



Applying a value-based care framework to post-mastectomy reconstruction

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Abstract

Purpose Reconstructive breast surgeons, like all procedural care providers, face a transition from volume reimbursement (i.e., per unit of service) to value-based care. Value can be defined as the relationship between outcomes and costs, or more specifically healthcare outcomes per unit cost. Although the definition of a meaningful outcome for a particular treatment can vary, some weighted average of survival, function, complications, process measures, and patient-reported outcomes (PROs) comprise the numerator, while the total cost of a complete care cycle is the denominator. We aim to construct a value-based care framework for reconstructive surgery using post-mastectomy reconstruction as an organizing element.

Methods A preexisting value framework was applied to breast reconstruction using expert opinion and literature review. Domains and associated realization strategies were constructed based on established health economic principles.

Results Seven domains were identified including: implementing an inclusive and transparent process for stakeholder engagement, practicing clear and explicit treatment goals, anchoring care delivery to the patient perspective, maximizing value across the entire continuum of care, optimizing operation efficiency, and scaling best practices with implementation science.

Conclusions In the near future, reconstructive plastic surgeons may be asked to solve clinical problems for fixed reimbursement (i.e. bundled payments). Considering breast reconstruction through a value lens provides surgeons with an opportunity to adapt and thrive in an evolving healthcare landscape. Lastly, we hope this document helps promote value assessment within the specialty.

Keywords Value-based care · Breast reconstruction · Mastectomy · Health policy

Value in healthcare: why it matters for reconstructive breast surgery

Reconstructive breast surgeons, like all procedural care providers, face a shift in remuneration from volume-based reimbursement (i.e., per unit of service) to *value-based care*. Value can be defined as the relationship between outcomes and costs, or more specifically healthcare outcomes per

unit cost [1]. Although the definition of what constitutes a meaningful outcome for a particular condition may vary, some weighted average of survival, function, complications, process measures, and patient-reported outcomes (PROs) comprise the numerator, while the total costs for a complete care cycle encompass the denominator [2].

In the USA, healthcare costs have risen much faster than the gross domestic product (GDP), inflation, and wage growth [3, 4]. Compared to the remainder of developed world that spends upwards of 10% of GDP on healthcare, the USA spent over 18% in 2017 [3]. This has placed significant financial burden on patients, payers, and society at large. Some of this escalating cost can be attributed to the use of advanced medical technology (computed tomography–angiography, near infra-red spectroscopy), an aging population, a fragmented model of care delivery (“fee for service”), misaligned incentives, and waste/inefficiencies [5]. The convergence of these forces has fueled the current transition towards high-value healthcare. Subsequently, both

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public (i.e., Medicare and Medicaid) and private payers (i.e., employer-based insurance) are using value-based contracts, as a lever for cost control, for both providers and hospitals. Physicians and hospitals are now increasingly called upon to bear financial risk for cost and outcomes of the services they deliver. The Medicare Access and CHIP Reauthorization Act (MACRA) passed with strong bipartisan support in 2015, creating a framework and financial incentive for clinicians to adopt value-based business models. Though change has so far been incremental, ultimately, this will transform the way reconstructive surgeons approach the traditional reconstructive paradigm and deliver care.

Value-based care is especially germane to post-mastectomy reconstruction in light of its preference-sensitive nature. Ideally, its utilization should be in line with the personal preferences and values of patients. Existing variation in the rates of breast reconstruction, driven by *both* underuse from healthcare disparities and overuse in instances where the preferences of recipients are more concordant with a mastectomy-only procedure, suggests that this is not the case [6]. In the present article, we apply a pre-existing value-assessment framework to breast reconstruction [3]. By presenting a systematic approach to defining and measuring value in plastic surgery, we aim to create a guiding document to inform and promote evidence-based and patient-centered treatment decisions by reconstructive surgeons.

Implement an inclusive and transparent process for stakeholder engagement

The inputs to our aforementioned value definition (i.e., costs and benefits) are known to vary widely across the relevant stakeholders (surgeons, patients, payers, caregivers, and hospitals). Consequently, the concept of value is dynamic [7]. We can expect to encounter some similarities as well as differences with respect to the intended goals of value-based care and the mechanisms to achieve them. These differences will largely be driven by stakeholder perspective and assumptions [3]. In a lot of ways, getting everyone *on the same page* is the first concrete step towards engendering a sustainable value-based framework. It will also allow involved parties to productively share their insights and experience. Organizing stakeholders and advocating for a shared message with the American public is another important element of engagement (e.g., Susan G Komen Foundation). For example, successful passage of the Women's Health Cancer Rights Act in 1998 has contributed to two decades of patient-centered care in breast cancer and is directly attributable to broad-based advocacy [8].

