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Financial

Underwriting Cognitive Issues

Managing the Risk

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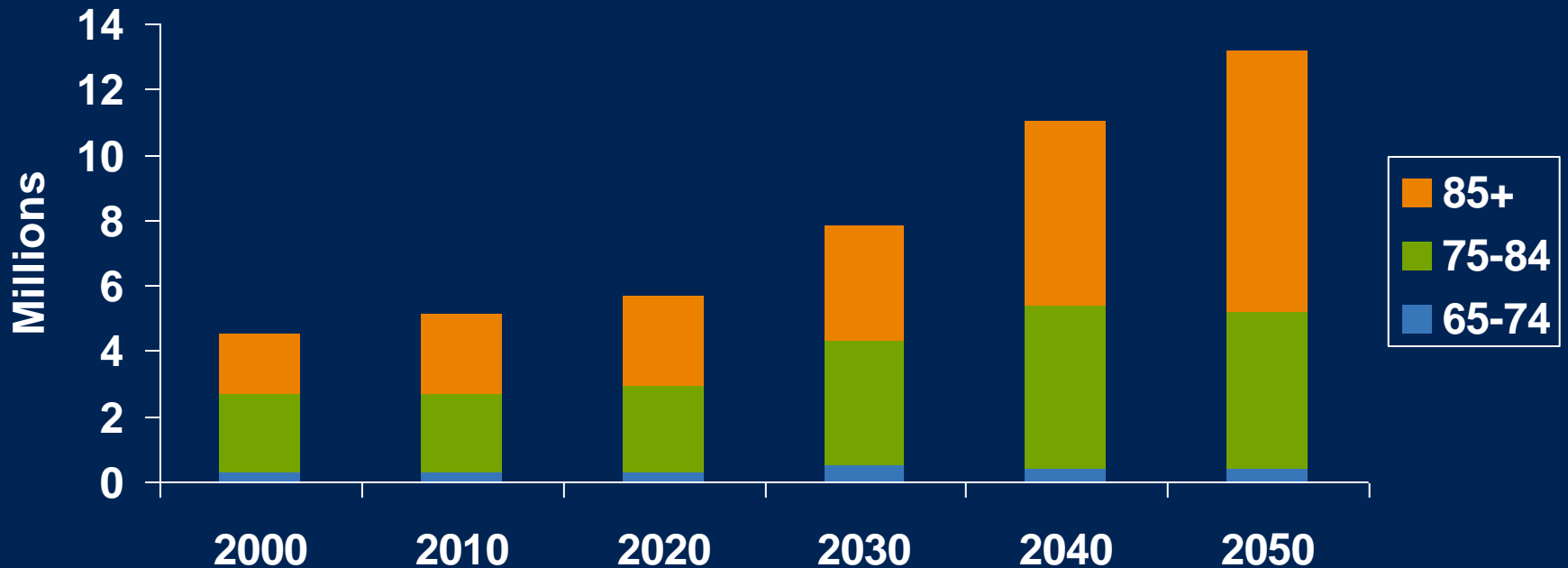
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Today's Objectives

- **Understand the Importance of Cognitive Impairment to LTCI Industry**
- **Understand “Normal” Age-Related Memory Changes**
- **Understand the Progression of Alzheimer’s Disease**
- **Understand Mild Cognitive Impairment**
 - Definition
 - Prognosis
- **Develop an Underwriting Approach**
 - Who Should Be Screened
 - Cognitive Screening Tests and the LTCI Industry
 - Resolving Medical Record Comments
 - Resolving Failed Cognitive Screening Tests
- **Summary**

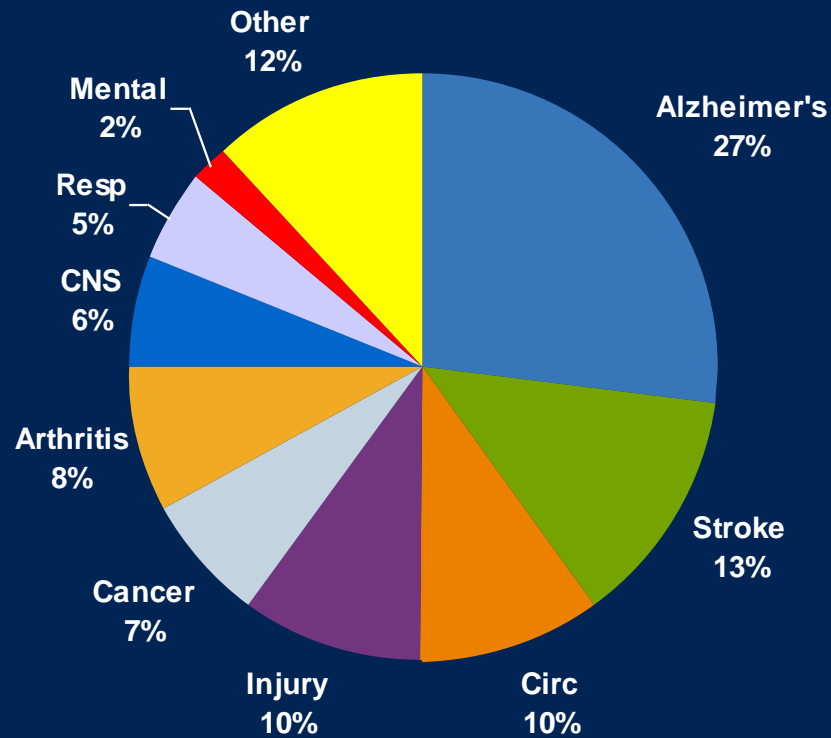
Prevalence of Alzheimer's Disease (AD)

