >50% time in range with <1% time below range is now recommended.”
  - TIR goal is usually >70%
  - Time below range goal is usually <4% (with <1% for “very low”)
    - Each % point represents 15 minutes of the day in that range
- “... deintensification of treatment goals is now recommended to reduce the risk of hypoglycemia if it can be achieved within the individualized A1C target.”

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## HYPOGLYCEMIA IN OLDER ADULTS

- As discussed, concerns re: hypoglycemia and cognitive impairment
- Additional concerns:
  - Risk for fatal hypoglycemia increases with age
  - Some older adults may experience altered psychomotor performance when blood glucose is low
    - Makes correcting hypoglycemia even more difficult

Trujillo J, Haines S. Diabetes Mellitus. In: DiPiro JT, Yee GC, Posey L, Haines ST, Nolin TD, Ellingrod V, eds. *Pharmacotherapy: A Pathophysiologic Approach*, 11e. McGraw Hill; 2020. Accessed January 13, 2022. <https://accesspharmacy-mhmedical-com.offcampus.lib.washington.edu/content.aspx?bookid=2577&sectionid=228901946>

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## HYPOGLYCEMIA IN OLDER ADULTS

- Older adults may have reduced hypoglycemia awareness
  - May not experience adrenergic symptoms associated with hypoglycemia
- Older adults often have reduced glucagon secretion
  - (counterregulatory hormone)
- Falls and hypoglycemia
- Look at the medications!

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## MEDICATION CONSIDERATIONS

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## MEDICATION CONSIDERATIONS FOR OLDER ADULTS WITH TYPE 2 DIABETES

- ADA Standards of Care 2023 – Recommendations
  - **Medications** with **low hypoglycemia risk** preferred (especially those at high risk for hypoglycemia)
  - **Avoid overtreatment** (common in older adults)
  - Recommend **deintensification** or **simplification** of complex regimens
    - Reduce hypoglycemia and polypharmacy if possible

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## METFORMIN

- First-line drug therapy for type 2 diabetes for most
- Safe for most
- NOT likely to cause hypoglycemia
- **Concerns:**
  - Kidneys! Should NOT be used in those with advanced renal insufficiency
    - Generally ok if eGFR  $\geq$  30
  - Can cause GI upset
  - Possible Vitamin B-12 deficiency if used long-term

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## DPP-4 INHIBITORS

- Generally safe for most
- Very few side effects
- Not likely to cause hypoglycemia
- **Concerns**
  - Possible high cost for little benefit A1C-wise
  - No impact on cardiovascular outcomes (as other medication classes provide)

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## GLP-1 RECEPTOR AGONISTS

- Demonstrated cardiovascular benefit
    - in those with and at high risk for ASCVD
      - Including for patients 65+
  - Possible burden reduction with weekly dosing
  - Weight loss
- Concerns**
    - Most are injectable medications
      - Requires visual, motor, cognitive skills
    - Significant GI side effects
      - Nausea, vomiting, diarrhea
    - Weight loss

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## SGLT-2 INHIBITORS

- Cardiovascular benefits
  - Beneficial for those with heart failure
  - May slow progression of CKD
  - Generally well-tolerated
- Concerns**
    - UTI / genital infection risk
      - Concern if increased urinary incontinence
    - Possible volume depletion
    - May lower BP (slightly)

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## POSSIBLY CONCERNING MEDICATIONS FOR OLDER ADULTS WITH DIABETES

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## THIAZOLIDINEDIONES

- Not used often anymore, but some may still be on them if started a while ago
- **Use with caution**, especially with those on insulin
- Risks:
  - Heart failure
  - Osteoporosis
  - Falls / fractures
  - Macular edema

