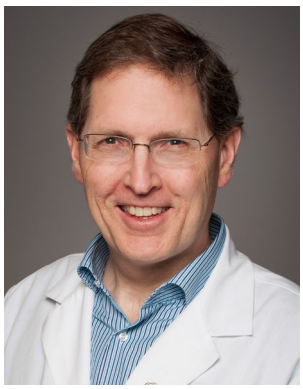
ASNC PRESIDENT'S MESSAGE

WHAT DOES THE FUTURE HOLD FOR NUCLEAR CARDIOLOGY?



Rob S.B. Beanlands MD, FRCP(C), FASNC. President of ASNC, 2019.

Beware of prophecy, especially about the future

Whether it was Nostradamus, Mark Twain, Neils Bohr or Yogi Berra who said it, these wise words remind us to be cautious when discussing the future. However, it is important to consider current trends and to anticipate the direction of our field so we may set our own goals, adapt and potentially shape our own future to provide best patient care.

In the tradition of many of our prior leaders, the first president's message for 2019 highlights the above titled presentation from the 2018 annual ASNC meeting. In preparation for this, the 2018 ASNC executives (P. Soman, R, Russell, B. Abbott, S. Dorbala, R. Thompson, D. Calnon, K. Flood) were polled with these three questions:

What do you think will be the single most important:

1. Development to impact nuclear cardiology in the next 5 years?
2. Development to impact nuclear cardiology in the next 20 years?
3. Thing that ASNC can do to prepare for or enable the future success of nuclear cardiology?

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Before providing their responses, it is important to consider the different forces which shape our future.

There are ''external forces'' such as: the environment; society with its evolving culture (social media, social accountability, diversity, globalization); political forces; economic forces and technological advances. In general, while our field may not directly impact these, we must embrace and adapt to these forces. Closer to home are potential future breakthroughs relevant to the medical field such as in personalized medicine, regenerative therapies and immunological therapies for which nuclear imaging has the potential to play a pivotal role in optimizing patient selection for innovative therapies which may carry high costs and/or risks. Another anticipated future development is the role of machine learning and deep learning that show potential application in cardiovascular disease and cardiac imaging.[1] Early work already shows improved accuracy for detecting obstructive CAD with myocardial perfusion imaging.[2]

There are also ''internal (or strong 'nuclear') forces'' that are emerging in the nuclear cardiology field. In consideration of some of these, the celebration of the 25th anniversary of ASNC gave me pause to consider other life celebrations such as weddings and the tradition of '*something old, something new, something borrowed and something blue'* which remind us of some current trends (internal forces) that are shaping our future:

Who would have thought that ***something old*** such as Tc-99m pyrophosphate imaging (Figure 1) would emerge as one of the most useful new applications and a major tool to direct new therapies for cardiac amyloidosis? This is a reminder that in addition to validated accurate and reproducible methods that are safe, available and easy to apply, the value of imaging in practice has the greatest impact when results can change clinical decisions to enable effective therapies that improve patient outcomes or quality of life.

The FAME trial[3] showed that therapy directed by flow physiology can lead to improved outcomes compared to anatomy alone. The concept of functional significance to direct therapy decisions is one ***borrowed*** from myocardial perfusion imaging originally used to validate FFR! We have also ***borrowed*** the concept of flow quantification with PET and shared this with

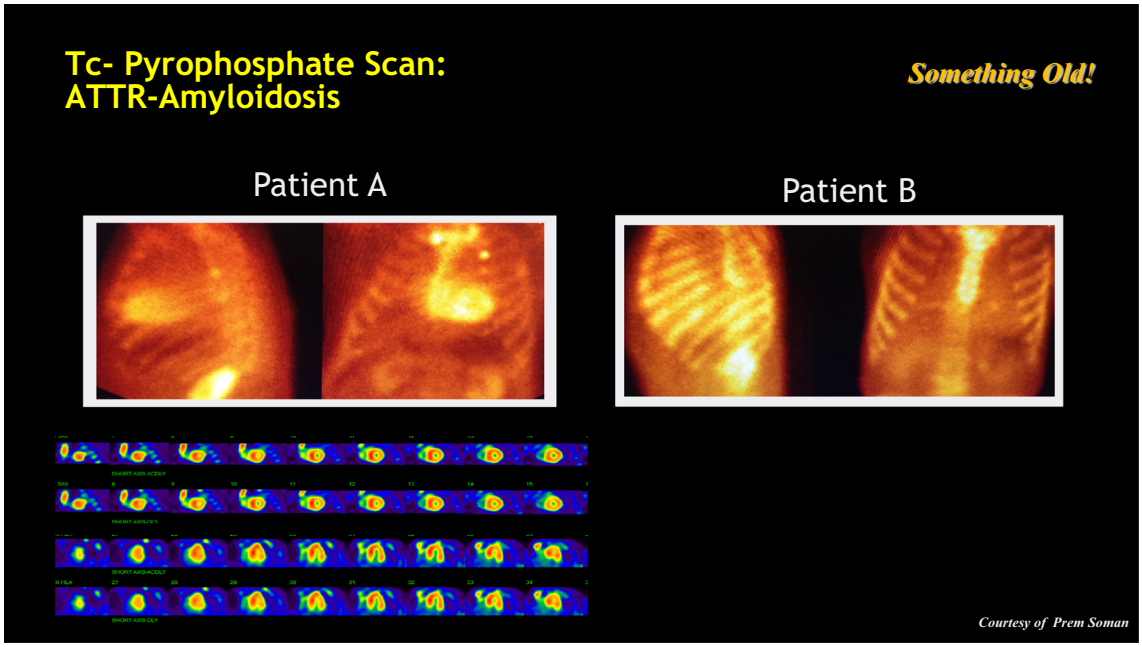

Figure 1. Tc-99m pyrophosphate images: (A) in a patient with ATTR Cardiac Amyloidosis; (B) in a patient without Cardiac Amyloidosis. Courtesy of Dr Prem Soman.

