

Appendix 1: Scoring Mechanism

The Michigan Hand Outcomes Questionnaire (MHQ) contains 6 scales: (1) overall hand function, (2) activities of daily living, (3) work performance, (4) pain, (5) aesthetics, and (6) satisfaction with hand function. In the pain scale, high scores indicate greater pain; in the other 5 scales, high scores denote better hand performance.

The raw scale score for each of the 6 scales is the sum of the responses of each scale item. The raw score is converted to a score range from 0 to 100. The scoring equation for each of the scales is listed below.

The score for the affected hand is obtained by

selecting either the right- or the left-hand score. If both hands are affected (eg, rheumatoid patients), the right- and left-hand scale scores are averaged to get the score.

Missing values in each scale may affect the validity of the scores. If 50% or more of the items in a scale are missing, then that particular scale cannot be scored. For scales with less than 50% missing, the average of the existing scale items may be imputed for the missing items. An overall MHQ score can be obtained by summing the scores for all 6 scales and divide by 6. If scores for more than 2 scales are missing, an overall MHQ score cannot be computed.⁸

MHQ Scoring Algorithm*

<i>Scale</i>	<i>Recode†</i>	<i>Raw Score Range‡</i>	<i>Normalization§</i>
Overall hand function	None	5 to 25	$-(\text{raw score} - 25)/20 * 100$
Activities of daily living	None	5 to 25 1-handed 7 to 35 2-handed	$= -(\text{raw score} - 25)/20 * 100$ $= -(\text{raw score} - 35)/28 * 100$
Work	None	Overall ADL	$= (1\text{-handed} + 2\text{-handed})/2$
Pain	Question 2: (1 = 5) (2 = 4) (4 = 2) (5 = 1)	5 to 25	$(\text{raw score} - 5)/20 * 100$ If question 1 = 5, then pain score = 0; if question 1 \neq 5, then $-(\text{raw score} - 25)/20 * 100$
Aesthetics	Question 1: (1 = 5) (2 = 4) (4 = 2) (5 = 1)	4 to 16	$(\text{raw score} - 4)/16 * 100$
Satisfaction	None	6 to 30	$-(\text{raw score} - 30)/24 * 100$

* The scoring algorithm is available from the authors in SAS program.

† The response categories for some of the questions are reversed and are recoded.

‡ Sum of the responses for each scale.

§ For the pain scale, higher scores indicate more pain. For the other 5 scales, higher scores indicate better hand performance. The scores are normalized to a range of 0 to 100.

Appendix 2: Michigan Hand Outcomes Questionnaire

Instructions: This survey asks for your views about your hands and your health. This information will help keep track of how you feel and how well you are able to do your usual activities. Answer *every* question by marking the answer as indicated. If you are unsure about how to answer a question, please give the best answer you can.

I. The following questions refer to the function of your hand(s)/wrist(s) *during the past week*. (Please circle 1 answer for each question.)

A. The following questions refer to your *right* hand/wrist.

	<i>Very Good</i>	<i>Good</i>	<i>Fair</i>	<i>Poor</i>	<i>Very Poor</i>
1. Overall, how well did your <i>right</i> hand work?	1	2	3	4	5
2. How well did your <i>right</i> fingers move?	1	2	3	4	5
3. How well did your <i>right</i> wrist move?	1	2	3	4	5
4. How was the strength in your <i>right</i> hand?	1	2	3	4	5
5. How was the sensation (feeling) in your <i>right</i> hand?	1	2	3	4	5

B. The following questions refer to your *left* hand/wrist.

	<i>Very Good</i>	<i>Good</i>	<i>Fair</i>	<i>Poor</i>	<i>Very Poor</i>
1. Overall, how well did your <i>left</i> hand work?	1	2	3	4	5
2. How well did your <i>left</i> fingers move?	1	2	3	4	5
3. How well did your <i>left</i> wrist move?	1	2	3	4	5
4. How was the strength in your <i>left</i> hand?	1	2	3	4	5
5. How was the sensation (feeling) in your <i>left</i> hand?	1	2	3	4	5

II. The following questions refer to the ability of your hand(s) to do certain tasks *during the past week*. (Please circle 1 answer for each question.)

A. How difficult was it for you to perform the following activities using your *right* hand?

	<i>Not at All Difficult</i>	<i>A Little Difficult</i>	<i>Somewhat Difficult</i>	<i>Moderately Difficult</i>	<i>Very Difficult</i>
1. Turn a door knob	1	2	3	4	5
2. Pick up a coin	1	2	3	4	5
3. Hold a glass of water	1	2	3	4	5
4. Turn a key in a lock	1	2	3	4	5
5. Hold a frying pan	1	2	3	4	5

B. How difficult was it for you to perform the following activities using your *left* hand?

	<i>Not at All Difficult</i>	<i>A Little Difficult</i>	<i>Somewhat Difficult</i>	<i>Moderately Difficult</i>	<i>Very Difficult</i>
1. Turn a door knob	1	2	3	4	5
2. Pick up a coin	1	2	3	4	5
3. Hold a glass of water	1	2	3	4	5
4. Turn a key in a lock	1	2	3	4	5
5. Hold a frying pan	1	2	3	4	5

