Screening for Cognitive Impairment

Anne-Marie Kimbell, PhD, MSEd.
Educational Consultant
Pearson

April 27, 2017

Agenda
What is Cognitive Impairment?
Implications of Cognitive Impairment
Cognitive Domains
Screening vs. Evaluation
Screening Instrument examples
What is Cognitive Impairment?

Definitions

- **Cognition** - Processes of knowing, including attending, remembering, and reasoning; also the content of the processes, such as concepts and memories (APA).

- **Cognitive Impairment** means there is a change in how a person thinks, reacts to emotions, or behaves. Can range from mild memory problems to an inability to think independently.
Definitions cont.

- **Cognitive Disorder** – any disorder that significantly impairs the cognitive function of an individual to the point where normal functioning in society is impossible without treatment or assistance.

Some common cognitive disorders include:

- Dementia
- Delirium
- Developmental disorders
- Motor skill disorders
- Amnesia
- Substance-induced cognitive impairment

Causes of Cognitive Impairment

- Can be present at birth
- Can be caused by abuse of prescription medications, alcohol, street drugs or other chemicals
- Can be caused by a disease
- Can be a side effect of some medications
- Can be caused by a trauma
Risk Factors for Cognitive Impairment

Increasing age
Cardiovascular factors
diabetes
Tobacco use
Hypercholesterolemia
Hypertension
Metabolic Syndrome
Head trauma
Learning Disabilities
Depression
Alcohol abuse
Physical frailty
Low educational level
Low social support
Having never been married

Definitions cont.

Cognitive Aging - process that occurs in every individual, beginning at birth and continuing throughout the life span.

COGNITIVE CHANGES WITH AGE

INTACT

Motor learning
Priming
Semantic memory (not word finding)
Episodic Memory for well-learned life events
Passive short-term storage of information
Recognition memory
Prospective memory in the real-world

DECREASE

Working Memory—especially with interference
Encoding new information in deep elaborative way (less strategic)
Retrieval (particularly when effortful)
• Uncued recall, prospective memory, recovery of specific details, source memory
Cognitive Impairment

All types of cognitive impairment are treatable and many are reversible.

Treatment for each is unique, although some overlap.

Early identification can lead to early intervention and treatment.

DSM-5 Neurocognitive Disorders

Dementia and amnestic disorder are now included under neurocognitive disorder (NCD).

Dementia has been associated with the older population whereas NCD expands the category to also include etiologies occurring in younger adults.

The term dementia is not excluded from use in etiological subtypes.
Neurocognitive Disorders

Neurocognitive Domains
• Complex Attention
• Executive Function
• Learning and Memory
• Language
• Perceptual-Motor
• Social Cognition

DSM-5 Neurodevelopmental Disorders

Intellectual Disabilities
Communication Disorders
Autism Spectrum Disorders
Attention-Deficit/Hyperactivity Disorder
Specific Learning Disorder
Motor Disorders
Other Neurodevelopmental Disorders
Neurocognitive Disorders

Delirium
Major and Mild Neurocognitive Disorders
• Major Neurocognitive Disorder
• Mild Neurocognitive Disorder
Major or Mild Neurocognitive Disorder Due to Alzheimer’s Disease
Major or Mild Frontotemporal Neurocognitive Disorder
Major or Mild Neurocognitive Disorder With Lewy Bodies
Major or Mild Vascular Neurocognitive Disorder

Delirium
Key Features: Rapid and Abrupt onset of:
• Impaired Attention
• Lack of Awareness of environment
Change in at least ONE Cognitive Domain:
• Recent Memory
• Orientation
• Language (i.e. rambled speech, mumbling, difficult to understand)
• Perceptual Disturbance
Associated Features
• Change in sleep-wake cycle
• Change in emotional states
• Worsening of behavioral problems in the evening
Neurocognitive Disorders

Major or Mild Neurocognitive Disorder
- Due to Traumatic Brain Injury

Substance/Medication-Induced Major or Mild Neurocognitive Disorder

Major or Mild Neurocognitive Disorder
- Due to HIV Disease
- Due to Prion Disease
- Due to Parkinson's Disease
- Due to Huntington's Disease
- Due to Another Medical Condition
- Due to Multiple Etiologies

Modest cognitive decline from previous levels in one or more domains based on both of the following:
- Concerns of the patient, a knowledgeable other, or a clinician
- Modest impairment in cognitive performance, preferably documented by standardized neuropsychological testing or, in its absence, another quantified clinical assessment.

