

Dementia Screening for Seniors

An “Always” Event



Rhonna Shatz, DO

Clayton Alandt Chair of Behavioral Neurology

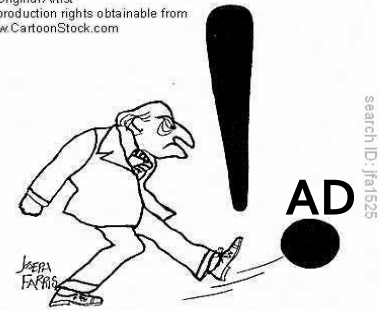
Henry Ford Health Systems

March 14, 2013



Dementia: Imperative to Act

© Original Artist
Reproduction rights obtainable from
www.CartoonStock.com



search ID: jfa1525

World Health Organization

- Significant threat to health of all nations
- First chronic disease to be cited

Dementia as Chronic Disease

- Genetics and environmental exposure
- Importance of risk factor modification
 - Nondegenerative contributions **>55%**
 - Less dementia by 50% if risks managed early
 - Risk reduction best managed by primary care

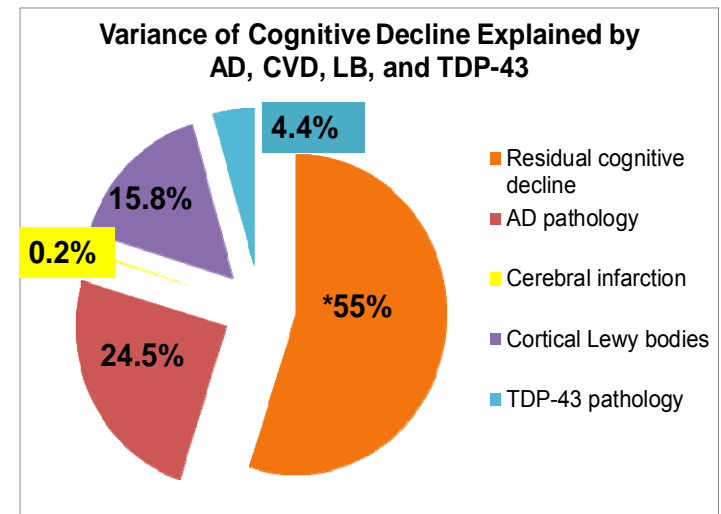
National Alzheimer's Association

- Pre-dementia states
 - Mild Cognitive impairment
 - Pre-clinical AD
- Earliest stages are target of treatment

National Alzheimer's Project Grant

Medicare Wellness Visit

- Patients must be asked about cognition at an annual visit



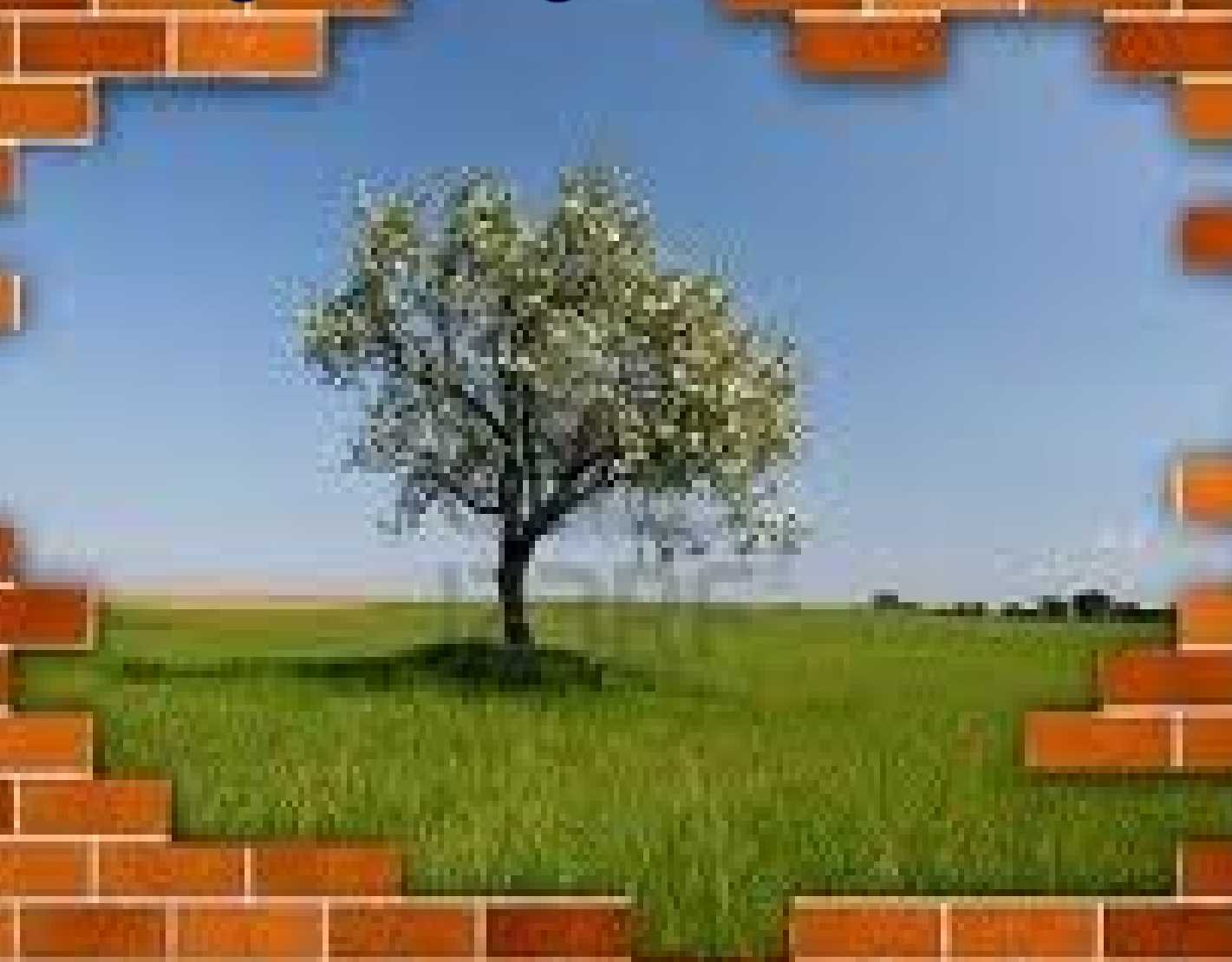
The Brick Wall

- **Cognitive tests**
 - Lack of time
 - Inappropriate environment
 - Nonstandard administration
 - Uncertainty in interpretation
 - Ceiling, floor, and repeated assessment issues
- **Medical evaluation**
 - Discriminating history
 - Medication review
 - Targeted neuro exam
 - Essential objective tests
- **Symptom and caregiver management**