SPECT[4] which has the potential to significantly broaden the impact of this tool with proven diagnostic and prognostic capabilities. Flow quantification with PET and SPECT is certain to be part of our future.

New is the emerging potential of plaque inflammation imaging with novel tracers such as ^{68}Ga-DOTATATE[5] building on the increasing robust data using ^{18}F-FDG, but with greater specificity for macrophages and with the ability to better define coronary vessel inflammation. With new emerging immunotherapies such as canakinumab,[6] the use of plaque inflammation could become pivotal to decisions for this novel therapy.

As for something ***blue,*** *(or blue-green; the color of money)* value-based healthcare has emerged as central to the practice of cardiac imaging. This is eloquently articulated in the scientific statement from the AHA by L. Shaw et al.[7] where the patient is at the center of care (Figure 2). ***Blue*** (*and green*) also symbolizes the world and international reach of ASNC now in 62 countries. Nuclear cardiology continues to have global impact in the management and care of patients—the strength of this international impact will be an important force that affects our future.

So, what did our executive prophets say? Seven out of eight said the single most important development in nuclear cardiology in the next 5 years will be related to myocardial blood flow with PET and SPECT. Over the next 20 years, most of our experts suggested that important developments will be related to targeted, non-perfusion imaging expanding beyond CAD [molecular imaging, innervation, apoptosis, amyloidosis, etc]. Other developments they proposed that will impact nuclear imaging included: artificial intelligence and the role of CT in stable CAD as well as the regulatory and business side of medicine whereby algorithms and payment plans may direct the ‘‘right test’’ for the right patient at the right time.

As far the single most important thing ASNC can do to prepare and enable the future success of nuclear cardiology, our expert executive members indentified the following actions: education around the world; focus on quality; development of molecular tracer; have robust scientific data to support the use of nuclear cardiology; value payment models and perhaps most importantly, ***invest in our trainees and young faculty!***

Fortunately thanks to you, the nuclear cardiology community, Dr. Prem Soman (past-president), our executive and other previous leaders, ASNC is well poised to take the lead and define the future with strategies for professional development, quality and research initiatives, advocacy, membership engagement as well as building alliances and collaborations. Through its strategic plan to inspire research in innovation;

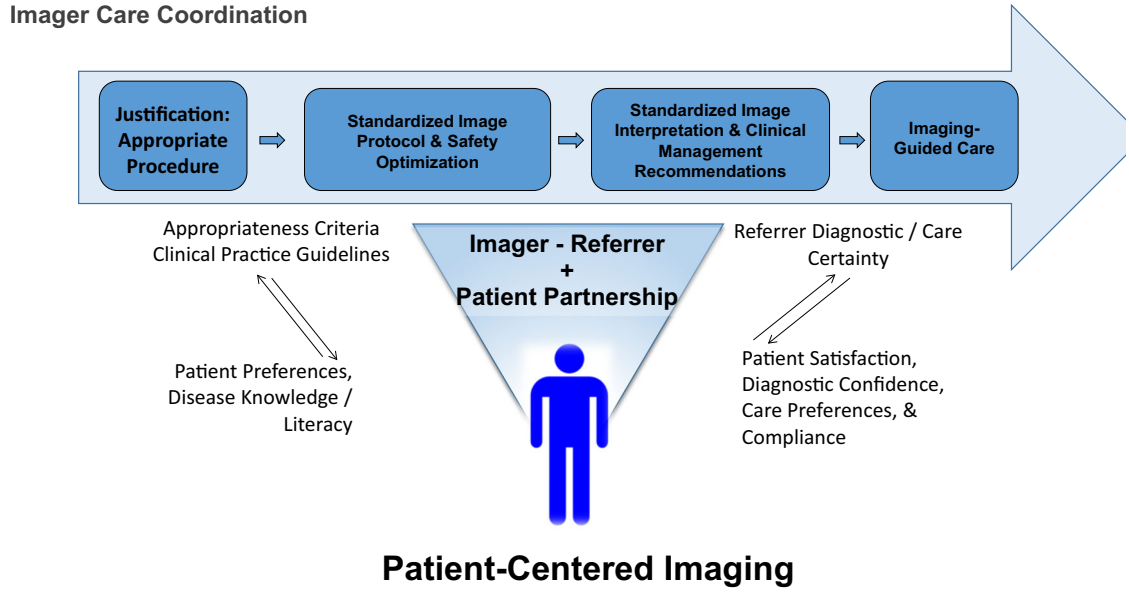

Figure 2. Imager Care Coordination, reprinted from Shaw et al.[7] (with permission from Dr Leslee Shaw and Circulation Cardiovascular Imaging (American Heart Association)).

enhance engagement pathways for early career professionals; and a call for a partnership and alliances, ASNC will continue to transform nuclear cardiology and its unique role in cardiac imaging.

Key activities planned for the next year include (among others):

- Development of on-line PET curriculum and PET workshops
- Amyloid workshop and education efforts to raise awareness and support quality imaging
- Nuclear cardiology workshops in countries around the world
- Future Leaders Symposia and an enhanced leadership development program

The future will be bright if we focus on our strengths [quality, education, research and programs]; take care of our patients [value based care]; find the care gaps and create solutions [e.g., amyloid imaging, flow quantification, inflammation, AI]; collaborate to compete; lead by example nationally and globally; and remember to foster our youth.

I am humbled by this opportunity to serve as ASNC President but it's thanks to you the nuclear cardiology community and the strong ASNC team led by Kathy Flood—***our future is bright***.

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