Commentary: The dream of predicting postoperative atrial fibrillation: Are we getting closer?

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Right to left: Edward D. Percy, MD, Sary F. Aranki, MD, and Tsuyoshi Kaneko, MD.

Atrial fibrillation is a common complication after cardiac surgery, with a prevalence of 30% to 50% depending on the operation performed.¹ Its association with poor outcomes and increased economic burden has been well described.^{2,3} Given the scope of the problem, the 2011 American College of Cardiology Foundation and American Heart Association guidelines for coronary surgery recommend preemptive β -blockade.⁴ Other atrial fibrillation guidelines make broad recommendations that are not targeted with specific risk profiles in mind.⁵ Real-world risk-stratification for atrial fibrillation in cardiac surgery is not universally accepted.⁶

In this edition of the *Journal*, Burgos and colleagues⁷ present a study examining the utility of various scores for the prediction of postoperative atrial fibrillation in a large and diverse cardiac surgery cohort.⁷ The CHA₂DS₂-VASc, POAF, and HATCH scoring systems (described in the article of Burgos and colleagues⁷), applied in a retrospective fashion, all showed good discriminatory ability for the prediction of postoperative atrial fibrillation. Among them, the CHA₂DS₂-VASc score was found to have the highest predictive ability.

This is an interesting result, given that the CHA₂DS₂-VASc was originally developed to predict stroke risk and need for anticoagulation in patients with known atrial fibrillation.⁸ This finding corroborates previous studies; however, the tools have not previously been compared directly.⁹ Despite significant differences in the origins of the 3 tools, they all performed well in terms of discrimination and calibration. This may speak to the complex nature of atrial fibrillation after cardiac surgery. Nonetheless, the value of such simple and powerful screening tools should not be ignored.

The study is limited by its sample population. It was performed at a center with a large proportion of high-risk cases. Furthermore, we note that cardiopulmonary bypass was used in 52.9% of all cases and only 2.2% of CABG procedures. The link between cardiopulmonary bypass and atrial

fibrillation has been described previously.¹⁰ The high number of off-pump cases in this study limits generalizability to centers that perform mostly on-pump surgery.

The World Health Organization has adopted a framework with which to judge the utility of screening tools in medicine (Table 1).¹¹ Although these criteria are generally

Central Message

Postoperative atrial fibrillation is a common complication associated with increased morbidity and cost. If our predictive ability improves, targeted prophylaxis may mitigate its adverse outcomes.

See Article page 2279.

TABLE 1. World Health Organization's classic criteria for screening tests¹¹

1.	The condition sought should be an important health problem.
2.	There should be an acceptable treatment for patients with recognized disease.
3.	Facilities for diagnosis and treatment should be available.
4.	There should be a recognized latent or early symptomatic stage.
5.	There should be a suitable test or examination.
6.	The test should be acceptable to the population.
7.	The natural history of the condition, including development from latent to declared disease, should be adequately understood.
8.	There should be an agreed policy on how to treat patients.
9.	The cost of case finding (including diagnosis and treatment of patients in whom the condition is diagnosed) should be economically balanced in relation to possible expenditure on medical care as a whole.
10.	Case finding should be a continuing process, not a "once and for all" project.

applied to screening tests for cancer and other diseases, the principles are well worth considering in this context. The tools examined in this study fit many of these criteria. The CHA₂DS₂-VASc demonstrated an ability to discriminate and predict atrial fibrillation with a simple framework familiar to cardiovascular providers. It is painless, it is free to administer, and there are established, guideline-directed prophylactic options to offer in response to the screening outcome. This tool could easily be integrated into existing electronic medical records for automated calculation and stratification.

Any complication that affects up to half our patient population is worthy of greater understanding. Use of these rules may guide future investigation into prophylactic options for our patients at highest risk. Furthermore, as our ability to predict postoperative atrial fibrillation improves, we may better identify patients at low-risk, who thus could avoid unnecessary exposure to prophylactic medications. We hope that this research will guide a systematic approach to the prevention of this important problem.

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