**Henry Ford
Hospital**

Breaking through the brick wall



The “Always” Event

Annual Cognitive Screen Pilot

INCLUSION CRITERIA

- \geq 70 years
- English fluency
- Visual acuity adequate to read a computer screen
- Able to hear (with hearing aids if needed)
- Mechanical ability to use a mouse



Wellness or well visit
Two primary care sites
90 day pilot

EXCLUSION CRITERIA

- Dementia diagnosis
- Acute infection, exacerbation of chronic illness
- $<$ 2 weeks post antibiotic therapy
- $<$ 30 days post hospitalization

NIH Toolbox



- Standardized for 5-85 years
- Utilizes **Item Response Theory** and **Computer Adaptive Testing** to limit items, increase precision
- Adjusts for education and performance (ceiling, floor effects reduced)
- Random variations in items allows for serial testing
- Instruction and administration standardized
- Interpretation standardized
- FDA medical device regulation
- Public domain, royalty free
- Continuously updated and revised
- Shorter than standard neuropsychological tests (30-60min)
- May be administered by any trained technician (medical assistants, etc)

16,000 subjects for calibration and validation

4,859 subjects 3-85 administered all measures

Toolbox Tests

Executive Function

Pictures same or different

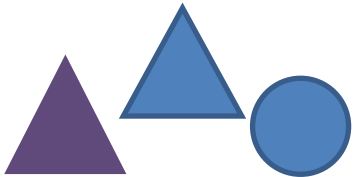
Executive Function

(Reaction time)



Executive Function

Stroop
Color or shape match



Executive Function

Digit-symbol



Estimate IQ

Vocabulary

Word-picture match

Reading

Working Memory

See animals

Recall in order of smallest to largest



See animals and food

Recall in order of smallest to largest food then animals

Episodic Memory

Visual

Recall successively longer sequences of pictures depicting activities in the park

Episodic Memory

Verbal

RAVLT

15 word list

learning

Primary Outcome Measures

- **# Patients screened vs eligible**
- **# Screen failures who return for evaluation**
- **Medication review**
- **Screening labs done**
- **MRI/CT done**
- **Specific diagnosis**
- **Acetylcholinesterase inhibitor treatment**
- **Social work call/conference**



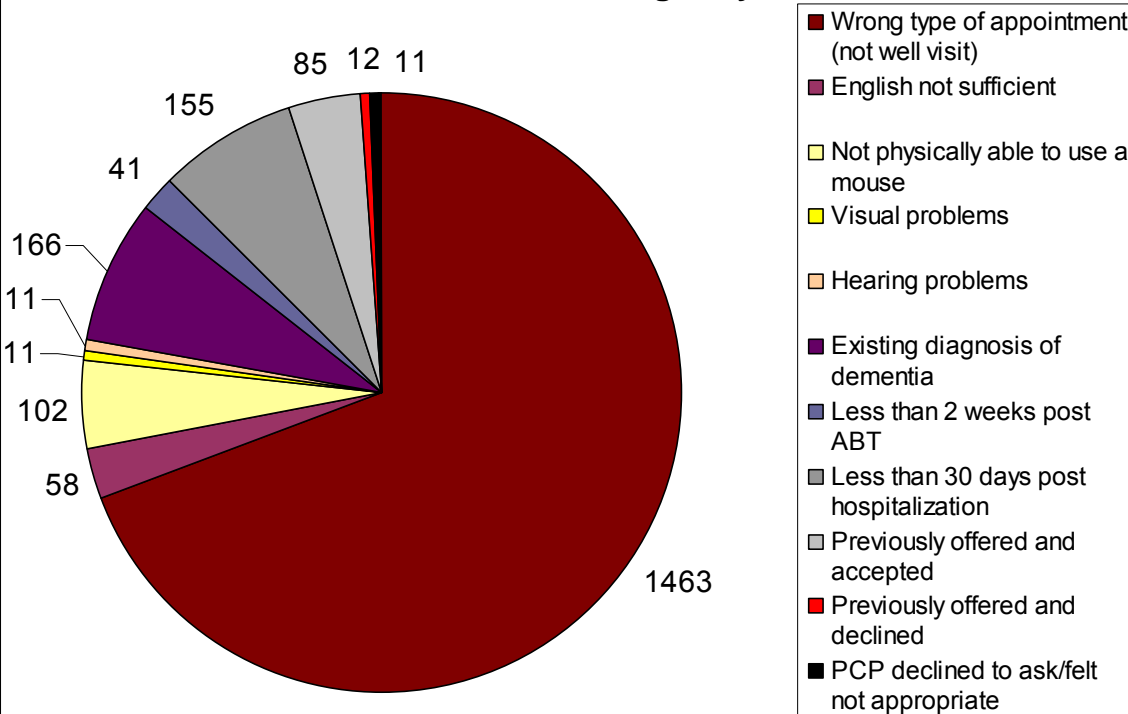
Focus Groups

- 48 clinic patients 70-89y
- Knowledge, fears and misconceptions regarding brain health and dementia
- Brain health brochure
- Test-taking tip card
- Feedback on NIH Toolbox



Enrollment and Eligibility: Visits

Reasons for Ineligibility



- **3366** visits among 12 IM practices of patients ≥ 70 y

- **2/5** of visits fit well criteria

- Visits occurred in **2268** unique patients

- **1/5** of visits in >85 y, high risk

- Small proportion physically ineligible (**3.6%**)

