



Assessment of Cognitive Complaints Toolkit

for Alzheimer's Disease

Instruction Manual

PRODUCED BY
THE CALIFORNIA
ALZHEIMER'S
DISEASE CENTERS
AND FUNDED BY
THE CALIFORNIA
DEPARTMENT OF
PUBLIC HEALTH,
ALZHEIMER'S
DISEASE PROGRAM

ACKNOWLEDGMENTS

Thank you to the California Alzheimer's Disease Centers Task Force members for their leadership on this toolkit project.

Howie Rosen, MD (chair)

Cynthia Barton, GNP (co-chair)

Loren Alving, MD

John Danner, LCSW

Sarah Farias, PhD

Douglas Galasko, MD

Joshua Grill, PhD

David Johnson, MD

Terence Kelley, MS

Sarah Kremen, MD

John Olichney, MD

Aimee Pierce, MD

Blake Scanlon, PhD

Freddi Segal-Gidan, PA, PhD

Shirley Sirivong

Maya Slowinska

Karen Stevens, MS

Lon Schneider, MD

Sarah Dulaney, RN

For their significant contributions to the toolkit production, our gratitude also goes to Alissa Bernstein, PhD, who helped extensively with the testing and piloting of the toolkit and Caroline Prioleau, who designed it with us.

The project was supported by a grant from the California Department of Public Health, Alzheimer's Disease Program. The Assessment of Cognitive Complaints Toolkit is released in the public domain.

This toolkit was developed for use by healthcare providers and should not be used by non-professionals to diagnose or determine significance of cognitive complaints without the involvement of an experienced and knowledgeable professional. Interpretation of the answers to these questions requires expert knowledge and must be done in the context of knowing the general health history. If, in reviewing this toolkit, you identify concerning problems, you should discuss it with your physician. Similarly, if you have concerns about your memory or cognition, you should discuss them with your physician even if reviewing this toolkit has led you to believe they are not worrisome.

CONTENTS

California Alzheimer's Disease Centers	1
CADC Locations and Contact Information	1
Introduction to the CADC Toolkit	3
Why Was This Toolkit Developed?	3
Causes of Dementia and Principles Underlying Diagnosis	4
Dementia Table	6
Why is a Specific Diagnosis of Dementia Important?	8
Why Should Specific Diagnosis be Pursued in a Primary Care Setting?	9
Which Patients Should be Evaluated Using this Toolkit?	10
Approach to Assessment	12
Components of the Toolkit	14
A. Wellness Visit Interview	14
B. Full Clinical Assessment	14
C. Diagnostic Disclosure and Counseling	14
D. Guidance on Making a Referral	14
E. Guidance on Billing	15
Toolkit Limitations	16
A. No Informant Available, or Informant Has Limited Knowledge about Patient	16
B. Patient and Family Speak No or Limited English	16
Resources	18
Neurological Examination	18

CALIFORNIA ALZHEIMER'S DISEASE CENTERS

The California Alzheimer's Disease Centers (CADCs) are a statewide network of ten dementia care Centers of Excellence at university medical schools, established by legislation in 1984. The CADCs effectively and efficiently improve dementia health care delivery, provide specialized training and education to health care professionals, and advance the diagnosis and treatment of Alzheimer's disease and dementia. The CADCs also provide an important ongoing economic stimulus, attracting fiscal resources to meet the growing needs of Californians affected by dementia. These include industry and federal support for clinical trials and research; foundation and federal support for training programs, fellowships, and research grants; and private philanthropy. Each CADC plays a critical role in building a vital workforce for the growing needs of the state through training physicians, nurses, physician's assistants, health care professionals and research investigators. The CADCs serve the diverse population of California by providing culturally and linguistically appropriate care to Latinos, African Americans, Asians and Pacific Islanders, and LGBTQ individuals.



Community education and outreach are also provided by the CADCs in the form of lectures, workshops, forums, and support groups that are open to the public.

