

DYSPNEA

SCORING MANUAL

A brief guide to scoring the PROMIS® Dyspnea instruments:

ADULT
PROMIS Item Bank v1.0 – Dyspnea Functional Limitations
PROMIS Item Bank v1.0 – Dyspnea Severity
PROMIS Pool v1.0 – Dyspnea Activity Motivation
PROMIS Pool v1.0 – Dyspnea Activity Requirements
PROMIS Pool v1.0 – Dyspnea Airborne Exposure
PROMIS Pool v1.0 – Dyspnea Assistant Devices Resources
PROMIS Pool v1.0 – Dyspnea Characteristics
PROMIS Pool v1.0 – Dyspnea Emotional Response
PROMIS Pool v1.0 – Dyspnea Task Avoidance
PROMIS Pool v1.0 – Dyspnea Time Extension
PROMIS Short Form v1.0 – Dyspnea Functional Limitations 10a
PROMIS Short Form v1.0 – Dyspnea Severity 10a

SCORING THE INSTRUMENT

Short Forms: PROMIS Dyspnea Functional Limitations and Severity instruments are scored using item-level calibrations. This means that the most accurate way to score the Dyspnea Functional Limitations and Severity short forms is to use the [HealthMeasures Scoring Service](https://www.assessmentcenter.net/ac_scoringervice) (https://www.assessmentcenter.net/ac_scoringervice) or a data collection tool that automatically calculates scores (e.g., REDCap auto-score). This method of scoring uses responses to each item for each participant. We refer to this as “response pattern scoring.” Because response pattern scoring is more accurate than the use of raw score/scale score look up tables included in this manual, it is preferred. Response pattern scoring is especially useful when there is missing data (i.e., a respondent skipped an item), different groups of participants responded to different items, or you have created a new questionnaire using a subset of questions from a PROMIS item bank.

For the two short forms, response options range from 0 to 3. Respondents who indicate that they did not perform an activity in the past 7 days will not produce a score for that item, which is equivalent to missing data for purposes of scoring the dyspnea short forms. **To use the scoring tables, respondents must indicate that they have done the activity described in all 10 items (i.e., answered all 10 items with a response other than “I did not do this in the past 7 days”). If a respondent indicates that they did not do one or more activities (either they responded with “I did not do this in the past 7 days or they did not answer an item), you must use the HealthMeasures Scoring Service (https://www.assessmentcenter.net/ac_scoringervice) or other data collection tool that automatically calculates scores in order to obtain a valid score.** If the respondent has answered all items, the total raw score for a short form can be obtained by summing the values of the response to each question. For example, for the adult 10-item short form, the lowest possible raw score is 0; the highest possible raw score is 30 (see both short form scoring tables in Appendix 1).

Locate the applicable score conversion table in Appendix 1 and use this table to translate the total raw score into a T-score for each participant. The T-score rescales the raw score into a standardized score with a mean of 50 and a standard deviation (SD) of 10. Therefore a person with a T-score of 40 is one SD below the mean.

For the adult PROMIS Dyspnea Severity 10a short form, a raw score of 10 converts to a T-score of 48.8 with a standard error (SE) of 2.0 (see scoring table for the 10a short form in Appendix 1). Thus, the 95% confidence interval around the observed score ranges from 44.88 to 52.72 (T-score $\pm$ (1.96*SE) or $48.8 \pm (1.96*2.0)$).

CAT: A minimum number of items (4 for adults) must be answered in order to receive a score for the Dyspnea Function Limitations and Severity CATs. The response to the first item will guide the system's choice of the next item for the participant. The participant's response to the second item will dictate the selection of the following question, and so on. As additional items are administered, the potential for error is reduced and confidence in the respondent's score increases. The CAT will continue until either the standard error drops below a specified level (3.0 on the T-score metric CATs), or the participant has answered the maximum number of questions (12), whichever occurs first.

Pools: For all Dyspnea item pools, sum the raw response scores for all items.

SCORES

For most PROMIS instruments, a score of 50 is the average for the United States general population with a standard deviation of 10 because calibration testing was performed on a large sample of the general population. However, the dyspnea instruments were calibrated on a sample of adults with COPD, so a score of 50 is the average of this group of people with COPD. You can read more about the calibration and centering samples at HealthMeasures.net in the [Interpret PROMIS](#) section. The T-score is provided with an error term (Standard Error or SE). The Standard Error is a statistical measure of variance and represents the "margin of error" for the T-score.

