18th Annual Mild Cognitive Impairment PUBLIC EDUCATION FORUM

WHO GETS MCI? WHAT HAPPENS TO THEM?

Mary Ganguli, MD, MPH,

Professor of Psychiatry, Neurology, and Epidemiology,

University of Pittsburgh,
Pittsburgh, PA

DISCLOSURE

Mary Ganguli served on Biogen *“Patient Journey Working Group”*

in 2016 and 2017.

WHAT IS MCI?

MCI (Mild Cognitive Impairment) is an in-between state in which people have mild loss of memory and/or other cognitive functions.

- Worse than expected for age;
- Not severe enough to be called “dementia.”

WHAT CAUSES MCI?

- All the same conditions that cause dementia, including Alzheimer’s disease
- Maybe also some other conditions that cause MCI but not dementia.

What is a “Risk Factor” for a condition?

- Something which increases the chances of getting that condition.
- Having a risk factor does not guarantee that we will get the condition.
- We could get the condition even without the risk factor.
- A risk factor may be something we can modify to reduce our chances of getting the condition.

“Risk factors” for MCI -

- Increasing age.
- APOE-e4 gene

Medical conditions including:

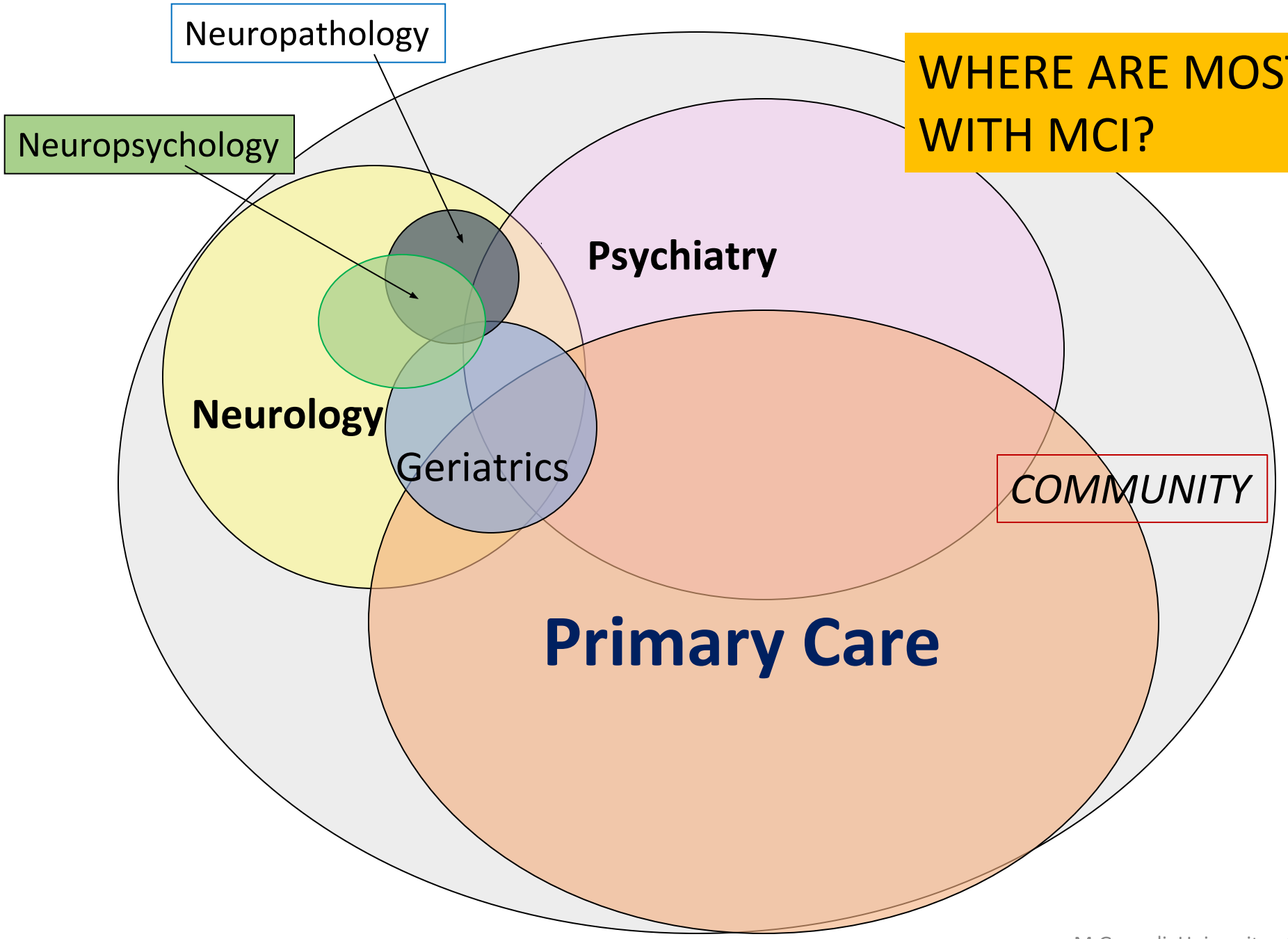
- Diabetes.
- High blood pressure
- Elevated cholesterol
- Obesity
- Depression

