European perspective: Comparing the AHA/ACC and ESC guidelines for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death

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In this issue of the *Journal of Nuclear Cardiology*, the ''Guidelines in Review'' series provides a comparison of the AHA/ACC and ESC Guidelines for the Management of Patients with Ventricular Arrhythmias and the Prevention of Sudden Cardiac Death.[1] Of note, the ESC guidelines committee specifically mentions in its introduction that their guidelines from 2015[2] should be seen as a European update of the 2006 AHA/ACC guidelines, which at that time were a joint effort together with ESC.[3] AHA/ACC have not come up with a specific update of those guidelines to date. For this reason, Velasco and colleagues included recommendations from other, more recent AHA/ACC guidelines on heart failure,[4] implantable electronic devices,[5] and congenital heart disease[6] in their comparison.

From a general cardiologist's perspective, the differences between both sets of guidelines with regard to device implantation are minor. While AHA/ACC distinguishes between the primary and secondary prevention for ICD therapy, and provides a longer list of class I indications, based on the specific inclusion criteria of respective large clinical trials, the ESC in their most recent version has taken a broader, more clear-cut approach: Based on the accumulated sum of evidence from clinical trials since the 2006 version, they provide one specific recommendation for ischemic and non-ischemic cardiomyopathy each, which focuses on heart failure in NYHA class II–III, LVEF $\leq$ 35%, 3 months or more on medical therapy and reasonable survival expectation as standard criteria for ICD therapy. This facilitates and homogenizes the clinical use, but has little effect on common practice because it is a well-defined summary of the other, often less precise criteria outlined in the multiple indications of the older AHA/ACC documents. Furthermore, some broader class I indications (based on better evidence obtained from more recent studies) are given for CRT and CRT-D, but the sum of the recommendations given for therapy are not going to result in relevant differences of guideline-based clinical practice between America and Europe.

For diagnostic testing and specifically for imaging, there are also no significant differences. As shown by Velasco and colleagues in a final figure to their guidelines in review comparison,[7] a matched, clear-cut strategy for the use of exercise testing and stress imaging can be derived from both guidelines. This supports the use of stress imaging in suspected CAD with intermediate pretest probability, in a manner very similar to general guidelines for the management of stable angina.[8] Also, the role of echocardiography to determine LV function and the value of direct coronary angiography in recurrent ventricular arrhythmia is emphasized, while cardiac CT and MRI are seen as class IIa indications, for assessing LV morphology/function and ruling out coronary artery disease.

What is important about both sets of guidelines is not just what is written there (especially because differences seem to be limited). From an imager's point of view, it is also important to recognize what is not written

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there (and the significant time difference between the ''older'' AHA/ACC and the ''younger'' ESC guidelines has not changed this):

No mention is made of specific techniques aiming at characterization of the substrate of ventricular arrhythmia or of ventricular dyssynchrony. Several such novel approaches have been introduced with the hope to achieve a broader application for guidance of device-based therapy. Echo-, magnetic resonance (CMR)- or gated-SPECT-based analysis of contractile patterns have been introduced and explored with regards to their benefit for identification of candidates for CRT.[9] Imaging of sympathetic innervation with MIBG[10] or PET,[11] or imaging of the gray zone using contrast-enhanced CMR,[12] have been introduced to identify subjects at elevated risk of ventricular arrhythmia. For some of those techniques, larger registries have been created years before the 2015 update of the ESC guidelines.[10] Also, at least in Europe, those techniques have been widely available for potential clinical use. Yet, they have not achieved sufficient recognition to be included in clinical guidelines. For ICD implantation, prospective studies linking the use of those imaging techniques to therapeutic decision making and subsequent outcome and/or cost benefit are lacking. For guidance of CRT, dyssynchrony imaging by echocardiography did not yield convincing results in larger trials,[13] and initial enthusiasm created by early work could not be rolled out onto a broader clinical stage.[14] And the use of CMR and SPECT in CRT, like in ICD implantation, is lacking prospective trial evidence.

As evidenced by the recent guidelines for infective endocarditis,[15] which have triggered a widespread interest in multimodal and molecular imaging of device infection, Europe does provide an environment that is generally open towards inclusion of novel imaging techniques in guidelines in case of clinical need. Hence, from a European perspective, the most important lesson to be learned as an imager from integrated analysis of American and European guidelines on ventricular arrhythmia is that efforts should be focused on finding an entry for newer imaging techniques into the next edition of these guidelines. Further prospective studies linking imaging and therapy will be needed. Continued open discussion, interdisciplinary interaction between imagers and clinicians, and standardization of techniques (within and across continents) will be other criteria to improve clinical acceptance.

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Disclosure

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