tralia. In our experience, the incidence of clinically significant phrenic nerve injury with this technique is less than 5%. We therefore believe that efficient topical cooling by recirculation is preferable to the use of iced saline slush with or without a pericardial insulation pad.

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References

Reply
To the Editor:

Dr. Rosenfeldt's comments highlight another important consideration concerning the use of iced saline slush for achieving topical hypothermia, specifically that of cold-induced myocardial injury. Although topical hypothermia remains part of most open-heart procedures currently done, there is no agreement as to the optimal temperature for myocardial preservation. The optimal level of cooling based on available data is a function of the parameter assayed.

For example, if one is interested in maintaining the lowest possible oxygen consumption during cardioplegic arrest, then there is little benefit to lowering the temperature below 22°C [1]. Conversely, determinations of myocardial carbon dioxide production [2] and high-energy phosphate levels [3] would indicate that the myocardial temperature should be 4°C for optimal protection. Functional recovery of the heart following ischemic arrest, which is probably the most relevant parameter, is complete in most experiments if the myocardial temperature is maintained in a range of between 4 to 20°C [1, 2, 4, 5].

Myocardial temperature below 4°C is the critical issue, as it is possible to obtain this level of hypothermia with the use of iced saline slush. Dr. Rosenfeldt's data clearly demonstrate myocardial injury at temperatures below 4°C. Furthermore, earlier reports by Speicher and colleagues [6] provide histopathological evidence of frostbite injury to the myocardium following the use of iced saline slush during aortic valve replacement.

These data would strongly support the abandonment of the use of iced saline slush during open-heart surgery.

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References