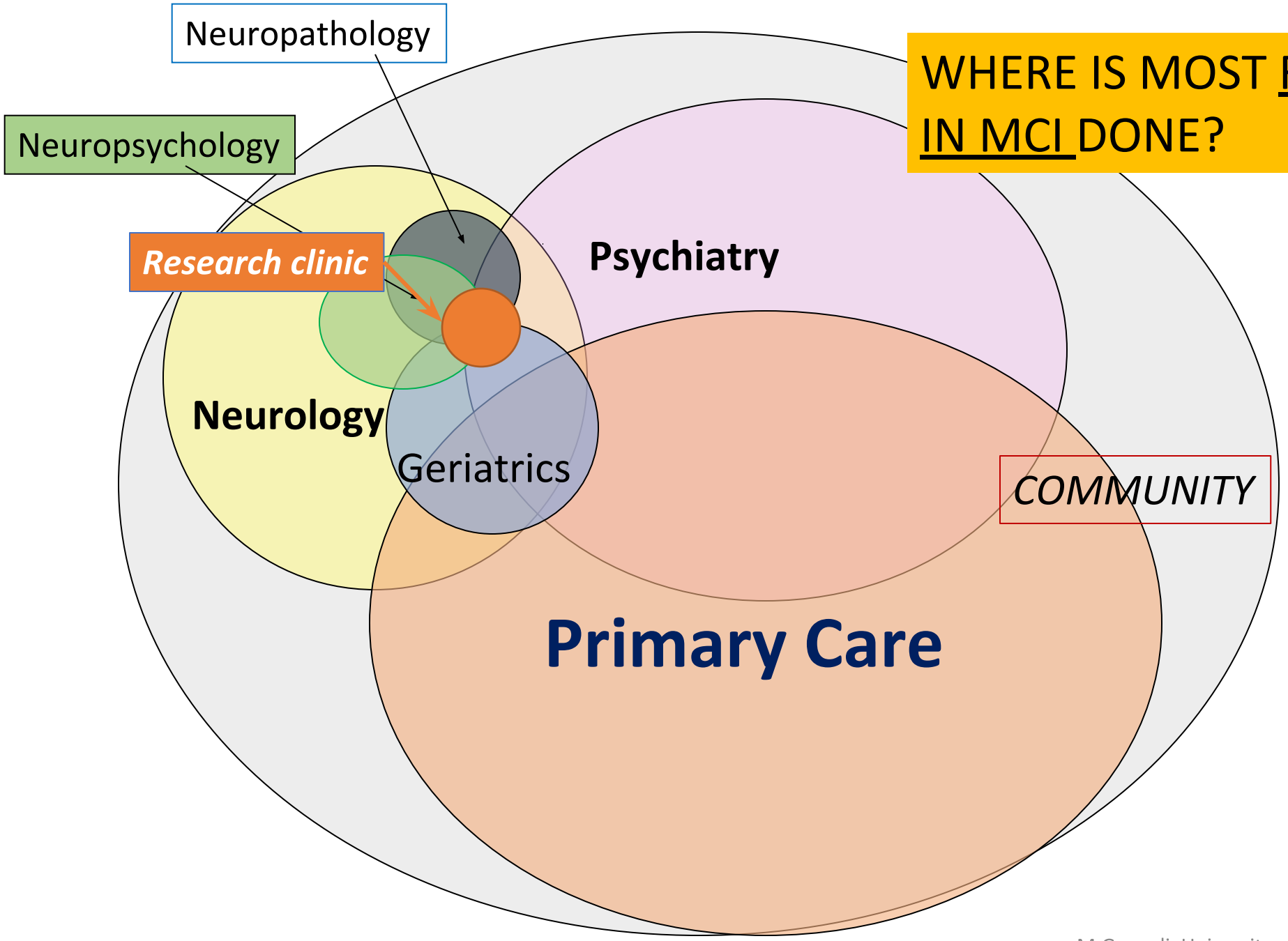
Lifestyle Factors including:

