Caregiver Connections
An Educational Webinar Series With The Experts

The presentation will begin shortly.
Thank you for your patience!

dukefamily-support.org
919-660-7510
Dementia 101

Daniel Parker, MD
Assistant Professor – Division of Geriatrics
Duke School of Medicine
January 26, 2022
• I’m a geriatrician, memory disorders specialist, and researcher.

• I see patients at the Duke Memory Disorders clinic.

• My research centers on understanding how diet and exercise promote brain health.
Outline

1. What changes in memory and thinking are part of “normal” aging and what changes are concerning?
2. How do we define mild cognitive impairment (MCI) and dementia?
3. What causes mild cognitive impairment (MCI) and dementia?
4. Are mild cognitive impairment (MCI) and dementia preventable?
5. What happens at a Memory Clinic evaluation? How do we make a diagnosis?
6. How do we treat mild cognitive impairment (MCI) and dementia?
“Normal” Aging
• Making a bad decision once in a while.
• Missing a monthly payment.
• Forgetting which day it is and remembering later.
• Sometimes forgetting which word to use.
• Losing things from time to time.

Concerning Changes
• Making poor judgements and decisions a lot of the time.
• Problems taking care of monthly bills.
• Losing track of the time, date, or time of year.
• Trouble having a conversation.
• Misplacing things often and being unable to find them

Adapted from https://www.nia.nih.gov/health/infographics/forgetfulness-normal-or-not
What do we mean by SCI, MCI, and dementia?

**Cognitively-Unimpaired**
- I notice subtle changes in my memory and thinking
- Cognitive assessment is normal.
- These changes do not interfere with my day to day activities.

**Subjective Cognitive Impairment (SCI)**
- There are changes in my memory and thinking that I and others notice.
- These changes are picked up on cognitive assessments.
- These changes do not interfere with my day to day activities.
- These changes aren’t caused by another medical or psychiatric problem.

**Mild Cognitive Impairment (MCI)**
- I need extra help with day to day activities.
- These changes aren’t caused by another medical or psychiatric problem.

**Dementia**
- There are changes in my memory and thinking that I and others notice.
- These changes are picked up on cognitive assessments.
- I need extra help with day to day activities.
MCI and dementia are “umbrella” terms

- MCI and dementia are syndromes or “umbrella” terms which describe a group of symptoms that occur together.
- They don’t tell us what’s going on in the brain that is causing the symptoms.
- There are different diseases that can cause MCI and dementia.

Syndromes or “Umbrella” Terms

- Difficulty with Attention
- Difficulty with Planning
- Word-Finding Difficulty
- Requires Assistance with Finances
- Requires Assistance with Medications
- Short-Term Memory Loss
What diseases cause MCI & dementia?

<table>
<thead>
<tr>
<th>Alzheimer’s Disease</th>
<th>Frontotemporal Dementia</th>
<th>Lewy Body Dementia</th>
<th>Vascular Dementia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abnormal deposits of proteins form amyloid plaques and tau tangles throughout the brain.</td>
<td>Abnormal amounts or forms of tau and TDP-43 proteins accumulate inside neurons in the frontal and temporal lobes.</td>
<td>Abnormal deposits of the alpha-synuclein protein, called “Lewy bodies,” affect the brain’s chemical messengers.</td>
<td>Conditions, such as blood clots, disrupt blood flow in the brain.</td>
</tr>
</tbody>
</table>

*These changes are just one piece of a complex puzzle that scientists are studying to understand the underlying causes of these forms of dementia and others.*
Alzheimer’s Disease is the most common cause of MCI and dementia.

The “Amyloid Cascade Hypothesis” is the leading theory for the development of Alzheimer’s Disease.

Genetic Risk Factors
- APOE Gene
- Midlife Obesity
- Hypertension
- Strokes
- Diabetes

Cognitive Reserve
- (Education, IQ, work history)

Amyloid Cascade Hypothesis

Neurodegeneration

SCI, MCI, Dementia
10% of Adults ≥ 65 have AD

Dementia 6th Leading Cause of Death in the US

Dementia care cost is $56,290 per person per year

Total expenditures on dementia is ~$200 billion

2/3 of Americans with AD are women

Dementia Risk for African-Americans is 2X higher than whites

Some good news?

