One potential reason for avoiding strategies that have mixed cardioplegia and systemic perfusion temperatures (cold for one with warm or tepid for the other) is the concern that the myocardial temperature in the mixed temperatures situation would likely result in highly variable and inconsistent myocardial temperatures.¹ It has been demonstrated that the delivery of cold cardioplegia results in decreased subepicardial and midwall ventricular perfusion. This datum, coupled with information that myocardial temperature is variable with cold cardioplegia, suggests that myocardial protection may be compromised by such a mixed temperature environment.²

However, others have shown no increase in the release of myocardial injury markers (troponin I and T) after normothermic systemic perfusion relative to hypothermic systemic perfusion when a regimen of cold cardioplegia with topical cooling was used for myocardial protection, and acceptable clinical results are possible.³ Furthermore, acceptable clinical results have been reported with the technique of cold cardioplegia with warm systemic perfusion.⁴ Thus considerable controversy continues to exist regarding whether cold cardioplegia with warm systemic perfusion is harmful; however, there are no studies demonstrating its superiority to the strategy of warm cardioplegia with tepid systemic perfusion.

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References

1. Bert A, Singh A. Right ventricular function after normothermic versus hypothermic cardiopulmonary bypass. *J Thorac Cardiovasc Surg.* 1993;106:988-96.
2. Torchiana DF, Vine AJ, Titus JS, Hahn C, Shebani KO, Geffin GA, et al. The temperature dependence of cardioplegic distribution in the canine heart. *Ann Thorac Surg.* 2000; 70:614-20.
3. Birdi I, Caputo M, Underwood M, Angelini GD, Bryan AJ. Influence of normothermic systemic perfusion temperature on cold myocardial protection during coronary artery bypass surgery. *Cardiovasc Surg.* 1999;7:369-74.
4. Singh AK, Feng WC, Bert AA, Rotenberg FA. Warm body, cold heart: myocardial revascularization in 2383 consecutive patients. *J Cardiovasc Surg (Torino).* 1993;34:415-21. doi:10.1016/S0022-5223(03)01333-3

Nickel allergy to the percutaneous patent foramen ovale occluder and subsequent systemic nickel allergy

To the Editor:

We read with great interest the article "Systemic Allergic Reaction to the Percutaneous Patent Foramen Ovale Occluder" by Fukahara and colleagues.¹ In that article, Fukahara and colleagues¹ described the case of a 37-year-old patient who underwent patent foramen ovale closure with the Star device (Cardia Inc, Burnsville, Minn). In the following 2 months, the patient began demonstrating hypersensitivity to the device, confirmed by skin patch testing as an allergy to nitinol. Removal of the device ultimately led to this patient's recovery.

In October 2001, we treated an 11-year-old boy who had undergone transcatheter closure of a secundum type atrial septal defect with the HELEX Septal Occluder (W.L. Gore and Associates, Flagstaff, Ariz).² Similar to Fukahara and colleagues' patient, our patient had a similar reaction to the device; he ultimately had positive skin patch test results for nickel allergy. This patient underwent uneventful removal of the device as well but also required subsequent removal of the sternal wires, which had trace amounts of nickel. This patient was initially unavailable for follow-up at our institution. To our knowledge, however, he has had an otherwise uneventful recovery.

We thank Fukahara and colleagues¹ for their report on the subject. We encourage the cardiothoracic community at large to report such events to determine objectively the incidence of adverse outcomes that may be associated with these emerging technologies.

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References

1. Fukahara K, Minami K, Reiss N, Fassbender D, Koerfer R. Systemic allergic reaction to

the percutaneous patent foramen ovale occluder. *J Thorac Cardiovasc Surg.* 2003; 125:213-4.

2. Latson L, Zahn EM, Wilson N. HELEX septal occluder for closure of atrial septal defects. *Curr Interv Cardiol Rep.* 2000;2:268-73.

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Activated prothrombin complex concentrates and recombinant factor VIIa in the bleeding patient: Are they appropriate and safe?

To the Editor:

I read with great interest the article of Bui and colleagues,¹ "Fatal Thrombosis After Administration of Activated Prothrombin Complex Concentrates in a Patient Supported by Extracorporeal Membrane Oxygenation Who Had Received Activated Recombinant Factor VII," in the October 2002 Journal. Many issues related to the administration of activated prothrombin complex concentrates presented by this case were too simply discussed.

First, the patient had evidence of disseminated intravascular coagulation both before the cessation of heparin and after its discontinuation, with prolonged prothrombin time and partial thromboplastin time. No data are available regarding the patient's platelet count before or after surgical intervention. Both recombinant factor VIIa and factor VIII bypassing activity (FEIBA) were used off-label, about which the authors made little comment. Cardiac surgery with extracorporeal membrane oxygenation is known to activate clotting, and death might well have occurred even without either biologic agent. The cardiac death may not have been from thrombus, but of another origin; because no autopsy was performed, however, all this is pure speculation.

The authors stated with great conviction that thrombosis with recombinant factor VIIa is less common than with FEIBA. Continued hemorrhage itself is a cause of activation of coagulation. Agents known to aid in stopping hemorrhage in patients with coagulation defects have caused thrombotic episodes.

Almost all the life-threatening thrombotic events with FEIBA have occurred with doses exceeding those recommended.² Bui and colleagues¹ provided no data regarding the dose of FEIBA given. Thrombotic events, including myocardial