- Smoking
- Lack of physical exercise
- Low education level

(from www.MayoClinic.org)

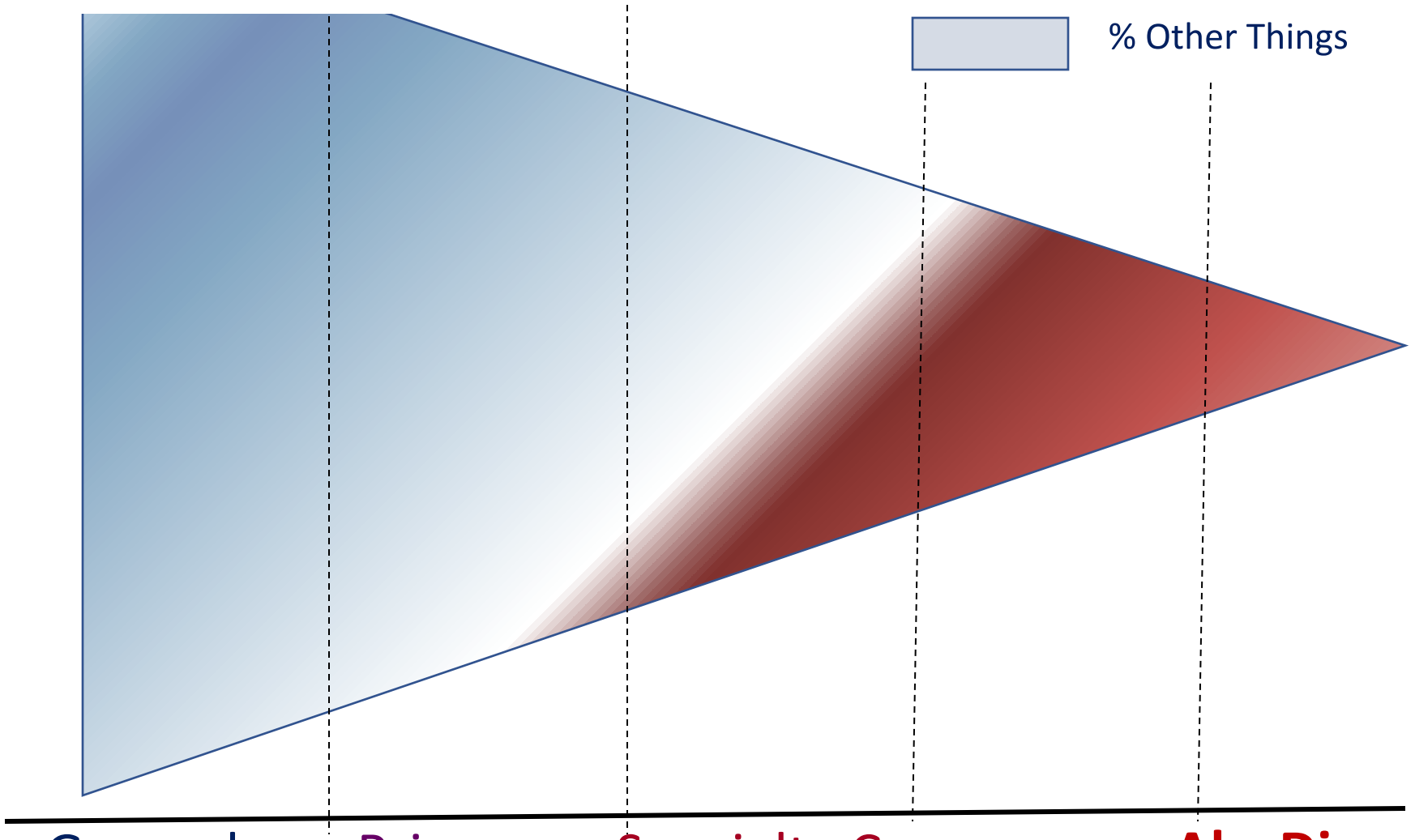
WHERE ARE MOST PEOPLE WITH MCI?