- **0.3%** visual deficit

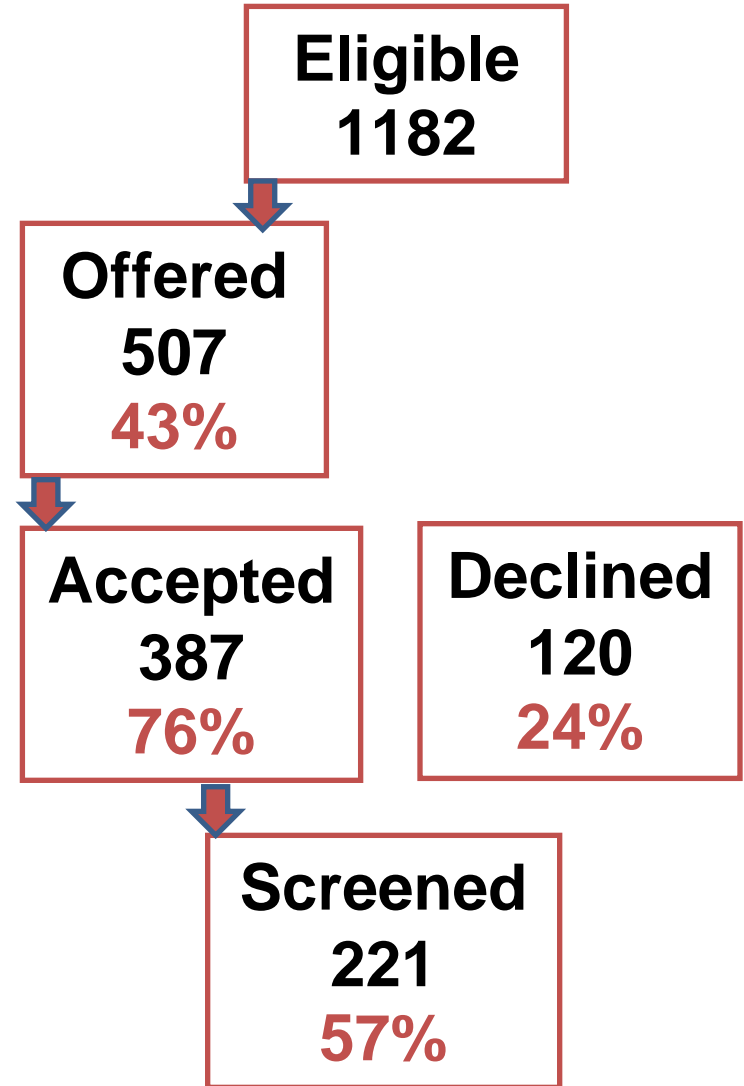
- **0.3%** hearing deficit

- **3.0%** not able to/never used mouse

- **1255** visits met eligibility requirements

Offer and Acceptance Patients

- Majority of those offered accepted
 - $\frac{3}{4}$ accepted
- Of groups offered vs not offered
 - No difference in gender
 - Trend for **>85y not offered** (p=0.05%)
- Of groups accepted vs declined
 - No difference in gender
 - No difference in numbers >85
- Majority of eligible **not offered** screen
 - May reflect MA or MD bias
 - MA tester/MD dyad highest offer rate
 - Lead physician most overall offers



Sites	Lead dyad avg.	Site avg.
Farmington	53%	36%
Sterling Hts	50%	21%

Demographics (screened)

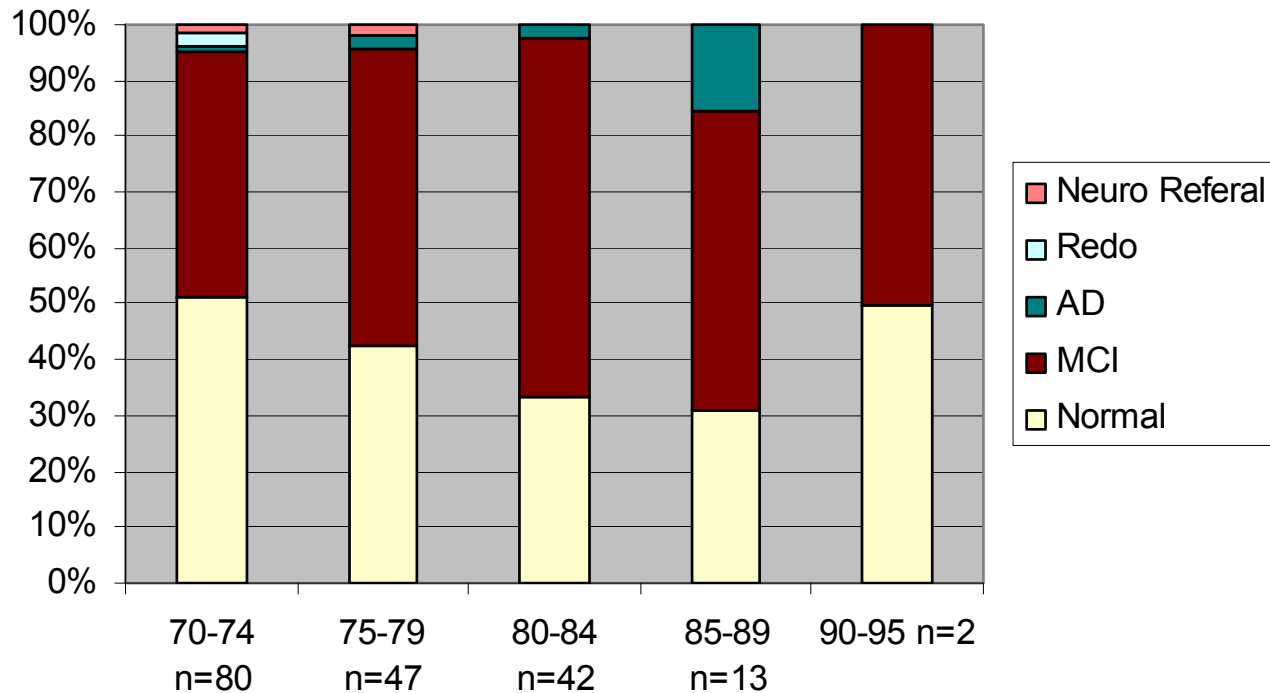
Gender, n (%) 221	Female	106 (48%)
	Male	115 (52%)
Education, n(%)	< High school	15 (7%)
	HS or equivalent	61 (28%)
	Some college	68 (31%)
	Bachelor's degree	36 (16%)
	Post graduate degree	41 (19%)
Age 85+	Yes	25 (11%)
	No	196 (89%)
Age	Mean (SD)	76.8 (5.4)
	Median (Range)	76 (70 to 92)

