

## ASNC INTERNATIONAL SESSION—EDITORIAL

## Radiation Reduction and Competing Technologies in Cardiac Imaging from a Nuclear Perspective

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The many challenges faced by Nuclear Cardiology (NC) presently are ironically the result of the great success that NC has enjoyed in the realms of diagnosis of ischemic heart disease (IHD). The recognition that demonstration of ischemia and viability are so important to the management of IHD has made it such that many other modalities are now trying to emulate the success of NC. This has resulted in competition for the same patient population, and it is important to realize the benefits and adverse effects that each of these modalities have. Knowing these imaging variables will put the ordering physician in a better position to order the test best suited for the individual patient. NC also inherently involves radiation risk for the patient, and this issue should be adequately addressed.

**Radiation reduction in nuclear cardiology**

Exposure to radiation has always been a risk in cardiac imaging. The hazards of radiation have been made more apparent by the Fukushima incident in Japan in March 2011, and many publications have highlighted the need to reduce the radiation burden of myocardial perfusion imaging (MPI) (1–3). Although NC employs very low doses of gamma-emitting radio-isotopes, the cumulative risks are not negligible, especially in the younger population. It is thus important to employ strict radiation reduction strategies so as to minimize the radiation exposure in NC. Strategies such as tailoring the radio-isotope dose to the size of the patient, employing a stress first protocol, using the newest software and hardware technologies to reduce the amount of radio-isotope required and performing the test only when clinically indicated are all steps that can be taken to reduce radiation exposure.

The American Society of Nuclear Cardiology (ASNC) has published a set of guidelines for such radiation reduction measures (4). It presents a framework by which decisions pertaining to the type and appropriateness of imaging can be made when a patient is referred for MPI, with the ultimate goal of achieving maximal reduction in patient radiation exposure. The guidelines also recommend the application of appropriate use criteria, and urge the consideration of alternative imaging modalities without radiation exposure in younger patients. Finally, it is also emphasised that achieving these goals will require individualised patient assessment at the time of scheduling and flexibility in dealing with patient flow, as multiple patient factors may contribute to the eventual choice of protocol.

Furthermore, the Imaging Wisely and Choosing Wisely (5, 6) campaigns are very relevant in selecting the most appropriate forms of cardiac imaging for each patient. In this issue of ANC, the radiation reduction strategies and impact of radiation on the cardiac imaging community in Japan are highlighted.

In this issue of *Annals of Nuclear Cardiology*, Kudo T alluded to the increased of cardiac CT imaging at the expense of cardiac nuclear SPECT imaging, because of the widespread availability of CT machines in the country (7). This phenomenon is currently being corrected by increased physician education on the useful on functional imaging as opposed to anatomical ones. The frequent use of Thallium-201 for nuclear cardiac imaging is also being phased out due to increased recognition of the higher radiation exposure to the patient. Japan is recognized worldwide for its use of BMIPP and MIBG for cardiac imaging, and other countries should

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learn about the Japanese experience of these radio-isotopes and perhaps use these agents more frequently (7).

### Competition in cardiac imaging

With the knowledge that ischemia and viability are fundamental to the management of IHD, many techniques are now available for perfusion and viability imaging. However, one should realize that NC is the only true metabolic imaging technique for assessment of viability. Each technique has its pros and cons, and recognition of these is essential. Many factors are important in deciding on the cardiac imaging test to perform, such as patient comfort, the need for contrast or radio-isotope injections, duration of imaging, cost of imaging, radiation exposure, availability of technique and expertise, diagnostic accuracy of the test and finally physician preference and knowledge (8-10). Once again, in this issue of ANC, the South American experience on imaging competition in IHD is discussed.

In his review article, Vitola JV introduces some interesting suggestions as to how to promote the use of nuclear cardiology for diagnosis and treatment of coronary disease. In a summarized form, the suggestions deal with a) providing a clinically useful nuclear cardiac report, b) providing a forum for discussions in nuclear cardiology in the form of conferences and meetings, c) education of cardiologists and physicians alike, d) encouraging research in all aspect of nuclear cardiology to improve its implementation (11).

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### Conflicts of interest

None.

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