4.17.15

UNC SCHOOL OF MEDICINE

Screening For Memory Problems? A Translational Perspective

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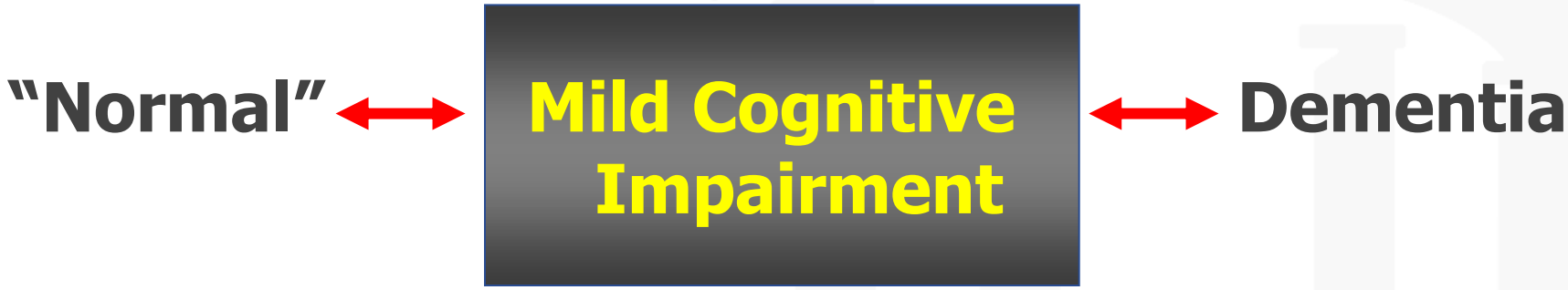
UNC DEPARTMENT OF NEUROLOGY

CAROLINA ALZHEIMER'S NETWORK

Why is DEMENTIA such a big problem?

- Mind-Body: Brain disorders that affect *mental functions* are viewed differently than other medical problems
- Anosognosia: A person with dementia often doesn't think anything is wrong with them (lack awareness)
- "Alzagnosia": others often ignore early signs

Spectrum of Cognitive Decline: Mild Cognitive Impairment



- Two main types:

- Amnestic: short-term memory deficit only, often progresses to AD dementia (CSF, brain imaging, genetic biomarkers may help "predict")

- Non-amnestic: (one or more cognitive domains) (heterogenous, "PD-MCI")

Neurocognitive Disorder (a.k.a. dementia)

Cognitive or *neuropsychiatric* symptoms:

- Decline from a previous level of functioning
- Interferes with daily functional activities
- Impairment involves a minimum of two domains: memory, reasoning, visuospatial, language, "behavior" (apathy, depression, anxiety)

- Major and minor (e.g. mild cognitive impairment)
- Separate clinical and pathological diagnoses

2011 NIA-AA Criteria; DSM V

AD Diagnosis & Treatment

Cognitive **Psychiatric**

[Clinical manifestations]

