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Sacral neuromodulation device heating during lumbar and pelvic MRI – a phantom study

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Running head: Sacral neuromodulation device heating during imaging.

Key words: Magnetic resonance imaging, sacral neuromodulation, patient safety, MRI risks, lower urinary tract symptoms

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Abstract
Objective: To evaluate radiofrequency induced temperature rises associated with performing lumbar and pelvic magnetic resonance imaging studies with an implanted sacral neuromodulation device using a phantom model.

Materials and Methods
An accepted phantom model of RF-induced heating in human tissue was used to measure the temperature rise in the stimulator lead electrodes and impulse generator under the conditions used during routine clinical lumbar and pelvic MRIs in a 1.5-Tesla MRI scanner. Testing configurations included an intact device (tined lead connected to generator), an intact lead, and a lead fragment (model of lead fracture). Variations in the position of the phantom relative to the scanner were also tested.

Results