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Commentary: Eighty is not the new 50: Recognizing risk in the elderly surgical patient

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The elderly segment of the US population continues to grow rapidly. In fact, older adults are predicted to outnumber children within the next decade.¹ As the prevalence of cardiovascular disease increases with age, a growing elderly population will require a greater number of cardiovascular interventions and surgery. Advancements in surgical technique and perioperative care have improved outcomes, although elderly patients remain at greater risk for postoperative mortality and morbidity.^{2,3} Careful patient selection and perioperative decision-making are needed to improve postoperative outcomes and quality of life for the elderly cardiac surgical patient.

In this issue of the *Journal*, Atladottir and colleagues⁴ provide data and guidance to address patient selection and perioperative decision-making for patients aged 80 years and older. In a cohort of 2342 elderly cardiac surgical patients, the authors examined perioperative risk factors associated with greater 30-day and 1-year postoperative mortality. Although previous reports examined risk factors^{5,6} and reported outcomes in elderly cardiac surgical patients,⁷ this report includes a large cohort of patients with excellent 1-year follow-up. One risk factor, severely impaired preoperative renal function (creatinine clearance ≤ 30 mL/min), was associated with an observed 1-year mortality greater than 30%—a nearly 5-fold increase in risk. Additional intraoperative and postoperative variables were also strongly associated with adverse outcomes. For example, cardiopulmonary bypass time greater than 180 minutes was associated with a nearly 6-fold increase in the odds of 1-year mortality. Intraoperative transfusion of greater than 2 units of red blood cells and postoperative

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CENTRAL MESSAGE

Identifying risk factors for postoperative mortality improves patient selection and perioperative decision-making while providing realistic expectations for the elderly cardiac surgical patient.

factors, including length of intensive care unit stay >3 days, were associated with a 4- to 6-fold increase in the odds of 1-year mortality with an observed 1-year mortality of about 30%.

Identification of these risk factors for adverse outcomes is not new.^{8,9} However, this report quantifies risk for 1-year mortality and nicely illustrates the extent that risk is increased in this elderly population. These data provide guidance to help identify patients who are more likely to benefit from surgery. Although many of the reported variables (ie, perioperative blood transfusion, prolonged cardiopulmonary bypass time) are not known preoperatively, evidence is provided to support a decision to perform a less-complicated surgical procedure in an elderly patient—thus reducing exposure to these perioperative risk factors. The quantification of risk in this report provides realistic expectations of potential benefit for elderly patients who present for cardiac surgery.

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References

1. US Census Bureau website. Available at: <https://www.census.gov/library/visualizations/2018/comm/historic-first.html>. Accessed March 17, 2019.
2. Johnson WM, Smith JM, Woods SE, Hendy MP, Hiratzka LF. Cardiac surgery in octogenarians: does age alone influence outcomes? *Arch Surg*. 2005;140:1089-93.
3. Habib AM, Hussain A, Jarvis M, Cowen ME, Chaudhry MA, Loubani M, et al. Changing clinical profiles and in-hospital outcomes of octogenarians undergoing cardiac surgery over 18 years: a single-centre experience. *Interact Cardiovasc Thorac Surg*. 2019;28:602-6.
4. Atladottir HO, Modrau IS, Jakobsen C-J, Torp-Pedersen CT, Gissel MS, Nielsen DV. Impact of perioperative course during cardiac surgery on outcomes in patients 80 years and older. *J Thorac Cardiovasc Surg*. 2021;162:1568-77.

5. Shavit L, Lifschitz M, Slotki I, Oren A, Tauber R, Bitran D, et al. Preoperative renal dysfunction and clinical outcomes of cardiac surgery in octogenarians. *Exp Gerontol*. 2013;48:364-70.
6. Scandroglio AM, Finco G, Pieri M, Ascari R, Calabrò MG, Taddeo D, et al. Cardiac surgery in 260 octogenarians: a case series. *BMC Anesthesiol*. 2015; 15:15.
7. Arora RC, Manji RA, Singal RK, Hiebert B, Menkis AH. Outcomes of octogenarians discharged from the hospital after prolonged intensive care unit

length of stay after cardiac surgery. *J Thorac Cardiovasc Surg*. 2017;154: 1668-78.e2.

8. Thakar CV, Worley S, Arrigain S, Yared JP, Paganini EP. Influence of renal dysfunction on mortality after cardiac surgery: modifying effect of preoperative renal function. *Kidney Int*. 2005;67:1112-9.
9. Koch CG, Li L, Duncan AI, Mihaljevic T, Loop FD, Starr NJ, et al. Transfusion in coronary artery bypass grafting is associated with reduced long-term survival. *Ann Thorac Surg*. 2006;81:1650-7.

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Commentary: Age is just a number?

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The life expectancy in the United States is 78.6 years per Centers for Disease Control and Prevention reports.¹ It is estimated that by 2050, 19 million Americans will be 85 and older and 1 million will be 100 years and older.² Although an amazing achievement of medical advancement and technology, it is an immense challenge to health care delivery. The majority of these individuals will be living with chronic health conditions requiring medical or surgical care. Often this vulnerable population is excluded from clinical trials, yet the health care community needs vigorous scientific research to understand this group's unique medical needs. In this light, the *Journal* presents an important study by Atladottir and colleagues. This retrospective study included 2342 patients older than the age of 80 years undergoing open-heart surgery.³ The authors performed a logistic regression analysis to determine preoperative, intraoperative, and postoperative risk factors associated with an increase in morbidity and mortality. They found that severe renal impairment (glomerular filtration rate <40 mL/min) and prolonged cardiopulmonary bypass time (>180 minutes) were associated with greater than 50% mortality at 1 year. Postoperative intensive care length

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CENTRAL MESSAGE

Octogenarians are a complex patient population. Specific risk factors that predispose them to increased morbidity and mortality after cardiac surgery need to be further elucidated.

of stay greater than 3 days and mechanical ventilation greater than 2 days were also associated with increased mortality within 1 year.

Although the findings of this study are not surprising, they pose vital questions about health care objectives for the very elderly. What is the best care for these patients? Is 50% mortality acceptable? The study lacks data on postoperative quality of life and cognitive function. Are patients able to return to their normal lives after surgery? As clinicians we lack a comprehensive understanding of the risks and benefits of medical/surgical treatment for the elderly. Part of the puzzle is that chronological age is not necessarily equivalent to biological age. Some octogenarians live independent, active lives, whereas others need assisted living due to a decline in physiological functional capacity. In the last decade, the concept of frailty, rather than age or disease, as immersed as a valuable measure of preoperative risk

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