



# Transformation of Patient Reported Outcome Measures for Assessing Value in Interventional Oncology

Mithil Gudi<sup>1</sup>, Priya Gupta<sup>2</sup>, Peter J. Massa, M.D.<sup>2</sup>

Wayne State University School of Medicine<sup>1</sup>, Henry Ford Hospital<sup>2</sup>

## Learning Objectives

- Highlight the role of patient reported outcome measures (PROMs) in Interventional Oncology
- Provide a breakdown of surveys used to obtain PROMs data along with the transformation of survey data into a utility score and a Quality-Adjusted-Life-Year (QALY) for use in value-based care comparison studies or economic evaluations.

## Background

- Interventional Oncology (IO) offers minimally invasive cancer therapies aimed at reducing morbidity and improving patient satisfaction.
- As healthcare shifts towards value-based care, understanding cost and quality outcomes is crucial to compare therapies.
- The quality component of value calculations largely depends on patient-reported outcome measures (PROMs), which depict health status directly from a patient's perspective and complement important clinical endpoints.
- PROMs are converted to a Quality-Adjusted Time Year (QALY) that incorporates a time component and can be used in value-based comparison studies.
- The purpose of this exhibit is to review the **existing literature to understand the current PROMs used in clinical IO practice and their transformation into QALYs for use in value calculation.**



Figure 1: Broad components of value calculation

## Methodological Breakdown

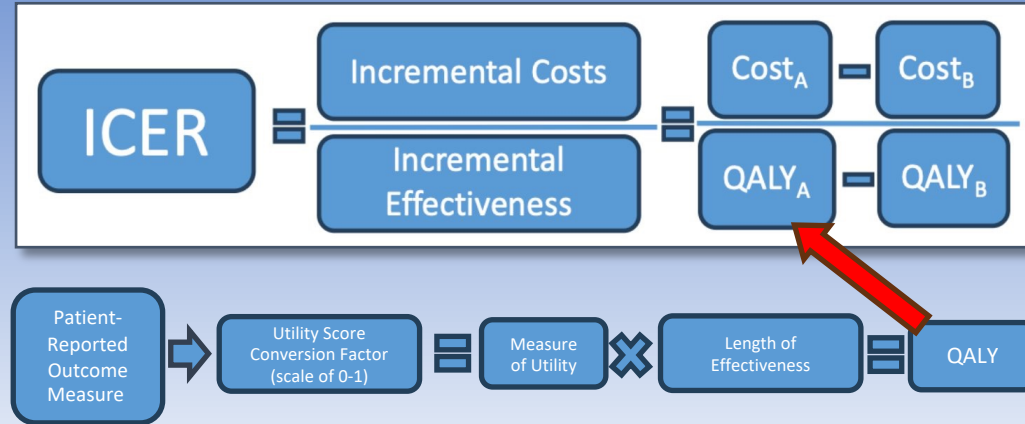


Figure 2: Role of quality measurement in the Incremental Cost Effectiveness Ratio (ICER) equation, a commonly used value formula

