

# The Role of Emotion in Cancer Surgery Decisions

## Applying Concepts From Decision Psychology

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Patient: “I have decided to have bilateral mastectomy.”

Surgeon: “Well, you realize that bilateral mastectomy has equivalent survival as unilateral mastectomy.”

Patient: “Sitting here with this information right now my feeling is that I can’t. I can’t have this anxiety all the time. If it was removed and there was no other cancer in there I don’t think that I would be upset with that at all.”

—Excerpted from actual consultation

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When a woman with breast cancer chooses to remove her unaffected breast, emotion often plays an important role. Patients have reported choosing contralateral prophylactic mastectomy (CPM) out of fear of cancer or a desire to prevent future worry.<sup>1</sup> Similarly, patient emotions may influence other surgical decisions, such as amputation, colostomy, or treatment of early-stage prostate cancer,<sup>2</sup> papillary thyroid microcarcinoma,<sup>3</sup> pancreatic intraductal papillary mucinous neoplasms, and ductal carcinoma in situ.<sup>4</sup> The detection of precursor or early malignant conditions will only become more frequent, with increasingly sensitive diagnostic and surveillance techniques. More patients than ever will find themselves deciding about surgery in the face of fear and uncertainty. Meanwhile, surgeons may not realize how emotions are affecting a patient’s choice, or they may prioritize outcomes that differ from the patient’s priorities (eg, complication risk versus relief from anxiety). Few surgeons have been trained to address a patient’s emotions skillfully during decision making. Despite the important role of emotion in these surgical decisions, our efforts to understand and support them have not adequately addressed emotion. In particular, we have not applied what psychologists know about how people make decisions when experiencing strong emotions.

The field of decision psychology, which incorporates elements from cognitive psychology, social psychology, and economics, has taught us that people frequently use their emotions to make judgments about risk, a concept known as the affect heuristic.<sup>5</sup>

Furthermore, we know that emotion works through several mechanisms, such as greater attention to some information and neglect of other information.<sup>6</sup> Despite this knowledge of how emotions influence people’s judgments, we have yet to apply it systematically to understanding emotion-laden surgical decisions, such as the choice of CPM. Such application could provide important insights into what some surgeons have called an “epidemic” of mastectomies and other surgical decisions influenced by emotion.

### PATIENTS’ MOTIVATIONS FOR CPM

Patients who have undergone CPM report that emotions, including anxiety, fear of recurrence, or fear of death, motivated their treatment choice.<sup>1</sup> Surgeons also have recognized negative emotion as a motivator for their patients. Some have argued that CPM is justified to address patients’ negative emotions, while others have questioned whether performing CPM to relieve anxiety is ethical. Positive emotions too appear to play a role, as more people know someone who has had CPM or have viewed positive stories of bilateral mastectomy. After actress Angelina Jolie wrote about having bilateral prophylactic mastectomy with reconstruction in *The New York Times*, internet searches and patient interest in the procedure surged. Patients have formed a community around CPM without reconstruction, called “going flat.”

### HOW DO EMOTIONS INFLUENCE DECISIONS?

The influence of emotion on behavior has been recognized for some time by psychologists and behavioral economists. In particular, 2 theories, the affect heuristic and “risk as feelings” hypothesis, proposed that people make judgments about risk primarily through their emotions, rather than their cognition, or thought processes.<sup>5</sup> These theories recognized that emotional reactions to risky situations often differ from cognitive evaluations, and drive behavior. For example, a person deciding whether or not to buy a lottery ticket may have positive emotion to the ticket due to its possible big win. This feeling then acts as information, so that the person perceives more benefit from the ticket and less risk.

