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CHAPTER 9

ADULT ATTENTION-DEFICIT HYPERACTIVITY DISORDER

Laura E. Knouse, M.A. and Steven A. Safren, Ph.D.

Attention-Deficit Hyperactivity Disorder (ADHD) is a developmental disorder characterized by symptoms of inattention, hyperactivity, and impulsivity that causes significant impairment in multiple domains of functioning[1]. Nearly two decades of research support the idea that ADHD continues to affect a substantial proportion of patients into adulthood [2] [3]. A recent population-based survey estimated the prevalence of ADHD in the adult population at 4.4%, which is consistent with previous estimates [4] and adults are now specifically seeking services for ADHD in mental health care settings.

While the validity of ADHD in adulthood has been empirically established, evidence concerning the accurate assessment and appropriate treatment of the disorder in adults lags behind the knowledge base for children. Even for an experienced clinician, adult ADHD is often difficult to diagnose. Self-report rating scales can generate useful information to guide clinical decision-making throughout the process of assessment and treatment. Ratings collected over time can be a source of data to guide treatment-related decision-making and improve communication between provider and patient.

Rating scales can play three distinct roles in clinical work with adults with ADHD:

(1) rating scales can be used as a general screening for patients in a variety of settings, with the goal of identifying adults who might require more comprehensive evaluation and follow-up.

(2) rating scales can be used as part of an evaluation to obtain data pertaining to several of the diagnostic criteria for ADHD.

(3) rating scales can be used to repeatedly assess the effects of treatment on symptom severity.

In this chapter, we focus primarily on the use of rating scales in the first and third roles -- screening and tracking treatment-related change --- because a comprehensive discussion of the role of rating scales in a multi-faceted adult ADHD assessment is beyond the scope of this chapter. We wish to emphasize that the establishment of a diagnosis of ADHD in adults cannot be accomplished using rating scales alone (see also “Conclusions” at the end of this chapter.) However, later in this chapter we briefly address how evidence for *Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition (DSM-IV)* [1] criteria could be gleaned from a rating scale.

SUGGESTED RATING SCALES FOR ADHD

Current Symptoms Scale (CSS) [Barkley & Murphy, 2006][5]

Adult ADHD Self-Report Scale (ASRS) [Kessler et al., 2005][6]

Current Symptoms Scale (CSS)¹

¹ The CSS is protected by copyright and therefore is not reproduced here. It is available in: *Attention-Deficit Hyperactivity Disorder: A Clinical Workbook – 3rd Edition* (Barkley & Murphy, 2006). The workbook also includes self-report scales assessing childhood symptoms retrospectively. Other-report forms for both current and past symptoms can be used to collect collateral information for assessment and treatment tracking. Normative data tables are also provided along with instructions on how to administer, score, and interpret results. Scales assessing other areas including medication side effects, risky driving behavior, and work performance are also provided, as are forms for use with children. Barkley & Murphy encourage clinicians to photocopy and use these forms in their practice.

Our research program at Massachusetts General Hospital develops and tests cognitive-behavioral interventions for adults who, despite medication treatment for their ADHD, continue to display residual symptoms. We use the self-report Current Symptoms Scale [5] both to assess treatment-related change in symptoms over time and as part of our baseline evaluations, because of its widespread use in research and clinical settings and the close correspondence of its items to *DSM-IV* criterion symptoms.

The *CSS* consists of the 18 *DSM-IV* inattentive and hyperactive-impulsive symptom items, worded in the first person and with some wording modified to fit adults (e.g. “playing” changed to “engaging in leisure activities”). Patients begin by rating their behavior over the past 6 months with respect to each item on a 4-point Likert scale (Never or Rarely, Sometimes, Often, or Very Often) scored 0-3. Thus, severity scores on the *CSS* can range from 0-54 across all symptoms. Next, they indicate the age the onset for endorsed symptoms. Finally they rate how often these symptoms have interfered with functioning in ten areas of life.

Application of Scale: The *CSS* is administered throughout our treatment outcome studies. Patients first complete the measure at their baseline assessment to establish an initial level of symptom severity. Importantly, the *CSS* is only one measure in a large battery of baseline assessments – both self-report and clinician-administered—that we use in establishing the ADHD diagnosis and assessing its associated features. We use total scores on the *CSS* as baseline data. Separate totals from inattentive versus hyperactive-impulsive symptom clusters are useful in follow-up analyses of our data. The *CSS* is also completed at post-treatment and at 6- and 12-month follow-up assessments.

