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Lessons Learned in Intraoperative Hypothermia Coming In From the Cold

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As a young surgical trainee in the 1980s, I learned quickly from my professors, and more profoundly, from my patients, that severe hypothermia was bad, eliciting a coagulopathy that, while reversible, could also be overwhelming. Hypothermia was otherwise indulged or even ignored, seen as an inevitable consequence of the operating room experience. Then, in the mid- to late 1990s, we learned that hypothermia had other consequences, including a reported increase in surgical site infections (SSIs). A landmark randomized prospective trial of routine care vs additional intraoperative warming by Kurz et al,¹ published in the *New England Journal of Medicine* in 1996, changed the landscape and led to the Surgical Care Improvement Project guidelines.² It also, as noted by Baucom et al³ in this issue of *JAMA Surgery*, led the Agency for Healthcare Research and Quality⁴ and the World Health Organization⁵ to create their own quality metric for the elimination of hypothermia. Baucom and colleagues set about to determine whether intraoperative hypothermia in patients who undergo segmental colectomy is associated with postoperative SSI and whether a more appropriate definition of hypothermia exists and to examine its effect on 30-day SSIs in patients who undergo elective colectomy. To both questions, the answer was no.

This study involved a tightly controlled population. Of 868 patients who underwent elective segmental colectomies during the 5-year period, only 296 (34.1%) were included in the analysis. Patients with inflammatory bowel disease, those who underwent urgent or emergent procedures, and patients who had stomas created were excluded. American College of Surgeons National Surgical Quality Improvement Program data were used for primary outcomes of SSI.

Unlike the study by Kurz et al, organ-space SSI was included with superficial and deep-wound infections. This decision may have obscured the primary outcome, and the fact that the study did not find any significant difference in SSI between laparoscopic and open operations would suggest that organ-space SSI was, at least, a distracting data point. Another major difference is that the landscape has changed. Given the current routine use of body-warming devices and other efforts to prevent hypothermia that are omnipresent in our operating rooms (and which were also present at Vanderbilt University Medical Center, where the study was performed), it is notable that only 7% of the patients failed to achieve the Agency for Healthcare Research and Quality metric of normothermia. On the other hand, the study by Kurz et al was a randomized study of only open colectomies in an era when the standard of care was quite different. The control group in the study by Kurz et al had a mean final intraoperative core temperature of 34.7°C compared with 36.6°C in the study by Baucom et al. It is apparent from the Baucom et al data that in their institution, like mine, the extremes of hypothermia have been eliminated, at least in the elective colectomy scenario.

So what are the lessons from this study? Namely, that we can stop worrying so much about hypothermia and turn our attention to other factors in the surgical environment that may affect SSI, including hyperoxia, goal-directed fluid therapy, and further use of laparoscopic approaches.

ARTICLE INFORMATION

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REFERENCES

1. Kurz A, Sessler DI, Lenhardt R; Study of Wound Infection and Temperature Group. Perioperative normothermia to reduce the incidence of surgical-wound infection and shorten hospitalization. *N Engl J Med.* 1996;334(19): 1209-1215.
2. American College of Surgeons National Surgical Quality Improvement Project Operations Manual: ACS NSQIP Variables and Definitions 7/1/2012, Chapter 4. <http://www.aast.org/Assets/fe526f57-5bd3-4700-94bc-497b035551db/635282483441930000/nsqip-definitions-7-1-2013-pdf>. March 19, 2015.
3. Baucom RB, Philips SE, Ehrenfeld JM, et al. Association of perioperative hypothermia during colectomy with surgical site infection [published online April 22, 2015]. *JAMA Surg.* doi:10.1001/jamasurg.2015.77.
4. Agency for Healthcare Research and Quality. National Quality Measures Clearinghouse. Rockville, MD: US Dept of Health and Human Services; 2008.
5. World Health Organization. Guidelines for Safe Surgery: Safe Surgery Saves Lives. Geneva, Switzerland: World Health Organization; 2009.