

Journal of Nuclear Cardiology
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A CLINICALLY VALIDATED TOOL TO HELP DIAGNOSE CORONARY ARTERY DISEASE

A conversation with **DEREK STEPTOE**, Senior Nuclear Cardiology Specialist at Bracco Diagnostics Inc.



Heart disease is the leading cause of death worldwide, accounting for more than 15 million deaths each year. Advances in technology have improved the diagnosis and management of coronary artery disease (CAD), but physicians still face challenges identifying the progression of CAD in patients and the most appropriate treatments. HeartSee™, a new software package from the imaging company Bracco Diagnostics, combines coronary flow, flow reserve and flow capacity data into a clinical tool that, when used in combination with standard PET MPI images, helps physicians more accurately understand a patient's condition. Derek Steptoe, a Senior Nuclear Cardiology Applications Specialist at Bracco, discusses how HeartSee allows clinicians to draw more diagnostic information from their cardiac PET imaging.

What is your background and current role with HeartSee?

At Bracco, I'm primarily involved in the development, implementation, training and education of the HeartSee software for cardiology, physicians and hospitals. Before joining Bracco, I was a nuclear medicine technologist working with Dr. K. Lance Gould at the University of Texas Weatherhead PET Imaging Center. Dr. Gould wanted an improved program to measure myocardial blood flow, so he invented HeartSee. During my time there, we tested HeartSee every day on every patient at our facility to gather data on its clinical performance.

How does this software add diagnostic value to traditional cardiac PET?

HeartSee displays traditional Rb-82 PET perfusion data and also quantifies myocardial blood flow and myocardial flow reserve information. Unlike other coronary flow software, it integrates that information into what is called a coronary flow capacity (CFC) map. That map categorizes a patient's CAD into stages of severity that range from normal to severely ischemic and is designed to make it easier for physicians to understand a patient's disease state. The CFC map was validated with more than four thousand patients to identify what CFC looks like for normal people and those with various risk factors and known disease. It accounts for

heterogeneity, biological variability, and other challenges associated with PET MPI, giving physicians a more complete representation of a patient's disease state.

How does the tool improve the management of coronary artery disease?

In March, Dr. Gould and his colleagues published research in the *Journal of Nuclear Medicine* that showed a 54% reduction in the risk of death, myocardial infarction or stroke for patients with a severe regional abnormality, as indicated by HeartSee, who were revascularized within 90 days of their diagnosis with cardiac PET. The CFC map outperformed traditional stress myocardial flow and flow reserve data alone, which are the two traditional metrics used to supplement perfusion images. HeartSee displays that information, but goes beyond to measure CFC, which the study showed was the best predictor for patient outcomes.

How can this product change patient-physician interactions?

Physicians with the CFC map can have different conversations with their patients. If a patient has known stable CAD, but it doesn't severely reduce CFC, the conversation may involve lifestyle changes, medical treatments or other conservative therapies the physician and patient deem beneficial. That's very different from a conversation

with someone who has stable CAD, but also severely reduced CDC. In those situations, the physician might decide doing an intervention and revascularization is warranted.

How does Bracco support those who want to use this software?

When you're talking about cardiac PET, myocardial blood flow measurement and HeartSee, training is critical. The right training enables hospitals, physicians and clinics to best assist their patients. Bracco takes a customized, one-on-one approach, in which we sit down with the physicians and technologists and walk them through everything from concepts and theories to hands-on application of HeartSee. With new program implementation, there's training before the physician starts doing PET MPI or myocardial blood flow measurement, then there's a week-long training session the week they start, as well as follow-ups with additional training. We are involved continuously.

What impact does this product have on the healthcare community?

When people go to their cardiologist to get a cardiac PET scan, what they want to do is live longer and feel better. Physicians and hospitals are always looking for ways to manage disease progression and identify whether

their patients need interventions. HeartSee is one of many advanced imaging techniques from Bracco that helps address a real challenge for hospitals and physicians while providing a real benefit for patients.

INDICATIONS FOR USE

HeartSee™ Software for cardiac positron emission tomography (PET) is indicated for determining regional and global absolute rest and stress myocardial perfusion in cc/min/g, Coronary Flow Reserve and their combination into the Coronary Flow Capacity (CFC) Map in patients with suspected or known coronary artery disease (CAD) in order to assist clinical interpretation of PET perfusion images by quantification of their severity.

HeartSee™ is intended for use by trained professionals such as nuclear technicians, nuclear medicine or nuclear cardiology physicians, or cardiologists with appropriate training and certification. The clinician remains ultimately responsible for the final assessment and diagnosis based on standard practices, clinical judgment and interpretation of PET images or quantitative data.

REFERENCES

Gould, K. Lance et al. "Regional, Artery-Specific Thresholds of Quantitative Myocardial Perfusion by PET Associated with Reduced Myocardial Infarction and Death After Revascularization in Stable Coronary Artery Disease" *Journal of Nuclear Medicine*. 10.2967/jnumed.118.211953 (August 16, 2018)

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The innovative diagnostic tool that helps you get more from your cardiac PET imaging

We are Cardiac PET™

When it comes to management of coronary artery disease, all the data matters.

Unique coronary flow capacity (CFC) map shows regional and global coronary defects and helps categorize severity of disease.

HeartSee delivers the new CFC map in easy to interpret reports along with traditional diagnostic data.

Invasive coronary intervention within 90 days after the PET scan is associated with a 54% reduced risk of death, myocardial infarction or stroke over five years for patients who show severely reduced blood flow capacity on HeartSee's CFC maps.¹

See the potential.

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REFERENCES: 1. K. Lance Gould, Nils P. Johnson, Amanda Roby, Tung T. Nguyen, Richard L. Kirkeeide, Mary Haynie, Dejian Lai, Hongjian Zhu, Monica B. Patel, Richard W. Smalling, Salman Arain, Prakash Balan, Nguyet (Tom) Nguyen, Anthony Estrera, Stefano Sdringola, Mohammad Madjid, Angelo Nascimbene, Pranav Loyalka, Biswajit Kar, Igor Gregoric, Hazim Safi and David McPherson. Regional Artery Specific Thresholds Of Quantitative Myocardial Perfusion By PET Associated With Reduced MI and Death After Revascularization In Stable CAD. *J Nucl Med*, 2018 Aug 16.

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