The cognitive deficits do not interfere with independence (i.e., tasks such as paying bills or managing medications), even though greater effort, compensatory strategies, or accommodation may be required to maintain independence.

The cognitive deficits do not occur exclusively in the context of a delirium and are not due to another psychological disorder
DSM-5 Criteria for Major Neurocognitive Disorder

- Evidence of significant cognitive decline from previous levels in one or more domains based on both of the following:
  - Concerns of the patient, a knowledgeable other, or a clinician
  - Substantial impairment in cognitive performance, preferably documented by standardized neuropsychological testing or, in its absence, another quantified clinical assessment
- The cognitive deficits interfere with independence
- The cognitive deficits do not occur exclusively in the context of a delirium and are not due to another psychological disorder

AGING VS DISEASE CONTINUUM

Normal Aging
- Primarily intact cognition, subtle processing speed slowing, & less efficient attention & executive reasoning

Mild Neurocognitive Disorder
- Decline from lifelong abilities in 1 or more areas of thinking + inefficiency in daily activities

Major Neurocognitive Disorder
- Needs help with daily activities + substantial decline in 1 or more cognitive abilities

(Adapted from Reynolds Institute on Aging, SR Cassidy)
Implications of Cognitive Impairment

Functional Consequences of Cognitive Impairment

• Forgetting
  • Things already learned, Appointments, Self-care (including medication)
• Getting Lost
• Following Commands/Instructions
• Mood
  • Depression, Anxiety
• Unpleasant Interpersonal Behavior
  • Anger, Paranoia, Inappropriate Sexual Remarks/Actions
• Capacity Limitations
  • Decision-Making: Financial, Medical
• Communication Deficits
  • Receptive, Expressive
Skills required for driving:

Visual-perceptual skills
Visual acuity
Information processing
Judgment
Decision-making
Performance of appropriate motor responses
Sequencing
Cognition
Executive Functioning skills
Memory
Attention to detail

Recognition of Cognitive Impairments - Importance

Increased risk for accidents, delirium, medical nonadherence, functional decline, falls, disability, and caregiver stress
5.5 million people have AD currently
• Less than 20% of people with AD have a diagnosis in their medical record.
Studies show that only 25 to 40% of patients with even moderate impairment are recognized in Primary Care Clinics
Early and differential diagnosis is critical
Effective treatments of depression or anxiety can improve cognitive functioning
Early Detection of Impairment is Desirable

Safety (driving, compliance, cooking, etc.)

Family stress and misunderstanding (blame, denial)

Early education of caregivers of how to handle patient (choices, getting started)

Advance planning while patient is competent (will, proxy, power of attorney, advance directives)

Patient's and Family's right to know

Specific treatments now available
  • May slow underlying disease process
  • May delay nursing home placement longer if started earlier

Red Flags for Possible Cognitive Impairment

Consistently poor historian
Inattentive to appearance or inappropriate attire for weather
Missed appointments or comes at wrong time or on wrong day
Repeatedly and apparently unintentionally fails to follow instructions
Has unexplained weight loss or failure to thrive
Unable to adapt or function in new settings
Defers to caregiver – family member answers questions directed at patient

Alzheimer's Association, 2003; Adapted from Elizabeth Clark, MD
Cognitive Concerns

Normal Aging – Worried well, age-associated memory changes
Mild Cognitive Impairment – earliest stage of detectible cognitive problems
Dementia or Neurocognitive Disorder

• Routine screening is not recommended in asymptomatic patients (USPSTF & VA)
• Medicare patients now get an evaluation for detection of cognitive impairment during their Annual Wellness Visit (AWV), though usually not by a mental health clinician.