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## SULFONYLUREAS

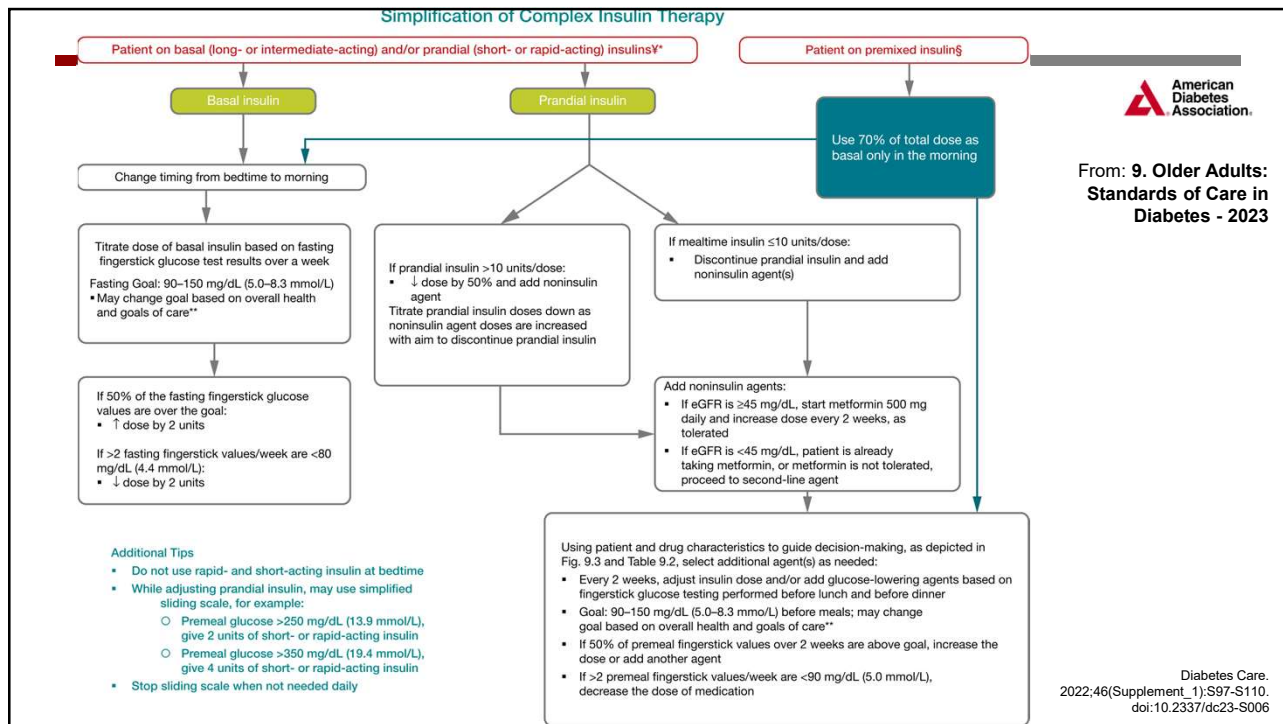
- **SIGNIFICANT** hypoglycemia risk
  - Increases insulin secretion **INDEPENDENT OF** blood glucose
- Associated with higher risk of CV events than other medications
- Still used quite frequently!
- Should be **used with caution** in older adults
- If used in older adults, consider shorter duration of action
  - (glipizide)

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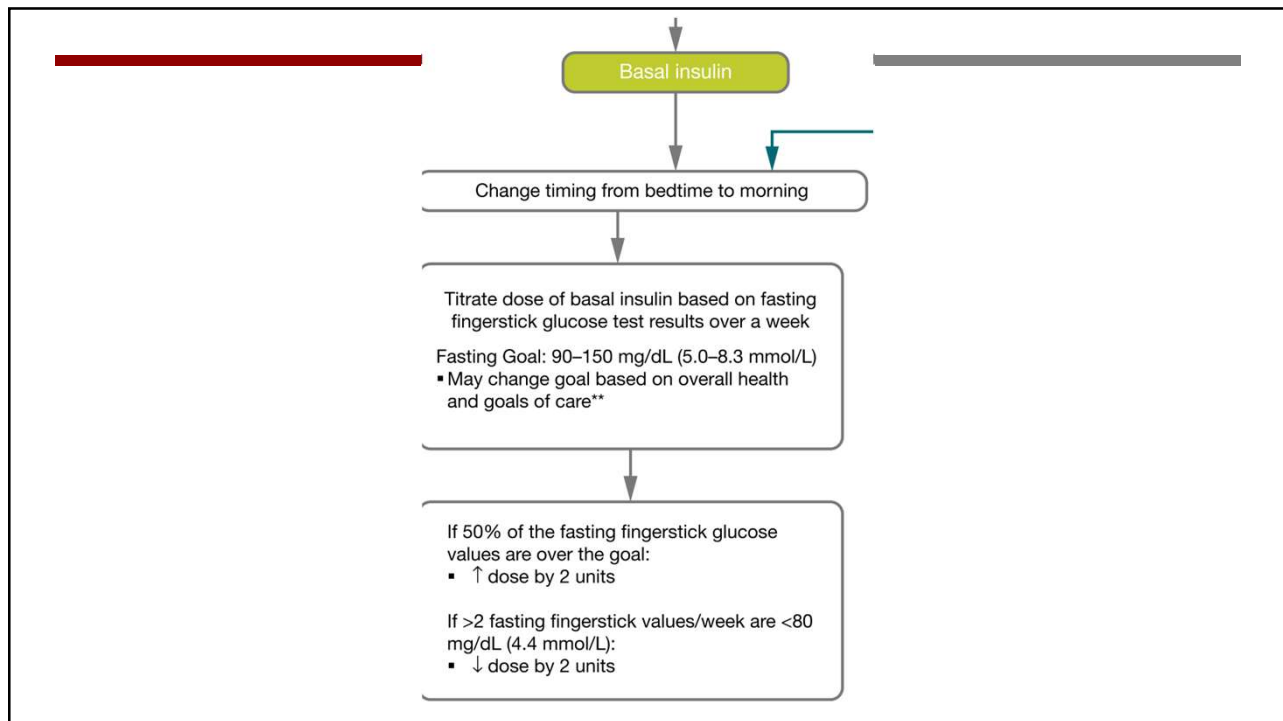
## INSULIN THERAPY

