

The Wender Utah Rating Scale: An Aid in the Retrospective Diagnosis of Childhood Attention Deficit Hyperactivity Disorder

Mark F. Ward, Ph.D., Paul H. Wender, M.D., and Fred W. Reimherr, M.D.

***Objective:** In an attempt to surmount the problem of retrospectively establishing the childhood diagnosis of attention deficit hyperactivity disorder, the authors constructed the 61-item Wender Utah Rating Scale (WURS) for adults to use to describe their own childhood behavior. In this paper they present their initial data collection and evaluation of the instrument's validity. **Method:** The scale was administered to 81 adult outpatients with attention deficit hyperactivity disorder, 100 "normal" adults, and 70 psychiatric adult outpatients with unipolar depression. The authors analyzed data from the 25 items of the scale that showed the greatest difference between the patients with attention deficit hyperactivity disorder and the normal comparison subjects and the relationship between the WURS and the patients' parents' judgment of childhood activity as measured by the Parents' Rating Scale. **Results:** The patients with attention deficit hyperactivity disorder had significantly higher mean scores on all 25 items than did the two comparison groups. The difference between the mean total scores of the patients with attention deficit hyperactivity disorder and the normal subjects was also highly significant. A cutoff score of 46 or higher correctly identified 86% of the patients with attention deficit hyperactivity disorder, 99% of the normal subjects, and 81% of the depressed subjects. Correlations obtained between WURS scores and Parents' Rating Scale scores were moderate but impressive. The ability of WURS scores to predict response to methylphenidate replicated the authors' finding regarding the ability of Parents' Rating Scale scores to predict response to pemoline. **Conclusions:** The WURS is sensitive in identifying childhood attention deficit hyperactivity disorder and may be useful in recognizing attention deficit hyperactivity disorder in patients with ambiguous adult psychopathology.*

(Am J Psychiatry 1993; 150:885-890)

The diagnostic criteria for attention deficit hyperactivity disorder in adults, as defined by DSM-III-R, require a childhood history of attention deficit hyperactivity disorder. Unfortunately, most patients being evaluated for the adult disorder have not been psychiatrically evaluated as children; therefore, a recurring problem in the diagnosis of attention deficit hyperactivity disorder in adults is the retrospective diagnosis of childhood attention deficit hyperactivity disorder. In an attempt to surmount this problem, we have used the Parents' Rating Scale (appendix 1), which is a modification of the Conners Abbreviated Rating Scale (1-4). The ratings on the Parents' Rating Scale are not at all (score=0), just a little (score=1), pretty much (score=3),

and very much (score=4). A Parents' Rating Scale score of 12 or more places someone above the 95th percentile of childhood "hyperactivity." Parents of adult patients, however, are not always available or willing to participate in such an evaluation. Therefore, we constructed the Wender Utah Rating Scale (WURS) (appendix 2) for adult patients to use to describe their own childhood behavior.

We compared the scores of adult patients with attention deficit hyperactivity disorder, adults with major depression, and "normal" adults on the WURS and determined the correlation between these scores and the subjects' scores on the Parents' Rating Scale, which would serve as our benchmark. This paper represents our initial data collection and evaluation of the validity of the WURS.

METHOD

The 61 items comprising the WURS were signs and symptoms collected from Wender's 1971 monograph *Minimal Brain Dysfunction*

Received Oct. 30, 1991; revision received July 15, 1992; accepted Aug. 14, 1992. From the Department of Psychiatry, University of Utah School of Medicine. Address reprint requests to Dr. Wender, Department of Psychiatry, University of Utah School of Medicine, 50 N. Medical Drive, Salt Lake City, UT 84132.

Supported in part by NIMH grant MH-31130.

Copyright © 1993 American Psychiatric Association.

in Children (5). The subjects were instructed to rate these items, which described their own childhood behavior, as not at all or very slightly (score=0), mildly (score=1), moderately (score=2), quite a bit (score=3), or very much (score=4).

