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Burn Associated with Temperature Monitoring during Magnetic Resonance Imaging

To the Editor:—In a recent letter, Bashein and Syrovoy described two cases of burns associated with the use of a pulse oximeter during magnetic resonance imaging (MRI) under general anesthesia.¹ We have had a similar case in which a patient suffered a second-degree burn from the use of a temperature probe specifically designed for use during MRI.

A 10-yr-old patient underwent MRI of the lumbosacral spine during general anesthesia. Monitoring included an axillary skin probe that is part of the Omni-Trak Vital Signs Monitoring System (Invivo Research Inc., Winter Park, FL). At the end of the 2-h procedure, examination of the axillary area revealed a large second-degree burn. Conservative therapy resulted in resolution of the burn without scarring. Examination of the probe by both the personnel present and the institution's biomedical engineers did not detect any faults in the probe.

Although equipment specifically designed for the MRI setting has been constructed to minimize both interference with the image and interference of the MRI on the monitor's signal,² it is still possible for enough heat to build up to generate a skin burn, especially if the monitor shielding is inadequate or the monitor cable is looped.³ Neither fraying nor looping was observed in this case, although the bed was moved in and out of the scanner, with consequent movement of the cable. Because of this problem, we have switched to intermittent sampling between scanning sessions as a reasonable alternative to constant sampling. Also, all monitor cables are examined after each change in patient position to prevent inadvertent cable-heating from coiling.

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In Reply:—The authors correctly point out that "looping" of conductors within the magnetic resonance imaging (MRI) bore can increase burn risk. These loops permit better coupling of the radiofrequency excitation pulses onto the conductors by essentially forming efficient antennae. We also suspect a cross-coupling effect between essentially straight, but multiple, conductors used within the MRI bore.

Specifically addressing burn from surface temperature sensors, Invivo Research Inc. would also like to point out that, in addition to the need for careful patient preparation of monitoring lead wires and constant user vigilance, the directions for use of the temperature monitoring feature given in our users' manual and reference card advise

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setting the upper temperature alarm limit to provide warning of probe tip heating. This precaution might have eliminated the occurrence of this unfortunate event.

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