Dementia Assessment: Using the Clinical Dementia Rating Scale

What is the Clinical Dementia Rating Scale?

The Clinical Dementia Rating Scale (CDR) is an instrument used in clinical and research settings to assess the severity of Alzheimer disease (AD). (For more information on Alzheimer disease, see Quick Lesson About ...Alzheimer’s Disease)

• What: The CDR rates the severity of AD using a 5-point scale that rates the severity of signs and symptoms as they affect the patient’s ability to function in the 6 cognitive categories of memory, orientation, judgment and problem solving, community affairs/involvement, home life and hobbies, and personal care. Although designed for use with patients with a probable diagnosis of AD, the CDR is appropriate for use in the assessment of dementia that is associated with other medical disorders (e.g., Lewy body disease)

• How: The CDR is completed by the researcher or a clinician after performing a face-to-face, semi-structured interview with the patient and a reliable informant (e.g., spouse or other family member/caregiver). The informant is interviewed first, and the results of that interview are used to assess patient recall of events and to confirm the accuracy of patient responses. In each cognitive category the patient receives a score of 0 (no cognitive impairment) to 3 (severe cognitive impairment). The CDR can be scored to obtain a global score by using an algorithm that weights memory more heavily than the other categories, or it can be scored using the sum of boxes (SOB) method in which all categories are weighted equally; in general, the higher the score, the greater the severity of dementia

• Where: The CDR can be administered and interpreted in any setting in which a patient requires evaluation or treatment for AD or other dementia, including inpatient and outpatient healthcare settings and community settings (e.g., during provision of in-home care by a home health nurse; as part of a public health screening program)

• Who: The CDR is administered and interpreted by specially trained healthcare clinicians who provide treatment to patients with suspected or known dementia and/or medical conditions that are known to correspond with dementia

What is the Desired Outcome of Using the Clinical Dementia Rating Scale for the Assessment of a Patient with Dementia?

The healthcare provider gains an accurate assessment of severity of the patient’s dementia in order to appropriately develop or revise a plan of care

Why is Using the Clinical Dementia Rating Scale for the Assessment of a Patient with Dementia Important?

Dementia is often nonreversible and affects a patient’s memory, thinking process, language, judgment, and/or behavior. Dementia can develop as a result of numerous medical conditions; the most common type of dementia is that caused by AD. Dementia manifests with a variety of signs and symptoms, including insomnia, delusions, and loss of language. Persons with progressive and worsening dementia eventually lose the ability to independently perform activities of daily living (ADLs) and to recognize familiar
people and places, and may exercise poor judgment and lose the ability to recognize danger.

› Healthcare providers must accurately determine the level of severity of dementia in order to provide appropriate patient care and treatment and to identify the effectiveness of prescribed treatment interventions in patients with dementia.

**Facts and Figures**

› The CDR is one of the most commonly used tools for assessing the severity of dementia (Lowe et al., 2012).

› Combined with clinical judgment, the CDR is an important tool that assists healthcare providers in characterizing and evaluating patients with a neurodegenerative disease. An advantage of the CDR is the gathering and integration of data from the patient as well as from other informants (e.g., family member/other caregiver) during the interview process (Knopman et al., 2011).

› The CDR was developed in 1979 as part of the Memory and Aging Project at Washington University School of Medicine. With appropriate training in the semi-structured interview protocol, healthcare providers have good reliability in administering the CDR (Meuser, 2001).

› Investigators criticize the use of a standard weighted algorithm in scoring the CDR because there is substantial score variance and the total CDR score may not reflect the degree of underlying dementia. Some experts believe that the SOB method of scoring may also fail to capture important data about the degree of dementia in evaluated patients. Use of the item response theory (IRT) scoring method has been suggested to increase precision in estimating the severity of dementia. The IRT factors in the differential ability of each category to predict and reflect specific patterns of scores across the all CDR domains (Lowe et al., 2012).