Number of People with AD



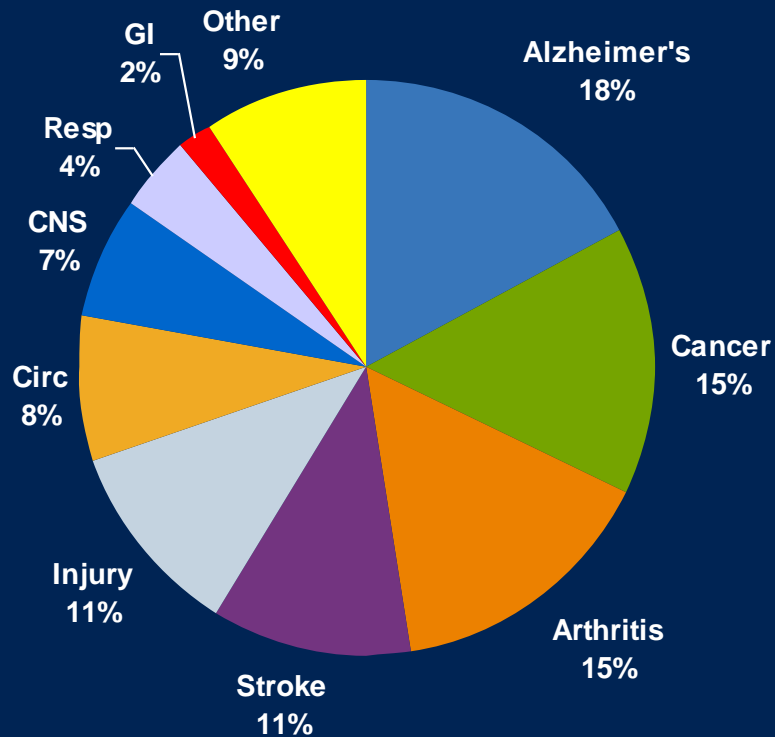
www.nih.gov/news/pr/aug2003/nia-18.htm

Nursing Home Claims by Diagnosis



SOA LTC Intercompany Study 1984-2004

Home Health Care Claims by Diagnosis



SOA LTC Intercompany Study 1984-2004

Cost of Dementia – Nursing Home



SOA LTC Intercompany Study 1984-2001

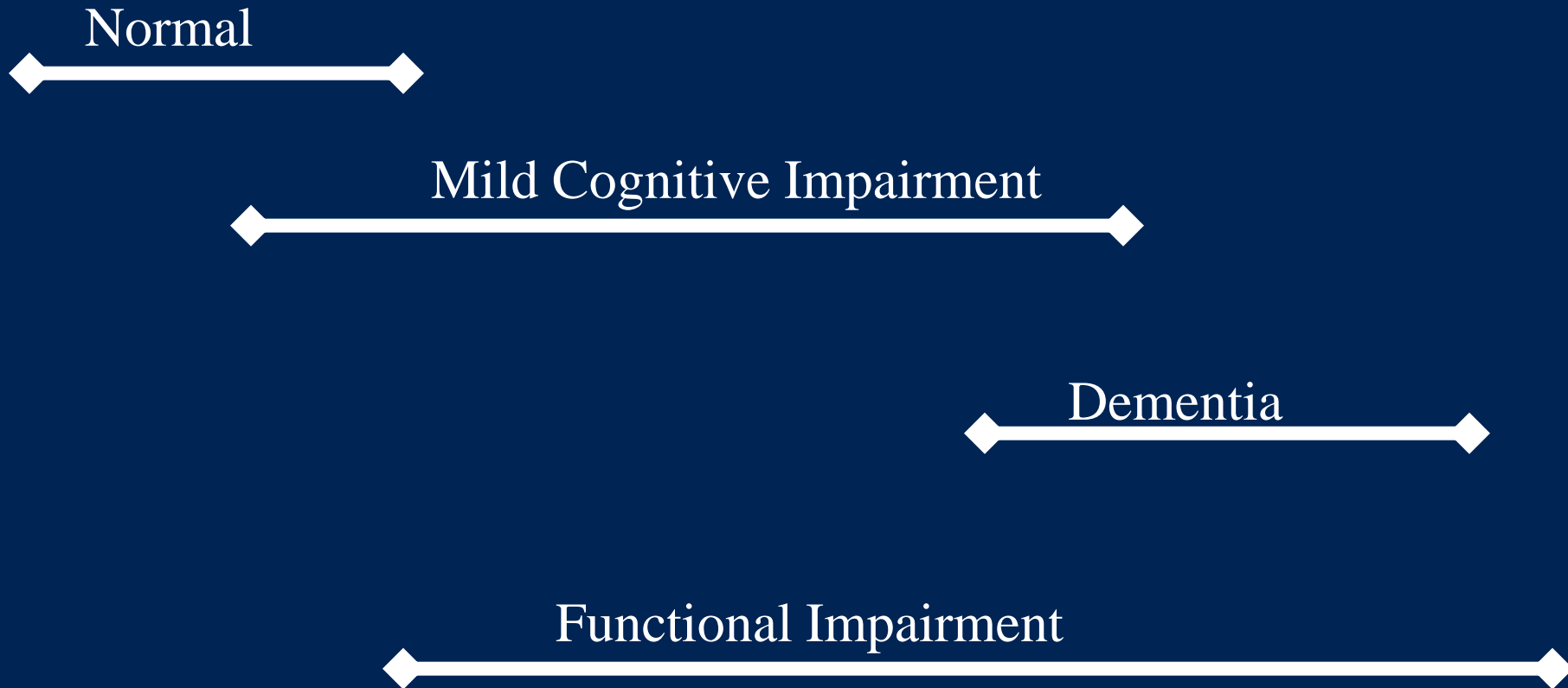
Cost of Dementia – Home Care



SOA LTC Intercompany Study 1984-2001

Continuum from Normal Aging to AD

Cognitive Changes



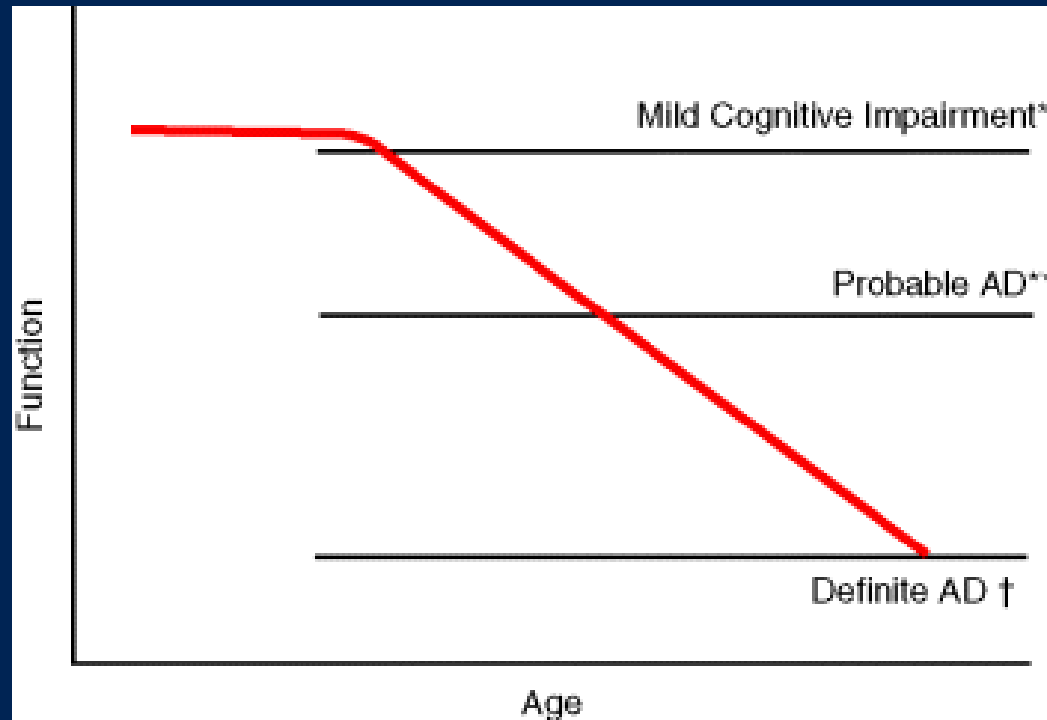
From J Galvin LTCIF Teleconference

Age Related Memory Loss

- **Controversial Entity**
- **Self Perception of Memory Loss**
- **Evidence of Memory Loss on Standardized Test Compared to Younger Adult**
- **Estimated 40% Those Over 65 Have Age Associated Memory Impairment**
- **About 1%/Year Will Progress to Dementia**

Small GW. *BMJ* 2002;324:1502

Continuum of Cognitive Function



Hypothetical change in function as an individual develops Alzheimer's disease.

Petersen, RC. *J Intern Med* 2004;256:183

Stages of Alzheimer's Disease

Functional Assessment Staging (FAST)

FAST Scale Stage	Characteristics
1 – Normal Adult	No memory/cognitive deficit
2 – Forgetfulness (Normal Older Adult)	Self reported forgetfulness
3 – Mild Cognitive Decline	Noticeable deficits perhaps in more than one area (e.g., getting lost, decrease job performance, decreased concentration)
4 – Moderate Cognitive Decline (Mild Alzheimer's)	Requires assistance with complicated tasks. Orientation intact.
5 – Moderately Severe Cognitive Decline (Moderate AD)	Requires assistance in choosing attire. Unable to recall major events.
6 – Severe Cognitive Decline (Moderately Severe AD)	Requires assistance with dressing, bathing and toileting. Incontinence. Delusions, agitation, anxiety.
7 – Very Severe Cognitive Decline (Severe AD)	Declining speech and ambulatory ability.

Adapted from Reisberg B. NYU.

Clinical Dementia Rating (CDR)

Subject Initials _____

CLINICAL DEMENTIA RATING (CDR)

CLINICAL DEMENTIA RATING (CDR):	0	0.5	1	2	3
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	Impairment				
	None 0	Questionable 0.5	Mild 1	Moderate 2	Severe 3
