CORRESPONDENCE

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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 Level 1’s claim is supported by unpublished clinical data kept on file at the company.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 0.5°C.

Approximately 30 kcal are required to increase the temperature of 1 l of refrigerated blood (1°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 1.0–2.0%. 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. 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...
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. 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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*In Reply.*—Our patient did not experience paraplegia but aortic dissection, which caused visceral infarct, leading to sepsis and the patient’s demise.

Brown and Moore reported two cases of pneumothorax in 136 patients and no permanent neurologic or other complications. They state that the expected incidence of neurologic complications should be less than 1% but provide no reference to indicate how that was determined.

Lieberman and Waldman did not report paraplegia as a complication in 124 patients. They referenced the complications of retroperitoneal hematomas (0.1–0.5%) for the transcatheter technique specifically and paraplegia (1%) for celiac blocks in general. Although they cite a reference for the approximately 1% stated incidence of paraplegia, that reference does not indicate exactly how this figure was derived, but it appears that it was obtained by combining two case reports of paraplegia to approximately 400 patients they summarized from reported series in the literature. In addition to being an illegitimate means for determining the incidence of an event, none of the 400 patients from the summarized cases were reported to have paraplegia as an adverse event.

Eisenberg et al. quote a 1% incidence of neurologic complications, defined as lower extremity weakness, paresthesia, epidural anesthesia, and lumbar puncture. Eight of 268 patients experienced one (or more) of these complications. It is therefore difficult to know the incidence for any particular complication, and paraplegia specifically was not listed.

While a Medline search revealed no complications from celiac neurolysis when computed tomography (CT) was used, this cannot be interpreted that there are none. It can mean only that none have been reported. For example, Brown and Moore provide “hearsay” reports in their discussion of seven patients who experienced paraplegia and one who required nephrectomy after celiac plexus block. I also have heard of isolated severe complications (e.g., bilateral renal pelvis scarring and ureteral stricture; massive retroperitoneal hemorrhage leading to death) associated with celiac neurolysis, but these have yet to be brought to the attention of the medical community via journal publications. One can surmise only that not all adverse events from celiac plexus blocks are being reported, regardless of the method by which they are performed.

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