

# Diabetes and Dementia

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# Objectives

- Talk with patients about how diabetes affects living with dementia.
- Talk with patients and caregivers about how diabetes affects the risk of developing cognitive impairment and dementia.
- Identify how to include dementia in the holistic care of dementia patients.



# Sound Familiar?

- I did a talk on this last year. What is different now?
- Increasing data on neurocognitive disorders (NCD) and diabetes
- Emphasis on the complicated nature of the self-care of diabetes and chronic-disease management for those with NCD

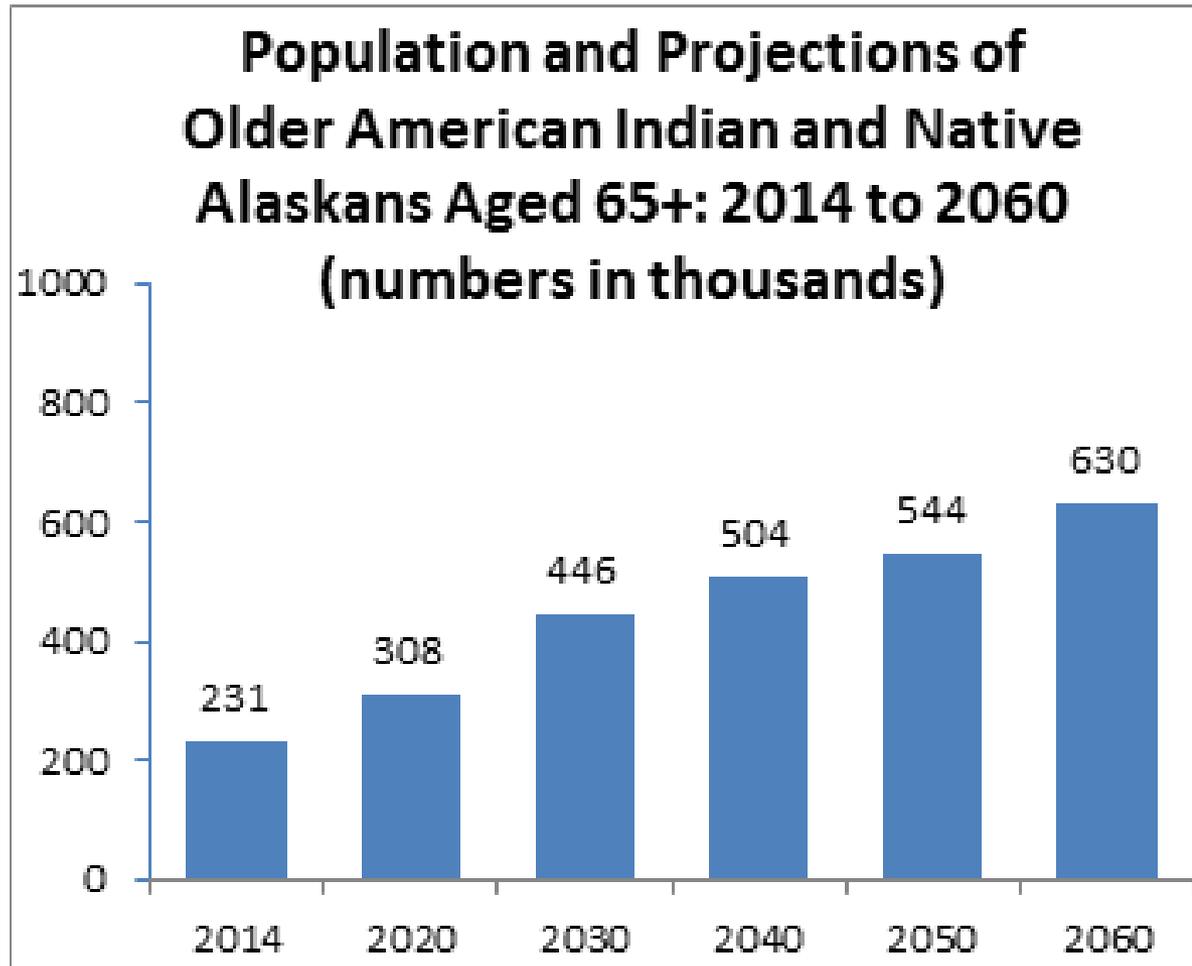


# Attention Boomers!

- According to the Administration on Aging, there were 46.2 million people aged 65 and older in 2014. That equals 14.5% of the U.S. population.
- By 2060, there will be 98 million. That's more than twice the number in 2014.
- By 2040 they will represent 21.7% of the population