Memory	No memory loss or slight inconsistent forgetfulness	Consistent slight forgetfulness; partial recollection of events; "benign" forgetfulness	Moderate memory loss; more marked for recent events; defect interferes with everyday activities	Severe memory loss; only highly learned material retained; new material rapidly lost	Severe memory loss; only fragments remain
Orientation	Fully oriented	Fully oriented except for slight difficulty with time relationships	Moderate difficulty with time relationships; oriented for place at examination; may have geographic disorientation elsewhere	Severe difficulty with time relationships; usually disoriented to time, often to place	Oriented to person only
Judgment & Problem Solving	Solves everyday problems & handles business & financial affairs well; judgment good in relation to past performance	Slight impairment in solving problems, similarities, and differences	Moderate difficulty in handling problems, similarities, and differences; social judgment usually maintained	Severely impaired in handling problems, similarities, and differences; social judgment usually impaired	Unable to make judgments or solve problems
Community Affairs	Independent function at usual level in job, shopping, volunteer and social groups	Slight impairment in these activities	Unable to function independently at these activities although may still be engaged in some; appears normal to casual inspection	No pretense of independent function outside home Appears well enough to be taken to functions outside a family home	Appears too ill to be taken to functions outside a family home
Home and Hobbies	Life at home, hobbies, and intellectual interests well maintained	Life at home, hobbies, and intellectual interests slightly impaired	Mild but definite impairment of function at home; more difficult chores abandoned; more complicated hobbies and interests abandoned	Only simple chores preserved; very restricted interests, poorly maintained	No significant function in home
Personal Care	Fully capable of self-care		Needs prompting	Requires assistance in dressing, hygiene, keeping of personal effects	Requires much help with personal care; frequent incontinence

Score only as decline from previous usual level due to cognitive loss, not impairment due to other factors.