• As our population ages, more people are living with MCI and dementia.

• However, the number of people diagnosed with dementia in a given year may be decreasing.

• Up to 40% of dementia may be preventable.
Can we prevent dementia?

Early Life
- Educational attainment

Midlife (45-65)
- Hearing/Vision Loss
- Traumatic Brain Injury
- High Blood Pressure
- Excess Alcohol Use
- Obesity

Later Life (>65)
- Smoking
- Depression
- Social Isolation
- Physical Inactivity
- Air Pollution
- Diabetes

What happens at a Memory Clinic evaluation?

• Obtain a history of cognitive symptoms.
• Perform a cognitive assessment and neurological examination.
• Look for other factors that may contribute to cognitive symptoms.
• Obtain brain imaging.
• Consider additional testing to identify the cause of the cognitive changes.
• Develop a treatment plan.
### Mood Disorders
1. Depression & Anxiety

### Sleep
1. Sleep apnea
2. Insomnia

### Sensory Impairment
1. Hearing impairment
2. Visual Impairment

### Medications
1. Anticholinergic medications (Benadryl, amitriptyline, tolterodine, paroxetine)
2. Sedatives (muscle relaxants, benzos)
3. Hypnotics (ambien)

### Medical Problems
1. Heart failure, liver disease, kidney disease, thyroid problems

### Vitamin Deficiencies
1. Vitamin B12

### Infectious Diseases
1. HIV, Syphilis, Hepatitis C

### Lifestyle Factors
1. Substance use
2. Lack of exercise
# How do make a clinical diagnosis?

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Patient &amp; Caregiver-Reported Symptoms</th>
<th>Cognitive Assessment</th>
<th>Functional Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Cognition</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>Subjective Cognitive Impairment (SCI)</td>
<td>Abnormal</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>Mild Cognitive Impairment (MCI)</td>
<td>Abnormal</td>
<td>Abnormal</td>
<td>Normal</td>
</tr>
<tr>
<td>Dementia</td>
<td>Abnormal</td>
<td>Abnormal</td>
<td>Abnormal</td>
</tr>
</tbody>
</table>

Here is a table summarizing the stages and outcomes for various cognitive conditions:

- **Normal Cognition**:
  - Patient & Caregiver-Reported Symptoms: Normal
  - Cognitive Assessment: Normal
  - Functional Assessment: Normal

- **Subjective Cognitive Impairment (SCI)**:
  - Patient & Caregiver-Reported Symptoms: Abnormal
  - Cognitive Assessment: Normal
  - Functional Assessment: Normal

- **Mild Cognitive Impairment (MCI)**:
  - Patient & Caregiver-Reported Symptoms: Abnormal
  - Cognitive Assessment: Abnormal
  - Functional Assessment: Normal

- **Dementia**:
  - Patient & Caregiver-Reported Symptoms: Abnormal
  - Cognitive Assessment: Abnormal
  - Functional Assessment: Abnormal
How do we use brain imaging in our evaluation?

- We obtain an MRI of the brain in most patients.
- Brain imaging is **often normal** in patients with MCI and dementia.
- We mainly use brain imaging to **rule out other problems** in the brain that can lead to changes in memory and thinking.
- Other types of brain imaging can help identify the cause of MCI or dementia.

**MRI**
- Sometimes we can see changes in brain regions that are consistent with a specific disease, like shrinkage of the hippocampus in Alzheimer’s.

**FDG-PET**
- Evaluates how much energy different regions of the brain are using. Decreased energy use in certain regions is seen in Alzheimer’s.

**Amyloid PET**
- Special chemicals bind to amyloid plaques and light up. Amyloid plaques are part of Alzheimer’s disease.
How do we determine which disease is causing MCI/dementia?

At the Duke Memory Disorders Clinic, we offer advanced diagnostic testing to identify the disease causing the MCI or dementia. This is mostly for information and does not usually affect our management.

**Alzheimer’s Disease**

- We can perform a lumbar puncture to obtain a small amount of spinal fluid to check for Alzheimer’s disease proteins.
- We also offer a blood test (Precivity AD) to check for Alzheimer’s disease proteins, although this is not yet covered by insurance.
- We can perform genetic testing for familial Alzheimer’s disease.
- We can perform APOE genotyping.

