

The Medical Outcomes Study (MOS) Measures of Patient Adherence

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Given the current state of the art of the measurement of adherence, we elected to rely on a carefully designed self-report assessment instrument in the MOS. Collateral reports were rejected because of the difficulty of identifying a knowledgeable informant, especially among older patients. Objective measures were not relied on because none were available that were comprehensive enough to capture the wide range of behaviors we were interested in studying. However, many of the patients in the study were given independent health examinations (at baseline and exit) and adherence-related data was gathered at that time (e.g., blood pressure, foot check, lung exam, cholesterol level, glucose, weight and height).

Both a general and a specific measure were developed for assessing the adherence of patients with heart disease (congestive heart failure or recent myocardial infarction), diabetes, and hypertension. The generic or general measure of adherence summarizes a patient's tendency to adhere to medical recommendations using the five items presented in Table 1 below. The five general adherence items were well distributed, although there was a tendency for patients to report complying with treatment (see Table 2). The internal consistency reliability of the scale was acceptable ($\alpha = 0.81$). To score general adherence, we averaged together the responses to the five general adherence items after reversing the scoring of items 1 and 3.

Tables 3 and 4 supply information about adherence to particular treatment recommendations. Specific adherence measures necessarily vary with the kind of medical condition examined. Our specific adherence measure was developed to be appropriate to patients with the MOS tracer conditions and comprises two parallel lists, one of specific

treatment recommendations made by the provider (e.g., to exercise, follow a low-salt diet) and the other of how often the patient actually carries out these activities. To minimize response bias during the initial assessment of adherence, the interview and how often they did the activities was asked on a baseline patient assessment questionnaire 3 to 4 months later.

An overall specific adherence measure tailored to each patient was constructed by averaging responses about the extent to which each of the behaviors were performed. Only behaviors that were recommended for a patient were averaged together. Results were transformed linearly to a 0-100 distribution. We also created three measures of adherence specific to each of the three medical tracers: diabetics, hypertensives, and heart disease patients. For these measures, we identified a subset of behaviors recommended for most patients with a given disease condition: eight for diabetics (follow a low fat or weight loss diet, follow a diabetic diet, take prescribed medications, check your blood for sugar, exercise regularly, check your feet for minor bruises, carry something with sugar in it, and carry medical supplies for self-care), and four for hypertensives and heart disease patients (follow a low salt diet, follow a low fat or weight loss diet, take prescribed medications, and exercise regularly). Patient adherence rates for these subsets of specific behaviors were averaged for those with the condition, and scores were transformed linearly to a 0 to 100 scale. Internal consistency reliability estimates for these three disease-specific measures generally exceeded minimum standards for group comparisons.

The correlations between specific adherence and general adherence tended to be very small, ranging from -0.12 to 0.29. Thus, specific adherence measures appear to capture information not contained in the general measure. To determine if the low correlations between general and specific adherence measures could be due to differential susceptibility to response bias (we hypothesized that general adherence would be more subject to bias than specific

adherence), we correlated the MOS socially desirable response set (SDRS) scale with the adherence measures. The associations of SDRS with self-reported adherence were low, ranging from -0.14 to 0.22 for specific adherence. General adherence and SDRS intercorrelated $r = 0.15$. Thus, the small associations between the general and specific adherence measures do not appear to be attributable to differences in susceptibility to SDRS.

The stability of adherence in the MOS was estimated based on correlations of the general and specific measures over a two-year time interval. These correlations, presented in Table 5, indicate that adherence is fairly stable among chronic disease patients.

MOS Patient Adherence Publications

DiMatteo, M. R., Hays, R. D., & Sherbourne, C. D. (1992). Adherence to cancer regimens: Implications for treating the older patient. Oncology, 6, 50-57s.

DiMatteo, M. R., Sherbourne, C. D., Hays, R. D., Ordway, L., Kravitz, R. L., McGlynn, E. A., Kaplan, S., & Rogers, W. H. (1993). Physicians' characteristics influence patients' adherence to medical treatment: Results from the Medical Outcomes Study. Health Psychology, 12, 93-103.

Hays, R. D., Kravitz, R. L., Mazel, R. M., Sherbourne, C. D., DiMatteo, M. R., Rogers, W. H., & Greenfield, S. (1994). The impact of patient adherence on health outcomes for patients with chronic disease in the Medical Outcomes Study. Journal of Behavioral Medicine, 17, 347-360.

Kravitz, R., Hays, R. D., Sherbourne, C. D., DiMatteo, M. R., Rogers, W. H., Ordway, L., & Greenfield, S. (1993). Recall of recommendations and adherence to advice among patients

with chronic medical conditions: Results from the Medical Outcomes Study. Archives of Internal Medicine, 153, 1869-1878.

Sherbourne, C. D., Hays, R. D., Ordway, L., DiMatteo, M. R., & Kravitz, R. (1992).
Antecedents of adherence to medical recommendations: Results from the Medical Outcomes
Study. Journal of Behavioral Medicine, 15, 447-468.