Mild Cognitive Impairment (MCI)

“A syndrome defined as cognitive decline greater than that expected for an individual’s age and education level but that does not interfere notably with activities of daily living.”

- **Amnestic subtype of mild cognitive impairment**
 - Memory complaint, preferably corroborated by an informant
 - Memory impairment relative to age and education matched healthy people
 - Largely intact activities of daily living
 - Not clinically demented

Gauthier S, et al. *The Lancet* 2006;367:1262

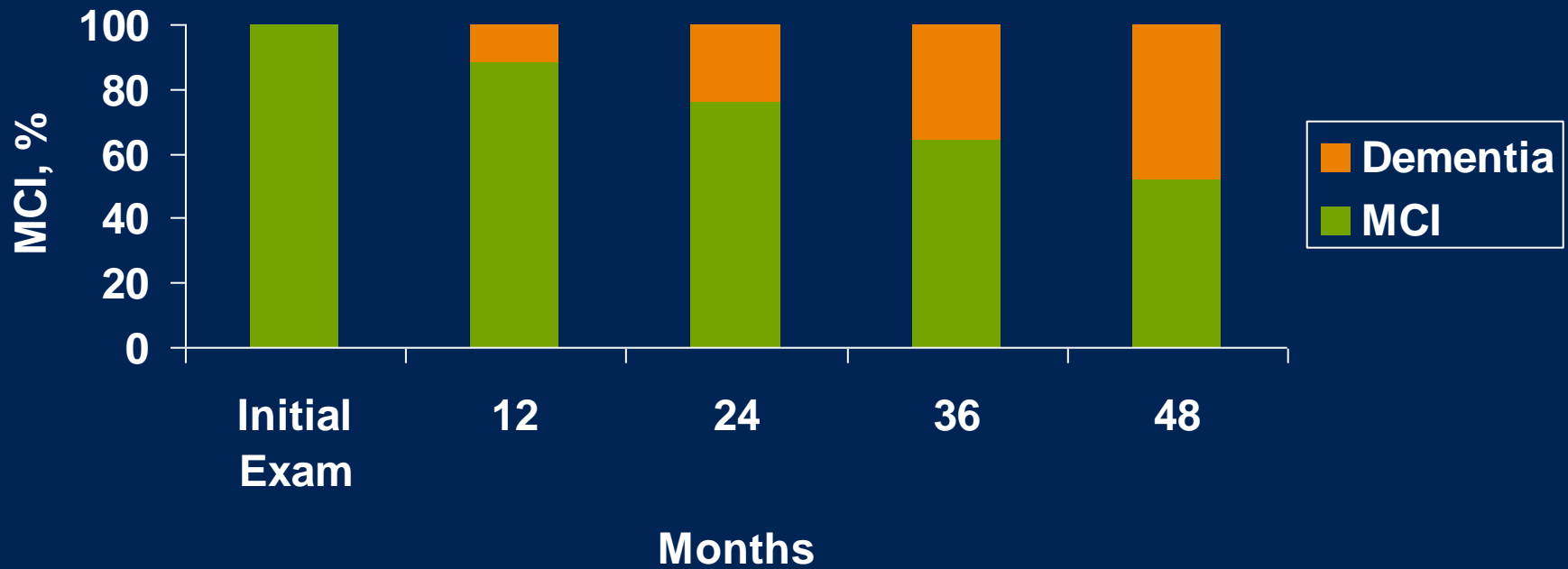
Prevalence of Mild Cognitive Impairment

Author	Country	n	Prevalence MCI (%)	Modified Prevalence Of MCI (%)	Rate of Conversion to AD (%)/yrs	Incidence
Busse et al	Germany	1265	3.1	5.1	33/2.6	8/1000
Fisk et al	Canada	1790	1.03	3.02	46.7/5	
Ritchie et al	France	833	3.2	19.3	11/2	58/1000
Tervo et al	Finland	806	8.8			26/1000
Lopez et al	USA	3608	19			
Qiu et al	China	3910	2.4			

Ritchie K. *Dialogues Clin Neurosci.* 2004;6:401

Conversion of MCI to Dementia

Annual Rates of Conversion



From Petersen RC, et al. *Arch Neurol* 1999;56:303

Underwriting for Cognitive Impairment

- **Initial Signs and Symptoms Are Subtle and Insidious**
- **Long Timeline of Earliest Symptoms**
- **Family May Notice Earliest Signs**
- **Physicians Often Do Not Screen**
- **No Simple Effective Screening Test**
- **Physician Reluctance to Note Diagnosis in Medical Record**

Indications for Cognitive Screening

- **Older Ages – 70+**
- **Self-reported Memory/Forgetfulness Complaints in Medical Record**
- **Friend/Family Reported Memory/Forgetfulness Complaints in Medical Record**
- **Memory/Forgetfulness Complaints Referring to Applicant Found in Spouse/Partner Medical Record**

Risk of Anti-Selection

Percentage of Participants Who Changed or Thought About Changing Insurance Coverage During a One-Year Period, Stratified by Testing Status

Type of insurance	Percent reporting an actual change			Percent reporting “thinking about” making a change		
	No APOE disclosure	€4-negative	€4-positive	No APOE disclosure	€4-negative	€4-positive
Health	6.52	5.56	12.50	23.9	13.0	25.0
Life	6.52	7.41	2.08	4.35	5.56	16.67
Disability	4.35	3.70	4.17	8.70	7.41	18.8
Long-term Care	4.35	1.85	16.7	32.6	22.2	45.8

Zick CD, et al. *Health Affairs*. 2005;24:483

Forgetfulness/Memory Loss - Causes

- Age-Related Memory Loss
- Depression
- Medications
- Menopause?
- Mild Cognitive Impairment
- Early Dementia
 - Alzheimer's
 - Vascular Dementia
 - Dementia with Lewy Bodies
 - Frontotemporal Dementia
 - Alcoholism