- No gender differences
- Education
 - **<1/10** <high school
 - **> 1/4** high school degree
 - **>1/3** college or above
- Most screens in younger
 - Median 76y
 - **1/10** in >85y

Diagnoses: Toolbox + Supplemental



**Full Toolbox and Supplemental Tests
Diagnosis by Age**



- MCI increased from **45% to 66%**

- AD diagnosis higher in 85-89y/o

- Overall

- Normal **43%**

- MCI **52%**

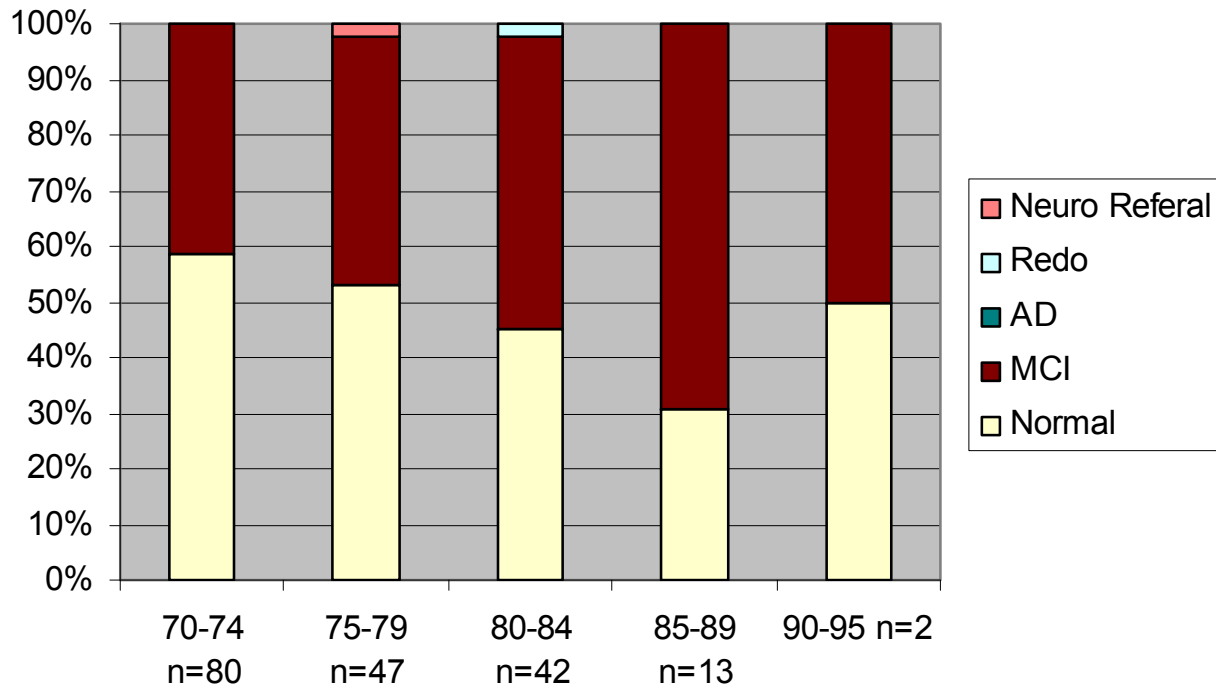
- AD **3%**

- Non-AD **1%**

Diagnoses: Toolbox without supplements



**Full Toolbox Only
Diagnosis by Age**



- MCI increased from **42% to 70%** from age 70 to 92
- **No** AD diagnosis
- Overall
 - Normal **52%**
 - MCI **47%**
 - AD **0%**
 - Not AD **0.5%**

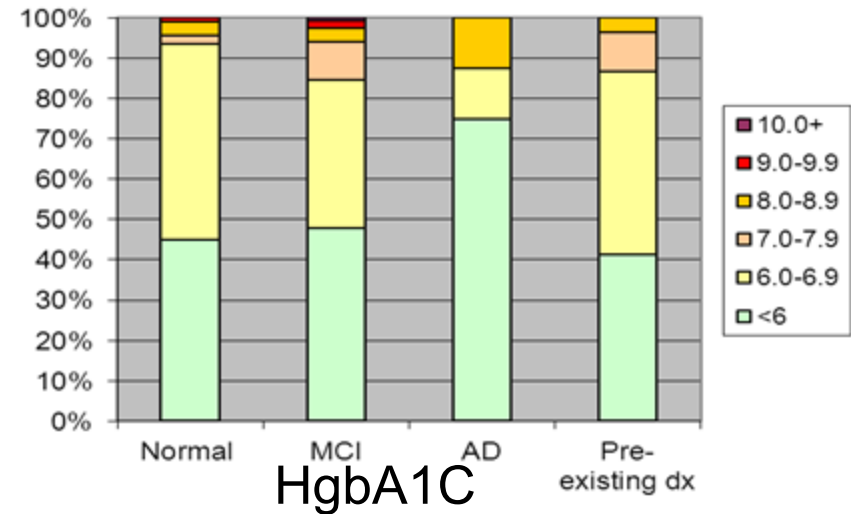
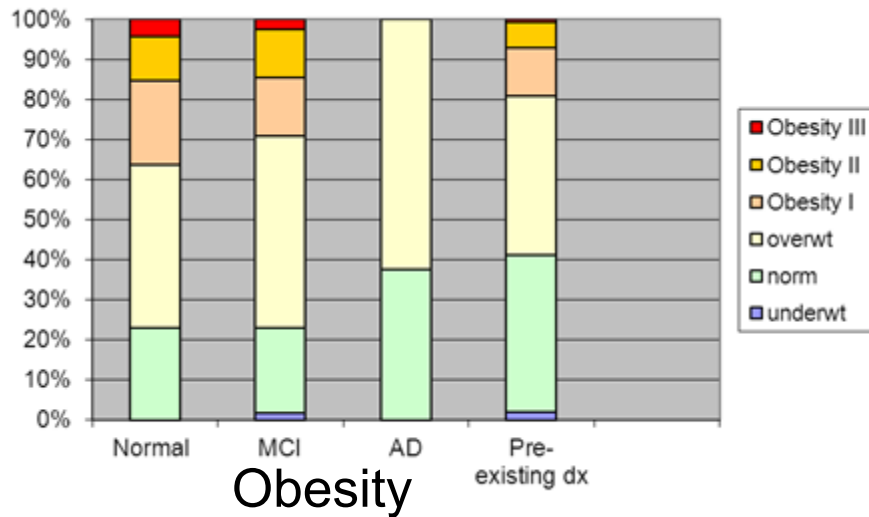
AD: more than plaques