Past/Present

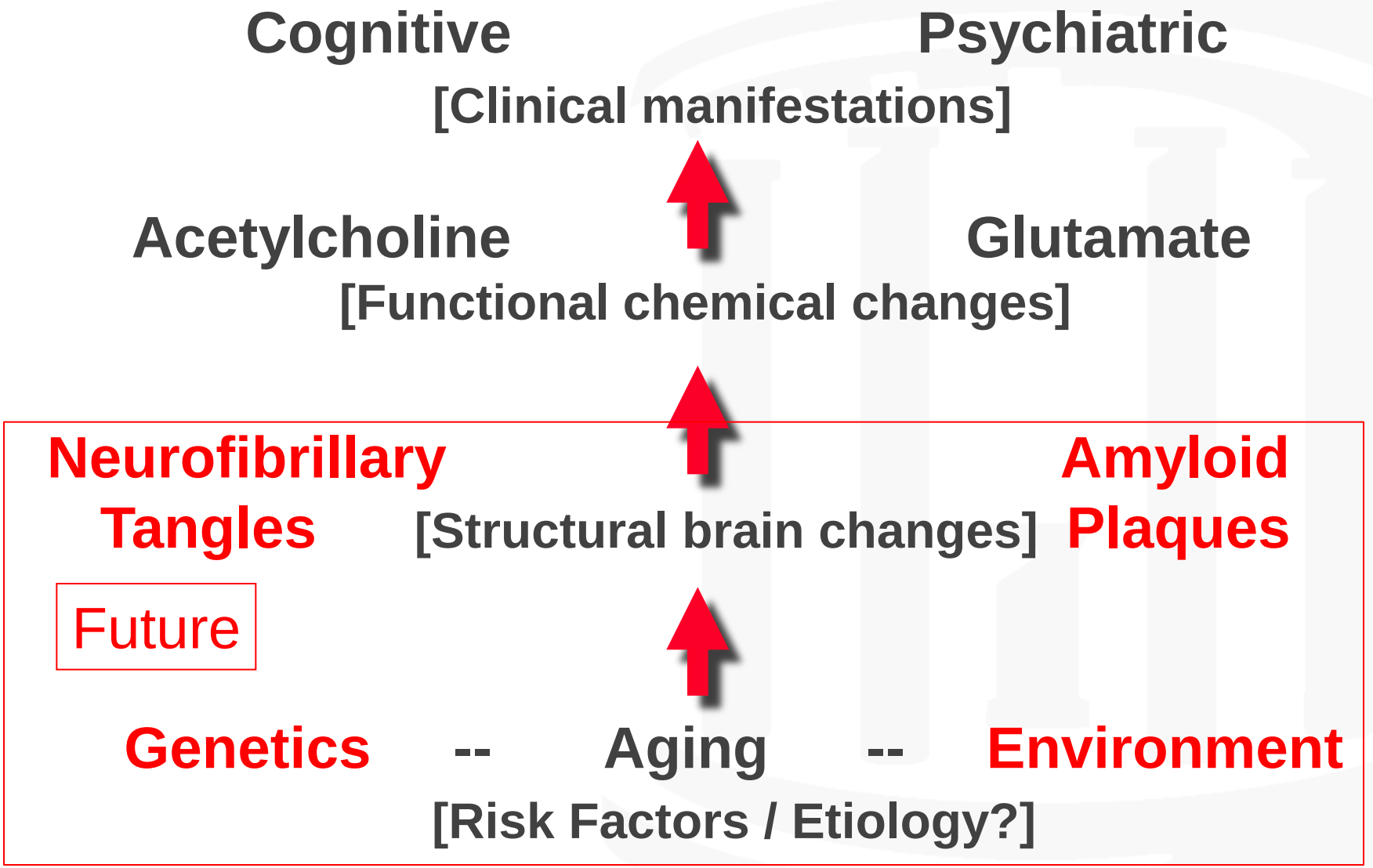
Acetylcholine **Glutamate**

[Functional chemical changes]

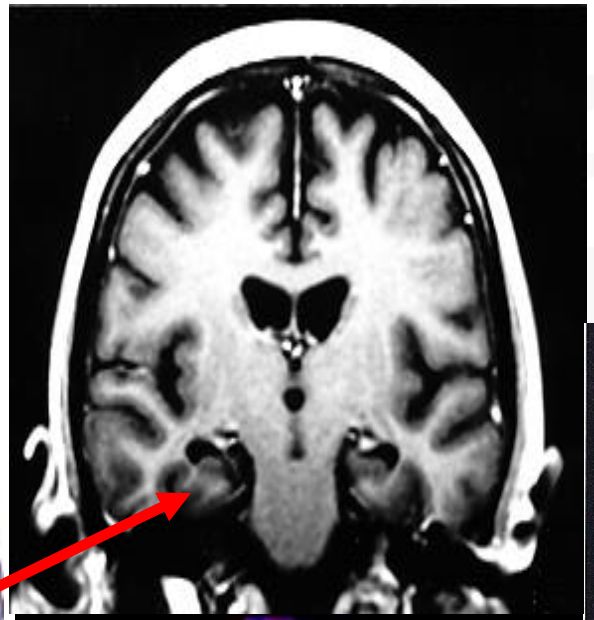
Neurofibrillary Tangles **[Structural brain changes]** **Amyloid Plaques**