CADC Locations and Contact Information

Northern California Locations

Stanford University

Stanford/VA Alzheimer's Center
Palo Alto VA Health Care System
Mail Code: 116F-PAD 3801
Miranda Avenue Bldg. 4,
1st Floor, Rm. C151A
Palo Alto, CA 94304
650.858.3915

UC Davis – East Bay

100 North Wiget Lane,
Ste 150
Walnut Creek, CA 94598
925.357.6515

UC Davis – Sacramento

UC Davis Medical Center
Lawrence J. Ellison
Ambulatory Care Center
4860 Y Street, Ste 3900
Sacramento, CA 95817
916.734.5496

UC San Francisco

1500 Owens Street, Ste 320
San Francisco, CA 94143
Clinic appointments:
415.353.2057
Research inquiries:
415.476.3722
adrc@memory.ucsf.edu

Central California Locations

UC San Francisco – Fresno

6137 N. Thesta Avenue, Suite 101B
Fresno, CA 93710

559.227.4810

Fax: 559.227.4167

alz@fresno.ucsf.edu

Southern California Locations

UC Irvine

1100 Gottschalk
Medical Plaza
Irvine, CA
92697-4285

949.824.2382

Fax: 949.824.3049

research@mind.uci.edu

UCLA

Mary S. Easton
Center for Alzheimer's
Disease Research at
UCLA

710 Westwood Plaza,
Room C-224
Los Angeles, CA
90095-1769

310.794.3665

310.794.6191 Trials

310.794.8580

Español

NeuroEaston@mednet.ucla.edu

UC San Diego

UC San Diego Health –
La Jolla
8950 Villa La Jolla Dr.,
Suite C101
La Jolla, CA 92037

858.534.7792 (PSYC)

cgigliotti@ucsd.edu

University of

Southern California
Healthcare

Consultation Center II
1520 San Pablo St.,
Suite 3000
Los Angeles, CA
90033

323.442.7600

adrc@med.usc.edu

USC Rancho Los Amigos National Rehabilitation Center

Geriatric
Neurobehavior and
Alzheimer Center
7601 E. Imperial Hwy
Downey, CA 90242

562.385.8130

adrc@med.usc.edu

INTRODUCTION TO THE CADC TOOLKIT

Why Was This Toolkit Developed?

The Alzheimer's Association reported in 2018 that there were over 650,000 Californians suffering from Alzheimer's disease. Research suggests that almost half of people are not told of their diagnosis. Specialty physicians are most often relied on to provide work-up and diagnosis; however, the numbers of these specialists are not sufficient to meet the overwhelming need. In 2016, the ten California Alzheimer's Disease Centers (CADC) were charged by Senate Bill 833 with providing guidance via a toolkit to improve recognition and diagnosis by primary care providers. The CADCs comprise a group of expert clinicians and researchers, with diverse knowledge in the assessment and management of these conditions. To create this toolkit, the CADCs drew upon peer-reviewed evidence, best practices, Medicare and Medicaid policy, and reimbursement standards in the primary care setting.

This toolkit is designed to provide primary care providers with the tools necessary to recognize normal cognition, diagnose Alzheimer's disease, and identify other cognitive problems requiring specialty referral. It differs from many other toolkits that have been published for this purpose because many of other toolkits focus on diagnosis of *dementia* but provide limited guidance on identifying the specific neurodegenerative disorder.

CAUSES OF DEMENTIA AND PRINCIPLES UNDERLYING DIAGNOSIS

This toolkit is primarily designed as a practical tool for assessment of cognitive complaints. It can also be used as a training tool for less experienced clinicians. It is not designed as a comprehensive review of the causes of dementia, but in this section, we provide a brief background on dementia. Interested readers can consult several other sources such as the Gerontological Society of America's [KAER Toolkit](#) and the Health Resources and Services Administration's [Training Curriculum: Alzheimer's Disease and Related Dementias](#).

Dementia is a general term used to refer to a situation where a patient has suffered from a progressive decline in cognitive and/or behavioral function over at least six months, and they have reached the point where they are unable to independently perform activities that they were able to independently accomplish in the past. Determining when an individual has reached this point can be difficult and subjective, and the level of cognitive impairment sufficient to reach this threshold may be different in people who are working versus those who have retired, and may differ based on educational and occupational background, but impact on daily function remains the standard requirement for a diagnosis of dementia. The term *dementia* has been replaced in the DSM-V manual for psychiatric diagnosis with the term *major neurocognitive impairment*, but the term dementia is still commonly used in neurology and by many psychiatrists.