Plastic surgery is unique among the surgical subspecialties in that the problem-solving paradigm offers various credible solutions to a single problem, e.g., oncoplastic, implant-based and free-flap breast reconstruction. This

expansive decision-making also introduces a more complex value analysis that stands to benefit from the knowledge sharing inherent in a diverse and broad stakeholder representation. To say the least, stakeholders are manifold, and each has a voice in determining value.

Clear and explicit treatment goals

The traditional “reconstructive ladder” provides plastic surgeons with an organized approach to clinical problem-solving. The bottom rungs of the ladder denote the simplest treatments in terms of *technical difficulty*, i.e., local tissue rearrangement or primary closure for segmental mastectomy. Higher rungs on the reconstructive ladder, i.e., loco-regional flaps such as a transverse rectus abdominis (TRAM) flap, require increased technical skill and donor sites [9]. The highest rungs are reserved for operations that mandate microsurgical skill such as free perforator flaps [10]. However, contained within this conceptual framework is the tacit understanding that surgeons should *always* move from lower to higher complexity options. Iterations by Gottlieb challenged this notion and proposed the “reconstructive elevator” in attempt to offer patients the *best* operation the first time without failing the simpler alternatives [11]. However, the working definition for “best” is imprecise, inconsistently applied within providers, and highly variable across providers and settings.

Both of these frameworks, i.e., reconstructive ladder and reconstructive elevator, are also disadvantaged by the fact that they are cost-blind and do not sufficiently account for patients' preferences or values. While any given surgeon may incorporate shared-decision-making practices, these discussions are still informal, and non-systematized. To date, patient-reported outcomes, post-operative quality-of-life, and cost-effectiveness measures have not been universally implemented in clinical practice. The present reconstructive framework is expert-driven and not particularly patient-centered or cost-conscious. Moving forward, treatment goals should be explicit, measurable, and mutually agreed upon prior to the onset of any surgical intervention, e.g., treatment downtime, breast shape, scar locations. Explicitly stating the plan of care ensures that it aims to improve a functional or aesthetic abnormality that is individually meaningful to the patient.

Anchoring care delivery to the patient perspective

Unquestionably, every plastic surgeon desires the best results for her/his patient. Historically, outcomes have been defined by complication rates and subjective assessments from surgeons. Although complications remain important, patient-reported outcomes (PROs) and assessments of patient experience surveys are increasingly supplanting

them. Breast surgery boasts the largest literature on PROs, partly a reflection of the effectiveness of the BREAST-Q in capturing these outcomes. Additional psychometric instruments have been developed for every dimension of plastic surgery ranging from wound care to craniofacial surgery. Payers, employers, and consumer groups are rapidly adopting PROs as a staple performance metric; however, more work needs to be done as *ideal PROs* should be condition-specific, externally validated, prospectively captured, and readily available at the point-of-care (i.e., embedded in the electronic medical record). It is incumbent on plastic surgeons to become versed in the best evidence available for PROs when deciding between operations.

Eliciting patient preferences is a critical step to improving the *value* of care that we deliver. Shared-decision-making can be a powerful lever for achieving this, and is defined as “an approach where clinicians and patients share the best available evidence when faced with the task of making decisions, and where patients are supported to consider options, to achieve informed preferences” [12]. Using validated tools, it enables us to effectively and efficiently guide patients as they make complicated decisions [13]. Decision aids have been associated with reduced patient uncertainty and increased knowledge about treatment options. Available in print, web, and video formats, they allow surgeons to frame evidence into a patient’s specific health status [14].

In addition to the obvious disclosures between different operations, the entire spectrum of care should be discussed, including downtime, revisionary surgery, cost, and historical PROs. What might produce the best outcome profile in one patient could be undesirable for another, and it is therefore imperative that these nuances are identified and addressed prior to surgery.