Evidence Supporting Cognitive Screening

Patients with mild cognitive impairment should be recognized and monitored for decline due to their increased risk for subsequent dementia.

General cognitive screening instruments should be considered for the detection of dementia.

Interview based techniques may be considered in identifying patients with dementia, particularly in an at-risk population.

American Academy of Neurology Guidelines on Early Detection of Dementia and MCI.
## Cognitive Domains

### Neurocognitive Disorders

<table>
<thead>
<tr>
<th>Domain</th>
<th>Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complex attention</td>
<td>Major: diminished, multiple stimuli</td>
</tr>
<tr>
<td></td>
<td>Mild: takes longer</td>
</tr>
<tr>
<td>Executive abilities</td>
<td>Major: abandon complex activities</td>
</tr>
<tr>
<td></td>
<td>Mild: effort, multi-tasking</td>
</tr>
<tr>
<td>Learning/memory</td>
<td>Major: repeat self in conversation</td>
</tr>
<tr>
<td></td>
<td>Mild: recent events, occasionally repeat</td>
</tr>
<tr>
<td>Language</td>
<td>Major: anomia, paraphasias</td>
</tr>
<tr>
<td></td>
<td>Mild: Ø naming, word finding</td>
</tr>
<tr>
<td>Visuoconstruction Visuoperception</td>
<td>Major: not driving, Ø navigation</td>
</tr>
<tr>
<td></td>
<td>Mild: maps, effort</td>
</tr>
<tr>
<td>Social cognition</td>
<td>Major: insensitivity social contexts</td>
</tr>
<tr>
<td></td>
<td>Mild: subtle personality, Ø empathy</td>
</tr>
</tbody>
</table>
Attention

Determines which information is perceived, processed, and remembered.

- Selective attention – ability to choose task on which to attend.
- Focused attention – ability to maintain focus on task in presence of distraction
- Divided attention – ability to allocate mental resources between tasks performed together or at the same time.
- Sustained attention – ability to sustain mental resources on task over longer periods of time.

Affects all ADLs

Executive Function

Multi-factorial set of cognitive abilities required to plan and carry out complex, goal-oriented behavior:
- learning new information, retrieval of long-term memory
- prospective memory, goal planning
- task organization and strategy formation
- attention, cognitive flexibility, working memory
- temporal sequencing
- abstracting, novel problem solving
- motor programming
- inhibiting over-learned responses
- alternating behavioral patterns in response to environmental feedback, self-regulation/self-monitoring
- mood management
Behaviors Associated with Deficits in Executive Functions

Disinhibition
Perseveration
Forgetfulness-of-task behaviors
Anticipatory Behavior
Inefficiency
Difficulty understanding consequences and cause-effect
Frequently violate rules despite knowledge of rules
Apathetic
Difficulties accessing knowledge
Concrete thinking
Emotional dysregulation
Poor frustration tolerance
Disorganized
Difficulties coping with change
Poor judgment

Adults with Executive dysfunction

Cannot solve problems
Cannot learn a new task
Are disorganized
Have impaired judgment
Exhibit concrete thinking, mental inflexibility
Have no insight
Cannot incorporate feedback
Cannot see their mistakes
Make unsafe decisions when driving, spending, etc.
Memory

- Most common referral concern
- Nature of complaint important:
  - Recent vs. Remote
  - Immediate vs. Delayed
  - Verbal vs. Visual
  - Recall, Recognition
- Testing evaluates ability to acquire, store, and retrieve information in memory
- Related to ability to care for self, manage schedule, remember appointments, follow directions.