Several mechanisms can explain how emotions influence decisions.<sup>6</sup> In addition to acting as information, emotion functions as a spotlight. The emotion’s quality (eg, positive vs negative) focuses the decision maker on different information. Then, that information, rather than the feeling itself, is used to guide judgment. For example, when people who smoke are exposed to more emotional health warnings, they experience more negative emotion to smoking, scrutinize the warnings more closely, and recall more risks, with subsequent effects on their risk perception and intention to quit.<sup>7</sup> Emotion also acts as a direct motivator of behaviors. For example, women who are more worried about breast cancer are more likely to have a mammogram, independent of their risk perception.<sup>8</sup> Emotion’s function as motivator also means that, with strong emotions, people often ignore important numeric information such as probabilities, a problem’s scope, and effects of time.<sup>9</sup> Finally, motivated reasoning theory states that people perceive the world in ways

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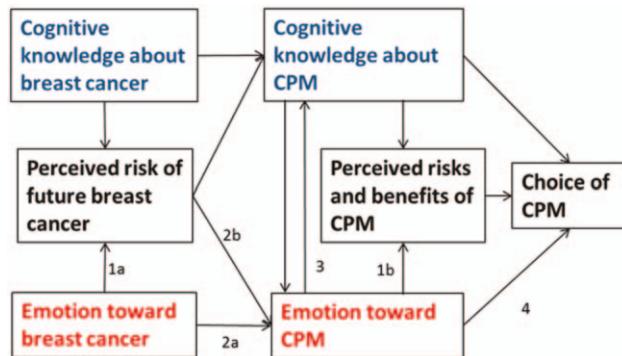
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consistent with their goals, partly to reduce cognitive dissonance.<sup>10</sup> Merging motivated reasoning with the affect heuristic, we expect people to make their perceptions more consistent with their feelings.

## HOW DO EMOTIONS INFLUENCE DECISIONS ABOUT CPM?

Based on the mechanisms just described, we believe that women with breast cancer may use their emotions about breast cancer and CPM to evaluate risks and make choices, without being aware they are doing so (Fig. 1). Specifically, we propose that greater negative emotion about breast cancer leads a patient to perceive that her risk of future cancer is higher (path 1a of Fig. 1: emotion as information), whereas greater positive emotion toward CPM leads her to perceive that the risks of CPM are lower and its benefits are higher (path 1b: emotion as information). We expect that a patient who feels more negatively about breast cancer and/or who perceives her future cancer risk to be high will feel more positively toward procedures she believes might reduce that risk (paths 2a, 2b: motivated reasoning). Emotion toward CPM may also function as a spotlight, guiding learning about cancer and surgery. So, a patient who feels more positively about CPM may learn more about its benefits than its risks, whereas a patient who feels more negatively about CPM may do the opposite and learn more about its risks than its benefits (path 3: emotion as spotlight). Finally, we expect that a patient who feels more positively about CPM will be more likely to choose to undergo CPM (path 4: emotion as motivator). Each of these processes may be an opportunity for the surgeon to better understand the patient's experience or to address how emotion influences her choices. For example, a patient who is highly emotional about her breast cancer diagnosis may respond better to empathic communication by the surgeon than to data about survival and recurrence. Thus, surgeons may need to learn how to negotiate their patients' emotions and how to coach patients to think about risks in the context of intense emotions.



**FIGURE 1.** Conceptual model mechanisms: 1. Affect heuristic/ emotion as information: 1b. Negative emotion toward breast cancer functions as information about higher breast cancer risks, 1b. Positive emotion toward CPM functions as information about higher CPM benefits and lower risks 2. Motivated reasoning: 2a. Negative emotion toward breast cancer motivates positive emotion toward CPM, 2b. Greater perceived risk of breast cancer motivates more positive emotion toward CPM 3. Emotion as spotlight: positive emotion toward CPM increases attention toward benefits of CPM 4. Emotion as motivator: positive emotion toward CPM directly motivates choosing CPM.

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## FUTURE DIRECTIONS

Future research on CPM and other emotion-rich surgical choices should investigate psychological mechanisms, such as these potential pathways. The effectiveness of interventions will depend on which mechanisms are at play. Given our fixed resources, not all interventions will be possible or necessary, so identifying the correct mechanism(s) could hone resource targeting. Although patients have reported emotions influencing their choices, the role of emotion in surgical decision making is not proven, as few studies have assessed emotions before surgery, and no known studies have attempted to manipulate emotion to understand causal mechanisms. Specific mechanisms will likely differ by patient population and disease condition. In particular, the emotions associated with a cancer diagnosis may be different from emotions around nonmalignant surgical conditions; at the least, emotions may be stronger. Future research should examine whether emotions' influence on decision making is unique in the cancer context or generalizable to any context in which strong emotions exist.