Depression vs. Dementia

Major Depression

- Acute, nonprogressive
- Depression
- Affective before cognitive
- Attention impaired
- Orientation intact
- Vocal memory complaint
- Gives up on testing
- Language intact
- Patient complains
- Better at night
- Criticizes self
- Self-referred

Dementia

- Insidious & progressive
- Depression mild if present
- Cognitive before affective
- Recent memory impaired
- Orientation impaired
- Minimizes memory problem
- Patient makes effort
- Possibly aphasic
- Family complains
- Sundowning
- Criticizes others
- Referred by others

Goals of an Insurance Screening Test

- **Easy to Administer**
- **Relatively High Sensitivity and Specificity**
- **High Reliability**
- **Cost Effective**
- **Wide Availability**
- **Easy for Underwriter to Interpret Results**
- **Minimize Risk/Maximize Cost Benefit**

Evolution of Cognitive Testing

- **1st Generation**
 - Mini-Mental State Exam (MMSE)
 - Short Portable Mental Status Questionnaire (SPMSQ)
 - Introduced 1990
- **2nd Generation**
 - Delayed Word Recall (DWR)
 - Introduced 1990
 - Minnesota Cognitive Acuity Screen* (MCAS)
 - Introduced 1999
- **3rd Generation**
 - Enhanced Mental Skills Test* (EMST)
 - Introduced 2004
 - AQT*

*Proprietary Tests

Reported Sensitivity/Specificity Rates

Cognitive Screening Test	Sensitivity	Specificity
MMSE	59-92%	62-92%
SPMSQ	55-92%	72-87%
DWR	89-96%	98-100%
MCAS (dementia)	97.5%	98.45%
EMST* (normal vs MCI/MD)	96%	91%
(normal vs MD)	96%	99%

From Yoes ME, et al. Development and Standardization of a New Cognitive Screening Test: The Minnesota Cognitive Acuity Screen (MCAS). March 1999.

*From Shankle WR et al. *PNAS* 2005;102:4919.

Domains of Cognitive Testing

Domain	Assessment
Orientation	Person, Place, Time
Registration	Repetition
Memory	Recall of Objects or Words
Executive Function	Attention, Motivation
Language	Naming, 3-Stage Command, Reading, Writing
Visuospatial	Geometric Figure
Calculation	Mathematics
Automaticity	Speed of Performance

Mini-Mental State Exam (MMSE)

Domain	Assessment
Orientation	Person, place, time
Registration	Repeat 3 objects
Memory	Recall 3 words at 3 minutes
Attention	3-stage command
Calculation	Serial 7 subtraction
Language	Naming, repetition, reading, writing
Visuospatial	Geometric figure

Mini-Mental State Exam (MMSE)

	Age													
Education	18-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	>84
4 th Grade	22	25	25	23	23	23	23	22	23	22	22	21	20	19
8 th Grade	27	27	26	26	27	26	27	26	26	26	25	25	25	23
High School	29	29	29	28	28	28	28	28	28	28	27	27	25	26
College	29	29	29	29	29	29	29	29	29	29	28	28	27	27

Normative Data on the MMSE

Crum RM, et al. *JAMA*. 1993;18:2386

Delayed Word Recall

- **Encoding Phase**
 - Examiner speaks/shows 10 words (nouns), one at a time
 - Individual repeats each word and uses the word in a sentence
- **Delay Interval**
 - 5 minute delay with interference
- **Recall Phase**
 - Individual recalls as many words as possible

Delayed Word Recall

- **Comments**

- Alzheimer's patients have rapid rate of forgetting within first 5-10 minutes
- Elaborative encoding provides benefit to normal subjects but not to Alzheimer's patients
- Overall predictive accuracy 95% in identifying Alzheimer's patients from normal controls (Knopman & Ryberg. *Arch Neur.* 1989;46:141)
- May be difficult to differentiate depression from Alzheimer's disease (O'Carroll, et al. *Psych Med.* 1997;27:967)
- Can be administered via phone or in person

Minnesota Cognitive Acuity Screen (MCAS)

- Developed for telephonic use
- Tests 9 domains
- Impaired group – 210 elderly nursing home residents with dementia (avg. age 82.4 yrs)
- Unimpaired group – 129 seniors without dementia (avg. age 73.8 yrs)
- Weighted analysis of each domain score used to discriminate impaired from unimpaired
- Reported Sn 97.5%; Sp 98.5%; PPV 88%

Minnesota Cognitive Acuity Screen (MCAS)

Domain	Assessment
Orientation	Person, place, time
Attention	Multiple digit repetition
Memory	Delayed word recall (10 words)
Language	Follow multi-step command
Repetition	Sentence repetition
Naming	Identify object described
Computation	8 simple math problems
Judgment	4 judgment questions
Verbal Fluency	Name fruits and vegetables

Knopman, DS, et al. *Neuropsychiatry, Neuropsychology, and Behav Neuro.* 2000;13:286

Minnesota Cognitive Acuity Screen (MCAS)

- **Comments**

- High Sn/Sp
- Incremental improvement over MMSE and DWR alone
- Used telephonic and face-to-face
- Convenience sample used – could impact discriminating ability of test
- Not validated against mild dementia or mild cognitive impairment
- Potential for cheating exists with almost any telephonic assessment tool

Enhanced Mental Skills Test (EMST)

- **Developed by Medical Care Corporation (MCC)**
- **Based on CERAD Battery and Validated in Study Published in the Proceedings of the National Academy of Sciences (2005)**
- **High Sensitivity for Detecting MCI**
- **Multiple Domains**
- **9 Balanced Word Lists**
- **No Reliance on a Single Cut-off Score**
- **Can Be Administered via Phone or In-Person**

Enhanced Mental Skills Test (EMST)

MCI vs. normal-aging test	Sensitivity	Specificity
CWL* with CA**-weighted scoring	94	89
Object delayed recall with proactive interference	85	89
Clock drawing test	75	76
MMSE	61-71	80-85
7-minute test	28	?

