Cardiology in the Young

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When not all three-dimensional anatomic teaching resources are the same

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Letter to the Editor

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We thank Chytas and colleagues for their letter addressing our study, in which we evaluated the outcomes of a structured cardiac morphology teaching session for paediatric residents when using heart specimens.[1] Chytas and colleagues point out that several previous studies have failed to demonstrate any advantage when using three-dimensional, as opposed to two-dimensional, teaching resources.[2–5] We can several points of clarification in response to their criticisms. In the first instance, we were not aiming to make comparisons between the value of three-dimensional and two-dimensional resources for teaching. We sought to achieve no more than to assess the change in retained knowledge subsequent to teaching sessions using cardiac specimens, which of course are three-dimensional. We accept that, in our discussion, we ourselves introduced the outcomes of three-dimensional as opposed to two-dimensional teaching resources. That, however, was not an aim of the study itself.

Second, all the studies cited by Chytas and colleagues to underscore their bias in favour of two-dimensional resources had used printed models as the three-dimensional resource for teaching. We did not use printed models, but rather heart specimens. This means that the objects themselves, rather than artefacts, were being used to illustrate the points of emphasis. We recognise that, when specimens are unavailable, then printed models can have their place. Printed models, nonetheless, can have their own shortcomings, specifically based on limitations of the spatial resolution and the materials used for printing. Their quality, furthermore, depends on the quality of the underlying dataset used, and the quality of the mode of acquisition, be it CT or MRI. Specimens themselves, if properly preserved, are not susceptible to these imperfections. They are the real thing. We are unaware of any studies that have proved that specimens themselves, when used as teaching resources, are inferior to the alternative use of two-dimensional resources. It is also the case that, even when using printed models, some of the studies cited by Chytas and colleagues did demonstrate advantages when using three-dimensional resources to assess complex cardiac lesions.[5,6] Thus, we appreciate the attention paid by Chytas and colleagues to our study. We acknowledge that we discussed the issue of three-dimensionality. Our major purpose, however, was not to compare the value of our specimens, which were the real thing, with two-dimensional resources. An additional study would be required to assess that feature, which would be remarkably difficult to design.

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