Because the term dementia only represents a description of the course of cognitive decline and its severity, it does not represent a specific or complete diagnosis. A diagnosis of dementia is generally used to imply a likely neurological etiology, and there is a list of potential causes ([Galasko, 2013](#)), but the most common cause is neurodegenerative disease. This is a general term for a class of disorders characterized by progressive accumulation of injurious proteins in central nervous system tissues that leads to neuronal dysfunction and death. Examples of neurodegenerative diseases include Alzheimer's disease (AD) and Parkinson's disease. While AD is the most common, there are a number of other neurodegenerative causes. In particular, in patients with dementia beginning before age 65, the likelihood of a non-AD dementia is at least fifty percent ([Garre-Olmo, 2010](#)).

Most of the proteins that cause neurodegenerative disease cannot be identified in living patients, so that diagnosis must be inferred from the clinical presentation. This is possible because each type of protein has a tendency to affect certain portions of the nervous system early in the course of the disease and to spread to other parts of the nervous system over time. Thus a careful history to document the symptoms (and, by extension, the neural systems) involved earliest and those involved later in the course is critical to arrive at a specific diagnosis. Unfortunately, many of the important features in neurodegenerative disease, such as hallucinations and changes in socioemotional behavior, cannot be captured in objective

tests, such as neuropsychological testing. Conversely, deficits in neuropsychological tests can be similar across types of dementia. Thus, although cognitive testing can be an important component of the diagnostic assessment, it cannot substitute for a thorough clinical history. In addition, a physical neurological examination is critical because some neurodegenerative disorders include involvement of specific motor systems whereas others do not. Table 1 provides a brief summary of the major neurodegenerative syndromes that are commonly seen in clinical practice and the main clinical features that distinguish them.

Dementia Table

	Alzheimer's Disease (AD)	Vascular Dementia (VaD)	Lewy Body Dementia (DLB)	Behavioral Frontotemporal Dementia (bvFTD)	Corticobasal Degeneration (CBD)	Progressive Supranuclear Palsy (PSP)	FTD Language Variants
Onset	Gradual Usually after age 65	May be sudden or stepwise	Gradual	Gradual, usually before age 65	Gradual, between 60 – 80 (mean 64)	Gradual, between 50 – 80 (mean 63)	Gradual
Causative Protein	Beta amyloid and tau	N/A	Alpha-synuclein	Tau, TDP-43, FUS	Tau	Tau	TDP-43, tau
Typical First Symptom	Memory difficulties	Depends on ischemia	Varies: hallucinations or visuospatial	Behavior or personality changes	Unilateral motor changes	Falls	Language
Cognitive Domains, Symptoms	Memory, language, visuospatial	Depends on anatomy of ischemia	Memory, visuospatial, fluctuating symptoms	Executive: +/- memory	Executive: +/- memory	Spared memory, frontal subcortical deficits	Language, Loss of knowledge of word meaning
Psychiatric/ Behavioral	Delusions are common	Depression, irritability	Hallucinations, usually visual	Disinhibition, apathy	Disinhibition, apathy	Depression, impulsivity	Compulsions
Motor Symptoms	Rare early, apraxia later	Correlates with location of ischemia	Parkinsonism	Some rare cases with motor neuron disease	Alien limb, unilateral dystonia	Falls, supranuclear gaze palsy, axial rigidity, dysarthria, dysphagia	Effortful speech
Progression	Gradual, over 8 to 10 years	Stepwise with further ischemia	Gradual, but faster than AD	Gradual, but faster than AD	Gradual, motor symptoms	Gradual, mean survival 6 – 9 years	Gradual
Laboratory Tests	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Imaging	Possible global atrophy, small hippocampal volumes	Cortical or subcortical white matter lesions on MRI	Possible global atrophy	Atrophy in frontal and temporal lobes	Asymmetrical parietal and frontal atrophy	Midbrain atrophy	Left fronto-insular or anterior temporal atrophy

Table 1. Brief summary of the major neurodegenerative syndromes that are commonly seen in clinical practice and the main clinical features that distinguish them.

The goal of this toolkit is to help clinicians elicit the history and to interpret the physical examination findings and additional data necessary to make an accurate diagnosis of dementia due to neurodegenerative disease. Even among experts, however, clinical diagnosis of neurodegenerative disease is not perfect, and interpretation of unusual symptoms and physical examination findings can be challenging. In most settings where specialty expertise (neurology, psychiatry, or geriatrics) is available, referral of patients with atypical symptoms is appropriate. Thus, this toolkit focuses on the accurate diagnosis of typical AD and helps clinicians identify clinical features that should prompt referral.

WHY IS A SPECIFIC DIAGNOSIS OF DEMENTIA IMPORTANT?

