

# Cochlear Implant Quality of Life-Expectations Instrument Scoring Manual

The Cochlear Implant Quality of Life-Expectations (CIQOL-Expectations) is a patient-reported outcome measure that was developed to assess potential cochlear implant candidates' anticipated functional abilities in 6 domains:

- Communication: receptive and expressive communication ability in different situations
- Emotional: impact of hearing ability on emotional well-being
- Entertainment: enjoyment and clarity of TV, radio, and music
- Environmental: ability to distinguish and localize environmental sound
- Listening effort: degree of effort and resulting fatigue associated with listening
- Social: ability to interact in groups and to attend and enjoy social functions

The Global domain provides a general overall assessment of outcome expectations and can be derived from a subset of item-level responses. The CIQOL-Expectations instrument is based on the conceptual framework of the other CIQOL instruments<sup>1-7</sup>.

Participants should be instructed to answer all the items in the instrument so a comprehensive measurement can be obtained. The CIQOL-Expectation instrument was developed and validated for potential adult (ages 18+) cochlear implant users.

## Scoring the CIQOL-Expectations

All items in the instrument utilize the same five answer choices. Individual items can be forward scored where 1=Never, 2=Rarely, 3= Sometimes, 4=Often, 5=Always or reversed scored where 5=Never, 4=Rarely, 3=Sometimes, 2=Often, 1=Always. The table below describes how each item is assigned to a domain and whether the item should be forward or reversed scored.

Domain (item numbers)	Forward Items	Reversed Items
Communication (1-10)	1,2,3,4,5,7,8,9,10	6
Emotional (11-15)	11	12,13,14,15
Entertainment (16-20)	17,18,19,20	16
Environment (21-25)	21,22,23,24,25	
Listening Effort (26-30)	26,27,28	29,30
Social (31-35)	31,32	33,34,35
<b>Global</b>	1,5,9,11,17,25,26	14,30,33

To calculate the scores for each domain and the Global measure, sum the individual item scores to obtain the raw score. Then use the table below to convert the raw score to the interval-scale score ("outcome measure") as derived from item-response theory.<sup>6,7</sup> Each outcome measure score has a standard error (SE) term, which is a statistical measure of variance. The 95% confidence interval around the outcome measure can be calculated from the SE:  $95\%CI = \pm(1.96 * SE)$ . For example, a communication

raw score of 34 is converted to an outcome measure score of 52.84 with a standard error of 3.18 and 95% CI of  $\pm 6.23$ .

### Score conversion tables:

#### Communication:

Raw Score	Outcome Measure	SE	Raw Score	Outcome Measure	SE	Raw Score	Outcome Measure	SE
10	0.0	12.08	24	38.21	3.04	38	59.48	3.37
11	8.61	7.01	25	39.64	3.03	39	61.28	3.43
12	14.22	5.28	26	41.07	3.02	40	63.15	3.51
13	17.91	4.53	27	42.49	3.03	41	65.10	3.58
14	20.78	4.09	28	43.92	3.03	42	67.15	3.68
15	23.19	3.80	29	45.35	3.05	43	69.32	3.78
16	25.31	3.59	30	46.81	3.06	44	71.63	3.93
17	27.23	3.44	31	48.28	3.08	45	74.14	4.12
18	29.01	3.33	32	49.77	3.11	46	76.95	4.40
19	30.69	3.24	33	51.29	3.14	47	80.26	4.85
20	32.28	3.17	34	52.84	3.18	48	84.47	5.63
21	33.82	3.12	35	54.43	3.22	49	90.78	7.37
22	35.31	3.08	36	56.06	3.26	50	100.00	12.32
23	36.77	3.05	37	57.74	3.31			

#### Emotional:

Raw Score	Outcome Measure	SE	Raw Score	Outcome Measure	SE	Raw Score	Outcome Measure	SE
5	0.0	14.44	12	40.88	5.24	19	66.48	5.20
6	11.12	8.82	13	44.55	5.23	20	70.13	5.24
7	19.08	6.88	14	48.21	5.23	21	73.90	5.39
8	24.62	6.07	15	51.88	5.23	22	78.02	5.72
9	29.20	5.66	16	55.56	5.23	23	82.90	6.43
10	33.30	5.43	17	59.22	5.22	24	89.83	8.28
11	37.16	5.31	18	62.86	5.20	25	100.00	14.07