During our treatment studies, the *CSS* is used to track symptoms on a weekly basis. Patients are instructed to complete the 18 *DSM-IV* items of the scale at the beginning of each

treatment session and to try to rate the past week only. When the patient finishes the scale, his or her therapist totals the score and also looks over each item individually. They briefly discuss which items appear to be improving and which are still problematic for the patient. Importantly, the therapist directs the patient to talk about which skills the patient used successfully over the past week and how this may have impacted his or her ratings. This is important because we have found that patients with ADHD sometimes complete the scale with a “trait-like” attitude toward their ratings rather than considering behavioral changes that may have occurred more recently. Each week, the *CSS* helps us to track changes in symptoms and also serves as an important forum for patients and therapists to discuss how treatment is progressing. When patients are able to see even small gains as a result of their work in treatment, it can sustain their motivation to continue to practice their new skills until the skills become less effortful.

The *CSS* could also be useful to clinicians as part of a comprehensive evaluation of ADHD in adults. The scale yields data for *DSM-IV* Criterion A (symptom counts, developmental deviance via norms), Criterion B (symptom onset), and Criterion C (impairment across settings). Barkley and Murphy (2006) suggest that clinicians can score items rated as “often” or more as an indicator of *DSM-IV* symptom counts, although we have heard of using items rated as “sometimes” to be counted as a half symptom. Accordingly, a person would need two of these within the domain (inattention or hyperactivity-impulsivity) to “count” toward the 6-symptom criterion for diagnosis. Published deviance cutoffs for the scale enable the clinician to gauge symptom deviance compared to a general population sample (Criterion A). The scale collects information about symptom onset (Criterion B) and information about functional impairment across domains (Criterion C). However, during our evaluations we augment rating scale data

using structured diagnostic interviews, clinician ratings, and other self-report scales (e.g. quality of life, symptoms of other disorders).

Scoring Key: In our work, we have primarily used a simple sum of patient's self-report symptom ratings of the 18 *DSM-IV* ADHD items as an indication for ADHD symptom severity (0-54 range). The clinician can also obtain totals for inattentive versus hyperactive-impulsive symptoms separately – odd numbered items for inattentive and even numbered items for hyperactive-impulsive symptoms with a range of 0-27 for each symptom cluster. See above section for how the CSS could be used to obtain symptom counts.

Cutoff Scores: The clinical workbook in which the CSS is published [5] contains age-based deviance thresholds (1.5 standard deviations above the mean) for inattentive symptoms, hyperactive-impulsive symptoms, and total ADHD symptoms. These can be used as clinical cutoff scores.

Clinically Significant Change: We compare total scores on this measure at follow-up to those obtained at the baseline assessment. Medication treatment trials often consider a 30% reduction in scores from baseline a response to treatment [7]. While the symptom ratings of a clinician blinded to treatment condition serve as our primary outcome measure in the research setting, we believe that self-report ratings capture aspects of treatment-related change that are not reflected in the ratings of others. For example, the patient may be in the best position to sensitively rate changes in outcomes such as improvements in sustained attention. Thus, self-report data collected via rating scales continues to be an important part of the measurement of change in our research and clinical work.

Adult ADHD Self-Report Scale (ASRS)

The *ASRS* (*ASRS-v1.1*; [6][8]) is reproduced at the end of this chapter. It is an 18-item self-report scale developed by the World Health Organization as a screening tool for ADHD in adults that contains items similar to those of the *CSS*. There are two versions of the *ASRS*: a short screening version of six items (contained in Part A of the scale) and a full 18-item version containing content from all *DSM-IV* symptoms (Parts A and B). The *ASRS* has a growing body of literature supporting its reliability and validity, and is available online at no cost, with links to various language versions and background data available at <http://www.hcp.med.harvard.edu/ncs/asrs.php>. The full scale is available in English, Chinese (traditional), Danish, French, Hebrew, Norwegian, and Swedish. The 6-question screening version, Part A of the scale reproduced here, is also available in Chinese (Mandarin), Dutch, German, Japanese, Portuguese, Russian, and Spanish (both for use in Mexico/U.S. and Spain). Note, however, that no research on the properties of these translated instruments has been conducted.