Impacts all other areas

Language/Verbal Ability

Speech Comprehension (Receptive Speech)
- Ability to respond to questions
- Ability to react appropriately to comments
- Ability to respond to instructions for simple tests

Expressive speech
- Fluency
- Articulation
- Prosody
- Naming
- Repetition
Visuospatial and Visuoconstructive Function

Involved in processing and manipulation of visual information from the environment.
- Maneuvering through environment
- Locating other people or items in busy environment

Includes both written words and nonverbal stimuli such as picture, faces, and other images
Impacts navigating, using tools or equipment

Social Cognition

“…includes a broad spectrum of abilities, such as facial recognition, name-face association, prosody, and theory of mind, that are important aspects of social functioning.”

(ACS Social Cognition manual, 2009)
Screening vs. Evaluation

**Screening** - Use of one or more brief tests and/or instruments to identify people who may be at risk for some specific condition or mental health issue.

**Evaluation** - Comprehensive process including screening, testing, assessment as well as clinical interviews with the subject and interviews with collateral sources, history gathering/taking. May be part of a team process.
Cognitive Screening: Goals

- Assess multiple areas of cognitive function quickly
- Identify areas of cognitive dysfunction
- Screen in such a way that the results are reliable, valid and clinically relevant for patient care, safety and self-esteem
- Be practical about what is possible in the setting and the patient population

Screening Techniques

Informal – observation during any contact, conversation, collateral information

Formal - Screening Instruments

Signs – positive, indicating the presence of abnormal function
  negative – indicating the function is lost or significantly diminished.

Cut Scores – score that separates normal from abnormal performance on a test.
Observation

Ability to learn and retain new information
Handle complex tasks
Reasoning ability
Spatial ability and orientation
Language
Behavior
Gait
Vision and hearing

Domains of Comprehensive Assessment

Medical
Functional (ADL & IADL)
Mobility, Gait, Balance
Vision and hearing
Cognitive
• Mental status/orientation
• Memory
• Language
• Praxis
• Motor Speed / Psychomotor Processing
• Attention
• Executive Functioning
Behavior
Affective
Social Support
Environmental
Economic Factors
Quality of life
Nutrition
History

Can be most important part of evaluation
Information gathered from patient and from collateral sources (family or other person with knowledge of patient)
Description of behaviors, cognitive and memory functioning and problems and their effect on Activities of Daily Living (ADL)
Onset time/course of illness/problems
Looking for treatable causes

Screening Instruments
Brief Cognitive Assessments

• Assess an array of cognitive abilities in a relatively short period of time
• Cover multiple domains with a few items
• Test the likelihood of genuine cognitive impairment
• Less than 30 minutes to administer, many less than 10
• General guidelines of administration is to screen all individuals over 65 or those with high risk factors

Pros of Brief Cognitive Assessment

• Allows for early detection of cognitive impairment
• Potential for early treatment
• Shorter administration time than a comprehensive evaluation
Cons of Brief Cognitive Assessment

- Distress caused by false positives
- Problems with false negatives
- Paucity of treatment options
- Lack of evidence that early detection improves outcomes
- Need to cater to the specific needs of individual client

Brief Cognitive Assessment Instruments

- Mini Mental State Examination (MMSE)
- Brief Cognitive Status Examination (BCSE)
- Montreal Cognitive Assessment (MoCA)
- Dementia Rating Scale – Second Edition (DRS-II)
- Neurobehavioral Cognitive State Examination (NCSE) (Cognistat)
- Repeatable Battery for the Assessment of Neuropsychological Status UPDATE (RBANS® Update)
- Cognitive Linguistic Quick Test + (CLQT+)
Mini-Mental State Exam (MMSE)

Administration Time: 5-10 minutes
Ages: 18-85+
Domains Measured: Orientation to Time and Place, Attention and Concentration, Calculation, Language, Immediate and Delayed Memory, and Constructional Praxis
Strengths: Most commonly used and extensively studied, 100 translations, brief, and sensitive to dementia, education adjustments
Weaknesses: Doesn’t assess executive functions, working memory, and visual perception, high rate of false positives and negatives