Risk factor	Increases AD
Diabetes	40%
Mid-life HTN	60%
Mid-life obesity	60%
Inactivity	40-80%
Low education	40-80%
Smoking	60%
Depression	90%
Cognitive inactivity	(unknown)

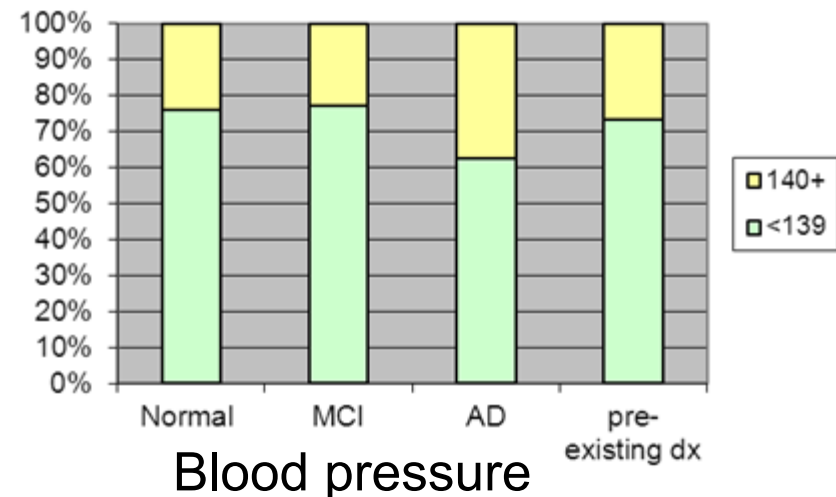
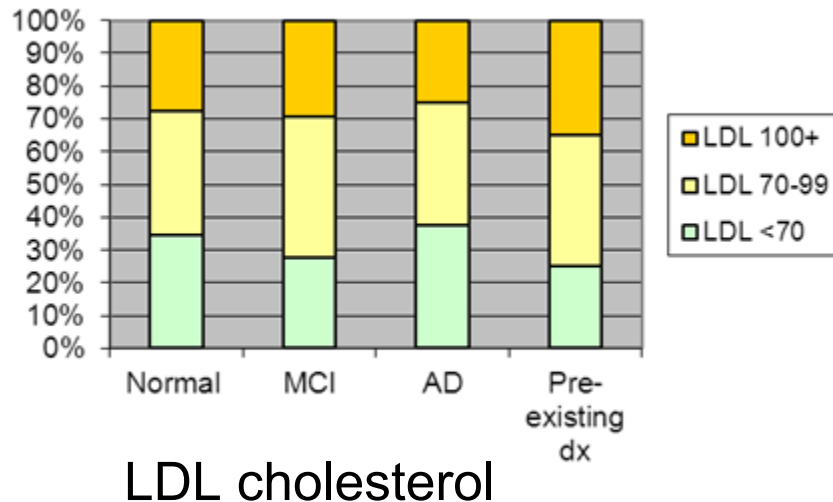
Barnes D, Yaffe K The projected effect of risk factor reduction on Alzheimer's Disease Prevalence. Neurology 2011; 10:819-28

Modifiable factors: Metabolic



- **Inflammatory and vascular risk**
- 80% of normal and MCI overweight or obese
 - 35% obese
 - Incidence diminishes with AD
- >50% normal and MCI glucose intolerant
 - incidence diminishes in AD

Modifiable factors: Vascular

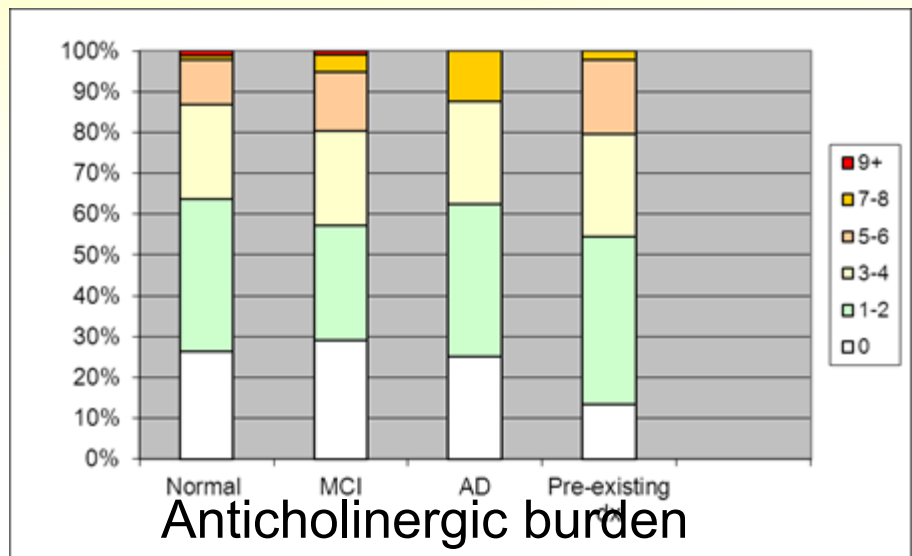
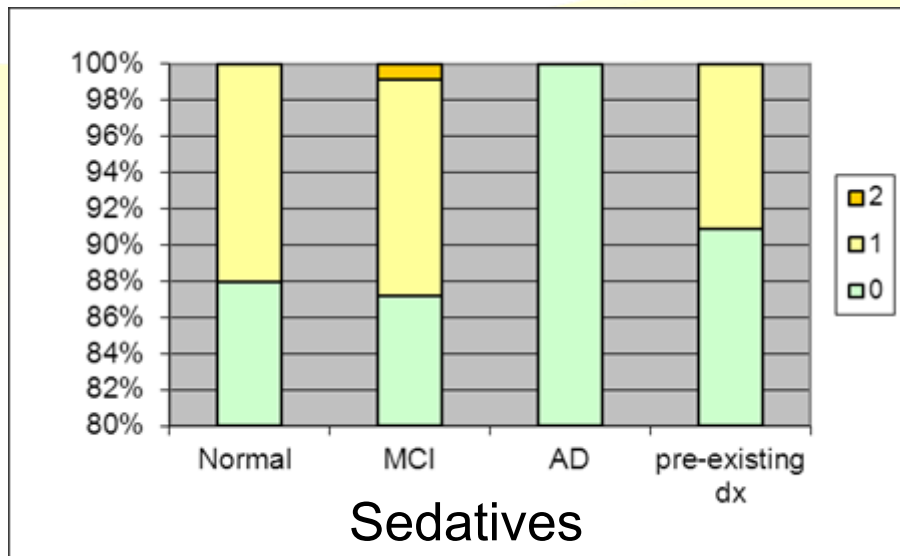