The *ASRS* was developed for use in World Health Organization (WHO) Mental Health Initiative surveys, designed to collect data from over 200,000 respondents in 28 countries. Kessler et al. [6] developed this new self-report measure covering all 18 *DSM-IV* symptoms with items re-worded to be more appropriate for adults. For each item of the *ASRS*, patients rate the frequency with which each symptom occurred over the past six months on a 0-4 scale with points labeled as Never, Rarely, Sometimes, Often, or Very Often. The scale was focused on frequency of symptoms rather than severity to make scale instructions easier for participants to understand.

Application of the Scale: The complete *ASRS-v.1.1* and its published instructions are reprinted on pages XX and are copyrighted by the World Health Organization. We describe

using the ASRS-v1.1 for two purposes: as a screening tool and as a way to track changes in adult ADHD symptoms in response to treatment. As a screening tool, the clinician should follow the scale instructions (page XX; see also updated information on scoring of Part A in Scoring Key and Cutoff Points section) and refer patients who exceed these cutpoints for further evaluation for possible adult ADHD. Clinicians should keep in mind, however, that this screening threshold still fails to identify a substantial portion (about 35%) of adults who meet criteria for adult ADHD using diagnostic interviews [6]. Therefore, following up with individual patients who display elevated scores on this measure (but who do not meet or exceed the threshold) may be warranted.

Based on our experience with the 18 *DSM-IV* items of the Current Symptom Scale, we suggest that the *ASRS* could be used as often as weekly to track treatment-related changes in adult ADHD symptoms. Recent adult ADHD medication trials have used symptom-based self-report measures and these scales appear to be sensitive to treatment-related change [9][10][11][12]. Self-reports are often used in conjunction with clinician ratings in medication studies. Importantly, the clinician-rated version of the *ASRS*, the *AISRS*, has been sensitive to treatment-related change in three recent studies [13][14][15]. While far fewer studies exist on tracking the efficacy of psychosocial treatment in treating adult ADHD, our own work using the *CSS* supports the sensitivity of this type of measure. For example, our group found that adults receiving a cognitive-behavioral treatment package reported, on average, a 50% reduction in total scores on the *CSS* from baseline assessment to post-treatment [16]. Solanto and colleagues [17] recently found that their Meta-Cognitive Therapy group treatment was associated with significant reductions on the *DSM-IV*-based inattentive items of the self-report *Conners' Adult ADHD Rating Scale (CAARS)*;[18]. Because items on the *ASRSv1.1* also parallel the *DSM-IV*

symptoms, total scores on this measure are likely to be sensitive to treatment-related changes. In addition, the expanded range of total scores on this measure (0-72 vs. 0-54) and its increased face validity for ADHD symptoms in adults may increase its sensitivity to change, but this possibility has not yet been investigated empirically.

Clinicians can administer the *ASRSv1.1* at their initial evaluation visit with a patient to establish a baseline level of total symptom scores on the measure. At each subsequent treatment session or follow-up visit, the patient should complete the measure *with respect to the time period since the last session* prior to his or her discussion with the clinician during that session. (This will avoid biasing the patient's ratings in the direction of the clinician's impressions.) We find it important to remind the patient frequently regarding the time-frame of the symptoms to maximize the chances that his or her ratings reflect behavior during the previous week rather than his or her behavior in general. The clinician should then total the patient's score on the measure and keep a record. For example, a computerized spreadsheet containing a record for each patient's weekly measures is an excellent way to organize and track scores. Later, these scores can be easily plotted on a chart and used in discussions of treatment effectiveness. During a particular appointment, the clinician should note the pattern of change from the previous visit and discuss with the patient whether this pattern reflects the patient's subjective impression of changes in symptoms. If the treatment in question is a psychosocial treatment, the clinician can note individual symptoms that have improved and those that continue to be problematic and use this in a discussion of which skills and strategies the patient has been able to implement successfully. This process can help both patient and clinician to more efficiently direct their time and efforts toward the most severe symptoms.

The screening thresholds previously mentioned could also be used targets below which it is less likely that the patient would meet criteria for adult ADHD upon clinical interview. Importantly, symptom scales should always be used to track progress in conjunction with evidence of improvement in functional domains based on the patient's report and other measures. In addition, rating scales appropriate for tracking symptoms of comorbid disorders (e.g., depression or anxiety) should also be administered during treatment if a patient's evaluation indicates that these symptoms are prominent.