3MS adds items to the MMSE and increases sensitivity

Brief Cognitive Status Exam (BCSE)

Administration Time: 10 minutes
Ages: 17+
Domains Measured: Orientation to time, Mental Control, Planning and Visual-Perceptual Processing, Incidental Recall, Inhibitory Control, Verbal Productivity
Strengths: Co-normed with WAIS-IV and WMS-IV, educational and age norms, sensitive to changes in functioning, provides levels of impairment
Weaknesses: Limited research, doesn’t assess immediate memory, orientation to place, or calculation
MoCA
Administration Time: 12-15 minutes
Ages: 49-85+
Domains Measured: Attention and Concentration, Executive Functioning, Memory, Language, Visuo-constructional Skills, Conceptual Thinking, Calculation, and Orientation
Strengths: Developed to identify MCI in individuals with normal MMSE scores, developing research literature, in public domain, multiple translations, and sensitive to dementia and MCI
Weaknesses: Cultural and linguistic impact on results, small normative sample

DRS-II
Administration Time: 10-15 in normals, 30-45 in clinicals
Ages: 55+
Domains Measured: Attention and Concentration, Initiation and Perseveration, Construction, Conceptualization, and Verbal and Nonverbal Memory
Strengths: Comprehensive, differentiates among dementia severity, tracks change over time, sensitive at the lower end of ability
Weaknesses: Administration time, less sensitive at higher ability levels
Neurobehavioral Cognitive Status Examination (NCSE) (Cognistat)

Administration Time: 15-30 minutes
Ages: 12+
Domains Measured: 3 major areas – Level of Consciousness, Orientation, and Attention; 6 ability areas – language, memory, constructional ability, calculations, reasoning, judgement
Strengths: useful for evaluating ability to complete complex tasks, identifying cognitive impairment in persons with focal neurological lesions.
Weaknesses: relies heavily on communication and language skills

RBANS UPDATE

Administration Time: 20-30 minutes
Ages: 12-89
Domains Measured: Attention, Immediate and Delayed Memory, Visuospatial/Constructional Ability, Language
Strengths: Comprehensive for a screener, sensitive to mild to severe forms of impairment, good normative sample, useful in tracking changes over time, available in Spanish
Weaknesses: Lengthy, scores not adjusted for education
Cognitive Linguistic Quick Test+ (CLQT+)

Administration Time: 15-30 minutes
Ages: 18-89
Domains Measured: Attention, Memory, Executive Function, Language, Visuospatial Skills
Strengths: brief administration time, two forms (traditional and aphasia), useful with patients who have decreased language skills
Weaknesses: little research support (as of yet)

ACS Social Cognition (not a screener)

Administration Time: 15-20
Ages: 16-90
Domains Measured: Social perception including affect naming, prosody, and pairs, Faces, and Names
Strengths: covers social cognition domain (not covered in other instruments), easily scored, brief administration time, normed with WAIS-IV/WMS-IV
Weaknesses: doesn’t cover all aspects of social cognition (e.g. judgment), can be affected by general memory impairment, requires stim book, memory grid, etc.
### Additional Instruments

**Brief**
- Mini-Cog
- St. Louis University Mental Status Exam (SLUMS)
- Cognitive Assessment of Minnesota (CAM)
- Kokmen Test of Mental Status
- AD8
When to Refer for a Formal Evaluation

When screening results are positive
When patient requests assessment or expresses concerns
When family members express concern
When there is a need for a comprehensive baseline
When documentation of disability or accommodation is required
When competency is an issue
When there are issues of placement in a rehabilitation or residential facility

Additional referrals to consider

Medical assessment
Multidisciplinary assessment:
  physician or geriatrician, nursing, neurologist, psychologist,
  physical therapy, social work, speech, occupational therapy, etc.
Neuropsychological assessment
Pharmacology consult
Nutritional consult
Neurological consult