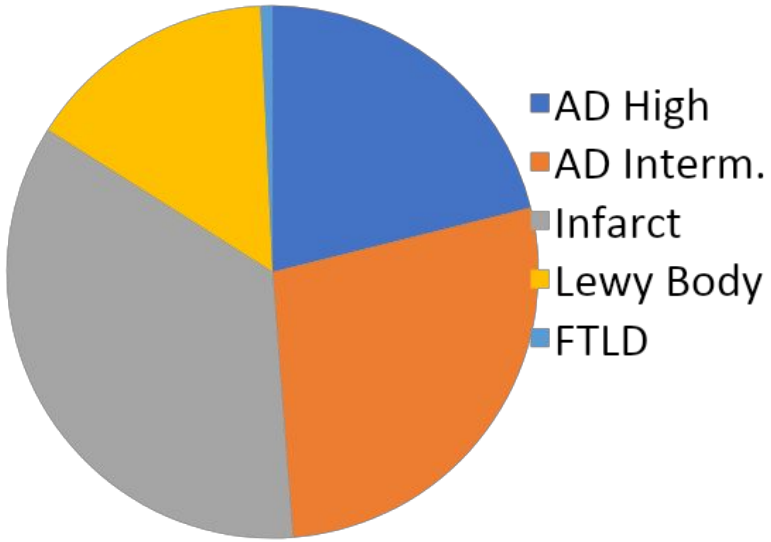
WHERE IS MOST RESEARCH IN MCI DONE?

Causes of MCI

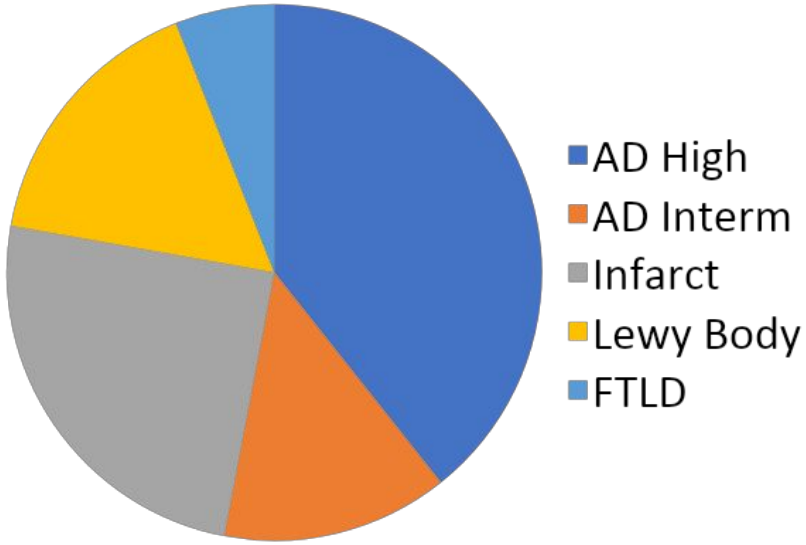


Neuropathological Diagnoses in all individuals with clinical dementia

Community Samples



Clinic Sample



Schneider JA et al., J. Alz. Disease 2009

What happens to people with MCI?