# Older American Indians and Alaska Natives (AI/ANs)



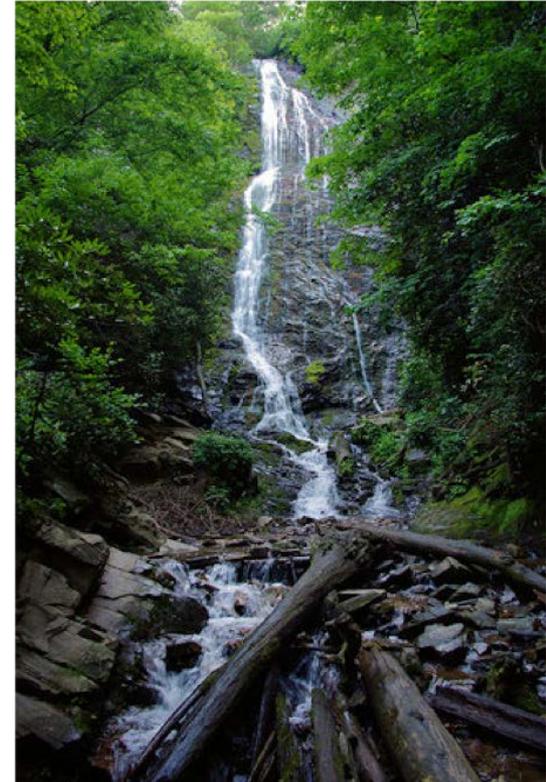
# General Info: Elders and Diabetes

- Older adults with diabetes have the highest rates of major lower-extremity amputation, myocardial infarction (MI), visual impairment, and end-stage renal disease of any age-group.
- Those aged 75 years and older have higher rates than those aged 65–74 years for most complications
- Up to one-third of elders with diabetes are unaware/undiagnosed.
- Older adults with diabetes have an approximate 10-year reduction in life expectancy and two times the mortality rate of those without.



# Why Does Prevalence Increase?

- Obesity
- Age-related decline in beta cell function
- Increase in visceral fat
- Increase in insulin resistance
- Decrease in activity
- Sarcopenia
- Higher likelihood of taking meds that increase glucose concentration



# DSM-5 Criteria for Major Neurocognitive Disorder

## DSM-5 criteria for major neurocognitive disorder (previously dementia)

**A.** Evidence of significant cognitive decline from a previous level of performance in one or more cognitive domains\*:

- Learning and memory
- Language
- Executive function
- Complex attention
- Perceptual-motor
- Social cognition

**B.** The cognitive deficits interfere with independence in everyday activities. At a minimum, assistance should be required with complex instrumental activities of daily living, such as paying bills or managing medications.

**C.** The cognitive deficits do not occur exclusively in the context of a delirium

**D.** The cognitive deficits are not better explained by another mental disorder (eg, major depressive disorder, schizophrenia)



# Under-diagnosis and Diagnosis Delivery

- Johns Hopkins study of over 7,000 Medicare beneficiaries
  - Only 44 percent of study participants with probable dementia, or their caregivers, reported receiving a diagnosis of dementia
- This is consistent with other studies, including the analysis of Medicare claims data in the 2015 Alzheimer's Disease Facts and Figures, which showed only 45 percent of those who have been diagnosed with Alzheimer's disease, or their caregivers, have been told of their diagnosis.
- If you likely have dementia and don't have a diagnosis, you are more likely to engage in unsafe behaviors like driving.