Vascular comorbidity and stroke risk

- 30% with LDL > 100
- 20% with uncontrolled hypertension
 - Worsening with AD

Modifiable factors

Medication side effects



- **Medication review**
- 13% normal and MCI on a sedative
- Anticholinergic burden high in all groups
 - 40% with score ≥ 3
 - highest burden score in AD

Outcomes



40% office visit follow-up

- ½ diagnostic visit with PCP
- >1/3 met with MSW
- 1/3 met with PCP and MSW same day

Underperformed

- 73% partial labs ordered
- 27% MRI or CT imaging
- 3% sleep clinic referral
- 4% prescribed AchEI tx

NIH Toolbox and Dementia



- Patient acceptance high
 - Expect memory testing as part of health care
- MA administrators
 - Career enhancer
 - Key to success of follow-through
 - Consolidated training
 - Practice patients

- Physicians skeptical
 - Bias against diagnosing dementia or MCI
 - Consider brain health strategy
 - Use of NP as proxy for dx
 - Low diagnostic and management follow-up
 - Low use of social work
 - Modifiable risk factors in normal and MCI groups high
 - BMI, metabolic syndrome
 - Medication side effects

NIH Toolbox and Dementia



- **Toolbox performance**
 - Good overall trends in detecting MCI vs normal
 - AD/dementia diagnosis low detection
 - Add fluency measures
 - Add CERAD or written memory tasks with delay and recognition
 - Need more validation with clinic standard

- **Special considerations in elderly for**
 - Mouse training
 - Keyboard alteration
 - Extra time: 60-90 min.
 - Hearing
 - Improved acoustics
 - Written memory tests

Partners

Henry Ford Health System

Rhonna Shatz, DO
Clayton P. Alandt Chair of
Behavioral Neurology
rshatz1@hfhs.org

Wendy Lemere DNP, GNP-BC
Gerontological Nurse Practitioner
wlemere1@hfhs.org

Lonni Schultz, PhD
Senior Biostatistician
Public Health Sciences

Sheila Daley, RN
Administrator Neurosciences

Karen Kippen
Director, Corporate Planning

Alzheimer's Association Greater Michigan Chapter

Kate Williams LMSW
kwili1@hfhs.org

Sterling Heights Internal Medicine

Dr. Greg Krol
Physician in Charge

Internal Medicine Providers

Dr. Ralph Greenberg
Dr. Mouna Haddad-Khoury
Dr. Brian Massaro
Dr. Kavita Paragi
Dr. Maria Samuel
Dr. Jayashree Sekaran
Karen Bauer, RN BSN MSA
Nurse Manager
Internal Medicine and Specialty
Clinics

Margaret Chinzi, MA
June Gorman, MA

NIH Toolbox NW University

Feinberg School of Medicine

Richard Gershon, PhD
PI NIH Toolbox
Vice-Chair Research, Medical Social Sciences
Cindy Nowinski, MD, PhD
Research Assistant Professor, Medical Social Sciences
Abigail Sivan, PhD
Associate professor psychiatry and behavioral services



Farmington Internal Medicine

Dr. Lynne Johannessen
Physician in Charge

Internal Medicine Providers

Dr. Rashid Alsabeh
Dr. Jeffrey Finn
Dr. Vera Khasileva
Dr. Lawrence Mitchell
Irina Shikin, RN
Nurse Manager
Courtney Saltmarsh, MA

alzheimer's association



Grosfeld
Collaborative



Vision



**A World without Alzheimer's
But until then,
A World that can treat
Alzheimer's**



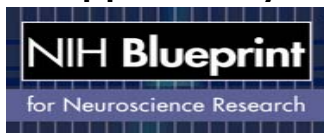
NIH Toolbox

Assessment of Neurological and Behavioral Function

For more information
visit
www.nihtoolbox.org



Supported by



This project is funded in whole or in part with Federal funds from the Blueprint for Neuroscience Research and the Office of Behavioral and Social Sciences Research, National Institutes of Health, under Contract No. HHS-N-260-2006-00007-C.

Medical Assistant Role

• Training essential

- ½ day, 1 day, ½ day at Northwestern
- Practice on volunteers from clinic/focus groups
- MA without consolidated training struggled

• Instruction manual modified

- Spiral flipbook mounted on book support
- Instruction on voice, demeanor, nonverbal cue
- Sample answers/responses to problems during tests

• Nodal support of the process

- Embraced enhanced role
- Ensured follow-up with physician



Toolbox Administration

General

Speak slowly and exaggerate pauses at commas, periods.

Change inflection to emphasize a command or important concept.

Look at patient as much as possible when reading directions and ensure they are attending to you while giving instructions.

Be positive in your comments, especially when patients appear frustrated or angry

Introduce the tests as “games” or “tasks”; avoid use of the word test.

Be mindful of facial expression, voice inflection, and gestures that may unintentionally inform patients of right or wrong answers.