*NIA CERAD 10-word list

**Correspondence analysis

Adapted from Shankle WR et al. *PNAS* 2005;102:4919

EMST Test Components

- **Comprehension**
 - Applicant must respond to simple, clear directions
- **Three Learning Trials of 10 Words Each**
 - Repetition and Encoding: Applicant repeats each word to assure correct encoding
 - Working Memory: Applicant immediately recalls as many words as possible
- **Metamemory/Judgment and Insight**
 - Applicant is told a final free recall will be completed after a time delay and is required to estimate the number of words she/he will recall
- **Abstract Reasoning: Distraction Phase: Triadic Animal Comparison**
 - Applicant chooses which of three (3) animals is least similar
 - 9 animals, 12 sets of comparisons
 - Roughly 3-5 minutes to complete
 - Task is largely independent of race, culture and individual differences

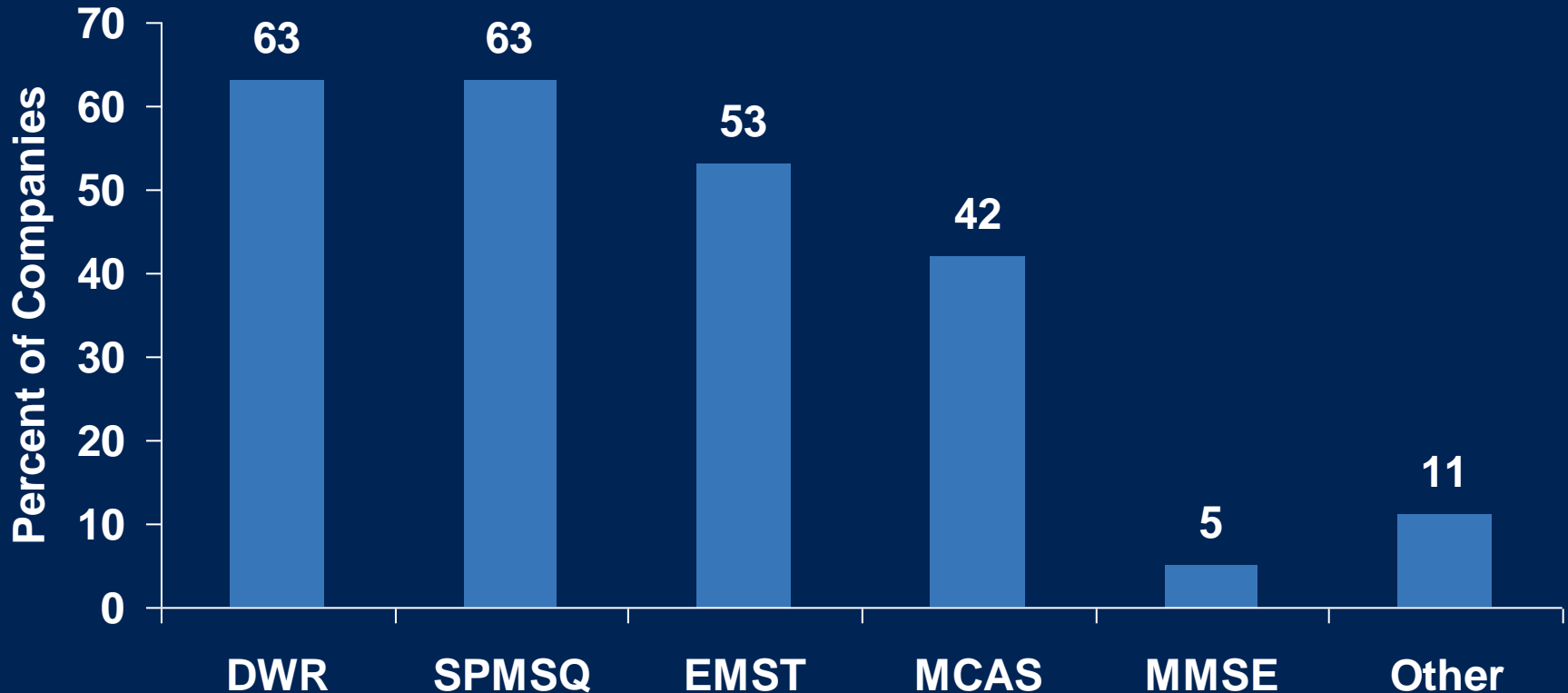
EMST Test Components (continued)

- **Delayed Free Recall**
 - Applicant recalls as many of original 10 words as possible
- **Delayed Cued Recognition: Item Cues**
 - Applicant is asked if specific words were included in original word list
- **Delayed Cued Recall: Category Cues**
 - Applicant recalls as many animals from triadic comparison as possible