The patients with attention deficit hyperactivity disorder filled out the rating scale before participating in a study of methylphenidate (4), pargyline (6), L-deprenyl (7), L-tyrosine (8), or DL-phenylalanine (9). To be included in these studies, patients had to meet the Utah Criteria for attention deficit hyperactivity disorder in adults. These criteria are 1) a childhood history of attention deficit hyperactivity disorder with *both* attentional deficits and motor hyperactivity, together with at least one of the following characteristics: behavior problems in school, impulsivity, overexcitability, and temper outbursts, and 2) an adult history of persistent attentional problems *and* motor hyperactivity together with two of the following five symptoms: affective lability, hot temper, stress intolerance, disorganization, and impulsivity. Patients were excluded from the studies if they had a diagnosis of current or past episodes of schizophrenia or schizophreniform disorders, bipolar disorder, current unipolar depression, schizotypal or borderline personality disorders, or the following symptoms of borderline personality disorder: prolonged anger, recurrent suicidal threats, marked or persistent identity disturbance, inability to tolerate being alone (fear of abandonment), or physically self-damaging acts.

All subjects completed the WURS, and, when available, their mothers completed the Parents' Rating Scale. We obtained completed WURS forms from 81 patients (45 men and 36 women) and Parents' Rating Scales from 67 parents. The mean age of the patients was 30.7 years (SD=5.7).

The "normal" comparison group was obtained from a neighboring school district where elementary schoolteachers were asked to select two or three well-adjusted children in their classes. The parents of these children were chosen for study because we assumed them to be of average or better than average psychological health. The children took the WURS home to be filled out by their parents. In addition, these parents asked their own mothers to complete the Parents' Rating Scale describing their recollection of the parents' childhood. Of the 250 completed WURS forms and Parents' Rating Scales obtained in this manner, we randomly chose those of 50 men and 50 women for these analyses. The mean age of these 100 subjects was 42.5 years (SD=5.4).

As another comparison group, we gave the WURS to patients with the current diagnosis of unipolar depression. We felt this to be a useful comparison group because these patients often display several symptoms similar to those of adults with attention deficit hyperactivity disorder. These symptoms include decreased concentration and forgetfulness, restlessness (agitation), affective lability, irritability (hot temper), and poor stress tolerance. The depressed comparison group consisted of 70 adult outpatients (23 men and 47 women) with Hamilton Rating Scale for Depression (17-item) scores of 21 or higher who had no axis II diagnosis and no history of attention deficit hyperactivity disorder. The mean age of these patients was 39.8 (SD=9.9)

RESULTS

The mean scores for all 61 items of the WURS were calculated, but we arbitrarily chose to analyze data from the 25 items showing the greatest mean difference between patients with attention deficit hyperactivity disorder and the nonpatient comparison group. The mean differences ranged from a high of 2.57 for concentration to a low of 0.23 for repeat grades. The number of patients in the study group was not sufficient to justify a more sophisticated factor analytic or multiple regression examination of the instrument.

The mean scores for each item and the summed scores are given in table 1. The item scores of the 81 patients

with attention deficit hyperactivity disorder ranged from 15 to 96, those of the 100 normal comparison patients ranged from 0 to 49, and those of the 70 depressed comparison patients ranged from 6 to 75.

Split-half reliability correlations comparing odd/even item groups in the normal subjects indicated satisfactory internal reliability; the Spearman-Brown corrected correlation was $r=0.90$ ($p<0.0001$, $N=100$). Mean differences between the patients with attention deficit hyperactivity disorder and the two comparison groups were statistically significant for all 25 items at $p<0.0001$ (one-tailed), which was well above the 0.001 level we had set to compensate for the use of multiple t tests; t ratios ranged from a low of 8.2 for trouble with mathematics or numbers to a high of 19.3 for concentration problems, easily distracted. Scores on 23 of the 25 items were significantly higher in the patients with attention deficit hyperactivity disorder than in the depressed group at the $p<0.001$ level (one-tailed).

Since attention deficit hyperactivity disorder is a multifaceted syndrome, patients can be expected to have different symptoms. Accordingly, we examined the total scores of the three groups. The difference between the mean total score of the patients with attention deficit hyperactivity disorder and the normal subjects was highly significant ($t=23.8$, $df=179$, $p<0.0005$, one-tailed). The mean score of the depressed patients was significantly lower than that of the patients with attention deficit hyperactivity disorder ($t=11.56$, $df=149$, $p<0.0001$, two-tailed) and significantly higher than that of the normal comparison subjects ($t=6.68$, $df=168$, $p<0.001$, two-tailed).

