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In Reply:—Werlhof has challenged Level 1’s guarantee that 90% of HOTLINE patients will wake up warm. Level 1’s claim is supported by unpublished clinical data kept on file at the company. We found that, by changing only the infusion equipment during an extensive variety of elective surgical procedures, nine of ten patients ended the procedure warm, with temperatures ≥ 36°C, or losing no more than 0.2°C.

Fluid warmers are an important method of heat conservation. During anesthesia, average heat production decreases from roughly 70 kcal·h⁻¹ to 40–60 kcal·h⁻¹ (1 kcal·kg⁻¹·h⁻¹). Because 17 kcal are required to increase the temperature of 1 l of room temperature (20°C) crystalloid to 37°C, administering just 3 l of room temperature crystalloid would require the equivalent of nearly 1 h of an anesthetized patient’s entire energy expenditure. With the specific heat of the body being 0.85 kcal·kg⁻¹·°C⁻¹, 3 l of room temperature fluid would decrease body temperature by approximately 0.9°C.

Approximately 30 kcal are required to increase the temperature of 1 l of refrigerated blood (4°C) to 37°C. Therefore, approximately 0.5 h total energy expenditure is required to increase the temperature of 1 l of cold blood to 37°C. One liter of refrigerated blood would decrease body temperature by approximately 0.5°C.

A study using HOTLINE and no other intraoperative warming devices conducted with 56 adult patients undergoing major orthopaedic and gynecologic surgery confirmed, “The HOTLINE fluid warmer... prevented accidental hypothermia in all patients.” Nineteen patients receiving HOTLINE therapy underwent surgery that lasted approximately 4 h and received approximately 4 l of intravenous fluids. No patients receiving HOTLINE therapy finished surgery with a body temperature below 35.5°C.

Regarding the studies Werlhof cites that “demonstrate that fluid warming alone will not maintain normothermia,” none involve a HOTLINE. All use old, conventional fluid-warming technologies with exposed patient tubing that fail to deliver body temperature fluids at any flow rate. Regarding the comment that “cooling at typical flow rates is trivial and of no consequence,” the study referenced by Werlhof does not make, or even imply, this referenced conclusion. Regarding Werlhof’s statement that “intravenous fluid temperature cannot much exceed 40°C without harming blood cells,” it has been demonstrated that erythrocyte integrity is not heat-compromised until a temperature of 46°C, and the American Association of Blood Banks’ standard has allowed blood warming to 42°C since November 1994. Level 1 is committed to changing surgical results for the better, which is why Level 1 unconditionally guarantees HOTLINE. If any clinician is not satisfied with HOTLINE or its results, Level 1 will gladly make good on its money-back guarantee with no questions asked.

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References

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Neurolytic Celiac Plexus Block: Can Paraplegia and Death after Neurolytic Celiac Plexus Block Be Eliminated?

To the Editor.—The case report by Kaplan et al. in which fluoroscopy was used to verify needle placement when attempting neurolytic celiac plexus block (NCPB) and that resulted in paraplegia and death raised a question.

The incidence of a catastrophic sequela after NCPB has been stated to be 1–2%. 3–5 Cases of paraplegia have been reported after NCPB with the use of fluoroscopy to verify needle placement and without the use of any type of roentgenography. 2,7 A Medline search revealed no complications from NCPB when needle placement was verified using computed tomography (CT).

During NCPB, CT interpreted by a radiologist, unlike fluoroscopy, which is usually interpreted by the anesthesiologist performing the procedure.
CORRESPONDENCE

block, certifies whether the needle's bevel is in the wall of a major blood vessel, passes through a kidney, or lies inside the pleura or in the epidural or subarachnoid space.3,6

If the readers of this letter know of the occurrence of a catastrophic sequela from NCPB using CT, it would be helpful in evaluating whether any roentgenographic technique could eliminate a catastrophe from NCPB.

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References
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Although use of CT might eliminate the morbidity from celiac neurolysis, the extremely low incidence of paraplegia from celiac block and vascular injury from transaortic lumbar arteriography (referred in our case report4) would require many thousands of patients to be studied to compare different techniques. I would expect that paraplegia specifically would not be lessened using CT, because any major arterial source to the spinal cord arising from the aorta and in the vicinity of the injected agent could be affected and lead to cord ischemia.5

I concur with Moore's request for readers of his letter to report adverse occurrences and emphasize that all adverse events associated with celiac neurolysis, not just those involving CT guidance, should be reported. However, the only truly accurate determination of complication rates associated with celiac plexus blocks would be through a mandatory central registry of all procedures.

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