Important: *A higher PROMIS T-score represents more of the concept being measured.* For negatively-worded concepts like Dyspnea Severity and Functional Limitations, a T-score of 60 is one SD worse than average. By comparison, a Dyspnea Severity and Functional Limitations T-score of 40 is one SD better than average.

Standard Error (SE): A PROMIS score includes a T-score and a standard error (SE). The standard error is a measure of the variability for a given T-score across hypothetical repeated measurements. The standard error can be used to construct confidence intervals around a T-score. A 95% confidence interval is common. A 95% confidence interval means there is a 95% probability that the true T-score is within this range. The formula for a 95% confidence interval is (T-score $\pm$ (1.96*SE)). For example, if T=52 and SE=2, the lower boundary of the confidence interval is $(52 - (1.96*2)) = 48$ and the upper boundary is $(52 + (1.96*2)) = 56$.

FREQUENTLY ASKED QUESTIONS (FAQs)

Q: I am interested in learning more. Where can I do that?

Review the HealthMeasures website at www.healthmeasures.net.

Q: How do I handle multiple responses when administering a short form on paper?

Guidelines on how to deal with multiple responses have been established. Resolution depends on the responses noted by the research participant.

- If two or more responses are marked by the respondent, and they are next to one another, then a data entry specialist will be responsible for randomly selecting one of them to be entered and will write down on the form which answer was selected. Note: To randomly select one of two responses, the data entry specialist will flip a coin (heads - higher number will be entered; tails – lower number will be entered).To



randomly select one of three (or more) responses, a table of random numbers should be used with a statistician's assistance.

- If two or more responses are marked, and they are NOT all next to one another, the response will be considered missing.

Q: What is the minimum change on a PROMIS instrument that represents a clinically meaningful difference? To learn more about research on the meaning of a change in scores, we suggest conducting a literature review to identify the most current information. The HealthMeasures website (<http://www.healthmeasures.net/score-and-interpret/interpret-scores/promis>) has additional information on interpreting scores.

APPENDIX 1 - SCORING TABLES

Dyspnea Functional Limitations 10a - Adult v1.0		
<i>Short Form Conversion Table</i>		
Raw Score	T-score	SE*
0	29.7	4.7
1	34.9	3.4
2	38.0	3.0
3	40.3	2.7
4	42.1	2.5
5	43.8	2.4
6	45.2	2.3
7	46.5	2.2
8	47.8	2.2
9	49.0	2.2
10	50.1	2.1
11	51.2	2.1
12	52.3	2.1
13	53.4	2.1
14	54.4	2.0
15	55.4	2.0
16	56.4	2.0
17	57.4	2.0
18	58.4	2.0
19	59.4	2.0
20	60.4	2.1
21	61.4	2.1
22	62.4	2.1
23	63.5	2.2
24	64.7	2.2
25	66.0	2.3
26	67.3	2.4
27	68.9	2.6
28	70.7	2.8
29	73.0	3.2
30	76.7	4.1

SE* = Standard Error on T-Score metric

Dyspnea Severity 10a - Adult v1.0		
<i>Short Form Conversion Table</i>		
Raw Score	T-Score	SE*
0	27.7	4.7
1	32.8	3.7
2	36.1	3.2
3	38.6	2.8
4	40.6	2.6
5	42.3	2.4
6	43.8	2.2
7	45.2	2.2
8	46.4	2.1
9	47.6	2.1
10	48.8	2.0
11	50.0	2.0
12	51.1	2.0
13	52.1	1.9
14	53.2	1.9
15	54.2	1.9
16	55.2	1.9
17	56.2	1.9
18	57.2	1.9
19	58.1	1.9
20	59.2	1.9
21	60.2	2.0
22	61.2	2.0
23	62.3	2.0
24	63.5	2.1
25	64.8	2.1
26	66.1	2.3
27	67.7	2.4
28	69.5	2.6
29	71.9	3.0
30	75.9	4.0

SE* = Standard Error on T-Score metric