Specific diagnosis of dementia causes has value for several reasons:

1. If a patient has dementia, having a diagnosis is critical. Early and accurate diagnosis allows patients and families to plan effectively for the future, in addition to helping the clinician anticipate necessary changes in the management of non-dementia health issues.
2. It determines currently available treatment. There are specifically approved therapies for AD, but not for other forms of dementia due to neurodegenerative disease. Some forms of dementia, such as DLB, are associated with a very high likelihood of adverse effects from specific medications such as antipsychotics.
3. It has specific implications for prognosis. For example, patients with FTD have shorter survival than patients with AD, and some dementia patients are at much higher risk of developing motor problems including parkinsonism in FTD and DLB and motor neuron disease in FTD. Patients with DLB often develop unique problems with sleep, and patients with DLB and particularly PSP are at very high risk of falls. There are many other similar prognostic implications.
4. It has specific implications for future treatments. Many treatments that are currently being developed are targeted at the specific proteins that cause each of the neurodegenerative syndromes. Once these treatments are developed, it will be critical to make a specific diagnosis to guide therapy.
5. It has specific implications for participating in research. Discovering treatments and cures for neurodegenerative disease requires patients to participate in research, both observational research to understand these disease and drug trials. A specific diagnosis defines the types of research for which a patient would be eligible.

WHY SHOULD SPECIFIC DIAGNOSIS BE PURSUED IN A PRIMARY CARE SETTING?

Failure to identify the specific cause of dementia can delay appropriate treatment and lead to avoidable adverse health outcomes. As noted above, specialty physicians are often relied on to provide work-up and diagnosis; however, the numbers of these specialists are not sufficient to meet the overwhelming need. Waiting lists for dementia specialty consultations are typically long, and specialty care can be very difficult to access in some settings, such as rural practice settings. While a specific diagnosis of dementia can be complex and require such expertise, this is not always the case. With proper assessment, a reliable diagnosis can be achieved in any setting, particularly for more common etiologies such as AD.

If patients with common problems such as cognitive complaints that are typical for aging, or dementia likely due to AD, were identified and accurately diagnosed in a primary care setting, this would allow the more efficient use of specialty referrals. Furthermore, completing workups for cognitive complaints in a primary care setting would allow more patients to maintain care within the setting of their primary care practice, decreasing the need for communication across care providers. This would allow better coordination of care and monitoring and control of treatments by the primary care practice.

WHICH PATIENTS SHOULD BE EVALUATED USING THIS TOOLKIT?

History of Motor Symptoms

The presence of any unexplained/undiagnosed motor symptom listed below is an appropriate indication for referral. Alzheimer's disease is not associated with motor symptoms until the advanced stage of dementia.

Subdomain: PARKINSONISM AND RESTING TREMOR

Question: Do you have a tremor?

Prompts: Has your hand, arm, chin, leg been shaking involuntarily?

Answer	Interpretation	Indications for Referral (for Diagnostic Purposes)
No.	Normal aging.	No referral. 
No.	Consistent with AD.	Typical of AD/No referral. 
Yes.	Defer to exam.	If present, refer to specialist. More concerning if at rest. 

Subdomain: RIGIDITY

Question: Do your limbs feel rigid?

Prompts: Do your limbs feel stiff?

Are you able to turn your head and neck easily?

Answer	Interpretation	Indications for Referral (for Diagnostic Purposes)
No.	Normal aging. Do not consider normal joint stiffness due to arthritis.	No referral. 
No.	Rigidity is not consistent with AD.	Typical of AD/No referral. 
Yes.	Defer to exam.	If present, refer to specialist. 

As discussed below, there are *two components* to this toolkit:

1. an initial component consisting of a few questions and
2. a more extensive set of questions and procedures for full evaluation that would be used when a problem has been identified.

Cognitive complaints are very common with aging. Some people assume that even severe cognitive complaints are normal, while others may have concerns but hesitant to share. Therefore, it is important to acknowledge the importance of any cognitive complaints with at least a few simple questions. The toolkit provides a few short questions that should be asked of all patients over the age of 65. They are designed to allow a patient or family member who has concerns to bring them up in an office visit. Since many people over the age of 65 note some changes in their thinking abilities, the toolkit provides additional questions to

differentiate cognitive complaints that are normal for aging from those that are concerning and should prompt further assessment.