Cutoff scores are useful in diagnostic categorization. A cutoff score of 36 or higher correctly identified 96% of the adults with attention deficit hyperactivity disorder (i.e., the sensitivity was 96%) and 96% of the normal subjects (i.e., the specificity was also 96%). The more important cutoff score was that between the patients with unipolar depression and those with attention deficit hyperactivity disorder. When the cutoff score was set at 46 or higher, 86% of the patients with attention deficit hyperactivity disorder, 99% of the normal subjects, and 81% of the depressed subjects were correctly classified.

As one measure of validity of the instrument, we calculated Pearson correlation coefficients between WURS scores and the 10-item Parents' Rating Scale scores in subjects with attention deficit hyperactivity disorder and normal subjects (Parents' Rating Scale scores had not been obtained for the depressed subjects). For the normal subjects, $r=0.49$ ($p\leq 0.0005$, $df=98$), and for the adults with attention deficit hyperactivity disorder, $r=0.41$ ($p<0.0005$, $df=65$). Although the correlations obtained were moderate, the fact that they were obtained with two entirely different instruments filled out independently by two different individuals describing childhood behavior 25 or so years earlier makes these correlations more impressive.

As another test of validity, we evaluated the ability of

TABLE 1. Wender Utah Rating Scale Ratings of Adults With Attention Deficit Hyperactivity Disorder, Normal Comparison Subjects, and Depressed Comparison Subjects

WURS Item	Adults With Attention Deficit Hyperactivity Disorder (N=81)		Normal Comparison Subjects (N=100)		Depressed Comparison Subjects (N=70)	
	Mean	SD	Mean	SD	Mean	SD
Individual items						
Concentration problems, easily distracted	3.3	0.9	0.7	0.9	1.3	1.4
Anxious, worrying	2.8	1.1	1.1	1.0	2.1	1.3
Nervous, fidgety	3.1	0.9	0.6	0.9	1.7	1.4
Inattentive, daydreaming	3.2	1.0	0.6	0.8	1.7	1.4
Hot- or short-tempered, low boiling point	2.7	1.3	0.8	1.0	1.0	1.2
Temper outbursts, tantrums	2.4	1.2	0.6	0.9	1.0	1.5
Trouble with stick-to-it-tiveness	3.0	1.1	0.7	0.9	1.3	1.3
Stubborn, strong-willed	3.1	1.1	1.4	1.2	1.7	1.2
Sad or blue, depressed, unhappy	2.2	1.2	0.4	0.7	2.0	1.4
Disobedient, rebellious, sassy	2.4	1.4	0.5	0.7	0.7	1.1
Low opinion of myself	2.6	1.3	0.7	0.8	2.2	1.5
Irritable	2.4	1.1	0.4	0.6	1.2	1.1
Moody, ups and downs	2.8	1.0	0.8	0.8	1.8	1.3
Angry	2.5	1.2	0.6	0.8	1.4	1.3
Trouble seeing things from someone else's point of view	2.3	1.1	0.8	1.2	1.0	0.8
Acting without thinking, impulsive	2.9	1.1	0.8	0.9	1.4	1.2
Tendency to be immature	2.8	1.6	0.7	0.9	1.1	1.1
Guilty feelings, regretful	2.6	1.1	0.6	0.8	1.8	1.4
Losing control of myself	2.2	1.3	0.3	0.6	0.8	1.0
Tendency to be or act irrational	2.0	1.2	0.2	0.5	0.9	1.1
Unpopular with other children	1.8	1.3	0.2	0.5	0.8	1.0
Trouble with authorities, trouble with school, visits to principal's office	1.8	1.6	0.2	0.6	0.4	0.8
Overall a poor student, slow learner	1.4	1.4	0.1	0.3	0.5	0.7
Trouble with mathematics or numbers	2.1	1.5	0.5	1.0	1.1	1.4
Not achieving up to potential	3.2	1.0	1.1	1.2	1.8	1.5
Total scores						
Men	60.3	14.2	17.9	11.0	34.2	18.0
Women	65.8	14.3	15.0	8.5	30.5	15.8
All subjects	62.2	14.6	16.1	10.6	31.7	17.4

the WURS to predict the treatment outcome of the 37 patients who participated in a placebo-controlled study of methylphenidate (4). WURS scores and physicians' global ratings were compared while the patients were receiving methylphenidate. The mean WURS scores of subjects who did or did not respond to the drug were 70.3 (SD=12.5) and 59.7 (SD=15.6), respectively ($t=2.13$, $df=36$, $p<0.025$, one-tailed). This is of interest because it replicates our finding that patients who responded to pemoline had higher Parents' Rating Scale scores than did nonresponders (3).

