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Letter to the Editor

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Patient Complexity and Risk Stratification in Modern Cardiac Surgery

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Letter to the Editor

Dear Editor,

Cardiac surgery is increasingly performed in patients characterized not only by cardiac pathology, but by substantial biological and systemic complexity. Frailty, metabolic disease, obesity, and sex-related vulnerability frequently shape perioperative trajectories, challenging the adequacy of a predominantly heart-centered framework for interpreting outcomes in contemporary practice. Despite major advances in surgical technique and perioperative care, perioperative morbidity remains substantial. Prolonged intensive care stay, delayed recovery, and non-cardiac organ dysfunction often follow technically successful procedures. These outcomes are commonly attributed to procedural complexity, yet growing evidence indicates that they are frequently driven by patient-related factors insufficiently captured by conventional cardiac risk assessment models. In particular, obesity has been consistently associated with increased postoperative complications, prolonged intensive care utilization, and higher resource consumption following cardiac surgery [1,2].

Frailty represents a clinically meaningful expression of reduced physiological reserve and impaired stress adaptability, consistently associated with adverse perioperative courses but still inconsistently assessed in routine cardiac surgical evaluation. Diabetes mellitus similarly reflects a systemic disease state characterized by microvascular dysfunction, altered myocardial energetics, and heightened inflammatory vulnerability, all of which compromise perioperative resilience even when traditional cardiac parameters appear acceptable [2-4] Obesity further compounds this vulnerability through impaired respiratory mechanics, increased metabolic demand, and a pro-inflammatory milieu that amplifies perioperative instability and delays recovery [1,2,4]. These observations support the need for a broader, patient-centered paradigm in cardiac surgery—one that extends beyond cardiac anatomy and ventricular performance to explicitly acknowledge systemic vulnerability and physiological reserve. Within this framework, the cardiac anesthesiologist plays a central role, integrating patient complexity into perioperative decision-making and facilitating individualized management strategies across the surgical continuum. Optimal

perioperative care relies on close and balanced collaboration between the cardiac surgeon and the cardiac anesthesiologist, whose complementary expertise jointly informs strategy, timing, and intraoperative decision-making.

Case-based literature offers a valuable opportunity to promote this conceptual shift. Explicit reporting of frailty status, metabolic comorbidity burden, obesity, and sex-specific considerations alongside perioperative management choices may enhance interpretability, stimulate hypothesis generation, and better reflect the realities of modern cardiac surgical practice. Large contemporary analyses and systematic reviews increasingly support the integration of patient complexity—beyond isolated cardiac metrics—into perioperative risk assessment frameworks **[3,5].** In contemporary cardiac surgery, meaningful outcomes are determined not only by the heart that is operated on, but by the patient who undergoes the operation—and by the team that cares for them.

Sincerely, Professor Paolo Nardi Dr. Giulia Franceschini Dr. Valentina Ajello

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