QLU-C100			
Domain	Level	Health state descriptions	Translation of QLQ-C30 response levels to QLU-C100 domain levels
Physical Functioning (PF) *	1	No trouble taking a long walk outside of the house	Item 2 (long walk) = 1
	2	No trouble taking a short walk outside of the house, but at least a little trouble taking a long walk	Item 3 (short walk) = 1 AND Item 2 ≥ 2
	3	At least a little trouble taking a short walk outside of the house, and at least a little trouble taking a long walk	Item 3 = 2 AND Item 2 ≥ 2
	4	Quite a bit or very much trouble taking a short walk outside the house	Item 3 ≥ 3 AND Item 2 ≥ 2
Role Functioning (RF)	1	Not at all limited in pursuing work or other daily activities	Item 6 = 1
	2	A little limited in pursuing work or other daily activities	Item 6 = 2
	3	Quite a bit limited in pursuing work or other daily activities	Item 6 = 3
	4	Very much limited in pursuing work or other daily activities	Item 6 = 4
Social Functioning (SF)	1	Physical condition or medical treatment interferes <b>not at all</b> with social or family life	Items 26 AND 27 = 1
	2	Physical condition or medical treatment interferes <b>a little</b> with social or family life	Items 26 OR 27 = 2
	3	Physical condition or medical treatment interferes <b>quite a bit</b> with social or family life	Items 26 OR 27 = 3
	4	Physical condition or medical treatment interferes <b>very much</b> with social or family life	Items 26 OR 27 = 4
Emotional Functioning (EF)	1	feeling <b>not at all</b> feeling depressed	Item 24 = 1
	2	feeling <b>a little</b> depressed	Item 24 = 2
	3	feeling <b>quite a bit</b> depressed	Item 24 = 3
	4	feeling <b>very much</b> depressed	Item 24 = 4
Pain (PA)	1	<b>no</b> pain	Item 9 = 1
	2	<b>a little</b> pain	Item 9 = 2
	3	<b>quite a bit</b> pain	Item 9 = 3
	4	<b>very much</b> pain	Item 9 = 4
Fatigue (FA)	1	<b>not at all</b> tired	Item 18 = 1
	2	<b>a little</b> tired	Item 18 = 2
	3	<b>quite a bit</b> tired	Item 18 = 3
	4	<b>very much</b> tired	Item 18 = 4
Sleep disturbance (SL)	1	<b>no</b> trouble sleeping	Item 11 = 1
	2	<b>a little</b> trouble sleeping	Item 11 = 2
	3	<b>quite a bit</b> trouble sleeping	Item 11 = 3
	4	<b>very much</b> trouble sleeping	Item 11 = 4
Appetite loss (AP)	1	<b>not at all</b> lacking appetite	Item 13 = 1
	2	<b>a little</b> lacking appetite	Item 13 = 2
	3	<b>quite a bit</b> lacking appetite	Item 13 = 3
	4	<b>very much</b> lacking appetite	Item 13 = 4
Nausea (NA)	1	<b>not at all</b> feeling nauseated	Item 14 = 1
	2	<b>a little</b> feeling nauseated	Item 14 = 2
	3	<b>quite a bit</b> feeling nauseated	Item 14 = 3
	4	<b>very much</b> feeling nauseated	Item 14 = 4
Bowel problems (BO)	1	<b>no</b> constipation or diarrhoea	Items 16 AND 17 = 1
	2	<b>a little</b> constipation or diarrhoea	Items 16 OR 17 = 2
	3	<b>quite a bit</b> constipation or diarrhoea	Items 16 OR 17 = 3
	4	<b>very much</b> constipation or diarrhoea	Items 16 OR 17 = 4

\* In the rare case of responses on PF that do not follow the logical order (e.g. more severe impairment on "short walk" than on "long walk") use the more severe health state (e.g. more severe impairment on "short walk").

Figure 3: Transformation of QLQ-C30 to QLU-C100 from user manual

## Results

- Simpler tools such as the Numerical Rating Scale (NRS), Visual Analog Scale (VAS) and Brief Pain Inventory (BPI) use linear scales to understand pain severity
  - The BPI adds an additional "activity of daily life" component
  - But they cannot be converted to QALY directly.
- The more comprehensive, cancer-specific surveys used in IO are the **EORTC QLQ-C30** and the **Functional Assessment of Cancer Therapy-General (FACT-G)**.
- The QLQ-C30 is a 30-item survey that covers functional, symptoms, and quality-of-life scales.
  - It cannot be used in value calculations because it does not provide a single preference-based index of quality (0-1 utility scale).
  - EORTC QLU-10D was developed to transform health states into utility scores that can be multiplied by time to achieve a QALY (QALY = Utility \* Years).
- The FACT-G is a 27-item tool that surveys physical, social, emotional, and functional well-being.
  - To derive utility, 8 components of FACT-G are used to develop a FACT-8D utility score (1 = perfect health and -0.54 = worst health).

## Conclusion

- PROMs provide utility in IO as they can be converted into QALYs to perform value-based comparisons.
- While there are many different clinical outcomes that can be considered by physicians, further investment is needed in the development of specialized surveys to capture PROMs in each tumor type
- As a more value-based approach is adopted by institutions, it is important for physicians and administrators to be familiar with the tools of collecting outcome data and their conversion to utility scores.

## References

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