Commentary: Cardiac surgery around the clock!

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Circadian rhythms (CRs) are endogenous autonomous oscillators of physiological activities resulting 24-hour day/night cycles that allow organisms to adapt to a fluctuating environment.1 How much CRs could influence the outcome of patients undergoing cardiac surgery in the morning versus in the afternoon is still debated.2-4 In this scenario, the multicenter study by Nemeth and colleagues5 try to shed light on the actual prognostic role of daytime variation. The strengths of this study are the large size of the cohort and the possibility to subanalyze the most frequent cardiac operations such as coronary artery bypass grafting and aortic valve replacement. The authors clearly demonstrate that undergoing cardiac surgery in morning versus in the afternoon does not influence the outcome. Why is that?

To answer that question, we should be asking how much morning surgery can be different from afternoon surgery in terms of CR desynchronization. The circadian clock can be divided into input pathway, core circadian clock, and output pathway.1 A series of external timing cues called synchronizers can reset the circadian clock and place all cells at the same phase of circadian oscillation. Synchronizers include light, feeding, arousal stimuli (eg, social interactions, exercise, and restraint stress), temperature, chemical factors, and oxidative stress. Intriguingly, sedatives, anesthetics, surgical stress, and the intensive care unit environment have all been shown to disrupt the circadian system in patients, altering all the synchronizers independent of the time of day for which surgery is scheduled.6

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CENTRAL MESSAGE

The outcome of our patients does not depend on the time of day of the operation.
However, chronobiology should be applied also during the perioperative period. For instance, acute coronary syndrome occurs more frequently in the early morning, so beta-blockers or other rate-control drugs as well as nitrates and anti-arrhythmia drugs should be administered between 6 AM and 12 noon.  

The routine practice requires us to submit patients to cardiac surgery both during the morning and during the afternoon. After the study by Montaigne and colleagues, many patients and surgeons wondered whether it was better to wait until the afternoon to undergo or to perform a cardiac operation, especially a high-risk operation. The study by Nemeth and colleagues provides us with the opportunity to tell a patient that the outcome of his or her intervention depends on many factors, but certainly not on the time of day he or she enters the operating room.

**References**


**CENTRAL MESSAGE**

Outcomes in coronary bypass and aortic valve replacement surgery are similar regardless of morning or afternoon case.