Despite our attempts to collect data from subjects of comparable age, the normal subjects were older than both groups of patients, and our youngest subjects had the highest WURS scores. To evaluate this potential relationship, correlation coefficients were examined within each group between age and WURS total scores. No significant relationships were detected. Correlation coefficients for the subjects with attention deficit hyperactivity disorder, the normal subjects, and the depressed subjects were $r=-0.09$, $r=-0.06$, and $r=-0.003$, respectively. Thus, there appears to be no substantial relationship between age and WURS scores that might have accounted for the differences observed in group scores.

DISCUSSION

The WURS was devised as a diagnostic aid to evaluate the presence and severity of childhood symptoms of attention deficit hyperactivity disorder in adult patients. The cutoff scores used discriminated very well between adults with attention deficit hyperactivity disorder and normal adults and quite well between adults with attention deficit hyperactivity disorder and depressed adults.

There are two groups of patients who have elevated WURS scores who were not included in this study because they did not meet the Utah Criteria but for whom the WURS may be clinically useful according to preliminary evaluation of the data. The first group is patients with borderline personality disorder. Several of the symptoms of this disorder overlap those of attention deficit hyperactivity disorder, including affective lability, volatile temper, and impulsivity. This overlap is of interest because in a few instances we have found that stimulants and bupropion have produced considerable improvement in symptoms (unpublished data) in such patients. The second group of patients who have elevated WURS scores are those with the diagnosis of atypical major depression. We have found that some

patients with this diagnosis have cluster B personality traits and histories of alcohol and/or substance abuse and that they do not respond to tricyclic antidepressants. (Our experience jibes with that of other investigators [10, 11], who have reported that the presence of personality disorders in patients with major depression is associated with a lower probability of a therapeutic response to treatment with "standard" antidepressant treatment.) We have found that some of these patients who are refractory to "standard" antidepressant treatment experience a clear-cut therapeutic response when drugs useful in the treatment of attention deficit hyperactivity disorder (presumably dopaminergic in action) (3, 4, 6-9, 12) are added (methylphenidate and *d*-amphetamine) or substituted (monoamine oxidase inhibitors or bupropion).

The clinician may find it useful to examine patients' responses qualitatively to the entire WURS pool of items because this scale asks the patient about specific learning problems, coordination difficulties, and academic underachievement—areas important in understanding the childhood antecedents of adult psychopathology but rarely assessed by adult psychiatrists.

The present study reports our initial attempt to develop, describe, and validate a new diagnostic instrument. Although we found substantial differences among three groups using only 25 of the 61 items, the full questionnaire is provided in appendix 2 for use by other researchers who might be interested in the specific items. We hope that other investigators will use the WURS to investigate the heretofore seldom explored relationship between attention deficit hyperactivity disorder and other forms of psychopathology in adult life.

REFERENCES

1. Conners CK: Rating scales for use in drug studies with children. *Psychopharmacol Bull* 1973; 9(Special Issue: Pharmacotherapy With Children):24-85
2. Sprague RL, Cohen M, Werry JS: Normative data on the Conners Teachers Rating Scale and Abbreviated Scale. Technical Report, Children's Research Center. Urbana-Champaign, University of Illinois, 1974
3. Wender PH, Reimherr FW, Wood DR: Attention deficit disorder ("minimal brain dysfunction") in adults. *Arch Gen Psychiatry* 1981; 38:449-456
4. Wender PH, Reimherr FW, Wood D, Ward M: A controlled study of methylphenidate in the treatment of attention deficit disorder, residual type, in adults. *Am J Psychiatry* 1985; 142:547-552
5. Wender PH: *Minimal Brain Dysfunction in Children*. New York, John Wiley & Sons, 1971
6. Wender PH, Wood DR, Reimherr FW, Ward M: An open trial of pargyline in the treatment of attention deficit disorder, residual type. *Psychiatry Res* 1983; 9:329-336
7. Wood DR, Reimherr FW, Wender PH: The use of L-deprenyl in the treatment of attention deficit disorder, residual type. *Psychopharmacol Bull* 1983; 19:627-629
8. Reimherr FW, Wender PH, Wood DR, Ward M: An open trial of L-tyrosine in the treatment of attention deficit disorder, residual type. *Am J Psychiatry* 1987; 144:1071-1073
9. Wood DR, Reimherr FW, Wender PH: The treatment of attention deficit disorder in adults with DL-phenylalanine. *Psychiatry Res* 1985; 16:21-26
10. Pfohl B, Stangl D, Zimmerman M: The implications of DSM-III personality disorders for patients with major depression. *J Affective Disord* 1984; 7:309-318
11. Frank E, Kupfer DJ, Jacob M, Jarrett D: Personality features and response to acute treatment in recurrent depression. *J Personality Disorders* 1987; 1:14-26
12. Reimherr FW, Wender PH, Ebert MH, Wood DR: Cerebrospinal fluid homovanillic acid and 5-hydroxyindole acetic acid in adults with attention deficit disorder, residual type (ADD, RT). *Psychiatry Res* 1984; 11:71-78