**What You Need to Know Before Administering the Clinical Dementia Rating Scale for the Assessment of a Patient with Dementia**

› The CDR is copyrighted and can be obtained at [http://alzheimer.wustl.edu/cdr/copyright.htm](http://alzheimer.wustl.edu/cdr/copyright.htm)

• The CDR is available for use in clinical settings without formal permission, but formal permission is required for use in clinical trials or in for-profit use.

• The CDR has been translated to a variety of languages.

› It is necessary that prospective users of the CDR participate in and successfully complete training in the Brief Training and Reliability Protocol (BTRP) offered by the Alzheimer’s Disease Research Center (ADRC) at the Washington University School of Medicine; face-to-face and online training sessions are available. There is no charge for online training for individual clinicians; for information on training, the ADRC can be contacted at adrcedu@abraxas.wustl.edu or by calling (314) 286-2882.

• The BTRP trains clinicians to successfully administer the semi-structured interview and score the instrument in a valid, reliable manner as outlined in the following:

  – An introduction to the CDR is provided by Dr. John Morris, the principal investigator and co-director of the ADRC at the Washington University School of Medicine.

  – Three videotaped patient interviews can be viewed for training purposes.

  – Six videotaped interviews can be viewed for reliability certification.

  - The ADRC recommends that “successful completion of the 6 reliability tapes is achieved when there is agreement with a gold standard on at least 5 out of the 6 tapes” or that training should involve individualized instruction and onsite observation of administration of the CDR to patients by an experienced clinician.

› The 6 cognitive categories of the CDR are evaluated during the semi-structured interview and the responses recorded by the healthcare researcher or clinician on the CDR worksheet. Depending on the category, some of the same questions are asked of both the patient and informant, whereas other questions are specific to either the patient or the informant. In some cases, the answers from the patient and the informant are compared in order to assess the accuracy of the patient’s statements. Examples include the following:

• To evaluate the memory domain, the healthcare clinician may ask the informant, “What is the patient’s birthdate?” and record the response on the worksheet. The healthcare clinician may subsequently ask the patient the same question and record and compare the patient’s response with that of the informant’s response to assess the accuracy of the patient’s memory.

• To evaluate the patient’s orientation, the healthcare clinician may ask the patient “What is today’s date?” and mark the patient’s response as “correct” or “incorrect.” In addition, the healthcare clinician may ask the informant how often the patient recalls the correct date and record “usually,” “sometimes,” “rarely,” or “don’t know” based on the informant’s response.
To evaluate the patient’s judgment, the healthcare clinician may ask the patient, “How are sugar and hot peppers different from one another?” (the answer is sweet and spicy), and record the patient’s response. In addition, the healthcare clinician may ask the informant, “Does the patient behave normally in social situations?” and record “usually,” “sometimes,” “rarely,” or “don’t know” based on the informant’s response.

The healthcare researcher or clinician consults the CDR scoring sheet, selects the appropriate score for each category based on the results of the semi-structured interviews, and indicates on the scoring sheet which score was selected in each category. Signs and symptoms of dementia do not typically progress in a uniform manner, and it is unusual for patients to score in the same severity range in all of the 6 categories.

• The memory, orientation, judgment and problem solving, community affairs/involvement, and home life and hobbies categories are scored using a 5-point ordinal scale, as follows:
  - 0 indicates no impairment
  - 0.5 indicates very mild impairment
  - 1 indicates mild impairment
  - 2 indicates moderate impairment
  - 3 indicates severe impairment

• The personal care category is scored using a 4-point ordinal scale, as follows:
  - 0 indicates no impairment
  - 1 indicates mild impairment
  - 2 indicates moderate impairment
  - 3 indicates severe impairment

• The descriptors for each score on the CDR scoring sheet vary based on the category being evaluated; the selection criteria for each score are clearly described on the scoring sheet.