- Depends on where researchers find them.

In Community Studies	In Research Clinics
Most people with MCI remain MCI.	Most people with MCI progress to dementia.
A small number progress to dementia.	
A small number get better.	


Traffic
More...
Duluth
Sudbury
Minnesota
Trois-Rivières
Maine
Wisconsin
Vermont
Michigan
New Hampshire
New York
Massachusetts
Iowa
Connecticut
A
Pennsylvania
Ohio
Illinois
Indiana
New Jersey
Maryland
West Virginia
Delaware
Missouri
Kentucky
Virginia
Tennessee
North Carolina
Arkansas
South Carolina
Wilmington
Mississippi
©2008 Google - Map


Allegheny R
PA
Pittsburgh
OH
Ohio River
Monongahela River
Youghiogheny River
MD
WV
VA
Monongahela River Basin
Monongahela River highlighted

Monongahela-Youghiogheny Healthy Aging Team (MYHAT)

- Cohort study funded in Sept 2005 by NIA.
- Objectives:
  - Identify older adults who are cognitively normal or only mildly impaired.
  - Identify those who progress to dementia and those who remain free of dementia.
  - Identify predictors of progressing to dementia vs. predictors of remaining dementia-free.

R01 AG02365

MYHAT Cohort recruitment

- Age-stratified random sample from publicly available 2004 voter registration list.
- Entry criteria:
  - Age 65+;
  - Not currently in long-term care institution;
  - Not severely impaired in vision or hearing;
  - No decisional incapacity.

MYHAT Design

- Recruited 2036 individuals.
- Triaged out 54 individuals with age-education corrected MMSE score <21.
- Full assessment of 1982 participants recruited between 2006-2008 (baseline wave/cycle).
- Annual reassessment waves.

Risk factors for MCI in the MYHAT Study

Higher Age

Diabetes

Abdominal obesity (*belly fat*)

Stroke

Heart Failure

Neurology 2013;80:2112–2120

MYHAT MCI Outcomes study

- We followed people with MCI for at least 5 years, identifying those who developed MCI (CDR=0.5) and dementia (CDR>=1) at any point.

Mild Cognitive Impairment (MCI) over at least 5 years				**Remained Normal**
Reverted to Normal	Stable MCI	Progressed to Dementia	(Total MCI)	
252	384	86	(722)	881
34%	*53%*	*12%*	(100%)	

MCI outcomes over > 5-year followup

- Defining MCI as CDR = 0.5 and dementia as CDR≥1.
- We **compared** 3 MCI subgroups:

  (1) those who **progressed** to dementia (n=86),

  (2) those who **stabilized** at MCI (n=384),

  (3) those who **reverted** to normal (n=252),

- **to** :

  (4) those who **remained consistently normal** (n=881).

3 MCI outcome groups

MCI subgroups with different 5-year outcomes had *some similar and some distinct* characteristics, suggesting different underlying causes.

Compared to those who remained consistently normal:

- The **progressors** to dementia had profiles broadly typical of Alzheimer's disease; objective memory deficits, *APOE*4*, and also history of stroke.
- The **reverters** to normal did *not* have memory deficits or *APOE*4*; they had more subjective complaints; they took more prescription medications.
- **Stable MCIs** *(biggest group!)*had diabetes, low diastolic pressure, took more prescription meds, and also had *APOE*4* genotype.