- To be used safely, patient (or caregiver) must have:
  - Visual skills
  - Motor skills
  - Cognitive ability
- Insulin comes with a high risk of hypoglycemia (especially if dosed incorrectly)
  - Especially rapid-acting or meal-time insulin
- Consider complexity!
  - Multiple daily injections may be too complex for some with advanced complications from diabetes, or limited functional status
- Once-daily basal insulin is often reasonable for most older adults
  - Few side effects, low risk of hypoglycemia

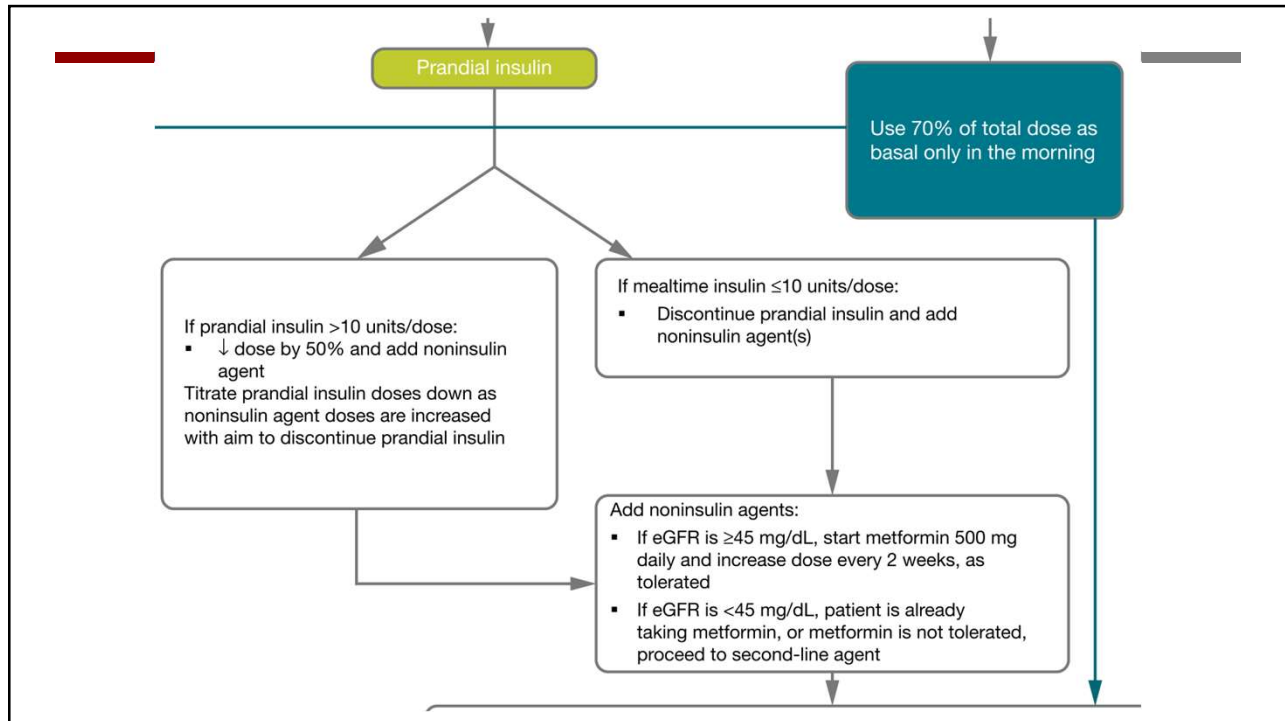
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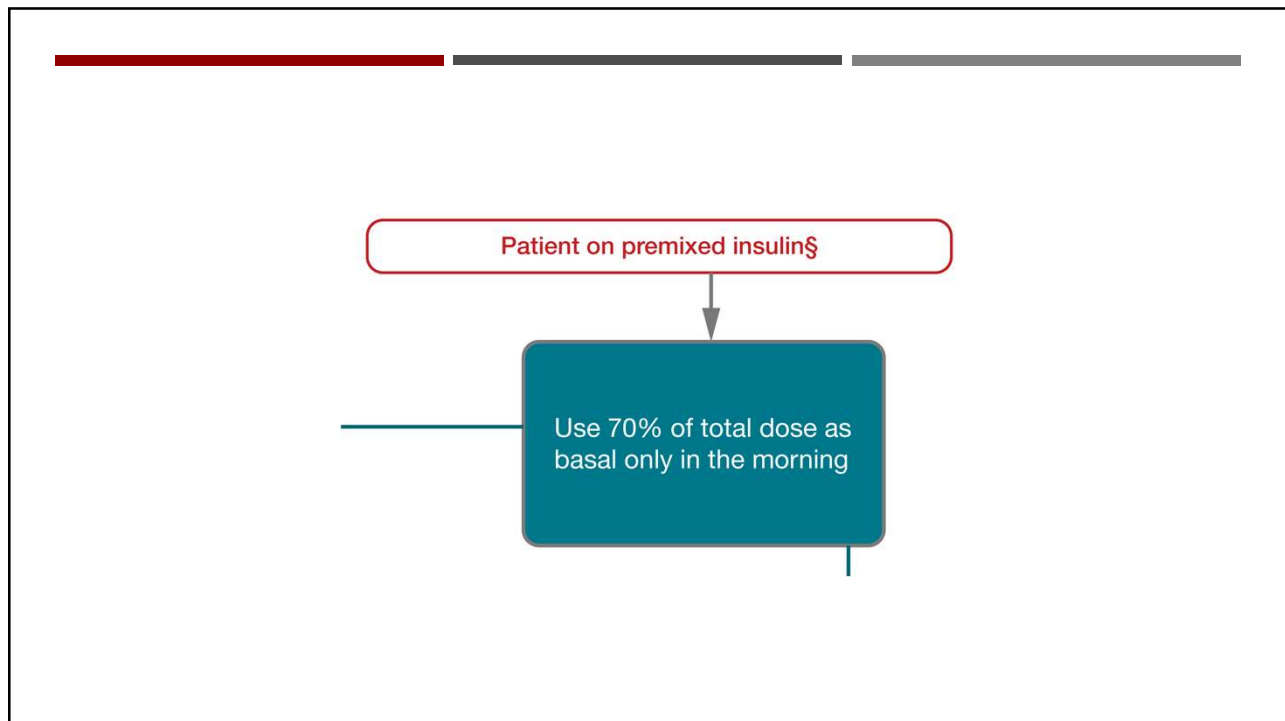
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### Additional Tips