An overall CDR global score indicating the severity of dementia is obtained based on a standard algorithm that weights memory as the primary category and weights the remaining categories as secondary.

• The Statistical Analysis System (SAS) algorithm scoring can be obtained at the Washington University Alzheimer’s Disease Research Center http://www.biostat.wustl.edu/~adrc/cdrpgm/index.html

• The global scores indicating severity of dementia are as follows:
  - 0 indicates no dementia
  - 0.5 indicates very mild dementia
  - 1 indicates mild dementia
  - 2 indicates moderate dementia
  - 3 indicates severe dementia

The second option for scoring the CDR is the SOB method in which all 6 categories are weighted equally and the scores for each of the categories are summed to obtain a total score; the total score can be 0–18.

• The advantages of the SOB method include
  - greater ease in calculating dementia severity
  - the ability to better detect subtleties in dementia severity
  - increased precision in serially tracking the severity of dementia

• SOB scores are used to rate dementia severity as follows:
  - 0 indicates normal cognitive functioning
  - 0.5–4.0 indicates questionable cognitive impairment
    - 0.5–2.0 indicates questionable impairment
    - 3.0–4.0 indicates very mild dementia
  - 4.5–9.0 indicates mild dementia
  - 9.5–15.5 indicates moderate dementia
  - 16.0–18.0 indicates severe dementia

Preliminary steps that should be performed before administering the CDR include the following:

• Review the facility/unit protocol for administration of dementia screening tools and for the CDR, in particular, if one is available

• Review the treating clinician’s order for administering the CDR, if necessary, although administering the CDR does not require a physician’s written or verbal order

• Review the instructions for the CDR semi-structured interview protocol and for scoring and interpreting the CDR

• Verify completion of facility informed consent documents, if appropriate
Review the patient’s presenting problem, including
- mental and medical health status and history
- family medical and mental health history
- functional status
- social and developmental history
- current medication regimen

Verify that a reliable informant is available to participate in data collection

Gather supplies necessary to administer the CDR, including the following:

- CDR assessment worksheet
- CDR scoring sheet
- Pen for data collection
- Computer for accessing the online scoring algorithm

How to Use the Clinical Dementia Rating Scale for the Assessment of a Patient with Dementia

Perform hand hygiene
Identify the patient according to facility protocol
Establish privacy by closing the door to the patient’s room and/or drawing the curtain surrounding the patient’s bed; if in the community setting, close the door to the room where the patient is being evaluated or allow for an appropriate distance between the patient and others in an open area such that completing the CDR interview will not be observed or overheard by others and discussion regarding its interpretation will not be overheard
Verify that the patient is alert. Introduce yourself to the patient and family member(s), if present, and explain your clinical role in administering the CDR. Assess for knowledge deficits and anxiety regarding the CDR
- Determine if the patient/family requires special considerations regarding communication (e.g., due to illiteracy, language barriers, or deafness); make arrangements to meet these needs if they are present
  - Follow facility protocols for using professional certified medical interpreters, either in person or via phone, when language barriers exist
- Educate regarding administering the CDR, including its purpose; answer questions and provide emotional support as needed
  - Explain the scoring system and correlating indications; emphasize that the CDR is a measurement tool for assessing the severity of dementia and not a diagnostic tool
Obtain the patient’s verbal consent prior to initiating the CDR, as appropriate
Initiate administration of the CDR by following the instructions in the semi-structured interview protocol, if available
- Ask the informant each question in all 6 categories of the CDR and record his/her specific replies (e.g., the patient’s birthdate) on the worksheet
- Ask the patient each question in all 6 categories of the CDR and record the patient’s specific response (e.g., the patient’s birthdate, ability to distinguish differences in objects) on the worksheet
  - As appropriate, compare the patient’s answers with those given by the informant to assess for accuracy
  - If the patient is aphasic, assess both language and nonlanguage functioning in each category
  - In some cases, asking additional questions (referred to as probing) to elicit more detailed information is necessary to accurately discriminate between levels of dementia severity; for example, the healthcare clinician may ask the patient, “How well do you perform housework?” and, depending on the patient’s response, ask additional questions about the frequency or type of cooking, cleaning, washing the laundry, or performing home repair
  - The videotaped assessments by the BTRP demonstrate how probing can be effectively utilized to elicit the most useful and accurate information
- Allow sufficient time for the patient and informant to complete the semi-structured interview; there is no time limit and the length of the interview varies
After conducting the semi-structured interviews, mark the appropriate individual box score on the scoring sheet according to the descriptions for each score in each category
- Score each category independently based on the responses provided; if the responses are ambiguous, use clinical judgment to determine which score to assign to a particular category
  - Score each category from 0 – 3
  - If the researcher or clinician is unable to discriminate between 2 scores, the higher score should be selected
– Rate the patient’s impairment or decline from previous level based solely on cognitive loss alone; do not consider impairment occurring as a result of physical handicap or depression

