Second National Doctors of Nursing Practice Conference: Defining Ourselves

Mild Cognitive Impairment Clinic: Improved Access, Assessment, & Interventions

> 2nd National DNP Conference, 9/30 10/2/09, Miami, FL



Carilion Center for Healthy Aging MCI Clinic 2118 Rosalind Ave. SW Roanoke, Va. 24014

MCI Clinic

Goal: Describe a DNP led memory clinic focused on assessment and quality interventions that target cognition, function, and mood with goals of care to maintain independence

Objectives

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 1. Identify innovative practices for nursing excellence as exemplified in development of a clinic for patients with mild cognitive concerns

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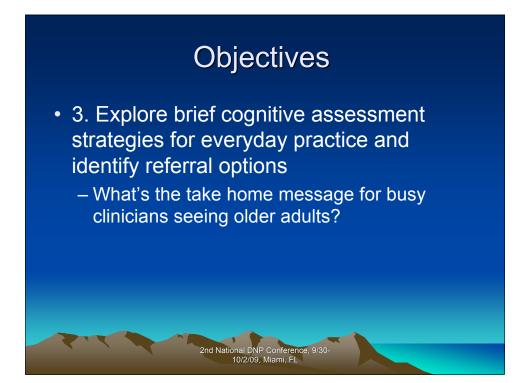
- How did we get here?

Objectives

 2. Explore strategies to improve the quality of care and maintain independence for community-dwelling older adults with MCI, based on assessment, identification of needs, and implementation of stratified interventions.

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- How would we know what works?



What is MCI?

- Briefly
- History
- Literature
- Importance
- Diagnosis

History of Mild Cognitive Impairment

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- Benign Senescent Forgetfulness (Kral, 1962)
- Questionable Dementia (Hughes, 1982)
- Age Associated Memory Impairment (Crook, 1986)
- Late-life Forgetfulness (Blackford, 1989)
- Aging-associated Cognitive Decline (Levy, 1994)

- Mild Neurocognitive Disorder (APA, 1994)
- Mild Cognitive Impairment (Petersen, 1999)

Literature Review

- Recommendations for screening for dementia have been made by numerous researchers.
 - The United States Preventive Services Task Force (2003) and others (Decarli, 2003; Petersen, 2004; Winblad et al., 2004).
- The acceptance of MCI as a risk factor or transitional state for AD calls for increased attention from nurses and primary care providers
 - (Pinals & Teresa, 2004; Plassman et al, 2008).
- Researchers found MCI and dementia were frequently missed in primary care
 In the Cardiovascular Health Study (Lyketsos et al., 2002)

Gaps in the Literature

- Few studies have examined the effect of pragmatic assessment and intervention strategies for MCI
- Despite work in laboratory, radiology and neuropsychology, there is no confirmed method of diagnosing MCI.
- Clinicians will increasingly need knowledge as the aging population swells with citizens who are more informed, and will expect earlier assessment of memory concerns.
- The effectiveness of interventions needs refinement to reflect the pattern of functional change.
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Current Issues in MCI: Significance

- Prevalence of MCI
 - 19% in patients < 75 years
 - 29% in those > 85 years in the cardiovascular health study (Lopez et al., 2003)
 - 22.2% ≥71 years in the U.S. had mild cognitive or functional impairment without dementia

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(Plassman et al., 2008)

Current Issues in MCI: Significance Higher conversion rate to dementia

- · Rates of conversion vary greatly;
 - 10-15% Peterson (2001)
 - 46.3% Marcos et al. (2006)
- Over a period of 6 years approximately 80% of MCI subjects will convert to dementia (Petersen, 2004).
- Annual conversion rate of 11.7% to dementia, but a 17% - 20% conversion in those with prodromal Alzheimer's disease or stroke. (Plassman et al., 2008)

Bennett, Wilson, Schneider, Evans, Beckett, Aggarwal, et al., 2002. Plassman et al. (2008) 10/2/09, Miami, FL

Diagnosis of MCI

- Diagnose MCI if:
 - The person has a memory complaint
 - Testing shows abnormal memory for age and education.
 - Performance on ADL's is normal.
 - General cognitive function is normal.
 - The person is not demented.