# The Different Kinds of Dementia

## The different kinds of dementia

Dementia is not one thing. There are several routes to similar symptoms

### **ALZHEIMER'S 62%**

Causes problems with memory, language and reasoning. 5% of cases start before age 65

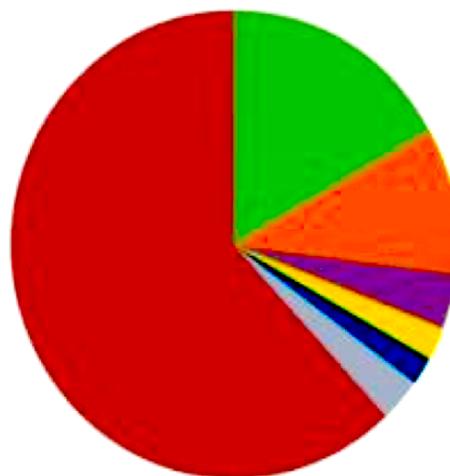
### **VASCULAR DEMENTIA 17%**

Impaired judgement, difficulty with motor skills and balance. Heart disease and strokes increase its likelihood

### **MIXED DEMENTIA 10%**

Several types of dementia contribute to symptoms. Most common in people over 85

SOURCE: ALZHEIMERS.ORG.UK



### **DEMENTIA WITH LEWY BODIES 4%**

Caused by Lewy body proteins. Symptoms can include hallucinations, disordered sleep

### **FRONTOTEMPORAL DEMENTIA 2%**

Personality changes and language problems. Most common onset between the ages of 45 and 60

### **PARKINSON'S DISEASE 2%**

Can give rise to dementia symptoms as the condition progresses

### **OTHER 3%**

Conditions such as Creutzfeldt-Jacob disease; depression; multiple sclerosis

Learn more at [https://www.alzheimers.org.uk/download/downloads/id/3416/what\\_is\\_dementia.pdf](https://www.alzheimers.org.uk/download/downloads/id/3416/what_is_dementia.pdf)



# What Kind of NCD?

- “Diabetic encephalopathy” was first used in 1950
- Diabetes is associated with and increased risk of vascular dementia **and** Alzheimer’s
- NIH DM Interagency coordinating committee in 2010 identified cognition among strategic priorities for diabetes research over the following decade
- American Diabetes Association 2013: perform cognitive screens and/or ongoing cognitive assessment in context of poor control or self-management
- Stroke or history of transient ischemic attacks (TIA) increases risk of NCD up to threefold



# Terms

- Vascular dementia: from single stroke or from multiple
- Multi-infarct dementia: stepwise but unpredictable
- Subcortical vascular dementia: more insidious—changes in personality, mood, behavior, cognition
- Vascular cog impairment: caused or associated with cerebrovascular disease



# Vascular Dementia and Cognitive Impairment

- Characterized by disturbance of frontal-executive functions
  - Working memory
  - Abstraction
  - Reasoning
  - Mental flexibility
  - Fluency

Less verbal memory impairment



# Diabetes and Impaired Cognition

- People with DM are at nearly twice the risk of developing NCD
- Additional risk: advanced complications, long duration, taking insulin
- Vascular cognitive impairment and dementia are the types that affect those with DM most
- Long-term risks and benefits of glucose management in those with cognitive impairment has not been examined



# Why?

- Infarcts
- Non-infarct ischemic lesions that affect white matter
- Chronic hypoperfusion
- Hemorrhage



# Medicare Beneficiaries with Alzheimer's and Other Dementias by Coexisting Medical Conditions

Percentages of Medicare Beneficiaries Aged 65 and Older with Alzheimer's and Other Dementias by Specified Coexisting Medical Conditions, 2004

Source: 2009 Alzheimer's Disease Facts and Figures, Table 11: [https://www.alz.org/national/documents/report\\_alzfactsfigures2009.pdf](https://www.alz.org/national/documents/report_alzfactsfigures2009.pdf)

## Percentages of Medicare Beneficiaries Aged 65 and Older with Alzheimer's and Other Dementias by Specified Coexisting Medical Conditions, 2004

