

# Collaborative Decision Making in High-Risk Cases: An Anesthesia Perspective

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## ABSTRACT

Collaborative decision making (CDM) has become an essential component of modern anesthetic practice, particularly in the management of patients undergoing high-risk surgical procedures. It expands the concept of informed consent into a multidimensional process that actively engages clinicians, patients, and their families in transparent and evidence-based dialogue. CDM allows anesthesiologists to align technical expertise with patient values, preferences, and contextual factors, integrating multidisciplinary input and structured tools such as risk calculators and decision aids. Evidence increasingly supports that such collaborative frameworks improve clinical outcomes, enhance satisfaction, and uphold ethical standards. However, implementation remains challenged by institutional inertia, time constraints, and variability in communication skills. Facilitators include standardized education, interdisciplinary engagement, and integration of digital technologies, including artificial intelligence. CDM represents the convergence of ethical responsibility and clinical precision—offering a patient-centered model that strengthens perioperative safety, equity, and trust in complex anesthetic care.

**Keywords:** Collaborative decision making, shared decision making, high-risk anesthesia, patient-centered care, perioperative risk, multidisciplinary team, decision aids.

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## Introduction

High-risk surgical cases present real challenges in anesthesiology. Such cases frequently involve patients with severe comorbidities, advanced age, poor physiological reserve, or undergoing major procedures with significant perioperative risk<sup>1,2</sup>. Collaborative decision making (CDM), with roots in shared decision making (SDM), establishes a framework through which clinicians, patients, and their families together navigate difficult choices, transforming the traditional idea of consent into a dynamic, informed partnership<sup>2,3</sup>.

This discussion reviews current literature, methodologies, tools, challenges and implications of collaborative decision making in anesthesia for high-risk cases, examining both clinical and ethical dimensions.

## The Rationale for Collaborative Decision Making

### The Vulnerability of High-Risk Patients

Patients classified as high-risk often suffer from multiple comorbidities, frailty, or advanced age—factors that increase postoperative morbidity

These individuals may be candidates for major surgeries (cardiac, oncologic, vascular, emergency trauma), in whom conventional risk assessment alone fails to capture the full spectrum of procedural outcomes. CDM thus recognizes the need for robust, multidimensional clinical dialogues and planning.

### **Evolving Models of Informed Consent**

Traditionally, consent for anesthesia and surgery emphasized information delivery rather than true collaboration. The expanded model of CDM requires clinicians to move beyond unidirectional information and actually integrate patient values, goals, and risk-taking preferences into every discussion<sup>6</sup>. SDM frameworks such as the “Three Talk Model,” the King’s Fund pathway, and the AHRQ “SHARE” approach now helps systematically structure these interactions<sup>7,8</sup>.

CDM is especially vital when all available management options carry significant risk, and the choice is not binary but instead nuanced—balancing survival, functional outcome, and quality of life<sup>9</sup>.

### **Literature Review: Collaborative Decision Making in Practice**

Recent literature underscores both the progress and barriers in integrating collaborative strategies in anesthesia for high-risk cases.

### **Patient-Centered Consultations**

Goldstein and colleagues<sup>10</sup> undertook qualitative interviews with clinicians and older patients undergoing hip fracture surgery—a prototypical high-risk scenario. They found strong support among both groups for SDM, especially when facilitated by tailored conversation aids and risk stratification tools. However, time pressure, care fragmentation, and lack of institutional protocols were persistent barriers<sup>10</sup>.

Trivedi et al.<sup>11</sup> conducted a prospective observational study in geriatric and cardiovascular patients, reporting improved perioperative outcomes when personalized, multidisciplinary strategies were employed. Decisions guided by the patient’s values,

functional status, and social context led to more appropriate anesthetic choices, reductions in post-operative complications, and shorter recovery durations<sup>11</sup>.

### **Interdisciplinary Collaboration**

Complex cases now often involve formal case conferences, with anesthesia, surgical, critical care, and sometimes ethics personnel contributing their views<sup>12</sup>. This multidisciplinary approach ensures technical aspects (e.g., anticoagulation reversal, advanced airway management), ethical issues (advanced directives, end-of-life care), and psychosocial elements are addressed together<sup>12,13</sup>.

### **Patient Preferences and Satisfaction**

Flierler et al.<sup>14</sup> measured patient satisfaction with involvement in anesthesia and analgesia decisions. Notably, 94% of participants preferred being included in all options discussions, and those who felt empowered showed significantly lower decisional regret and higher satisfaction scores<sup>14</sup>.

Meta-analyses by Ludwiczak et al.<sup>15</sup> and Sturgess et al.<sup>16</sup> confirm the broader applicability of SDM tools across high-risk patient populations, underscoring links to improved safety, hospital compliance, and equity in care access.

## **Tools and Technologies for CDM**

### **Conversation Aids and Decision Aids**

Validated conversation aids, including Option Grids<sup>™</sup>, graphical risk calculators, and patient-specific data sheets, help clarify complex anesthesia choices<sup>17,18</sup>. These tools present the benefits and risks of multiple options, integrating clinical risk prediction with tailored information for cognitive, visual, and literacy needs.

