LETTERS TO THE EDITOR

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Necessary clarifications and minor corrections: Letter to the Editor regarding ‘2013 ESC Guidelines on cardiac pacing and cardiac resynchronization therapy’

As welcome as including an overview on performing magnetic resonance imaging (MRI) in patients with pacemakers (PMs) and implantable cardioverter-defibrillators (ICDs) as well as suggestions on how to do it are, the just recently published guidelines1 are somewhat erroneous and require clarifications and minor, but important corrections.

First, the term MRI-compatible PMs/ICDs is used—a terminology which is outdated. Instead, the standards E-DIN 6877–12 and ASTM F2503–8,3 which form the basis for the CE certification, contain only the terms ‘MR-safe’, ‘MR-conditional’, and ‘MR-unsafe’. Here, MR-conditional PMs/ICDs should be exposed to MRI scanning only within the context of precisely defined restrictions. In this aspect, MR-conditional PM systems from different manufacturers vary widely (exclusion/inclusion of thorax region, maximum permitted value of MRI sequences, type of patient monitoring, and others). All these limitations have to be known for MR-conditional PMs, in order for the MRI scans to be performed only within the limits imposed by the manufacturers.

Secondly, monitoring electrocardiogram (ECG) only during MRI may prove to be insufficient due to radiofrequency (RF) noise overlay over the ECG (see Figure 1). For patient safety, monitoring should primarily be performed using pulse oximetry, which is insensitive to RF noise.

Thirdly, in addition to consulting an electrophysiology specialist, consultation with a radiologist is at least equally warranted—in fact, it may be even more important, because only the radiologist can determine if other imaging modalities may be sufficient for making a diagnosis. Furthermore, MR sequence optimization, which is necessary to lower the risk for MRI-related effects (for MR-unsafe devices) or to guarantee that MRI is performed within the CE labelling (for MR-conditional devices) almost always requires manual changes to the MR sequences—which requires an experienced radiologist.

Conflict of interest: Claas P. Naehle is a consultant to Medtronic (Minneapolis, MN).

References

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Figure 1 Simultaneous recording of ECG (top row) and pulse oximetry (bottom row) during MRI of a PM-dependant patient. RF noise artefacts severely overlay the ECG, but leave pulse oximetry and the diagnostic value of it unaffected.

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Reply to the letter of Claas P. Naehle, MD ‘Necessary clarifications and minor corrections: Letter to the Editor regarding “2013 ESC Guidelines on cardiac pacing and cardiac resynchronization therapy”’

We thank Dr Naehle for his useful comments.

The following is our reply:

Point 1. We agree that the most correct term is ‘MR-conditional’. Actually, the term MR-conditional was used in the text, but not in Figure 12. We apologize for that.

Point 2. Probably the combination of electrocardiogram monitoring and pulse oximetry monitoring is the best solution for safety of the patients. This can be easily achieved with modern monitoring devices, which includes both features.

Point 3. Since the examination is performed by an expert radiologist, his consultation was implicit.

Conflict of interest: none declared.

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