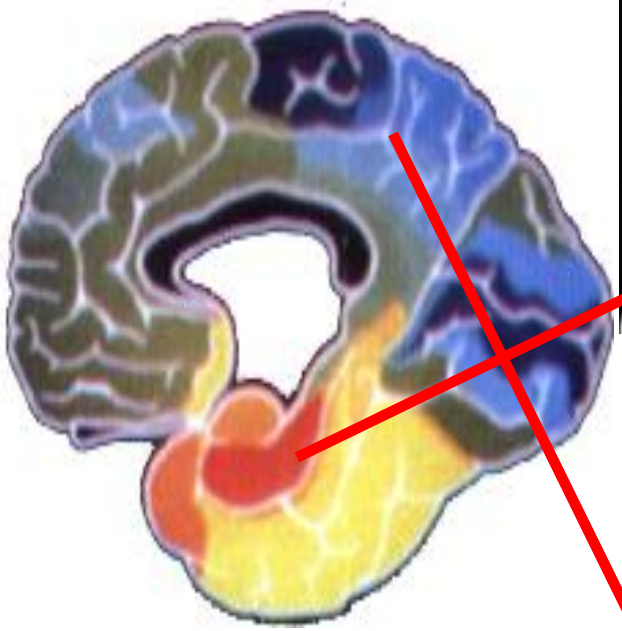
Genetics -- Aging -- Environment

[Risk Factors / Etiology?]


Cognitive
Psychiatric
[Clinical manifestations]
Acetylcholine
Glutamate
[Functional chemical changes]
Neurofibrillary Tangles
Amyloid Plaques
[Structural brain changes]
Future
Genetics -- Aging -- Environment
[Risk Factors / Etiology?]

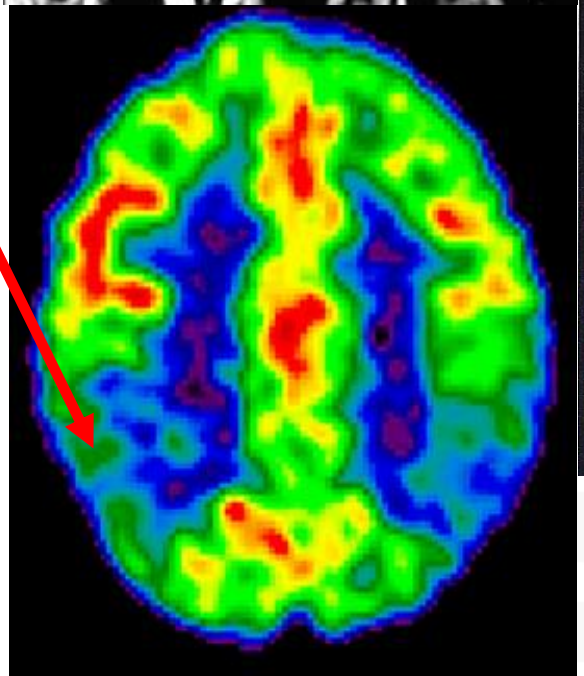
MRI





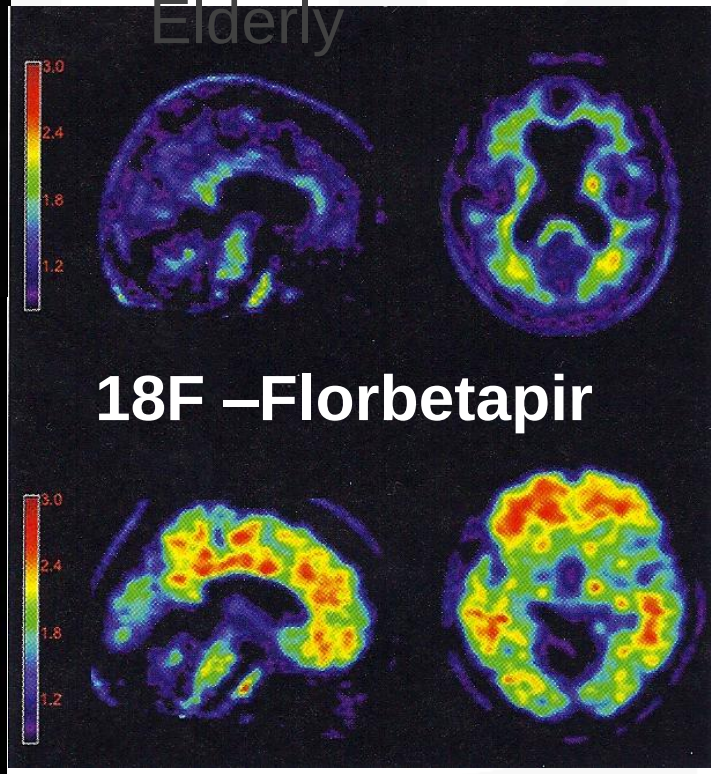
NFT Density (tau protein) Pathological Staging of AD