Petersen et al., 2001; Winblad et al., 2004

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Development of MCI Clinic

- Uniqueness of our setting
- Initial appointment
 - CC, HPI, Sleep, Pain, Meds review,
 - Function, memory, mood screen
 - Cognitive testing
 - PE vascular risks
 - Plan of care
- If MCI, follow every 6 months

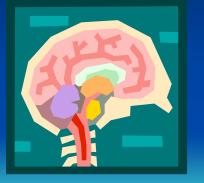
Probable Etiologies

Alzheimer's disease (typical or
atypical)Hypothyn
Normal pCreutzfeld-JakobParkinsoCortical Lewy Body diseasePolypharFocal right hemisphere lesions
(stroke or tumor)ProgressAdult onset diabetes mellitusSchizophAlcoholic dementiaWilson'sB12/FolateVascularPick's diseasecorticalHIVHuntingtrVascular dementias with
cortical infarcts2nd National DNP Conference, 9/30-
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Hypothyroidism Normal pressure hydrocephalus Parkinson's disease Polypharmacy Progressive supranuclear palsy Schizophrenia Wilson's disease Vascular dementias without cortical infarcts Huntington's disease

Vascular Risks--Medical

- Hypertension
- Diabetes
- Brain Pathology
- Stroke
- Heart Disease



Vascular Risks--Behavioral

- Mental Stimulation
- Diet and Weight Control (BMI)
- Exercise
- Alcohol and Tobacco Use



Other Non-Vascular Risk Factors

- Family History
- History of Falls
- Auditory and Visual impairment.
- Polypharmacy
- Head Injury with loss of consciousness

Challenges in Screening for MCI

- MCI patients are not clinically suspicious
- Bias of MMSE away from vascular symptoms
- MCI amnestic and non-amnestic syndromes under diagnosed or misdiagnosed

Detweiler, Trinkle, & Anderson, 2004; Marcos, 2006

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Increased Risk for Conversion to a Dementia

 What differentiates MCI converters (those that will eventually develop a dementia syndrome) from non-converters (normal aging)?

- Our study

- What types of screening tools best identify the differentials?
- Are various treatments suggested from the differentials?

Carilion Clinic Center for Healthy Aging: MCI Clinic

- Screens patients for:
 - Functional Assessment
 - Vascular Risks
 - Objective Memory Impairment
 - Executive Control Deficits
 - Type of MCI
 - Single domain amnestic
 - Multiple domain amnestic

Assessment: Cognitive Impairment

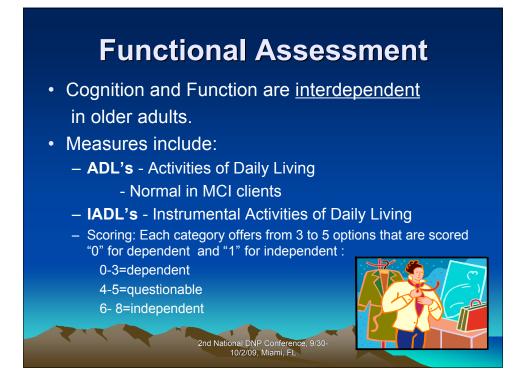
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- Screen MMSE and Function
- Depression GDS
- Executive Function EXIT 25, CLOX 1, BNT

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Memory

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Assessment Depression and Apathy

• Depression was measured with both the GDS and the HAM-D, but no differences found, so utilize the GDS now.

(Sheikh JL& Yesavage JA , 1986).

 Apathy is also measured using the Marin's Modified Apathy Scale (MMAS; Marin R, 1990).

EXECUTIVE FUNCTIONING

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- Executive control function deficits may be affected more than memory
 - planning, organizing, sequencing, abstracting disturbance in executive functioning

Clock Drawing Tests (CDTs)

- · Bedside screen for cognitive impairment
- Visuospatial task sensitive to right parietal pathology
- Less sensitive to the ECF deficits of MID and subcortical dementias
- No consensus scoring method for the CDTs
- · CDT rating systems vary on subject stimuli
- Qualitative differences in dementia subgroups scores