APPENDIX 1. Parents' Rating Scale

Patient's name _____ # _____ Date _____ Physician _____

To be filled out by the mother of the subject (or father only if mother is unavailable).

Instructions: Listed below are items concerning children's behavior and the problems they sometimes have. Read each item carefully and decide how much you think you were bothered by these problems when your child was between six and ten years old. Rate the amount of the problem by putting a check in the column that describes your child at that time.

	Not at all	Just a little	Pretty much	Very much
1. Restless (overactive)				
2. Excitable, impulsive				
3. Disturbs other children				
4. Fails to finish things started (short attention span)				
5. Fidgets				
6. Inattentive, distractible				
7. Demands must be met immediately; gets frustrated				
8. Cries				
9. Mood changes quickly				
10. Temper outbursts (explosive and unpredictable behavior)				

APPENDIX 2. Wender Utah Rating Scale (WURS)

PATIENT'S INITIALS _____ PATIENT'S NUMBER _____ DATE _____ M.D.'S INITIALS _____

	Not at all or very slightly	Mildly	Moderately	Quite a bit	Very much
As a child I was (or had):					
1. Active, restless, always on the go					
2. Afraid of things					
3. Concentration problems, easily distracted					
4. Anxious, worrying					
5. Nervous, fidgety					
6. Inattentive, daydreaming					
7. Hot- or short-tempered, low boiling point					
8. Shy, sensitive					
9. Temper outbursts, tantrums					
10. Trouble with stick-to-it-tiveness, not following through, failing to finish things started					
11. Stubborn, strong-willed					
12. Sad or blue, depressed, unhappy					
13. Incautious, dare-devilish, involved in pranks					
14. Not getting a kick out of things, dissatisfied with life					
15. Disobedient with parents, rebellious, sassy					
16. Low opinion of myself					
17. Irritable					
18. Outgoing, friendly, enjoyed company of people					
19. Sloppy, disorganized					
20. Moody, ups and downs					
21. Angry					
22. Friends, popular					
23. Well-organized, tidy, neat					
24. Acting without thinking, impulsive					
25. Tendency to to be immature					
26. Guilty feelings, regretful					
27. Losing control of myself					
28. Tendency to be or act irrational					
29. Unpopular with other children, didn't keep friends for long, didn't get along with other children					
30. Poorly coordinated, did not participate in sports					
31. Afraid of losing control of self					
32. Well-coordinated, picked first in games					
33. Tomboyish (for women only)					
34. Running away from home					
35. Getting into fights					
36. Teasing other children					
37. Leader, bossy					
38. Difficulty getting awake					
39. Follower, led around too much					
40. Trouble seeing things from someone else's point of view					
41. Trouble with authorities, trouble with school, visits to principal's office					
42. Trouble with police, booked, convicted					
Medical problems as a child:					
43. Headaches					
44. Stomachaches					
45. Constipation					

APPENDIX 2, continued

	Not at all or very slightly	Mildly	Moderately	Quite a bit	Very much
Medical problems as a child (continued):					
46. Diarrhea					
47. Food allergies					
48. Other allergies					
49. Bedwetting					
As a child in school, I was (or had):					
50. Overall a good student, fast					
51. Overall a poor student, slow learner					
52. Slow in <i>learning</i> to read					
53. Slow reader					
54. Trouble reversing letters					
55. Problems with spelling					
56. Trouble with mathematics or numbers					
57. Bad handwriting					
58. Able to read pretty well but never really enjoyed reading					
59. Not achieving up to potential					
60. Repeating grades (which grades? _____)					
61. Suspended or expelled (which grades? _____)					