PET



Amyloid PET Brain Imaging

Normal Elderly



Alzheimer's

Medical Risk Factors & AD Prevention

Medical disorders linked to cognitive problems:

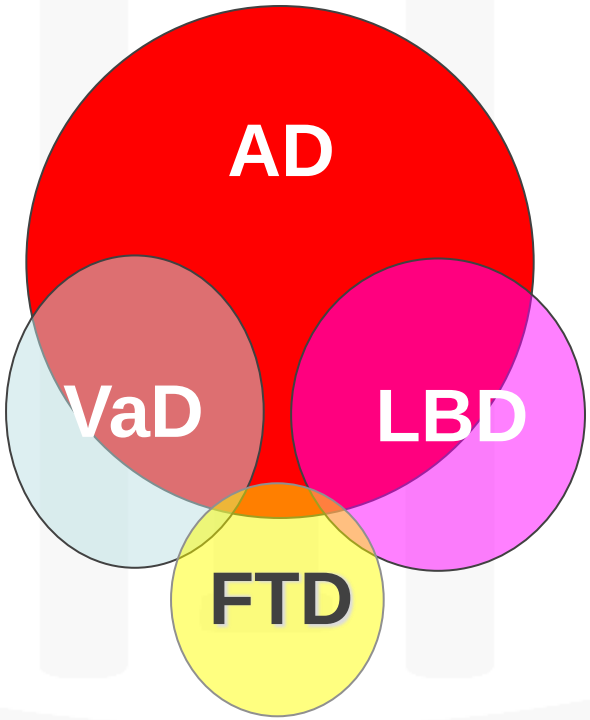
- High blood pressure
- Diabetes mellitus
- Elevated cholesterol
- Sleep apnea