Engaged patients are the cornerstone of any and all value-based healthcare activity. Sharpened focus should be directed towards ensuring that the concerns, values, preferences of patients, and their caregivers are understood by the care team. This will require a significant culture change in how we deliver care and train surgeons—one that moves away from an older paradigm of paternalism versus autonomy in favor of full patient–provider partnership and transparency in the decision space. Provider training, as well as patient education, will be necessary in patient-centered and culturally competent communication [15].

Maximizing value across the entire continuum of care

Plastic surgeons should gauge the value of their reconstructive strategy in the context of the downstream effects on the patient and payer. Costs compound across multiple treatment settings including the operating room, post-operative hospital stay, and home health services [16]. While it is

intuitive that more complex operations cost more upfront, in terms of both professional and technical fees, it is also conceivable that seemingly *less complex and lower cost* procedures, such as tissue-expander reconstruction may actually accrue significant economic and opportunity costs to patients and caregivers. For a 52-year-old female with breast cancer who elects for tissue-expander reconstruction, the treatment trajectory might involve multiple operations for implant exchanges, serial fat grafting, or breast revision (e.g., capsulorrhaphy). Therefore, value should be applied to an entire cycle of care, which includes all treatments that are required, rather than any single episode of care within that cycle. In this framework, a higher complexity procedure may provide more value if it offers one-stage problem resolution, even if the initial cost is higher.

Additionally, when deciding upon value-based contracts with payers, all parties should critically consider the episode duration. Period length should be anchored to the time horizon where cost and outcomes reach steady state. For example, in breast reconstruction, charges and complications accumulate for upwards of 3 years, suggesting a fairly lengthy period of risk [17].

The case for operational efficiency

Cost sinks are manifold in clinical practice especially with prolonged inpatient stays and post-acute care. As the utilization of enhanced recovery after surgery (ERAS) pathways gains traction in autologous breast reconstruction, it is our hope that it will become the de facto care paradigm [18]. This is because the tenets of ERAS pathway, namely multi-disciplinary input, protocol-driven interventions, and continuous audits of internal processes are all consistent with value-based care. Furthermore, a recent meta-analysis demonstrated superior clinical outcomes, namely reduced length-of-stay and opioid utilization, among post-mastectomy recipients who received ERAS in lieu of routine care [18].

Finally, wound care is a common element of many plastic surgery procedures including breast reconstruction. There are countless wound care products in the marketplace today, ranging from moistened gauze to amniotic membranes, with an accompanying wide dispersion in costs. However, there is a dearth of robust comparative and cost-effectiveness studies scrutinizing the majority of these products. Presently, outpatient wound care is reimbursed at a high level with liberal reimbursement of these products. This translates to a distortion of incentives for physicians and device companies who are rewarded each time products are deployed regardless of their utility in a clinical scenario (volume incentive). Physician incentives to deliver more *healthcare* rather than more *health* are contradictory to the value-based care agenda of maximizing health outcomes per unit cost. The intent of

cost-effectiveness analyses is to model incremental outcome improvements against the incremental costs of using new technology and procedures.

Scaling best practices and implementation science

Contemporary breast reconstruction is suffused with innovative practices, especially pertaining to the use of novel surgical techniques (perforator flaps) and technology (CT-angiography, intraoperative fluorescence imaging). Unfortunately, there is a paucity of investigations related to the relationship between innovation and best practices. A prominent example are the multiple studies explaining the futility of routine antibiotic use with breast implants—both reconstructive and cosmetic—yet no investigation to date attempts to understand or improve antibiotic stewardship [19]. The burgeoning field of implementation science uses standardized methods to understand barriers to and gaps in best practices, and then uses evidenced-based approaches to implement these strategies [20]. This represents a great opportunity through which the specialty can enhance patient care and achieve reconstructive goals at the highest value.

Conclusions

Plastic surgery fundamentally differs from other surgical disciplines in its unique problem-solving paradigm that offers various solutions to a single problem. This defining tenet attracts and compels our creative and innovative workforce. On the other hand, it might contribute to fragmented care, the use of costly technology, and unjustified practice variation and associated costs. Prospective, shared-decision-making with a focus on optimizing PROs and cost-effectiveness should guide surgical planning. Reconstructive surgeons should consider the entire continuum of patient care when choosing reconstructive modality and assigning value including post-acute and out-of-pocket expenditures. It is likely that in the near future, plastic surgeons may be asked to solve clinical problems for fixed reimbursement (i.e., bundled payments) [21]. In light of this, considering breast reconstruction through a value lens will provide surgeons an opportunity to adapt to the evolving healthcare landscape.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Research involving human participants and/or animals This article does not contain any studies with human participants or animals performed by any of the authors.