Table 1: Medical Outcomes Study General Adherence Items

How often was each of the following statements true for you during the past 4 weeks?

(Circle One Number on Each Line)

	None of the time	A little of the time	Some of the time	A good bit of the time	Most of the time	All of the time
1. I had a hard time doing what the doctor suggested I do . . .	1	2	3	4	5	6
2. I followed my doctor's suggestions exactly . . .	1	2	3	4	5	6
3. I was unable to do what was necessary to follow my doctor's treatment plans . . .	1	2	3	4	5	6
4. I found it easy to do the things my doctor suggested I do . . .	1	2	3	4	5	6

5. Generally speaking, how often during the past 4 weeks were you able to do what the doctor told you?

(Circle One)

- None of the time..... 1
 A little of the time..... 2
 Some of the time 3
 A good bit of the time..... 4
 Most of the time..... 5
 All of the time..... 6
-

Table 2: Distribution of Responses to General Adherence Items

	None of the time	A little of the time	Some of the time	A good bit of the time	Most of the time	All of the time
1. I had a hard time doing what the doctor suggested I do . . .	58%	16%	13%	5%	5%	2%
2. I found it easy to do the things my doctor suggested I do	13%	8%	13%	6%	30%	30%
3. I was unable to do what was necessary to follow my doctor's treatment plans	60%	17%	12%	3%	5%	3%
4. I followed by doctor's suggestions exactly.	15%	6%	12%	8%	30%	29%
5. General speaking, how often during the <u>past 4 weeks</u> were you able to do what the doctor told you?	3%	5%	11%	9%	35%	36%

Note. Time frame is last 4 weeks. Analyses are based on patients of medical providers in the Medical Outcomes Study longitudinal panel (N=2181).

Table 3: Medical Outcomes Study Specific Adherence Recommendations

Next I have a list of things your doctor, a nurse, or other health care professional may have recommended that you do as part of your treatment. As I read each one, please tell me if your doctor, a nurse or other health care professional has recommended that you do this now.

	<u>Yes</u>	<u>No</u>
1. Follow a low salt diet?	1	2
2. Follow a low fat or weight loss diet?	1	2
3. Follow a diabetic diet?	1	2
4. Take a prescribed medication?	1	2
5. Check you blood for sugar?	1	2
6. Take part in a cardiac rehabilitation program?	1	2
7. Exercise regularly?	1	2
8. Socialize <u>more</u> than usual with others?	1	2
9. Cut down on the alcohol you drink?	1	2
10. Stop or cut down on smoking?	1	2
11. Check your feet for minor bruises, injuries, and ingrown toenails?	1	2
12. Cut down on stress in your life?	1	2
13. Use relaxation techniques like biofeedback or self-hypnosis?	1	2
14. Carry something with sugar in it as a source of glucose for emergencies?	1	2
15. Carry medical supplies needed for your self-care?	1	2

Note. At baseline of the MOS, these questions are asked during a telephone interview that preceded questions about their adherence to recommendations by approximately three months. At the two-year follow-up point, they answered similar items at the latter part of a self-administered questionnaire. Performance of specific adherence behaviors was tapped earlier on the same questionnaire.

Table 4: Medical Outcomes Study Specific Adherence Behaviors

How often have you done each of the following in the past 4 weeks?

	None of the time	A little of the time	Some of the time	A good bit of the time	Most of the time	All of the time
1. Cut down on stress in your life	1	2	3	4	5	6
2. Used relaxation techniques (biofeedback, self-hypnosis, yoga, etc.)	1	2	3	4	5	6
3. Exercised regularly	1	2	3	4	5	6
4. Tried to socialize more with others	1	2	3	4	5	6
5. Took prescribed medication .	1	2	3	4	5	6
6. Took part in a cardiac rehabilitation program	1	2	3	4	5	6
7. Cut down on the alcohol you drank	1	2	3	4	5	6
8. Stopped or cut down on smoking	1	2	3	4	5	6
9. Checked your blood for sugar	1	2	3	4	5	6
10. Checked your feet for minor bruises, injuries, and ingrown toenails	1	2	3	4	5	6
11. Carried something with sugar in it (a source of glucose) for emergencies when outside your home	1	2	3	4	5	6
12. Carried medical supplies needed for your self-care when outside your home	1	2	3	4	5	6
13. Followed a low salt	1	2	3	4	5	6
14. Followed a low fat or weight- loss diet	1	2	3	4	5	6
15. Followed a diabetic diet	1	2	3	4	5	6

Note. At baseline of the MOS, the questions were included in the self-administered patient assessment questionnaire. At the two-year follow-up these questions were also included in the self-administered patient assessment questionnaire.

Table 5: Stability of Self-Reported Adherence Over Two Years

Type of adherence	Test-retest Correlation
General	0.40
Specific	0.32
Diabetes-specific	0.66
Heart disease-specific	0.55
Hypertension-specific	0.56

Note. Correlations are between measures of adherence at baseline and two years later. Analyses are based on patients of medical providers in the Medical Outcomes Study longitudinal panel (N=2181).