C. How difficult was it for you to perform the following activities using *both of your hands*?

	<i>Not at All Difficult</i>	<i>A Little Difficult</i>	<i>Somewhat Difficult</i>	<i>Moderately Difficult</i>	<i>Very Difficult</i>
1. Open a jar	1	2	3	4	5
2. Button a shirt/blouse	1	2	3	4	5
3. Eat with a knife/fork	1	2	3	4	5
4. Carry a grocery bag	1	2	3	4	5
5. Wash dishes	1	2	3	4	5
6. Wash your hair	1	2	3	4	5
7. Tie shoelaces/knots	1	2	3	4	5

III. The following questions refer to how you did in your **normal work** (including both housework and school work) during the **past 4 weeks**. (Please circle 1 answer for each question.)

	<i>Always</i>	<i>Often</i>	<i>Sometimes</i>	<i>Rarely</i>	<i>Never</i>
1. How often were you unable to do your work because of problems with your hand(s)/wrist(s)?	1	2	3	4	5
2. How often did you have to shorten your work day because of problems with your hand(s)/wrist(s)?	1	2	3	4	5
3. How often did you have to take it easy at your work because of problems with your hand(s)/wrist(s)?	1	2	3	4	5
4. How often did you accomplish less in your work because of problems with your hand(s)/wrist(s)?	1	2	3	4	5
5. How often did you take longer to do the tasks in your work because of problems with your hand(s)/wrist(s)?	1	2	3	4	5

IV. The following questions refer to how much **pain** you had in your hand(s)/wrist(s) **during the past week**. (Please circle 1 answer for each question.)

1. How often did you have pain in your hand(s)/wrist(s)?
 1. Always
 2. Often
 3. Sometimes
 4. Rarely
 5. Never

If you answered **never** to **question IV-1** above, please skip the following questions and go to the next page.

2. Please describe the pain you have in your hand(s)/wrist(s).
 1. Very mild
 2. Mild
 3. Moderate
 4. Severe
 5. Very severe

	<i>Always</i>	<i>Often</i>	<i>Sometimes</i>	<i>Rarely</i>	<i>Never</i>
3. How often did the pain in your hand(s)/wrist(s) interfere with your sleep?	1	2	3	4	5
4. How often did the pain in your hand(s)/wrist(s) interfere with your daily activities (such as eating or bathing)?	1	2	3	4	5
5. How often did the pain in your hand(s)/wrist(s) make you unhappy?	1	2	3	4	5

V. A. The following questions refer to the appearance (look) of your **right** hand during the past week.
(Please circle 1 answer for each question.)

	<i>Strongly Agree</i>	<i>Agree</i>	<i>Neither Agree Nor Disagree</i>	<i>Disagree</i>	<i>Strongly Disagree</i>
1. I was satisfied with the appearance (look) of my right hand.	1	2	3	4	5
2. The appearance (look) of my right hand sometimes made me uncomfortable in public.	1	2	3	4	5
3. The appearance (look) of my right hand made me depressed.	1	2	3	4	5
4. The appearance (look) of my right hand interfered with my normal social activities	1	2	3	4	5

B. The following questions refer to the appearance (look) of your **left** hand during the past week. (Please circle 1 answer for each question.)

	<i>Strongly Agree</i>	<i>Agree</i>	<i>Neither Agree Nor Disagree</i>	<i>Disagree</i>	<i>Strongly Disagree</i>
1. I was satisfied with the appearance (look) of my left hand.	1	2	3	4	5
2. The appearance (look) of my left hand sometimes made me uncomfortable in public.	1	2	3	4	5
3. The appearance (look) of my left hand made me depressed.	1	2	3	4	5
4. The appearance (look) of my left hand interfered with my normal social activities	1	2	3	4	5

VI. A. The following questions refer to your satisfaction with your **right** hand/wrist during the past week.
(Please circle 1 answer for each question.)

	<i>Very Satisfied</i>	<i>Somewhat Satisfied</i>	<i>Neither Satisfied Nor Dissatisfied</i>	<i>Somewhat Dissatisfied</i>	<i>Very Dissatisfied</i>
1. Overall function of your right hand	1	2	3	4	5
2. Motion of the fingers in your right hand	1	2	3	4	5
3. Motion of your right wrist	1	2	3	4	5
4. Strength of your right hand	1	2	3	4	5
5. Pain level of your right hand	1	2	3	4	5
6. Sensation (feeling) of your right hand	1	2	3	4	5

B. The following questions refer to your satisfaction with your **left** hand/wrist during the past week. (Please circle 1 answer for each question.)

	<i>Very Satisfied</i>	<i>Somewhat Satisfied</i>	<i>Neither Satisfied Nor Dissatisfied</i>	<i>Somewhat Dissatisfied</i>	<i>Very Dissatisfied</i>
1. Overall function of your left hand	1	2	3	4	5
2. Motion of the fingers in your left hand	1	2	3	4	5
3. Motion of your left wrist	1	2	3	4	5
4. Strength of your left hand	1	2	3	4	5
5. Pain level of your left hand	1	2	3	4	5
6. Sensation (feeling) of your left hand	1	2	3	4	5