Freedman, 1994; Goodglass, 1972a, Barcyard 962, 1995; Royall, 1998; Rouleau, 1992; Royall, 1994

the hands and numbers on the face so that a child could read them." Repeat the instructions un they are clearly understood. Once the subject begins to draw no further assistance is allowed. Rate this clock (CLOX 1). STEP 2. Return to this side and let the subject observe you draw a clock in the circle below. Place 12, 6, 3, and 9 first. Fill in the rest of the numbers. Set the hands again to 1.45". Make the hands into arrows. Make the hour hand shortest. Invite the subjects to copy your clock in the lower right corner. Score this clock (CLOX 2). Rating	STEP 1: Turn this form over on a light colored surface so that the circle below is visible. Have the subject draw a clock on the back. Instruct him or her to "Please draw me a clock that says 1.45. Set the hands and numbers on the face so that a child could read them." Repeat the instructions unit they are clearly understood. Once the subject begins to draw no further assistance is allowed. Rate this clock (CLOX 1). STEP 2: Return to this side and let the subject observe you draw a clock in the circle below. Place 12, 6, 3, and 9 first. Fill in the rest of the numbers. Set the hands again to '1.45'. Make the hands into arrows. Make the hour hand shortest. Invite the subject boserve you clock in the lower right corner. Score this clock (CLOX 2). Rating Organizational Elements Point Yalue Score 1 Score 2 Circle face present? 1 1 1 Numbers inside the circle? 1 1 1 Organizational Elements 1 1 1 Dameter > 1 inch? 1 1 1 Numbers inside the circle? 1 1 1 Only numbers 1 - 12 among the numerals present? (ignore notation) 1 1 1 Only numbers 1 - 12 among the numerals present? (ignore notation) 1 1 1 Ale that dobuously longer than hour? 1 1 1 1 Munubers 1 - 12 among the numerals present? <
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EXIT25

- The EXIT25 is a brief (25 item) bedside measure developed to assess ECF in dementia patients. (Royal, Mahurin, & Gray. 1992)
 - Internal consistency (alpha=.85) and interrater reliability (r=.91) are high.
 - EXIT25 correlates well with other measures of ECF (e.g., Trail Making Part B, Test of Sustained Attention)
- A score of >15/50 best discriminates normal elderly from ECF dysfunction.

Boston Naming Test

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- Consists of 15 pictures presented to patients one at a time
- Stimulus cues are used when it is clear the patient is unable to identify the picture
- Phonemic cues are used when the patient is clearly identifying the picture but cannot find the appropriate name
- Tests for expressive aphasia
- Norms are age correlated in the MOANS (ages 57 85 for BNT)

Cognition and Memory: Neuropsychological Screening

- Neuropsychological testing contains both memory tasks and non-memory tasks.
- Memory deficits are more typical in MCI subjects than in control and dementia subjects.
- Deficits in non-memory tasks are more typical in AD subjects than in MCI or control subjects.

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Memory Impairment and MCI

- One indicator of MCI is abnormal memory for age and education (≤ 1.5 SD below normal) (Petersen, 2000; Winblad, 2004).
- A decline in objective memory performance is helpful in detecting patients that may be predisposed for developing AD

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(Petersen et al., 1999)

Cognitive Battery: Memory Tests Wechsler Memory Scales-Revised

- 1. Auditory Verbal Learning
- 2. Logical Memory
- **3. Visual Reproductions**
- Auditory Verbal Learning (Learning Over Trials) Brief Delayed Recall of a word list read aloud 30-Minute Extended Delayed Recall 30-Minute Extended Delayed Recognition

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Cognitive Battery: Memory Tests

Logical Memory

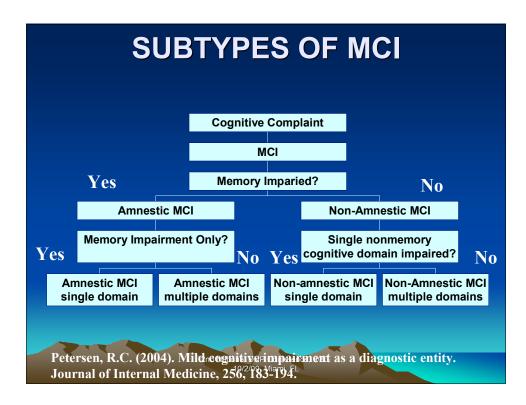
- Consists of two brief paragraph long stories.
- Recall is tested immediately and then again in 30 minutes.