The full evaluation should be used when a significant cognitive complaint has been identified, either through the initial questions or through any other observations. If the health provider has some concerns (for instance they note that the patient has forgotten some appointments or made mistakes with medications) but is not sure that the patient and/or family are concerned or aware of these issues, it would probably be prudent to go through the brief questions before pursuing a full evaluation. This would allow the health provider to raise their concerns at the same time as gauging the concerns of the patient/family.

APPROACH TO ASSESSMENT

Because this toolkit is designed for primary care settings, it assumes that the practitioners will not have or be seeking to develop a level of expertise sufficient to diagnose the full spectrum of disorders that cause cognitive impairment. Thus, the toolkit focuses on identifying cognitive complaints that are

1. normal for age and do not need further assessment,
2. those that are typical of AD and, therefore, also do not need a referral, and
3. those which potentially indicate another cause of dementia and suggest that referral to a specialist is appropriate.

The toolkit focuses on the questions recommended to take an appropriate history as well as guidance on how to interpret the answers. Each answer is characterized as being consistent with normal aging (not worrisome), consistent with Alzheimer's disease, or not consistent with AD and therefore a potential indicator of another cause of dementia. Answers falling into this latter category should prompt referral to a specialist. The toolkit includes information about interpretation of brief cognitive testing, functional assessment, imaging and lab work, family history and the neurological examination, all of which are necessary for accurate diagnosis. The toolkit also offers guidance in the form of scripts about the difficult conversations around disclosure of diagnosis and reporting requirements for driving. Finally, information about billing codes that allow reimbursement for these services in fee for service settings is included.

The outcome of this proposed assessment is a *clinical diagnosis* of AD. Thus, if a clinician diagnoses AD with this toolkit, they are diagnosing the clinical syndrome of AD, which is highly likely, but not 100% certain, to be caused by the accumulation of the proteins tau and Abeta-42 in that patient. Until recently, there was no way to confirm the presence of these specific proteins in the brain. Although such biological markers are now clinically available for AD (through positron emission tomography (PET) scanning and cerebrospinal fluid (CSF) assessment) the current expert opinion is that a diagnosis of the clinical syndrome is reasonable and adequate in most situations without the collection of additional biological markers in routine care of patients with a clinical syndrome consistent with AD.

This toolkit provides specific guidance on how to:

- collect a history that would identify all of the symptoms that support a diagnosis of typical AD and
- detect the signs and symptoms that suggest an alternate diagnosis.

Specific wording for open-ended questions and additional prompts, and the responses often encountered in clinical practice are provided and categorized in terms of their implications for the provider in diagnosis.

For each response, we designate the response as typical for:

- normal aging,
- typical for AD, or
- concerning for non-AD disorder.

If a symptom may be either typical of AD or another disorder, the decision about how to handle the case should raise concern and the clinician should be very vigilant about other symptoms that might suggest an alternate diagnosis. The questions are organized in a table format, and the decision about each question is indicated by color.

For example, in the following excerpt from the tables assessing motor symptoms, the question and prompts are highlighted in gray, and the potential responses are colored based on their potential significance.

You should know *all* the answers to the history questions in the assessment in order to make an accurate diagnosis. Any **red answers** or **red findings** are atypical for **normal aging** or **Alzheimer's disease** and referral to a specialist is recommended. You can proceed to complete more of the assessment including the neurological exam to become more familiar with the process or better characterize your findings for the referring provider. Labs and imaging can be deferred for specialist ordering and interpretation. Refer to guidance on making a referral.

Once you have identified that a full assessment is needed, you would proceed on to this component, likely scheduling an appointment for a full evaluation on a separate day. The questions on the full evaluation assume you know the patient's medical history, basic family history, social history, and medication regimen. If this is a new evaluation, consider that you will have to add time to collect these data. The assessment can be completed over several visits to accommodate patient and provider schedules.

COMPONENTS OF THE TOOLKIT

The toolkit is divided into different sections or modules. These include:

A. Wellness Visit Interview

A workflow and recommended questions for identifying significant cognitive complaints during a routine visit, such as an annual Medicare Wellness Evaluation. Based on the outcome of this brief assessment, the clinician be reassured that no additional assessment is necessary or they can schedule a full assessment.

B. Full Clinical Assessment

An outline of typical questions, tests, and logic flow in assessing cognitive and behavioral status by interviewing a patient and/or an informant, doing a neurological examination, doing brief cognitive testing, and ordering and interpreting basic lab tests and imaging.