AQT

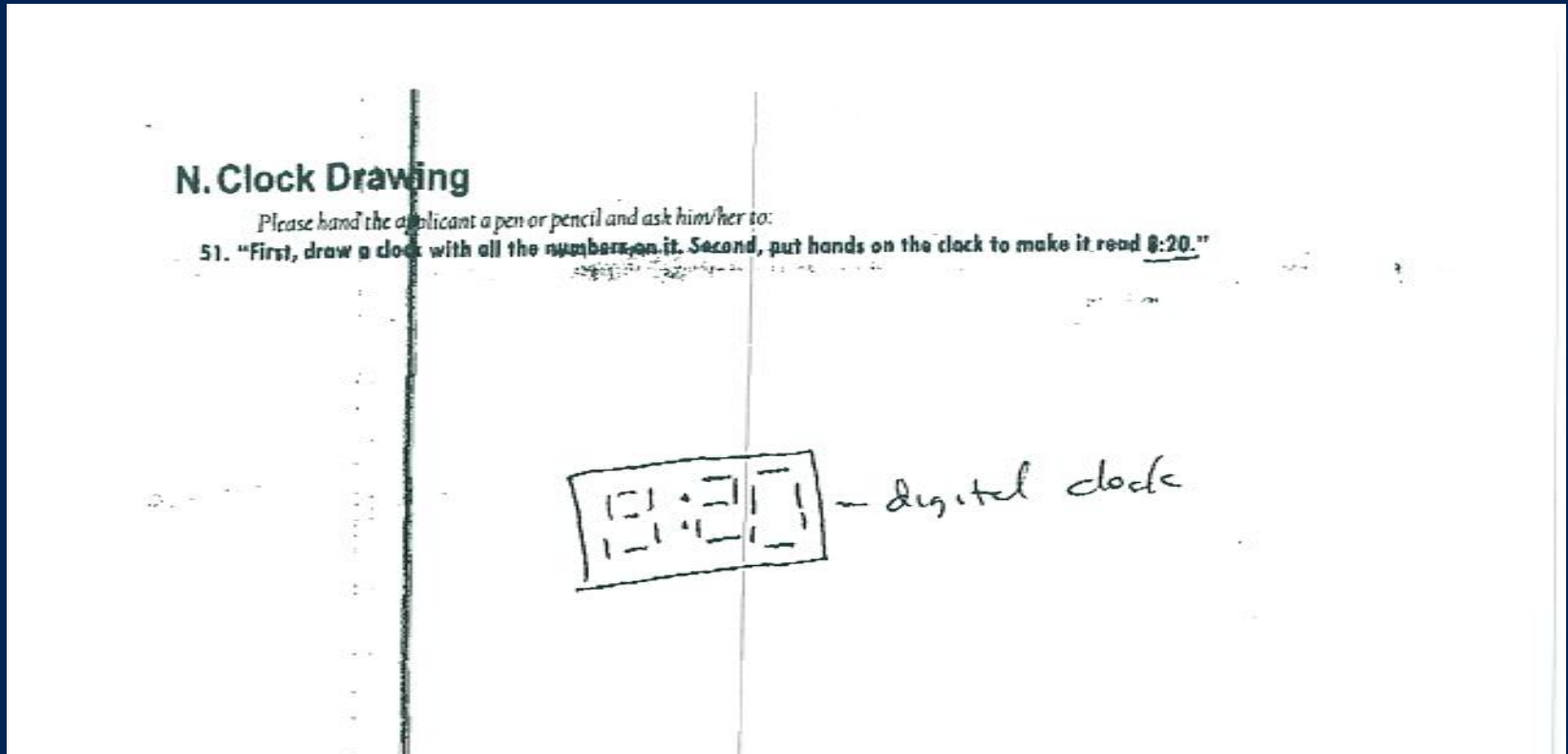
- **Measures Speed of Processing**
- **Rapid Naming of Familiar Competing Stimuli**
- **Tests Parietal and Temporal Lobe Function**
- **Has Been Used with Epilepsy, Executive Function Disorders and Medication Effect**
- **Rapid Naming of Series of Colors, Forms and Colored Forms**
- **Simple and Takes Little Time and Can Be Used Over Phone**
- **Reported Sn 99%/Sp 99%**