› Verify that all 6 categories have been completed and calculate the CDR score using either the global scoring or SOB method

• Calculate the CDR global score by using the SAS global algorithm at the Washington University Alzheimer’s Disease Research Center [http://www.biostat.wustl.edu/~adrc/cdrpgm/index.html](http://www.biostat.wustl.edu/~adrc/cdrpgm/index.html)

• Calculate the CDR SOB score by summing the scores in each category

› Interpret the results of the CDR and determine the severity of dementia by comparing the score received with the key listing the severity of dementia for each category (for details, see What You Need to Know, above)

› Inform the treating clinician of the results of the CDR, if indicated

› As appropriate, discuss results and interpretation of the CDR with the patient and/or informant

› Add the completed CDR worksheet and scoring sheet to the patient’s medical record

› Update the patient’s plan of care, as appropriate, and document the administration of the CDR in the patient’s medical record, including the following information:

• Date and time the CDR was administered

• Score and interpretation of the CDR, and whether or not the treating clinician was notified

• Patient assessment information, including
  – patient’s mood and cognitive and mental status (e.g., alert, oriented)
  – patient’s response to the administration of the CDR (e.g., cooperative; unable to understand and/or answer questions; emotionally labile)

• Any unexpected patient events, interventions performed, whether or not the treating clinician was notified, and patient outcome

• All patient/family education, including the purpose of administering the CDR, response to education provided, plan for follow-up education and/or interventions, barriers to communication, and methods that promoted successful communication

Other Tests, Treatments, or Procedures That May be Necessary Before or After Administering the Clinical Dementia Rating Scale for the Assessment of a Patient with Dementia

› Patients may require additional evaluation by a specialist (e.g., neurologist)

› Patients may undergo additional psychometric testing for the evaluation of dementia associated with underlying neurodegenerative diseases

What to Expect After Administering the Clinical Dementia Rating Scale for the Assessment of a Patient with Dementia

› The patient with dementia will be referred for appropriate evaluation and/or interventions to improve impairment and/or dysfunction related to dementia

› Collaborate with other members of the healthcare team for initiating or changing the individualized plan of care (e.g., referral to a neurologist), as appropriate

Red Flags

› A trusted family member or other caregiver should be selected as a reliable informant for details of the patient’s daily function related to cognitive status

› Disagreement may occur between the patient and informant regarding information or events during the semi-structured interview process; it is the healthcare clinician’s responsibility to make determinations regarding which information appears most accurate

What Do I Need to Tell the Patient/Patient’s Family?

› Educate that the purpose of the CDR is to measure the cognitive function and functional impairment in patients with dementia

  • Explain the scoring system and correlating indications; emphasize that the CDR is a measurement tool for assessing the severity of dementia and not a diagnostic tool

› Educate that referral to one or more clinician specialists may be warranted based on the CDR score, and explain any changes to current medical interventions (e.g., prescriptions), as appropriate
References


