

# The Future of Cancer Care: Are We Ready For Personalized Value?

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Tremendous advances have been achieved in the understanding of cancer biology, with cancer researchers extolling the potential of precision medicine in tailoring treatment to specific tumor markers. However, instead of feeling empowered, patients often have difficulty comparing and selecting among various treatment options.<sup>1</sup> Compounding this perplexity is the rising cost of cancer therapies coupled with continued concerns about side effects and their impact on quality of life (QOL). Although incremental improvements in overall survival remain the most important consideration when selecting a particular treatment, additional critical considerations are needed for proper therapeutic choosing. This delicate balance has recently been translated into so-called “value” in cancer care. Although frameworks to better understand and practice “value in cancer care” have been developed,<sup>2</sup> these tools have not actively involved patients. To create an effective model of value in oncology care, the views and needs of all stakeholders must be aligned with those of the patients. To that end, we propose a patient-centered value framework as a mechanism of optimizing cancer care moving forward (Figure 1).



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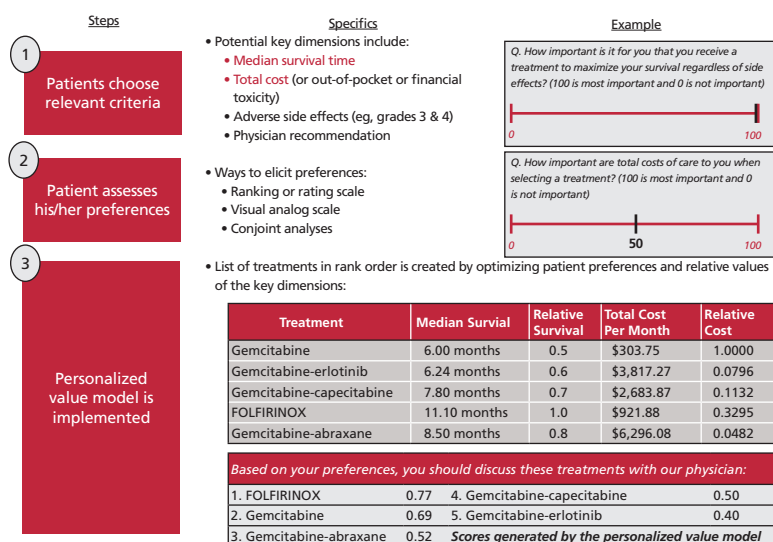


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## The Personalized Value Model

Porter<sup>3</sup> proposed aligning stakeholders’ incentives with the concept of value for the patient as an approach for improving the health care system as a whole. In that context, value was defined as “health outcomes achieved per dollar spent.” These outcomes incorporated measures of survival and QOL. Also, they consisted of a more complex set of functional measures, such as the time to recovery, its sustainability, and the lasting consequences of therapy. This proposal is a step in the right direction, but a missing piece is the assessment of patients’ preferences and views.<sup>4</sup> For example, one patient with metastatic cancer might choose to receive chemotherapy that maximizes survival, yet another individual might choose against active therapy because of concerns about toxicity or costs.



**Figure 1** Patient-centered value framework.

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Central to the proposed structure is multiple decision criteria analysis (MDCA), which is a method of taking many different considerations into account to make a decision by breaking it down into smaller, more manageable parts.<sup>5</sup> Although used in health care to help evaluate and prioritize interventions, MDCA has not yet been used as a method to account for patients' preferences in the shared-decision process. We propose using this tool as a backbone to incorporate the needs, views, and opinions of oncology patients moving forward. To illustrate how this model works, we provide an example by applying it to metastatic pancreatic cancer. The NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines) for Pancreatic Adenocarcinoma currently include 5 first-line treatments with varying lengths of median survival, total costs, and adverse effects.<sup>6</sup> Figure 1 illustrates 2 key dimensions: survival and cost.

Among the 5 regimens, FOLFIRINOX (5-fluorouracil, leucovorin, oxaliplatin, and irinotecan) has the longest median survival at 11.10 months. To estimate the relative survival benefit of the other 4 regimens, the survival length of each was divided by 11.10 months. If the shared decision-making process were solely based on survival, FOLFIRINOX would be selected in every case. However, this decision should incorporate other elements, including costs and adverse events. Relative cost is computed in a similar way. The lowest cost is chosen to calculate the relative values of the other treatments. Gemcitabine is the cheapest treatment at approximately \$303.75 per month, making it the most attractive from a cost perspective. If cost were the only factor in selecting therapy, gemcitabine would likely be selected. Adding to the complexity is the fact that gemcitabine, FOLFIRINOX, and the other therapies each have different adverse event profiles.

Therefore, the personalized value model (PVM) we propose balances all of these factors. In the PVM, the best selection might be neither gemcitabine nor FOLFIRINOX, but rather a regimen that has a proper balance between all the elements that matter to that specific patient. Importantly, this proposed framework allows adding and including additional variables as they become available. For example, grade 3 and 4 adverse events and physicians' recommendations can be added. As another example of its flexibility, costs may consist of total health care costs from a payer's perspective, out-of-pocket costs from a patient's perspective or even measures of financial toxicity, and how it impacts QOL.<sup>7</sup>

### Benefits of the PVM

Although this model might help patients in assessing treatment options, we argue that its importance also lies in the tangential benefit of patient empowerment. By engaging the patient in the discussion, providers embrace a true patient-centered approach. Against the backdrop of patient-centered care, physicians have identified the benefits of engaging and educating patients in the decision-making process.<sup>8</sup> Specifically, this can be accomplished when the physician develops a solid understanding of the variety and multitude of patient's preferences.

Engaging patients in decision-making could plausibly increase their satisfaction with treatment choices, engender trust in providers, and improve adherence. We hypothesize that this much-needed sense of empowerment will eventually lead to decreasing regret, improving QOL, and potentially better outcomes.

### Challenges of the PVM

However, operationalizing this framework also presents challenges. First, the value dimensions are dependent on each other. For example, increasing survival may increase costs. Second, this framework is based on the assumption that patients can articulate their

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preferences. However, patients are often affected by emotions, family pressure, and other stressors that can cloud decision-making. Also, patients may have difficulty assigning a value to an adverse effect that they have never experienced before. Finally, although most physicians believe that patients should be involved in treatment decision-making, few physicians feel adequately trained to implement shared decision-making into practice.<sup>9</sup>

## Conclusions

Despite these limitations, we believe that the framework put forth in the PVM is instrumental in formalizing the process of eliciting and incorporating patient preferences into treatment decisions. Providing patients who wish to participate in the decision-making with information while granting them the opportunity to state their preferences is the cornerstone of a patient-centered approach. Rather than a final pragmatic calculator stating what the best treatment for all patients is, one should acknowledge that such an approach does not provide true “value” in the contemporary era of cancer care. Rather, different patients have different preferences. We propose this framework as a reasonable starting point so that patients are included in the complex shared decision-making process in oncology, leading to enhanced personalized medicine.

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