Cognitive Screens Used – LTCI Industry

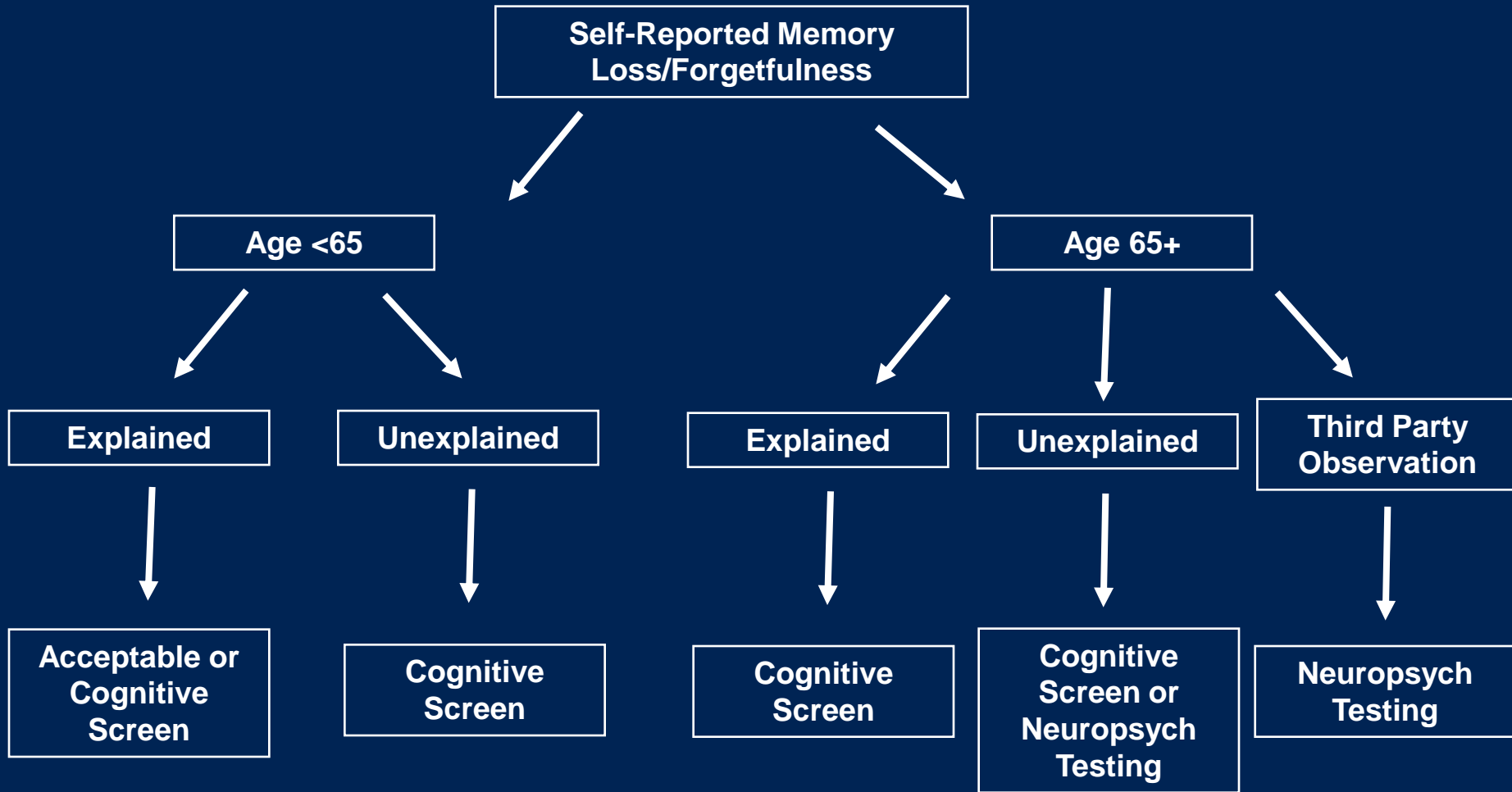


LifePlans LTC Underwriting Survey 2005

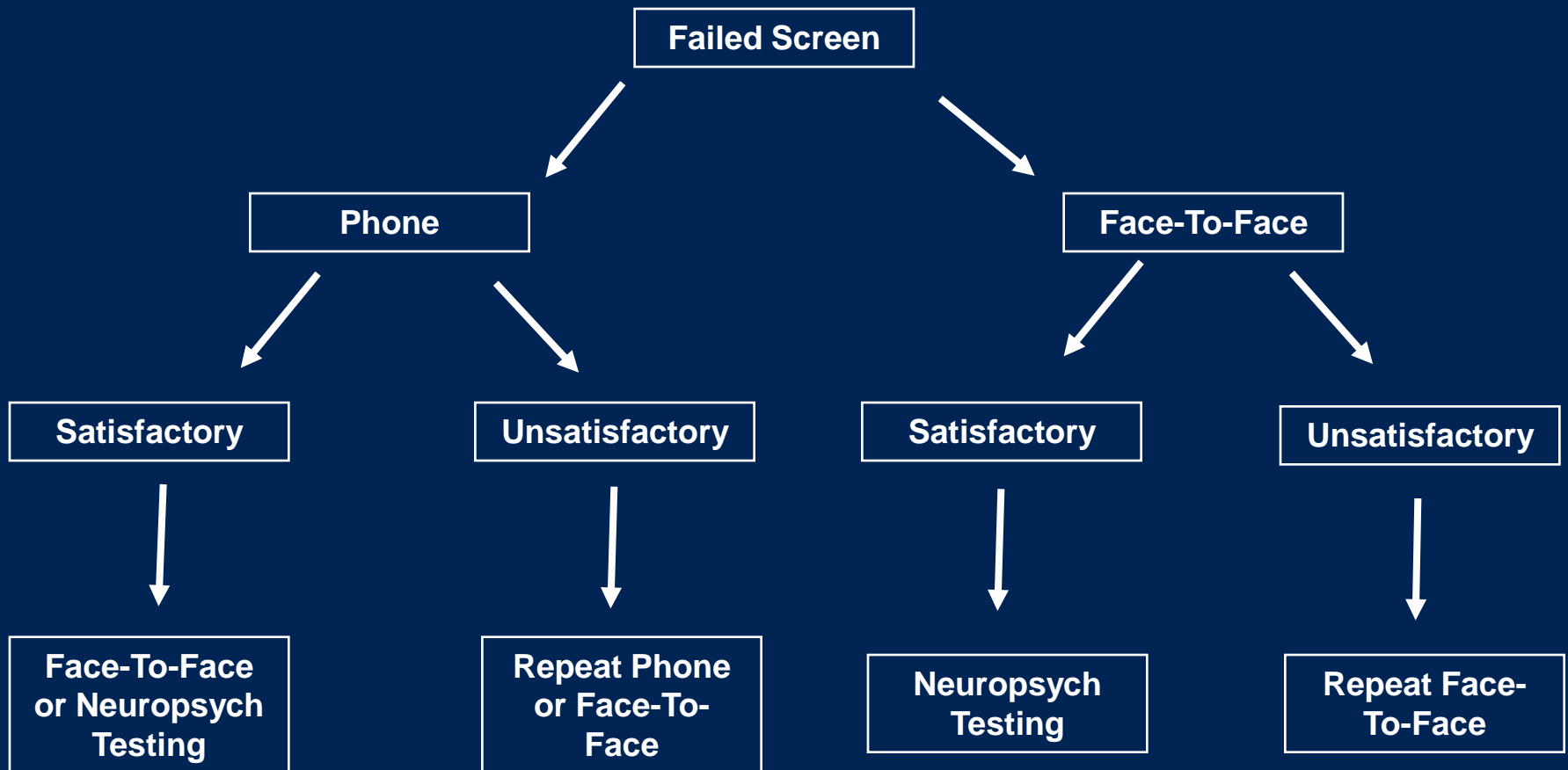
Clock Drawing Test



Memory Complaints – Algorithmic Approach



Failed Cognitive Screen – Algorithmic Approach



Summary

- **The prevalence of Alzheimer's is increasing**
- **There is significant morbidity and LTC costs associated with dementia**
- **Mild cognitive impairment precedes dementia by many years and the initial symptoms are subtle**
- **Healthcare providers often do not screen for early cognitive impairment**
- **Newer cognitive screening tests are available that can detect early dementia and perhaps mild cognitive impairment**
- **Consistent, methodical underwriting approach can help mitigate risk**
- **With advent of readily available commercial testing, risk of anti-selection will likely increase**

It's All About Risk Assessment



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