Dementia Prevalence: Two Views

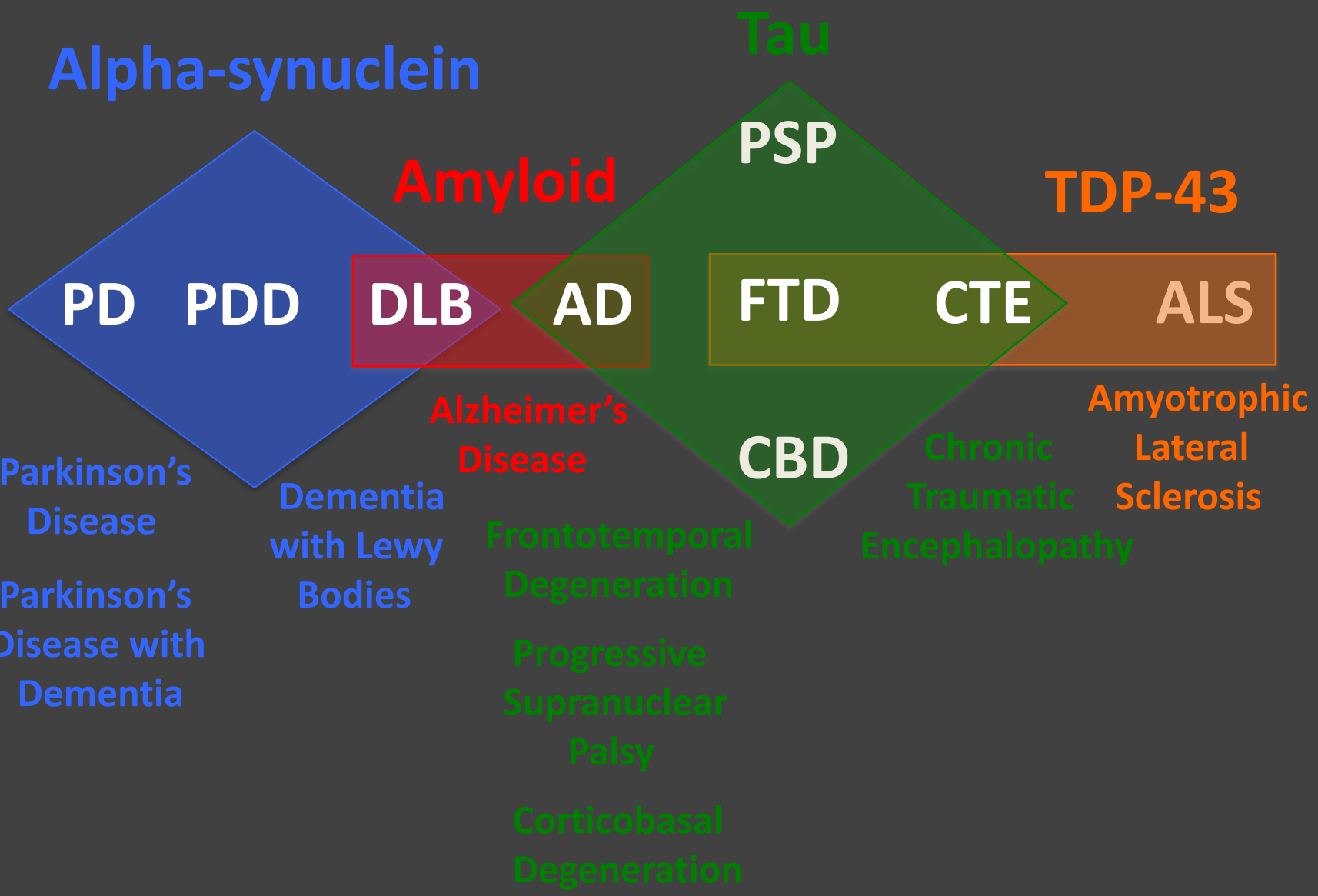
Textbook View

- Alzheimer's disease (AD) 60-70%
- Lewy Body Dementia (LBD) 15-25%
- Vascular dementia (VaD) 10-20%
- Frontotemporal dementia (FTD) 5%

Clinical View



Protein Families & Clinical Syndromes



Diagnostic Tests/Markers

Disease	Diagnostic Marker
Hypertension	blood pressure
Diabetes mellitus	blood sugar
Hypercholesterolemia	lipid profile
Alzheimer's disease:	amyloid + tau protein
Lewy body dementia:	alpha-synuclein +/- amyloid
Frontotemporal Degeneration	tau or TDP-43

Prevalence of Cognitive Disorders in NC

(2008-11)

Diagnosis	UNC	CMC
Memory Loss NOS	1,193 (48.6%)	6,095 (36%)
Alzheimer's disease	296 (12.1%)	5,258 (31%)
Senile Dementia	488 (19.9%)	2,967 (18%)
Vascular Dementia	363 (14.7%)	1,342 (8.2%)
Mild Cog. Impairment	63 (2.6%)	536 (3.2%)
Lewy Body Dementia	75 (3.1%)	137 (0.8%)
Pick's Disease / FTD	91 (3.7%)	58 (0.3%)
Cerebral Degeneration	488 (19.9%)	71 (0.4%)

Caregiver Impact of Neuropsychiatric Symptoms

Symptom Scale	Frequency (Percentage) of Moderate-Severe Caregiver Distress Ratings			
	MCI (N=61)	AD (N=45)	FTD (N=40)	LBD (N=41)
Delusions	3 (5.0)	6 (13.0)	4 (10.0)	8 (19.5)
Hallucinations	0 (0.0)	6 (13.0)	2 (5.0)	7 (17.1)
Agitation/Aggression	8 (13.3)	12 (26.1)	15 (37.5)	11 (26.8)
Depression/Dysphoria	16 (26.7)	7 (15.2)	6 (15.0)	9 (22.0)
Anxiety	12 (20.0)	8 (17.4)	14 (35.0)	18 (43.9)
Elation/Euphoria	1 (1.7)	0 (0.0)	5 (12.5)	1 (2.4)
Apathy/Indifference	13 (21.7)	3 (6.5)	15 (37.5)	14 (34.1)
Disinhibition	9 (15.0)	4 (8.7)	16 (40.0)	1 (2.4)
Irritability/Lability	12 (20.0)	6 (13.0)	17 (42.5)	8 (19.5)
Motor Disturbance	5 (8.3)	2 (4.3)	13 (32.5)	2 (4.9)
Nighttime Behaviors	10 (16.7)	4 (8.7)	10 (25.0)	10 (24.4)
Appetite/Eating	4 (6.7)	2 (4.3)	9 (22.5)	5 (12.2)

C Chi-square test p value for Frequency of Symptom-Associated Caregiver Distress Ratings Scored 3 or Above vs. Diagnosis is 0.0004 (AD vs. FTD: 0.0002, AD vs. LBD: 0.0009, FTD vs. LBD: 0.0002).