Sample answers to common problems or questions:

- **Patient talks about unrelated topics during a task**
 - “Stay focused on what we are doing and don’t talk about other things; you will do better on the game.”
- **Patient requests to go to the bathroom during a task**
 - “Let’s finish this task first and then you can have a bathroom break.”
- **Patient asks to stop the test or appears frustrated.**
 - “Let’s finish this task and then take a break.”
 - Offer a snack, a bathroom break, a walk, or distract with a conversation, humor, or jokes. It’s good to make someone who is ill at ease laugh.
- **If giving up too quickly, encourage:**
 - “Scratch your head and some more answers may fall out”
 - “Keep trying; sometimes the answers are slow in coming”
 - “It’s OK to guess; guessing is good”
- **Patient worries about how they are doing**
 - “Everyone has trouble with some of these/this task/s.”
 - “Don’t worry about **how** you are doing, just focus on **what** you are doing.”
 - “This task is only one way in which we look at brain function. Don’t worry about how you do on this part. Your doctor will also look at other things that may relate to thinking and memory”
 - “This task is to help us find a way to help you. If this is hard, we need to know why and then find a solution.”
- **Patient asks why they are doing this test.**
 - “This is a way to evaluate brain health and keep the brain functioning well. It’s just like measuring cholesterol or doing a colonoscopy; it’s a way of preventing problems or finding out about changes in thinking before they cause a problem”
- **Patient asks if they have Alzheimer’s disease or dementia**
 - “This task provides only one piece of information that is needed to know about how the brain is functioning. We can’t tell if you have dementia or Alzheimer’s disease just based on a test. Your doctor will do other tests to help find out about whether or not you have that/those problems.”
- **Patient asks to see spouse or family member or seems worried about where they are.**
 - “Your husband/wife/family member is meeting with the doctor/nurse/social worker and will be back when they are done”.
 - “Your husband/wife/family member went to the bathroom/to get a cup of coffee/answer a telephone call, etc., and will be back when they are done.”
- **Patient asks same question repeatedly.**
 - Provide a variation on the previous answer to their question.
 - Do not ask them to try and remember; they cannot.
- **Patient appears lethargic, sedated, difficult to keep awake**
 - Cancel testing
 - Return to primary care doctor for evaluation of infection, illness, medication side effect, sleep disorder
 - **Note in comments section that patient was lethargic and that testing was cancelled.**
- **Patient verbally or physically threatening**
 - Cancel testing
 - Institute appropriate procedures for managing difficult patients
 - Note in comments section that patient was threatening and that testing was cancelled.

Environment

Dedicated room, free of distraction

Separate appointment from clinic visit

Focus group and physicians concerned regarding spurious effects of lack of sleep, hearing, vision, test anxiety



As part of your annual physical, your Doctor has ordered a test to evaluate your brain health. The purpose of the test is to help your Doctor determine if he/she needs to take any specific measures to keep your memory and thinking at its best. While the test is taken on a computer, you do not need to have prior experience operating a computer. A trained technician will administer the test, and be there throughout the test if you have questions or need any help.

We recommend that this test be scheduled on a day other than your Doctor's appointment, so that you are well rested and have a chance to make a few simple preparations.

- **Get a good night's sleep the night before your test but avoid sedatives, over the counter or prescription sleeping pills, and alcohol. Melatonin is acceptable**
- **Make sure to eat your breakfast or lunch**
- **Take your usual medications**
- **Bring your reading glasses**
- **Wear your hearing aids if needed**
- **Empty your bladder before you come**

This test was developed by the National Institute of Health, and takes about an hour. Your Doctor will either send you a letter with the results, or call and ask you to come back to discuss the results at another office visit.

Please call _____ at least 24 hours in advance if you need to reschedule your appointment.

"F", Fruits/vegetables	1SD	2SD	Delayed Free Recall Delayed recognition	1SD	2SD
Category fluency			Savings ratio		
>12y			>12y		
Men 18.3 (4.5)	13.8	9.3	Men 81.5% (19.6)	61.9	42.3
Women 17.2 (4.2)	13	8.8	Women 85.3 (18.9)	66.4	47.5
<12y 14.4 (3.7)	10.7	7	<12y 89.7 (17.3)	72.4	55.1
Letter fluency			Delayed recognition		
>12y			>12y		
70-79 11.8 (3.2)	8.6	5.4	Men		
80-89 13.1 (4.1)	9	4.9	+ Yes 9.5 (0.8)	8.7	7.9
			+ No 9.8 (0.5)	9.3	8.8
			Total +	18	16.7
			Women		
			+ Yes 9.7 (0.7)	9	8.3
			+ No 9.9 (0.3)	9.6	9.3
			Total +	18.6	17.6
			<12y		
			+ Yes 9.3 (1.2)	8.1	6.9
			+ No 9.9 (0.3)	9.6	9.3
			Total +	17.7	16.2

MCI

>/= 1 domain 1 SD below norm
1 domain with 2SD below norm

Dementia

>/= 2 domains with 2SD below norm

Alzheimer's dementia

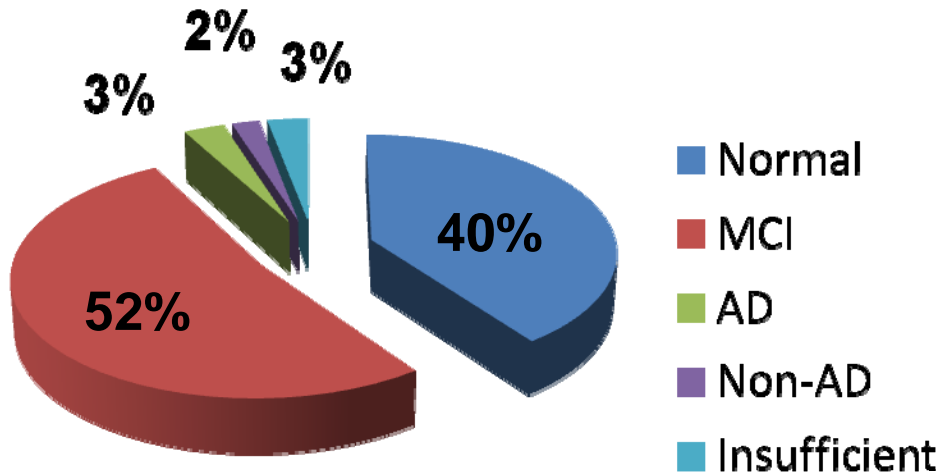
Meets dementia criteria and
Memory >/= 2SD below norm