**Lewy Body Disease**

- We can perform a skin biopsy to check for the protein that builds up in Lewy Body Disease (α-synuclein)

**Frontotemporal Dementia**

- We can perform genetic testing to identify variants that cause frontotemporal dementia.
How do we manage MCI and dementia?

- Address modifiable risk factors (especially for MCI).
- Increase cognitive resilience.
- Promote overall health and well-being.
- Consider medications that help with memory and thinking symptoms.
- In the future, we may use anti-amyloid therapies to slow down progression of Alzheimer’s disease.
Address Modifiable Risk Factors

**Mood Disorders**
- Treat anxiety/depression

**Medications**
- Discontinue or reduce the dose of medications that can worsen memory and thinking

**High Blood Pressure**
- Target BP of <130/80

**Other Medical Risk Factors**
- Treat high cholesterol
- Treat diabetes

**Hearing/Vision Impairment**
- Hearing aids
- Cataract surgery

**Sleep**
- Treat sleep apnea
- Treat insomnia

**Diet**
- Mediterranean, DASH, or MIND diet

**Physical Activity**
- 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity aerobic activity per week.
- Resistance training involving all major muscle groups 2x per week. Three sets of 6-8 reps per muscle group.
- Decrease sedentary time.

**Cognitive Stimulation**
- Encourage cognitively-stimulating activities
- Encourage social engagement
Medications that can treat dementia symptoms

• We have two types of medications that can help with memory and thinking symptoms in dementia.
  • Medications that increase the concentrations of acetylcholine in the brain (donepezil and rivastigmine). Can cause GI upset and slow down the heart rate, leading to falls.
  • Memantine, which decreases overstimulation of the NMDA receptor in the brain. Generally has few side effects.

• These medications do not slow down or reverse the disease process in the brain and the benefits are generally modest.

• These medications have not been shown to help in MCI, so we typically reserve them for patients with dementia.
Anti-Amyloid Therapy

• Aducanumab is an FDA-approved drug that can decrease the build up of amyloid in the brain.

• No convincing evidence (yet) that this slows down changes in memory and thinking due to Alzheimer’s disease.

• Aducanumab can cause brain swelling and brain bleeding.

• Most private insurers are not paying for aducanumab. Medicare will probably only pay for it for participants in a clinical trial.
What about....

**Bredsen Protocol**
- Popularized by a book called, “The End of Alzheimers.”
- Based on a “study” of 10 patients
- Involved diet modification, time-restricted feeding, vitamins, exercise, hormones, supplements, etc.
- Jelly fish protein

**Prevagen**
- Huge marketing campaign
- No evidence of benefit
- Based on experiments in mice

**Young Plasma**
- FDA shut down “young blood” clinics in February 2019
- Potential risks include transmission of disease, immune reactions

**Stem Cell Therapy**
- No evidence of benefit and potentially harmful
- Very expensive
- Some small studies have shown beneficial effects

**Hyperbaric Oxygen**
- Requires frequent treatments and how long the beneficial effects last is unclear
Summary

• MCI and dementia are syndromes or “umbrella” terms that describe changes in memory and thinking.

• MCI and dementia are caused by different diseases in the brain, the most common of which is Alzheimer’s disease.

• Some portion of MCI and dementia cases may be preventable.

• Healthy lifestyle changes may slow down progression of MCI to dementia by increasing cognitive resilience.

• Most people living with dementia do not end up in nursing homes.

• Over the past decade, we have made great strides in understanding the biology of dementia.
Take Home Message

• If you or someone you know is concerned about changes in memory and thinking, schedule an appointment with a memory specialist. Early intervention is key!!

• Even if you have already been diagnosed with MCI or dementia, adopting healthy lifestyle habits and addressing modifiable risk factors can keep your brain working at it’s best.

• Consider participating in research to help us identify effective preventions and treatments for dementia.
Questions?

Daniel.Parker@Duke.edu
Caregiver Connections
An Educational Webinar Series With The Experts

Thank you for joining us today!

dukefamilysupport.org
919-660-7510