



RESPONSE TO COMMENT ON UMPIERREZ AND KLONOFF

Diabetes Technology Update: Use of Insulin Pumps and Continuous Glucose Monitoring in the Hospital. *Diabetes Care* 2018;41:1579–1589

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We appreciate the comments of Delgado-Hurtado et al. (1) regarding our article (2) and the safety of MRI and CT in patients wearing insulin pumps.

The U.S. Food and Drug Administration (FDA) has reported serious adverse events, including patient injury and death, associated with the use of implantable infusion pumps in the magnetic resonance environment (3). Reported adverse events included medication dosing inaccuracies, including overinfusion or underinfusion or unintended bolus, and mechanical problems. Thus, it is recommended to remove insulin pumps during MRI procedures.

Delgado-Hurtado et al. (1) questioned the amount of evidence that exists to support the use of a lead apron to protect a pump during a CT scan. According to the FDA, when a CT scanner directly irradiates the circuitry of certain implantable or wearable electronic medical devices (i.e., when the device is visible in the resulting CT image), the radiation can cause sufficient electronic interference to affect the function and operation of the medical device, but the probability that this interference can cause clinically significant adverse events is extremely low (4).

Because of the possibility of radiation damage to an insulin pump's electronics, many manufacturers recommend removing the pump during a CT scan. Use of a lead apron is a traditional method of shielding the body or an underlying device attached to the body from exposure to radiation during a radiographic imaging study (4).

We agree that the presence of these devices should not preclude an appropriate and medically indicated CT scan because the probability of electronic interference is low. It is desirable for a clinician ordering a CT scan to discuss with the patient whether during the imaging study the pump can be safely removed, attached at a different location, or turned off and for how long, or whether alternative diabetes management is required. Interference is completely avoided when the medical device is outside of the primary X-ray beam of the CT scanner (3).

We recommend following the manufacturer's instructions for protecting an insulin pump during a CT scan. If these instructions do not mention use of a lead apron but specify removing the pump, then removal is the most prudent action.

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References

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