Visual Reproduction

- Consists of four geometric figures presented to subjects one at a time.
- Reproduction of each figure is required immediately after viewing the figure and again 30 minutes later.

MOANS Scoring

- Scores from the eight memory impairment tests are given a normative score that is adjusted for age.
 - as obtained from Mayo's Older Americans Normative Studies (Ivnik et al., 1992, 1996)
- Abnormal score definition 1.33 standard deviations below the norm for the patients age
- Deficit score definition 2.00 standard deviations below the norm for the patients age



Cognitive Impairment Not Demented

- Cognitive Impairment-Not Demented (CIND):
 - Normal scores for cognitive domains (CLOX 1 and 2, EXIT25, and BNT) and all of the eight objective memory tests, but
 - Average MOANS scores places their memory below the 80th percentile for the patient's age.

Classification of MCI Subtypes with Probable Aetiology

Amnestic	Domain	Degen- erative	Vascular	Psych.	Medical Cond.
Yes	Single	AD		Depr	
Yes	Multiple	AD	VaD	Depr	1
No	Multiple	DLB	VaD		
Νο	Single	FTD or DLB			
Petersen, R.C. (2	2004). Mild cogn	nizod National DNF	t Genfetfaghostile e Miami, FL	ntity. Journal of	Internal Medicine



Demographics as of 10/08

- n = 109
- (39 male, 70 female) patients are enrolled that meet MCI criteria
- Age range: 53-87 Average Age: 71.65
- 29 are taking acetylcholinesterase inhibitors at intake
- 45 are taking an antidepressant at intake
- Focus: 53 subjects who have completed testing at intake and again at 12 months (n=48) or who have converted to dementia in that 12 month period (n=5; 9% conversion annually)

- 22 males, 31 femalesaverage age 73.9 years
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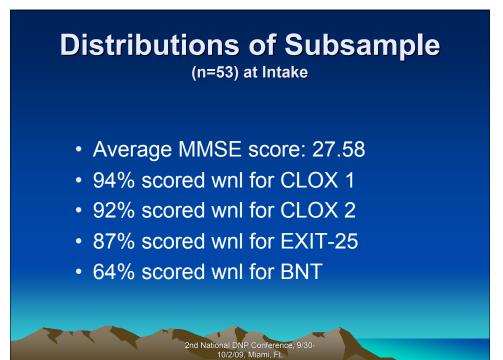
Risk Factors n=53

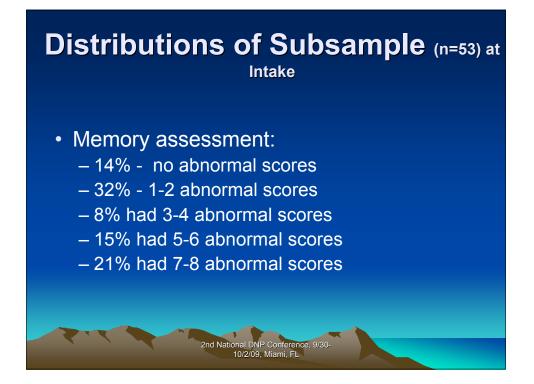
Vascular

- 54% HTN
- 23% cardiac disease
- 8% diabetes
- 48% depression
- 12% head trauma with LOC
- 10% stroke
- 19% obese

Non-vascular

- Falls within the past two (26%) and six (20%) months
- 39% visual deficits
- 31% hearing deficits
- 42% family history of memory loss or dementia





Improvement and Conversion as of 10/08

- Of 53 patients followed for 12 months, 30% remained stable (within same MCI subtype), 23% improved, and 20% declined.
- Of the 53 patients, five (9%) have converted to mild dementia. This is less than the 10-15% predicted by Petersen (2004)

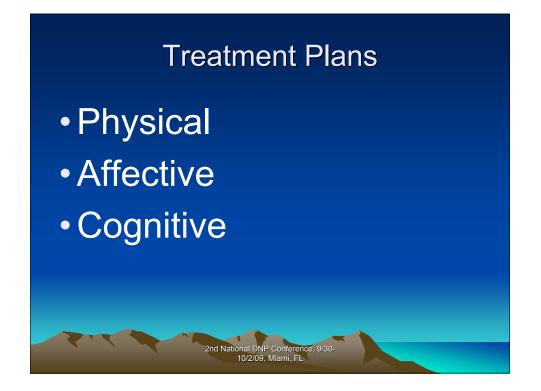
Possible Predictors of MCI Status There were no statistically significant differences between MCI types and