Carolina Alzheimers Network

- Directors: Dan Kaufer, MD, Phil Sloane, MD, MPH,
- Funded by the Duke Endowment, Area Admin. on Aging, NC Clinical Translational Research Center

- Objectives:
  - » Train community physicians how to efficiently diagnose and manage AD
  - » Link providers to community services
  - » Form statewide network of care providers and researchers

CAROLINA ALZHEIMER'S NETWORK

UNC Care Model

MEMORY CLINIC

Screening
Assessment
Diagnosis
Management
Care Partners

Research
Referrals:
MCI / AD
Diagnostic:
FTD / LBD

PRIMARY CARE OUTREACH

CAN Preceptorships

- Regional meetings (e.g. Buncombe, Bertie, New Hanover, Alamance counties)
- 8-12 Primary Care Physicians recruited for each (usually with one member of office staff)
- Full day of didactic lectures, hands-on cognitive screening, clinical assessment, review case studies, meet with county support services
- Goals:
  - » Improve PCP confidence in dementia skills
  - » Develop PCP-service provider partnership
  - » Improve patient and caregiver outcomes

CAROLINA ALZHEIMER'S NETWORK

CAN Statewide Training

KEY

Sites of CAN training workshops

Sites of CAN presentations

Lathren *et al. BMC Geriatrics* 2013, **13**:134
http://www.biomedcentral.com/1471-2318/13/134

BMC
Geriatrics

RESEARCH ARTICLE Open Access

Improving dementia diagnosis and management in primary care: a cohort study of the impact of a training and support program on physician competency, practice patterns, and community linkages

Christine R Lathren[1*], Philip D Sloane[1,2], Joseph D Hoyle[1], Sheryl Zimmerman[1,3] and Daniel I Kaufer[4]

PCP Self-Reported Practice Changes

(Pre-training vs 6 mo. post-training, p <.005 for all)

- Distinguish AD from other dementias
- Understand the value & use of cognitive tests
- Disclose and explain a diagnosis of dementia
- Provide initial treatment plans for memory loss
- Use medications for memory loss
- Educate pts and caregivers about dementia care
- Refer patients to community resources

Screening for Cognitive Impairment in Older Adults: An Evidence Update for the USPS Task Force

AHRQ, November 2013

- No rigorous studies on the effects of screening for cognitive impairment on patient, caregiver, or clinician decision-making or clinical outcomes
- Several brief screening instruments can adequately detect dementia (especially AD), but only a few instruments have been studied in > 1 study
- AChEIs, memantine, complex caregiver interventions, and cognitive stimulation all have evidence to support their use in mild to moderate dementia (esp. AD), but the clinical impact on outcomes is controversial

Memory Disorders:Tiers of Care

Affected / At-risk / Concerned

5.5 milion affected:

Primary Care

est. 5 million
(0-5% of practice)

Specialty Care
(Neurologist, Geriatrician)

est. 500,000
(10-20% of practice)

Non-AD disorders

Subspecialty Care
(Memory Clinic,
Research Center)

est. 10,000
(90-100% of practice)

Summary

- The value of screening is determined by the net risk/benefit ratio defined by the intersection of evidence-based and personalized medicine

- The expected availability of better diagnostic tools and treatments will greatly impact this equation

- Three paradigm shifts:
  - Neurocognitive disorders as brain diseases
  - Need to address AD and non-AD disorders
  - Prevention: cog. screening → brain fitness?

Need to develop, validate, and implement models of integrated care for neurocognitive disorders

‘The problems of the people are the problems the university must deal with.”

William C. Friday
President of the University
of North Carolina system
(1956-1986)

Healthy Brain Initiative (CDC)

Strategic Framework

Figure 1[38] **The Model: Moving Science into Public Health Practice**