Copy of Rating Scale: (insert here)

Scoring Key and Cutoff Points: Kessler et al. [6] identified thresholds for each item with maximum concordance with interview results. For 7 items, a rating of "Sometimes" (score of 2) best differentiated a positive symptom on the interview and for the remaining 11 items a rating of "Often" or higher (score of 3) was most appropriate. These thresholds correspond to the gray boxes on the form reprinted here. While the authors point out that a clinician could use a *DSM-IV* threshold of 6+ symptoms on either list to define diagnosis, they tested several scoring methods to determine which method best predicted diagnosis.

Following the recommendations of the scale's authors when using the entire scale (parts A and B), the clinician should count up the number of items the patient endorses that fall in the gray shaded boxes. If this symptom count is 9 or greater, the patient may need to be referred for further evaluation. Using only the 6-item screening scale contained in Part A, the authors now recommend adding up the *total score* (of items rated 0-4) rather than counting responses in the

gray boxes as suggested in the instructions and following up with patients whose total scores are 14 or higher [19].

Reliability and Validity: A subsample of 154 participants age 18-44 in the National Comorbidity Survey Replication (NCSR) was the test sample for the *ASRS*. Participants in four representative subgroups (no childhood ADHD, some symptoms in childhood, diagnosis in childhood but deny current symptoms, diagnosis in childhood and endorse current symptoms) completed a structured, clinician-administered interview of current ADHD symptoms and the *ASRS*. The authors found a significant correlation of .43 between total scores on the *ASRS* (0-72) and current clinical symptom severity and suggest that this finding may support the use of the *ASRS* in charting clinical improvement among treatment cases. Providing further evidence for the use of this scale in the clinical population, data from 60 adult ADHD clinic patients who completed the *ASRS* and clinician interview were analyzed to assess concurrent validity and internal consistency [20]. Internal consistency for the *ASRS* ($\alpha = .88$) was very good. Interclass correlation coefficients between the *ASRS* and clinician-administered interview were high (.84) with significant Kappa coefficients for each item.

More recently, data using the 6-item screening version of the *ASRS* were collected from a representative sample of 668 health plan members to assess its psychometric properties and to cross-validate this brief screening scale [19]. Internal consistency for continuous scores ranged from .63-.72 and test-retest reliability ranged from .58 - .77. Note, however, that these values apply only to the 6-item screener and not the full 18-item scale.

Clinically Significant Change: Changes in total scores on the *ASRSv1.1* or any other symptom-based measure of adult ADHD can provide information to aid in decision-making about treatment course. A 30% reduction in overall scale scores can be used as a guideline for

treatment response. This threshold is often employed in ADHD medication treatment studies [7]) and was used in a medication treatment study that employed the clinician-report version of the *ASRS* [14]. However, patient and clinician may decide to set a lower (or higher) threshold of symptoms severity as the goal of treatment, depending on a patient's level of functioning and baseline severity.

Comment on Symptom-Based Scales: Brief comment on the strengths and weaknesses of symptom-based scales such as the *ASRS* is warranted. A growing body of literature supports the *ASRS*, particularly as a screening tool. Its item wording appears to be face valid and appropriate for tapping the expression of *DSM-IV* ADHD symptoms in adults. The scale is widely available and has numerous non-English translations available. There is evidence that similarly-constructed scales are sensitive to change in medication and psychosocial treatment studies. The weaknesses of symptom-based scales highlight the need to augment the assessment and treatment process with other measures and procedures. The *ASRS* and some other adult rating scales do not provide information on childhood symptoms, which is critical to making an ADHD diagnosis. Symptom-based scales do not generate corroborating evidence from others of either current or childhood symptoms. The scale assesses only the frequency—not the functional impact—of symptoms. For these reasons, it is critical that scales like the *ASRSv1.1* be used for screening or tracking symptom frequency and not used as the sole basis of clinical diagnosis. As discussed previously, rating scales are only one tool in a comprehensive evaluation of adult ADHD that should also include diagnostic interview, detailed history, evidence of functional impact of ADHD, other report of symptoms, review of documentation, and thorough assessment of comorbid conditions.

OTHER SCALES AVAILABLE FOR THIS DISORDER

Though a comprehensive review of rating scales available for adults with ADHD is beyond the scope of this chapter, we briefly mention one other widely available set of rating scales that a clinician working with this population might consider--*Conners' Adult ADHD Rating Scales (CAARS)*; [18]). Detailed reviews of a much wider range of adult ADHD rating scales are available [21][22]. Notably, the CAARS can be used to partially bolster some of the weaknesses of a simpler scale like the *ASRS v1.1*.