J Am Geriatr Soc. 2019 Feb;67(2):232-238

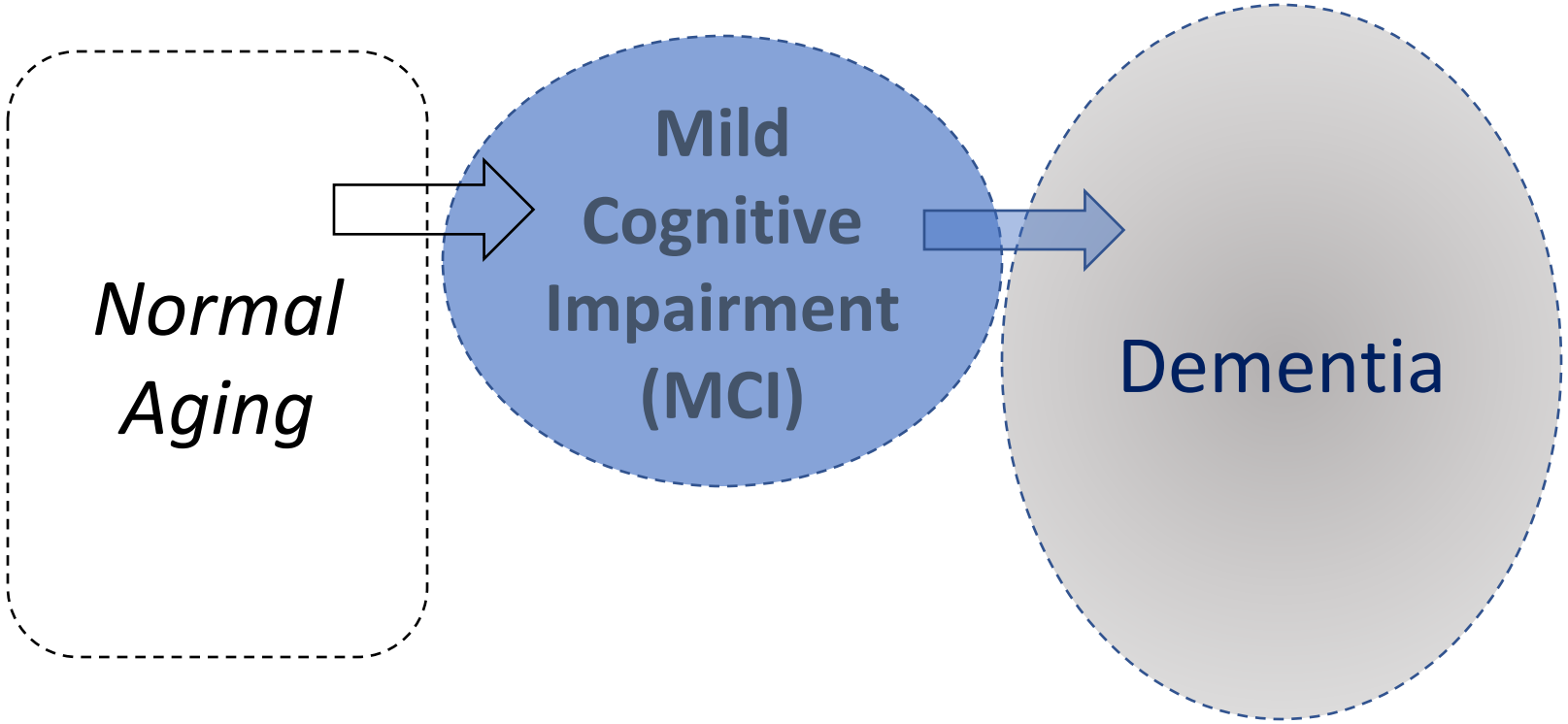
In conclusion

- MCI is not always prodromal dementia.
- “Intermediate” ≠ “Transitional”
- The majority of people with MCI in the community do not progress to dementia.
- MCI is even more heterogeneous than dementia.
- Several potentially treatable conditions are associated with MCI that does not progress to dementia.

For more information about our projects, please visit our website.

www.dementia-epidemiology.pitt.edu

The Cognitive Continuum in the Dementia Research Clinic



SUMMARY

The Cognitive Continuum in the Community