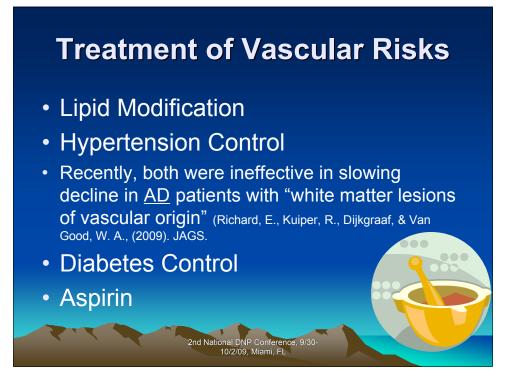
- IADL scores
- Apathy or Depression scores
- Neither of the two depression scales (GDS and HAM-D) were significantly correlated with any of the mental status exams
- Higher levels of apathy (MMAS) were significantly correlated with more impaired executive functioning CLOX 1, r=-.24, p<.10 EXIT25, r=.39, p<.01.

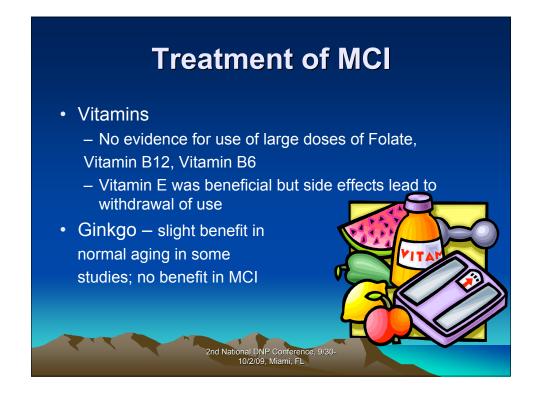
Analysis of Change Over 12 Months

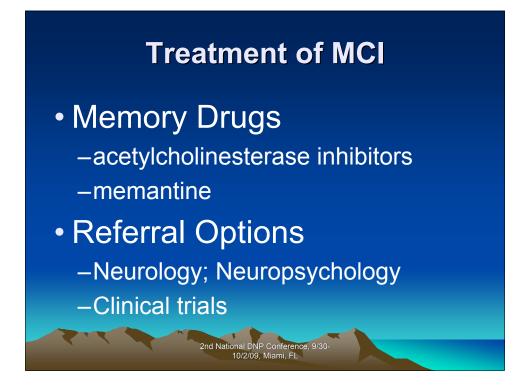
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- At six month follow-up appointment participants significantly improved their BNT scores from a mean of 8.10 (intake score) to 8.90. At 12 months, further significant improvement is noted (M=9.70).
- At six month follow-up appointment participants significantly improved their IADL scores from 6.00 (intake score) to 6.55. This improvement was maintained at the 12 month appointment (M=6.40)











Results Targeted Interventions Independent Variable

Targeted interventions in each of 3 functional domains were categorized:

Primary

- Identify stressors ex. Worry about having dementia, family or financial concerns
- Spiritual stress ex. Change in baseline of church attendance, religious reading or study
- Social stress ex. Decrease or absence of hobbies, friends

Secondary

- Recommend counseling
- Improve coping ex., exercise, socialization, reduce isolation
- Education and counseling on stressors identified

Tertiary

- Strategies to address non-compliance
- Add or increase medications
- Recommended assistance- ex., filling pillbox, monitoring medications, driving

Implications

- Depression in MCI subjects is significant and should be identified
- Brief cognitive measures such as a CLOX 1 demonstrated change in MCI subjects
- Conversion rate to dementia was lower than traditionally reported suggesting the model of regular assessment and targeted interventions as potentially beneficial.

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Recommendations

- Practice: Routine screening for memory, mood, and mental health issues
- Research: Which standardized tools are best for nurses to feel comfortable using reliably.
- Policy: APRNs should be leaders in policy development and advocacy (health care system and legislative) in cognitive, functional, and physical assessment of older adults