Semantic fluency >/= 2SD below norm

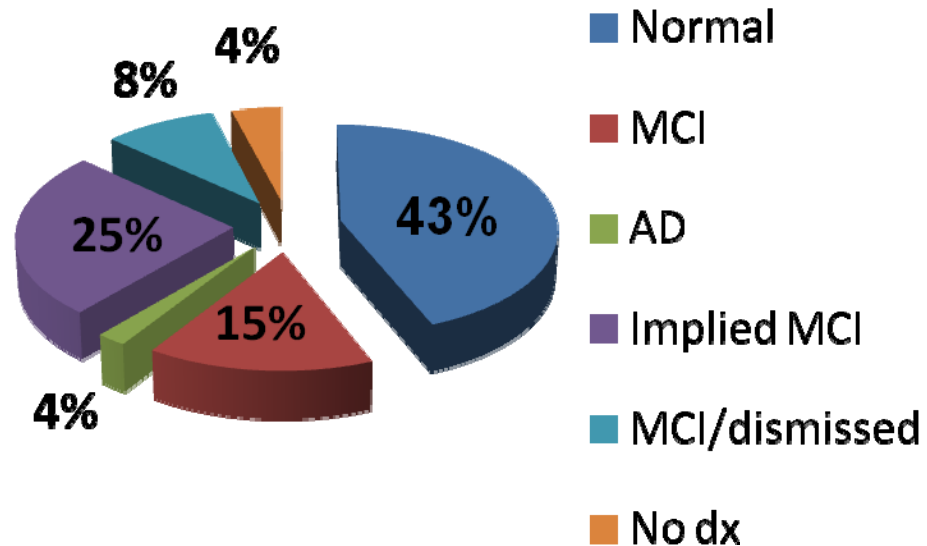
Diagnoses

N=221

Toolbox with Supplement Diagnosis



Final PCP diagnosis



Non-AD diagnoses not investigated

Two AD diagnoses dismissed

MCI diagnosis most variable follow-up

1/4 MCI acknowledged

about 1/2 diagnosis implied, not stated

about 15% dismissed

Notification

Diagnosis	Phone call	Office visit	Office letter	MSW letter
Normal (86)	28%	0.03%	39%	30%
MCI (115)	8%	39%	32%	21%
AD (7)	14%	86%	--	--
Non-AD (3)	67%	33%	--	--
No contact (10)	--	--	--	--

Physicians did not counsel over ½ of MCI patients
Dementia diagnoses were given over the phone
Some patients did not receive any feedback (10/221)

BMI

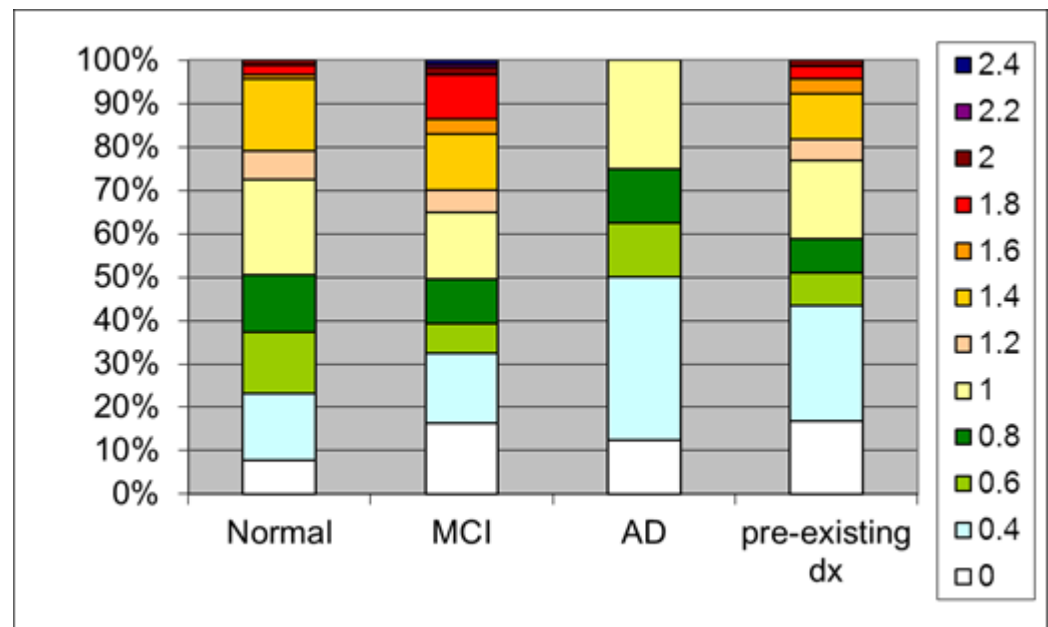
WHO guidelines 2000

BMI	Classification
<18.5	Underweight
18.5-29.4	Normal
25.0-29.9	Overweight
30.0-34.9	Class 1 Obesity
35.0-39.9	Class 2 Obesity
>/=40.0	Class 3 obesity

Dementia risk score and diagnosis

Category	Significant value	Risk score
HgbA1C	>/=6.0	0.4
LDL	>/=100	0.6
BMI	>/=30.0	0.6
Anticholinergic burden	@med ACB 2 or 3	0.4/medication

- For all 221 patients
X= 0.87 +/-0.54 (0-2.4)
- None of the differences between the different diagnoses were significant.



Handling dementia



- Physicians view cognitive test as definitive for diagnosis
 - Few followed up with EMR template, MRI, lab
 - Diagnosis given over phone or significance minimized
- Bias towards idea that nothing can be done, don't diagnose
- Higher standards for report with Toolbox
 - Detailed description of each test
 - Range of scores
 - Cut-off scores
 - Relationship to anatomic brain regions



Special considerations



10-15 minutes training
Button click instead of right/left click
Add special mouse training



Cover keyboard except for keys needed
Plan for 1 and 1/2h test time



14 tests incomplete
Anecdotally, more complained
Consider written version of memory tests