Investigating psychological mechanisms in surgical decision making will require prospective clinical studies that assess emotions at the time of decision making and experimental studies to demonstrate causality. In other words, we should conduct experiments that randomize participants to conditions that manipulate emotion toward the condition and emotion toward the treatment (participants would be volunteers who are similar to patients, but not patients themselves). These experiments would enable causal inference, thus informing how to interpret observations made in patients and how to design interventions. For example in the case of CPM, if patients' negative emotion about breast cancer acts "as information," causing inaccurate risk perceptions, we could prioritize the development of clinical interventions to reduce cancer fear, such as psychosocial counseling or mindfulness training. On the other hand, if positive emotion about CPM acts as information, communication strategies to balance popular CPM depictions may be warranted.

Surgeons would benefit from interventions that improve how they address emotions and surgical choices. We should gain better understanding from our patients about factors that influence emotions toward cancer, such as prior personal/family experiences, media exposures, and how patients anticipate future health states, and then develop and test corresponding interventions. Surgeons could undergo training in empathic communication techniques, which improve patient satisfaction and may modulate negative emotion. Surgeons could employ risk communication techniques proven to improve patients' risk perception, such as providing numeric risk, and using pictograms to explain risk. Future research should evaluate the effectiveness of these practices in real-world settings.

## CONCLUSION

The rapidly growing use of CPM is clearly related to patient emotions, yet most research has not adequately examined emotion and its mechanisms. By applying knowledge from decision psychology, future studies could clarify how emotion influences decisions about CPM and other high-stakes operations. Understanding these mechanisms will enable us to design the most effective interventions to support patients and surgeons navigating these complex decisions.

## REFERENCES

1. Hawley ST, Griffith KA, Hamilton AS, et al. The association between patient attitudes and values and the strength of consideration for contralateral prophylactic mastectomy in a population-based sample of breast cancer patients. *Cancer*. 2017;123:4547–4555.
2. Han PK, Hootsmans N, Neilson M, et al. The value of personalised risk information: a qualitative study of the perceptions of patients with prostate cancer. *BMJ Open*. 2013;3:e003226.

3. Pitt SC, Wendt E, Saucke MC, et al. A qualitative analysis of the preoperative needs of patients with papillary thyroid cancer. *J Surg Res.* 2019;244:324–331.
4. Partridge A, Adloff K, Blood E, et al. Risk perceptions and psychosocial outcomes of women with ductal carcinoma in situ: longitudinal results from a cohort study. *J Natl Cancer Inst.* 2008;100:243–251.
5. Slovic P, Finucane ML, Peters E, et al. Risk as analysis and risk as feelings: some thoughts about affect, reason, risk, and rationality. *Risk Anal.* 2004;24:311–322.
6. Peters E, Lipkus I, Diefenbach MA. The functions of affect in health communications and in the construction of health preferences. *J Commun.* 2006;56:S140–S162.
7. Evans AT, Peters E, Shoben AB, et al. Cigarette graphic warning labels are not created equal: they can increase or decrease smokers' quit intentions relative to text-only warnings. *Nicotine Tob Res.* 2017;19: 1155–1162.
8. Diefenbach MA, Miller SM, Daly MB. Specific worry about breast cancer predicts mammography use in women at risk for breast and ovarian cancer. *Health Psychol.* 1999;18:532–536.
9. Peters E, Kunreuther H, Sagara N, et al. Protective measures, personal experience, and the affective psychology of time. *Risk Anal.* 2012;32:2084–2097.
10. Kunda Z. The case for motivated reasoning. *Psychol Bull.* 1990;108:480–498.