#### Entertainment:

Raw Score	Outcome Measure	SE	Raw Score	Outcome Measure	SE	Raw Score	Outcome Measure	SE
5	.00	16.94	12	35.92	5.22	19	60.24	6.10
6	11.48	9.51	13	38.92	5.30	20	64.39	6.26
7	18.55	7.03	14	42.05	5.43	21	68.79	6.49
8	23.13	6.05	15	45.35	5.58	22	73.65	6.91
9	26.76	5.56	16	48.82	5.73	23	79.42	7.77
10	29.96	5.32	17	52.47	5.86	24	87.69	10.07
11	32.96	5.22	18	56.28	5.98	25	100.00	17.26

**Environment:**

Raw Score	Outcome Measure	SE	Raw Score	Outcome Measure	SE	Raw Score	Outcome Measure	SE
5	.00	13.41	12	34.60	4.92	19	61.22	5.65
6	9.59	7.84	13	38.02	4.97	20	65.74	5.71
7	16.06	6.06	14	41.53	5.04	21	70.36	5.80
8	20.58	5.38	15	45.14	5.11	22	75.26	6.09
9	24.38	5.07	16	48.85	5.20	23	81.01	6.81
10	27.87	4.93	17	52.73	5.34	24	89.06	8.63
11	31.23	4.89	18	56.85	5.51	25	100.00	13.92

**Listening Effort:**

Raw Score	Outcome Measure	SE	Raw Score	Outcome Measure	SE	Raw Score	Outcome Measure	SE
5	.00	12.60	12	35.05	4.66	19	59.57	5.19
6	9.30	7.54	13	38.30	4.63	20	63.73	5.33
7	15.88	5.95	14	41.53	4.64	21	68.21	5.58
8	20.62	5.33	15	44.82	4.71	22	73.28	6.06
9	24.63	5.02	16	48.24	4.82	23	79.59	6.97
10	28.29	4.84	17	51.83	4.94	24	88.66	8.73
11	31.73	4.73	18	55.61	5.07	25	100.00	13.29

**Social:**

Raw Score	Outcome Measure	SE	Raw Score	Outcome Measure	SE	Raw Score	Outcome Measure	SE
5	.00	13.64	12	38.61	5.07	19	64.15	5.22
6	10.28	8.25	13	42.20	5.05	20	68.05	5.33
7	17.62	6.49	14	45.79	5.06	21	72.17	5.53
8	22.85	5.79	15	49.40	5.07	22	76.72	5.88
9	27.24	5.43	16	53.03	5.09	23	82.10	6.58
10	31.21	5.23	17	56.68	5.11	24	89.60	8.32
11	34.97	5.12	18	60.38	5.15	25	100.00	13.68

**Global:**

Raw Score	Outcome Measure	SE	Raw Score	Outcome Measure	SE	Raw Score	Outcome Measure	SE
10	0.0	13.31	24	38.21	3.13	38	58.00	3.36
11	9.14	7.54	25	39.56	3.12	39	59.60	3.42
12	14.86	5.59	26	40.91	3.11	40	61.26	3.50
13	18.53	4.77	27	42.26	3.12	41	63.01	3.59
14	21.36	4.30	28	43.62	3.12	42	64.86	3.71
15	23.74	3.98	29	44.98	3.14	43	66.85	3.87
16	25.82	3.76	30	46.35	3.15	44	69.04	4.07
17	27.69	3.59	31	47.74	3.17	45	71.49	4.34
18	29.42	3.46	32	49.14	3.18	46	74.34	4.73
19	31.03	3.36	33	50.56	3.20	47	77.82	5.31
20	32.57	3.28	34	51.99	3.22	48	82.42	6.27
21	34.03	3.22	35	53.45	3.25	49	89.54	8.31
22	35.45	3.18	36	54.93	3.28	50	100.00	13.84
23	36.84	3.14	37	56.45	3.32			

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