C. Diagnostic Disclosure and Counseling

The toolkit includes specific suggestions for wording on how to discuss the following situations:

1. Discussing the diagnosis of dementia
2. Driving
3. Medications for treatment
4. Managing behavioral symptoms
5. Research opportunities, focusing on clinical trials

D. Guidance on Making a Referral

We provide a few details useful to provide to the center receiving the referral to help plan appropriate clinical assessments and staffing.

E. Guidance on Billing

In this section, we anticipate likely scenarios regarding the time you will spend to pursue this assessment, and we make specific recommendations on coding for Medicare billing to permit proper reimbursement. The scenarios assume that you might schedule the entire assessment for one visit, or that you might break the assessment into shorter visits.

TOOLKIT LIMITATIONS

There are situations where the assumptions underlying this toolkit will not be met. In all of these situations, we recommend *referral to a CADC or a local specialist* such as a neurologist, psychiatrist, or geriatrician. If referral is not possible, we provide possible options to be considered.

A. No Informant Available, or Informant Has Limited Knowledge about Patient

If, based on your initial brief assessment, you suspect the patient has significant cognitive problems you must try hard to identify a knowledgeable informant to participate in the full assessment. Without an informant, the history may be less reliable, because people with memory loss due to AD will often deny significant symptoms. If referral is not possible the evaluation should probably begin with cognitive testing (MoCA). If this is low (see cognitive testing section), the clinician should be aware that much of the history will be suspect, and they might seek additional resources to ensure the patient's well-being (e.g., home visit by social worker). Consideration of referral to an occupational therapist who can perform a functional assessment may also be helpful.

B. Patient and Family Speak No or Limited English

Cognitive testing is difficult in this situation. Although tests such as the Montreal Cognitive Assessment (MoCA) have been translated into many languages, it may be difficult to reliably use a translated version, even with a family member or a professional translator to assist. If referral is not possible the best course would be to rely on the detailed history rather than the cognitive testing. Michels and Graver provide an in-depth discussion of [neuropsychological evaluation in primary care](#).

Patient with low level of formal education or literacy

Patients with low levels of formal education (did not complete high school) will sometimes have achieved reasonable skills of literacy, for example through work experiences. In this situation, the rest of the assessment can be considered valid, but the patient should ideally be referred to a neuropsychologist for formal cognitive assessment. If referral is not possible the best course would be to rely on the detailed history rather than the cognitive testing.

Patients with major mental illness

Cognitive complaints may be common in people with major depression, bipolar affective disorder or chronic schizophrenia. Use of high doses of antipsychotic or anticholinergic medications may be associated with feelings of sluggishness or cognitive slowing. In patients who have had relatively mild psychiatric symptoms over the course of their life (e.g., mild depression not interfering with daily activities or bouts of serious depression with good recovery, and currently not severely depressed), the diagnostic assessment can proceed as outlined in this document. In patients who have had significant mental illness (e.g., preventing normal schooling or resulting in significant disability), referral to a specialist is advised. If referral is not possible, the evaluation should proceed with a focus on trying to identify changes from baseline (e.g., loss of previously stable level of function).

RESOURCES

Neurological Examination

The assessment of any patient with cognitive complaints must include a neurological examination. For those who need review of how to conduct and interpret a neurological examination, there are many resources available. Some good ones include:

- The book entitled, [*Clinical Neuroanatomy Made Ridiculously Simple*](#) by Stephen Goldberg. This book presents clinical neuroanatomy with mnemonics, humor, and case presentations. Includes tutorial on how to localize neurologic injuries and interactive quiz of classic neurologic cases. Windows/Macintosh CD and book.
- The [UCSF NeuroExam Tutor](#) iOS App for iPhone and iPad. The NeuroExam Tutor presents an innovative approach to learning the neurological physical exam. With clinical cases, physician-authored information and a library of real patient videos, the NeuroExam Tutor helps medical students, residents and practicing physicians perfect their understanding and execution of the neurological exam. The NeuroExam Tutor was developed as a partnership between University of California, San Francisco and Bandwidth Educational Publishing. It is downloadable from the Apple App Store.
- The website at neuroexam.com. This website is an interactive online guide to the main components of the neurologic examination with video demonstrations. It is based on the book *Neuroanatomy through Clinical Cases* by Hal Blumenfeld, MD, PhD, Yale University School of Medicine.