Involving a wide normative base and strong psychometric properties, the *CAARS* are self- and other-report measures of current adult ADHD symptoms. The *CAARS* items were derived from a pool of 93 items thought to be related to the manifestation of ADHD in adults and carefully selected based on exploratory factor analysis [23]. The final 66-item self-report scale includes the DSM-IV based items with adult-appropriate wording and non-DSM items loading on 4 dimensions: inattention/memory problems, hyperactivity/restlessness, impulsivity/emotional lability, and problems with self-concept. Reliability and validity for this scale are well-documented [24]. Norms for all subscales are available with respect to age and gender.

The properties of the *CAARS* demonstrate its suitability for all three functions of a rating scale in work with adults with ADHD in clinical practice. First, the *CAARS* can be used for screening. The entire scale shows good discriminant validity [24] and also contains an ADHD Index which the authors describe as producing the best discrimination between ADHD and non-ADHD patients [25]. Short (26 items) and Screening (30 items) versions of the *CAARS* contain this index and thus are suitable for use in screening for ADHD in adults. Second, the *CAARS* would be useful as part of a comprehensive assessment of adult ADHD. DSM-IV symptom counts can be derived (from items rated "Often" or above) and norms can be used to establish

developmental deviance. Other-report forms can provide corroborating evidence of current symptoms—a critical element of the assessment of ADHD symptoms in adults. (Note, however, that the *CAARS* does not assess symptoms in childhood or age of onset.) Third, the full *CAARS* or one of the shortened versions could be used to track treatment progress over time and the full scales show good test-retest reliability (.88-.91.; Erhardt et al., 1999).

The *CAARS* suite of products is available from Multi-Health Systems and appears to be the most comprehensive package of rating scale products currently available to a clinician working with adults with ADHD. Hand-scoring and computer-scoring packages are available. Computer-scoring software generates two types of detailed reports from the measure. The *CAARS* scales would be an excellent addition to the assessment library of a clinician who often provides comprehensive assessment and treatment of adults for ADHD with cost and time of administration/scoring being perhaps the most prohibitive factors.

CONCLUSIONS

Although this chapter describes how rating scales are used in our research group at Massachusetts General Hospital, a clinician wishing to assess ADHD in adults must collect multiple types of data from multiple sources to address each of the criteria in *DSM-IV* and to rule out alternative explanations for the patient's presenting problems. Other authors [26][27] address the complexities inherent in this process and readers should refer to these resources for a full discussion of assessment issues in adult ADHD. Brief consideration of several issues in the assessment of adult ADHD helps to define the role of rating scales in clinical practice.

First, the symptom criteria for the disorder as outlined in *DSM-IV* have been criticized as not developmentally appropriate for capturing the expression of ADHD symptoms in adults and symptom thresholds for diagnosis may be too stringent [28]. Items must reflect adult symptoms

while keeping content consistent with research-based conceptualizations of the disorder. Second, a patient's symptoms must be in excess of those exhibited by individuals of similar developmental level, requiring some ability to compare patient's symptom severity with other adults. Third, onset of symptoms and at least some impairment must occur in childhood, highlighting the need for retrospective reporting and review of documentation. Fourth, corroborating evidence of both current and past symptoms via other-report is essential to accurate diagnosis, and the extent to which these sources of data converge is often variable [29][30][31]. Finally, assessment of comorbid disorders is critical, given that adults with ADHD report significantly more comorbid disorders than their non-ADHD counterparts [32]. The clinician must rule out that other disorders account for symptoms and must assess the influence of other disorders on impairment and their possible impact on treatment of ADHD. Because of these complexities, expert clinicians emphasize that the assessment process must be comprehensive and multi-method (Murphy & Gordon, 2006). Thus, rating scales are only one element in a comprehensive assessment of adult ADHD.

In summary, assessment of ADHD in adults is a challenging process with a growing, but still limited, base of empirically-derived knowledge. Rating scales based on DSM-IV symptoms appear to be an efficient way to collect self-report data on current symptoms for use in screening, as part of a comprehensive ADHD assessment, and in tracking treatment progress. The *Adult ADHD Self-Report Rating Scale* [6] is a widely-available scale that can be used by busy clinicians for screening or in tracking treatment progress. Several other scales are available based on a clinician's needs and resources, including the *Current Symptoms Scale* [5] and the *Conners' Adult ADHD Rating Scale* [18]. Although the benefits of incorporating rating scales for adult

ADHD into clinical practice certainly outweigh the costs, more research is needed on their application in the three roles outlined in this chapter.

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