Coexisting Condition	Percentage With Alzheimer's or Other Dementia and the Coexisting Condition
Hypertension	60
Coronary heart disease	26
Stroke – late effects	25
Diabetes	23
Osteoporosis	18
Congestive heart failure	16
Chronic obstructive pulmonary disease	15
Cancer	13
Parkinson's disease	8

Created from data from Bynum, Medicare Current Beneficiary Survey.<sup>73</sup>



# Average Per Person Payments by Type of Service and Medical Condition

Medicare Beneficiaries with or without Alzheimer's and Other Dementias, 2006

Source: [https://www.alz.org/national/documents/report\\_alzfactsfigures2009.pdf](https://www.alz.org/national/documents/report_alzfactsfigures2009.pdf) (Table 13)

Selected Medical Condition by (AD/D) Status*	Average Total Medicare Payment	Average Medicare Hospital Care Payment	Average Medicare Physician Visits Payment	Average Medicare Skilled Nursing Facility Care Payment	Average Medicare Home Health Care Payment
<b>Coronary Heart Disease</b>					
With AD/D	\$20,780	\$7,453	\$1,494	\$3,072	\$1,497
Without AD/D	14,640	5,809	1,292	963	743
<b>Diabetes</b>					
With AD/D	20,655	7,197	1,412	3,071	1,651
Without AD/D	12,979	4,799	1,129	923	757
<b>Congestive Heart Failure</b>					
With AD/D	21,315	7,642	1,470	3,203	1,504
Without AD/D	17,739	7,172	1,499	1,424	1,026
<b>Cancer</b>					
With AD/D	18,775	6,198	1,328	2,488	1,283
Without AD/D	13,600	4,308	1,095	704	499

\*AD/D=Alzheimer's and other dementias.

Created from data from Bynum, *National 20% Sample Medicare Fee-for-Service Beneficiaries*.<sup>78</sup>



# Vascular Dementia

- Increasing age
- History of heart attack, strokes or mini strokes. **Heart disease is the leading cause of death in AI/AN; stroke is the sixth.**
- Atherosclerosis
- High cholesterol
- High blood pressure
- Diabetes – **The Likelihood of AI/AN to have DM compared to non-Hispanic white is 2.2.**
- Smoking – **29.2 percent of AI/AN currently smoke, compared to 18.2 percent of Whites.**
- Obesity
- Atrial fibrillation
  - [http://www.cdc.gov/dhdsp/data\\_statistics/fact\\_sheets/fs\\_aian.htm](http://www.cdc.gov/dhdsp/data_statistics/fact_sheets/fs_aian.htm)



# Exploring Challenges and Quality of Life for Caregivers

1. Memory loss was the first identified cause of self-care neglect leading to caregiver intervention.
2. Behavioral and psychological symptoms of dementia (BPSD) disrupted the daily diabetes care routine, with 'denial' of having diabetes or memory loss (anosognosia) being the most disruptive.
3. Caregivers reported that caring for both diabetes and dementia was highly burdensome, that they felt overwhelmed with BPSD, and that they wanted more support from family and patients' healthcare providers.



# National Academies of Sciences, Engineering and Medicine Consensus Study Report

- **Preventing Cognitive Decline and Dementia: A Way Forward**
- Hot off the press
- Extensive systematic review of evidence on interventions to prevent cognitive decline or progression to dementia
- We know brain changes begin years if not decades prior to symptoms
- There is also evidence that the incidence/prevalence of dementia is declining in high-income countries
- **Did not identify specific interventions supported by sufficient evidence to justify mounting an assertive public health campaign to encourage/disseminate**



# Consensus Report

- The three areas they found enough evidence to provide some degree of support for benefit for intervention are:
  - **Cognitive training**
  - **Blood pressure management with people who have hypertension**
  - **Increase physical activity**



# Consensus Report (continued)

- Cognitive training: Those aimed at enhancing reasoning (problem solving), memory, speed of reasoning (identifying visual information on a screen)
  - Examples: Learning a new language, playing bridge or another game, doing crossword puzzles
  - The ACTIVE trial is a 10-year trial looking at preserving normal cognition in a few thousand people and tracked interventions aimed at maintaining normal cognition in later life
  - This evidence is supported by low to mod strength RCT
- BP and activity: Observational studies and neurobiological understanding mostly from encouraging but inconclusive evidence