### **Structured Risk Stratification**

Preoperative quantitative tools such as the ACS NSQIP Surgical Risk Calculator, POSSUM, and other nomograms enable both patients and clinicians to “see” estimated risks of complications or mortality for diverse strategies<sup>19</sup>. These are essential for objective CDM in high-risk anesthesia assessment

### Digital Platforms and Artificial Intelligence

Emerging digital CDM platforms offer both remote and synchronous risk analysis and consent documentation. Additionally, artificial intelligence and machine learning models show promise in perioperative prediction, potentially reducing time to consensus and improving accuracy of patient-specific recommendations<sup>20,21</sup>.

### Interdisciplinary Case Conferences

Multidisciplinary preoperative meetings allow collective weighing of available data, institutional experience, and patient wishes. These events create shared accountability and integrate perspectives, often leading to nuanced modifications in the anesthetic plan<sup>12</sup>.

### Barriers to Effective CDM

Despite progress, collaborative models still face significant barriers.

#### Time Pressure and Workflow Integration

One of the most cited obstacles is the time required to conduct meaningful CDM discussions, especially in urgent or emergency settings<sup>10</sup>. Surgeons, anesthesiologists, and patients themselves may feel rushed, often defaulting to traditional methods.

#### Institutional Inertia and Protocol Deficits

Hospitals and surgical centers may lack standardized protocols for integrating CDM into routine practice. Staff training may be limited, with few benchmarks available for evaluating the quality of collaborative discussions, leading to care variability<sup>22</sup>.

#### Cultural and Educational Barriers

Not all clinicians are comfortable with shared models, particularly in cultures where paternalistic medicine remains the norm. Especially true when rigid hierarchy exists in certain systems. Furthermore, patients may lack understanding of complex medical risks, requiring structured education to support true SDM<sup>23</sup>.

#### Ethical Dilemmas

There are moments when patient or surrogate

choices conflict with clinician advice or institutional policy, especially in cases bordering on futile care or non-beneficial surgery<sup>24</sup>. Resolving these ethically requires both robust SDM frameworks and support from legal and ethics personnel.

### Facilitators: Strategies for Moving Toward True Collaboration

Empirical work highlights several facilitators of successful CDM:

- Use of standardized conversation aids, adapted for local patient demographics and health literacy levels<sup>17</sup>.
- Advanced preoperative education modules, addressing the nature of high-risk anesthesia in accessible formats (videos, handouts, interactive platforms)<sup>18</sup>.
- Dedicated scheduling for high-risk case preparation, allowing extra time for thorough exploration of preferences and goals<sup>25</sup>.
- Leadership engagement and culture shifts, with department heads or institutional champions modeling collaborative approaches<sup>26</sup>.
- Technology-driven support, from AI risk tools to integrated digital consent documentation<sup>20,21</sup>.

## Implications for Practice

### Improving Clinical Outcomes

Robust CDM models have demonstrated reductions in perioperative morbidity and improved safety profiles. When patients are true partners, they are more likely to adhere to recommendations, recognize early warning signs, and communicate effectively postoperatively<sup>11,16</sup>.

### Ethical and Legal Considerations

Medical law have increasingly recognized the right of patients to meaningful involvement in high-risk decisions<sup>27</sup>. Inadequate collaboration carries risk of legal action, adverse events, and reputational damage. Comprehensive CDM documentation provides medico-legal protection for both clinicians and institutions.

## Technological Advancements

The integration of artificial intelligence and data-driven tools enables instant access to risk profiles, evidence-based recommendations, and facilitated discussions<sup>20,21</sup>. These technologies have implications for future practice workflow: instant, personalized, transparent.

## Limitations and Future Research

Most available research comprised of qualitative interviews, observational studies, and institutional audits. There is limited evidence from randomized controlled trials or large-scale outcome studies regarding the direct impact of CDM frameworks on morbidity and mortality<sup>30</sup>. Further investigation is needed:

- To validate risk prediction models across diverse hospital settings and patient populations<sup>19</sup>.
- To evaluate impact on long-term patient satisfaction, decisional regret, and mental health outcomes<sup>14</sup>.
- To refine AI applications and address challenges in routine practice.
- To measure the effectiveness of decision-making interventions and case conferences on clinical and ethical decision quality<sup>29</sup>.

## Unexpected Findings in Recent Literature

Some studies suggest that the desire for collaboration may fluctuate depending on personality, cultural background, and urgency of the situation<sup>23</sup>. While most patients prefer involvement, about a quarter may become overwhelmed or defer decisions out of fear or anxiety, particularly in emergent situations. Strategies for identifying decision fatigue or distress need development.

## Implications for Practice

Based on current evidence, several recommendations are made:

1. Institutions should standardize CDM protocols for high-risk cases, including selection of validated decision aids and mandatory preoperative multidisciplinary meetings<sup>26</sup>.

2. Training curricula must emphasize risk communication, negotiation, and SDM skills for anesthesiologists, surgeons, and allied staff<sup>29</sup>.

3. AI and digital technologies should be explored not only for clinical prediction but also for educational and procedural support<sup>20,21</sup>.

4. Patient and family education must be central to the CDM process, with resources tailored to context, literacy, and digital access<sup>18</sup>.

## Conclusion

Collaborative decision making represents the ethical and practical frontier of anesthesia for high-risk patients. Supported by conversation aids, risk stratification tools, interdisciplinary teamwork, and emerging technology, CDM translates values and evidence into optimal perioperative care<sup>10,11,14,15,16,20,21</sup>. Although challenges remain, the benefits include improved outcomes, satisfaction, and quality of care, as well as stronger ethical and legal foundations for the resolution of collaborative decision-making challenges. Institutional leadership, research, robust training, and

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