References

- Porter ME (2010) What is value in health care? *N Engl J Med* 363(26):2477–2481
- Bowyer A, Royse CF (2016) The future of postoperative quality of recovery assessment: multidimensional, dichotomous, and directed to individualize care to patients after surgery. *Curr Opin Anaesthesiol* 29(6):683–690
- Papanicolaos I, Woskie LR, Jha AK (2018) Health care spending in the United States and other high-income countries. *JAMA* 319(10):1024–1039
- Healthcare prices to outpace inflation for the first time since 2010|Fortune [Internet]. <http://fortune.com/2018/02/15/healthcare-prices/>. Cited 28 Aug 2018
- Berwick DM, Hackbarth AD (2012) Eliminating waste in US health care. *JAMA* 307(14):1513–1516
- Offodile AC, Lee CN-H (2018) Future directions for breast reconstruction on the 20th anniversary of the women's health and cancer rights act. *JAMA Surg* 153(7):605–606
- Wheeler SB, Spencer J, Rotter J (2018) Toward value in health care: perspectives, priorities, and policy. *N C Med J* 79(1):62–65
- 29 U.S. Code § 1185b—Required coverage for reconstructive surgery following mastectomies [Internet]. LII/Legal Information Institute. <https://www.law.cornell.edu/uscode/text/29/1185b>. Cited 6 Mar 2017
- Majno G (1975) *The healing hand: man and wound in the ancient world*. Harvard University Press, Cambridge
- Levin LS (2018) From autotransplantation to allotransplantation: a perspective on the future of reconstructive microsurgery. *J Reconstr Microsurg* 34(9):681–682
- Gottlieb LJ, Krieger LM (1994) From the reconstructive ladder to the reconstructive elevator. *Plast Reconstr Surg* 93(7):1503–1504
- Elwyn G, Laitner S, Coulter A, Walker E, Watson P, Thomson R (2010) Implementing shared decision making in the NHS. *BMJ* 341(7741):c5146
- Lee CN-H, Deal AM, Huh R, Ubel PA, Liu Y-J, Blizard L et al (2017) Quality of patient decisions about breast reconstruction after mastectomy. *JAMA Surg* 152(8):741–748
- Hamid KS, Nwachukwu BU, Bozic KJ (2017) Decisions and incisions: a value-driven practice framework for academic surgeons. *J Bone Joint Surg Am* 99(10):e50
- Changoor NR, Udyavar NR, Morris MA, Torain M, Mullen JT, Kent TS et al (2017) Surgeons' perceptions toward providing care for diverse patients: the need for cultural dexterity training. *Ann Surg*. <https://doi.org/10.1097/sla.0000000000002560>
- Jopling JK, Sheckter CC, James BC (2018) To cut is to cure: the surgeon's role in improving value. *Ann Surg* 267(5):817–819
- Fischer JP, Fox JP, Nelson JA, Kovach SJ, Serletti JM (2015) A longitudinal assessment of outcomes and healthcare resource utilization after immediate breast reconstruction—comparing implant- and autologous-based breast reconstruction. *Ann Surg* 262(4):692–699
- Offodile AC, Gu C, Boukovalas S, Coroneos CJ, Chatterjee A, Largo RD et al (2018) Enhanced recovery after surgery (ERAS) pathways in breast reconstruction: systematic review and meta-analysis of the literature. *Breast Cancer Res Treat*. <https://doi.org/10.1007/s10549-018-4991-8>
- Ranganathan K, Sears ED, Zhong L, Chung T-T, Chung KC, Kozlow JH et al (2018) Antibiotic prophylaxis after immediate breast reconstruction: the reality of its efficacy. *Plast Reconstr Surg* 141(4):865–877

20. Brooke BS, Finlayson SRG (2015) What surgeons can learn from the emerging science of implementation. *JAMA Surg* 150(10):1006–1007
21. Shekter CC, Razdan SN, Disa JJ, Mehrara BJ, Matros E (2018) Conceptual considerations for payment bundling in breast reconstruction. *Plast Reconstr Surg* 141(2):294–300

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