# Risk Factors

- Estimate: one-third of late-life dementias are attributable to seven modifiable risk factors
  - Low education
  - Mid-life hypertension
  - Mid-life obesity
  - **Diabetes**
  - Physical inactivity
  - Smoking
  - Depression



# Risk Factors (continued)

- Reduction in prevalence of these risk factors by 10–20% per decade could reduce worldwide prevalence of Alzheimer's Disease by 8–50%



# Need for Individualized Plans/Outcomes

- Need to consider life expectancy, cognitive status, preferences, functional status, and social support
- Different barriers to care
- Caregivers ***must*** be considered
- Quality of life



# ADLs/IADLs

## Activities of Daily Living and Instrumental Activities of Daily Living

- Transferring
- Showering/bathing
- Dressing
- Self-feeding
- Personal hygiene
- Toileting
- Housework
- Medications
- Preparing meals
- Managing money
- Transportation
- Shopping
- Telephone



# Functionally Independent

- Live independently
- Need no assistance with ADLs
- Manage medications
- Have co-morbidities that may affect diabetes



# Tools

- Functional assessment/Katz Index/SCI-R
- TUG
- SLUMS/MOCA
- PHQ9/GDS
- MNA-SF for Nutrition
- Pain assessment
- Using PCMH multi-disciplinary team



# Nutrition Assessment

- For most diabetic patients, look at obesity and diet
- Some different points here:
  - Make sure med admin times coincide with meal times
  - Look for swallowing difficulties, denture problems
  - Maintain weight
  - Maintain fluid intake, especially in hot weather



# Exercise

- Muscle mass and strength decline with age
- People who have had diabetes longer or have higher A1c have lower strength per unit of muscle mass than age- and BMI-matched people without DM and people who have better control and DM of shorter duration
- ***Even light activity*** = psychosocial well-being and higher self-rated health



# Medication Reconciliation

- Do ***often***
- ***Please*** avoid sliding scale
- Try lowest frequency dosing
- Ask about Over the Counter (OTC) and herbal meds
- Assess for renal/liver function
- Look at weight



# Education, Self-Management, and Monitoring

- What may be different to consider?
  - Attitudes, decision-making processes, beliefs
    - But these can be affected by hyper/hypoglycemia, dehydration, cognitive impairment, illness
  - Diabetes may not be a priority
  - May prefer to learn from personal experience or peers
  - May have decline in short-term memory, trouble with complex motor performance, slower reaction time (trouble with information processing)



# Education, Self-Management, and Monitoring (cont.)

- Everyone should receive education-learning environment suited to him/her
- Consider individual plan
- Sick day management plan
- If functionally dependent — should take into account impairments, comorbidities, social situation



# Barriers to Education

- Cognitive issues: Alzheimer's, vascular ***at least*** twice as common in diabetic patients compared to age-matched non-diabetic
  - May need more repetition, different cues to help with retaining, such as analogies/stories, hands-on experience, demonstrations/models, sequenced visits, always speaking to the person, involving the caregiver



# Barriers to Education (cont.)

- Other impairments
  - Vision loss, hearing loss
    - One in five older adults with DM in the U.S. reports visual impairment
    - Hearing impairment is twice as prevalent
- **Ask what the goals are**



# Someone with DM Who Develops NCD

- Simplify regimen
- Look for support: family, community health
- Reminders: talking medication planner, clock with day/night on it, calendar, same location
- Shoes, footwear, neuropathy, fall risk
- Caregiver support
- Monitor for hypoglycemia: can be 2.5 times higher
- Transitions of care



# Someone with Uncontrolled Diabetes, Diabetes of Long Duration, No NCD

- Excellent time to talk about mental health, risk factors
- Discuss risk of developing NCD (twice the risk)
- Screen and monitor, especially if there is evidence of non-compliance, waves of control vs. out of control



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# Thank You!

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