**Title: Cardio-Oncology A-Z: CMR in Cardio-oncology**

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**Date:**

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- Hi, I'm Dr. Lauren Baldassarre and I am associate professor of Cardiology and Radiology and Biomedical Imaging at Yale School of Medicine.

**What additional benefit does CMR give in cardio-oncology patients?**

One of the greatest benefits of cardiac MRI in patients is that it gives not only structure and function information that one can get from some other imaging studies such as echocardiography ultrasound but it also gives additional information about what we would call tissue characterization. And that is looking a little bit closer at the muscle tissue of the heart where we can look at things like fibrosis or scar. We can look at inflammation and this is very important in many cardiology patients but specifically in cardio-oncology patients, especially when they are undergoing therapies that may have some effect on the heart, either during therapy or after receiving therapy. And we can take a closer look to see if there has potentially been any effects on the muscle of the heart.

**Does every cardio-oncology service need to have CMR?**

I think every cardio-oncology service, of course it would be ideal to always have cardiac MRI at your fingertips for patients, but at the minimum they're for certain patients where it is indicated to at least have a referral centre that patients can be sent to. But in general, yes, like cardiac MRI is an important component of a cardio-oncology practice and the imaging practice of cardio-oncology.

**Does every cardio-oncology patient need a CMR?**

So not every cardio-oncology patient needs a CMR. There's certain indications where one might want to use or consider cardiac MR. One of those indications is even just to simply look at structure and function when, for example, other imaging modalities that we would normally go to first for that question, such as echocardiography ultrasound of the heart, sometimes there's certain situations where images might not be diagnostic with those imaging modalities and cardiac MRI is considered the gold standard for cardiac function and volume. So when we really need to get a very clear answer about that for a patient, which could have implications for their cancer treatment plan, then we can reach for cardiac MRI to give us answers about the structure and the function of the heart in a very accurate way. And then additionally, on top of that, as I had mentioned previously, there are some situations where we want to look beyond that. We want to look at the muscle of the heart to see if there is potentially inflammation that can happen from certain cancer therapies or some scar or fibrosis that could happen as well. So, it's about picking and choosing the right imaging tests for the right patient at the right time. So certainly not all patients need it but there are frequently circumstances where it is appropriate to order cardiac MRI in our cardio-oncology patients.

**What are the cost and resource implications?**

So in general, cardiac MRI is a bit more expensive than, for example, ultrasound echocardiography. And so that's one of the reasons why we don't reach for it as the very first test. However, it is an affordable test. It can be used, we can do it with contrast, we can do it without contrast. There are abbreviated protocols that can be done to answer very specific questions in a short period of time that use less financial and time resources. So I think, again, it's using the test when it's appropriate, at the right time for the right patient, not just applying it to all patients.

**How can you convince oncologists of the role of CMR in their patients?**

Well, I think the best way to convince oncologists is to show them the utility in their patients. We work very closely with oncologists. They often send them to us when there's a cardiac question or concern. And when we do order a cardiac MRI and it does help change our diagnosis and management, we communicate that very closely and clearly with the oncologists to help develop a plan, next steps for that patient's cancer care. And I think when they see that, they see the utility of how it really clearly answered a question and help to move forward with a good plan for that patient and their cancer care, then it's pretty easy for them to see the benefit, and sometimes even oncologists in certain circumstances, will order a cardiac MRI on their own. They know, after working with us and others, to help take care of many patients, that sometimes they even know when they can order one, they don't even always have to refer to us to do that.