- Do not use rapid- and short-acting insulin at bedtime
- While adjusting prandial insulin, may use simplified sliding scale, for example:
  - Premeal glucose >250 mg/dL (13.9 mmol/L), give 2 units of short- or rapid-acting insulin
  - Premeal glucose >350 mg/dL (19.4 mmol/L), give 4 units of short- or rapid-acting insulin
- Stop sliding scale when not needed daily

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## BARRIERS TO SELF-CARE

AND OVERCOMING THOSE BARRIERS



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## BARRIERS TO SELF-CARE FOR OLDER ADULTS WITH DIABETES

- Comorbid conditions:
  - Mental:
    - Depression
    - Cognitive Impairment
  - Physical:
    - Tremor / Parkinson's Disease
    - Eyesight / Macular Degeneration
- Communication
  - Possibly poor from healthcare providers and patients/caregivers
  - Patients may have trouble communicating needs or concerns

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## BARRIERS TO SELF-CARE FOR OLDER ADULTS WITH DIABETES

- Support
  - Lack of family support
  - Lack of identified caregiver(s)
  - Ageism
- Knowledge
  - Lack of understanding of disease
  - May not appreciate the importance of glucose control
- Resources
  - Monetary
  - Educational

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## OVERCOMING BARRIERS

- ADA Recommendation: screen for early detection of mild cognitive impairment or dementia in adults 65+
  - Initial visit, annually, as appropriate
  
- Regularly assess patient's cognitive impairment
  - MMSE
  - Mini-Cog
  - Speak up if concerned during any patient interaction

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## OVERCOMING BARRIERS

- If physical impairment or limitation, consider finding ways to enable the patient to remain independent
  - Examples:
    - Counting “clicks” for insulin pens
    - Glucometer that “talks” to you (announces blood glucose values)
    - CGM using smart phone or “sharing” capabilities (fewer finger sticks and less device manipulation)

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## OVERCOMING BARRIERS

- Communication concerns?
  - Be the change!
  - Regularly ensure patient knows how to reach available resources
  - Connect patient to outside resources
    - Internet, community centers, etc.
  - Anticipate possible needs or concerns and address them

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