

New Study Published in *Journal of the American College of Cardiology* Finds Utilization of Contrast Echocardiography with Definity® Improves Patient Diagnosis and Management

February 24, 2009 2:59 PM ET

Study Finds Decrease in Percentage of Uninterpretable and Technically Difficult Studies with Contrast Echocardiography

N. BILLERICA, Mass. (February 24, 2009) – Lantheus Medical Imaging, Inc., a worldwide leader in diagnostic imaging, today recognizes and comments on a paper published online in the February 2009 issue of the *Journal of the American College of Cardiology* that reinforces the clinical use and impact of its echocardiography contrast agent DEFINITY® Vial For (Perflutren Lipid Microsphere) Injectable Suspension in hospitalized and critically ill cardiac patients. New data from a prospective, single center, cohort study of over 600 hundred patients find the use of contrast echocardiography with DEFINITY® in technically difficult cases improves endocardial visualization and significantly impacts cardiac diagnosis, resource utilization and patient management decisions. The study authors include Dr. William A. Zoghbi, M.D., F.A.C.C., and his colleagues at Cardiovascular Imaging Institute, The Methodist DeBakey Heart and Vascular Center in Houston, Texas.

The prospective study was designed to evaluate the impact of echocardiographic contrast utilization on patient diagnosis and management. While contrast echocardiography (CE) has improved left ventricular opacification and delineation of endocardial borders, its impact on physician decision making has not been evaluated in a large study.

“This large clinical study, conducted by Dr. Zoghbi and his collaborators, involved 65 practicing clinicians and reinforces the impact of DEFINITY® echocardiography among hospitalized and intensive care unit patients. The study found that the physicians’ ability to help their patients was positively impacted by the appropriate use of DEFINITY® contrast,” said Mark Hibberd, M.D., Ph.D., senior medical director, global medical affairs, Lantheus Medical Imaging, Inc. “This study confirms the important clinical use of DEFINITY® and that better left ventricular opacification and endocardial border delineation allows physicians to significantly improve left ventricular functional assessments and the detection of left ventricular thrombus. In doing so, other more costly tests were avoided and drug therapies were better tuned to patient needs. The impact of the appropriate use of DEFINITY® contrast was largest in critical care settings, where other diagnostic options are limited.”

A total of 632 consecutive patients (545 hospitalized inpatients and 87 outpatients) with technically difficult studies who underwent a rest echocardiogram and received DEFINITY® for endocardial enhancement from June to October 2007 were enrolled in the study. A technically difficult study was defined as a study in which > 2 myocardial segments were not visualized at baseline from any imaging window. Quality of the studies, number of left ventricular (LV) segments visualized, estimated left ventricular ejection fraction (LVEF), the presence, absence or suspicion of apical thrombus, and management decisions were compared before and after contrast.

The study found that the percent of uninterpretable studies decreased from 11.7% to 0.3% and the number of technically difficult studies decreased from 86.7% to 9.8% ($p < 0.0001$) after contrast echocardiography. An LV thrombus was suspected in 35 patients and was definite in three patients before CE. After contrast, only one patient had a suspected thrombus, and five additional patients with thrombus were identified ($p < 0.0001$).

A significant impact of CE on management was observed. In particular, additional diagnostic procedures were avoided in 32.8% of patients and drug management was altered in 10.4%, with a total impact (procedures avoided, change in drugs, or both) observed in 35.6% of patients. The impact of contrast increased with worsening quality of baseline non-enhanced study, the highest being in intensive care units. Lantheus did not provide funding for the study.

“These findings further support the benefit-risk profile of DEFINITY® and underscore the importance of ultrasound contrast with DEFINITY® in hospitalized patients, and especially in critically ill cardiac patients,” said Don Kiepert, president and CEO, Lantheus Medical Imaging, Inc. “These data provide the medical community with important, new clinical evidence of how DEFINITY® can significantly impact clinical decisions and improve the usefulness of their echocardiograms. Lantheus remains committed to providing important clinical and safety information on the use of DEFINITY® in routine clinical practice.”

Online copies of the article can be found at:

- *Journal of the American College of Cardiology*: “Impact of Contrast Echocardiography on Evaluation of

<http://content.onlinejacc.org/cgi/content/full/j.jacc.2009.01.005v1>

About DEFINITY®

Since its launch in 2001, activated DEFINITY® Vial For (Perflutren Lipid Microsphere) Injectable Suspension has been administered to over two million patients.¹ In patients with suboptimal echocardiograms, DEFINITY® enables physicians to visualize the borders of the heart more clearly.^{2,3}

In 2008, Lantheus announced the initiation of CaRES (Contrast Echocardiography REgistry for Safety Surveillance), the first multi-center Phase IV observational registry that will further evaluate the safety profile of DEFINITY® in patients with suboptimal echocardiograms and provide safety information on the use of ultrasound contrast agents in routine clinical practice. The open-label, non-randomized registry is being conducted in more than 10 clinical sites in the United States and will include at least 1,000 patients. The study will gather data on patient characteristics and demographics, indication for DEFINITY®'s use, results of safety monitoring of patients during and after DEFINITY® administration, and the nature and frequency of any adverse events that may occur.

Indications

Activated DEFINITY® (Perflutren Lipid Microsphere) Injectable Suspension is indicated for use in patients with suboptimal echocardiograms to opacify the left ventricular chamber and to improve the delineation of the left ventricular endocardial border. The safety and efficacy of DEFINITY® with exercise stress or pharmacologic stress testing have not been established. For full prescribing information, please visit www.lantheus.com.

Important Safety Information About DEFINITY®

WARNING: Serious Cardiopulmonary Reactions

Serious cardiopulmonary reactions, including fatalities, have occurred during or following perflutren-containing microsphere administration.

- Assess all patients for the presence of any condition that precludes DEFINITY® administration (see CONTRAINDICATIONS).
- In patients with pulmonary hypertension or unstable cardiopulmonary conditions, monitor vital sign measurements, electrocardiography and cutaneous oxygen saturation during and for at least 30 minutes after DEFINITY® administration (see WARNINGS).
- **Always have resuscitation equipment and trained personnel readily available.**

Do not administer DEFINITY® to patients with known or suspected cardiac shunts (right-to-left, bi-directional or transient right-to-left), or hypersensitivity to perflutren. Do not administer DEFINITY® by intra-arterial injection.

In postmarketing use, uncommon but serious reactions observed during or shortly following perflutren-containing microsphere administration included fatal cardiac or respiratory arrest, loss of consciousness, convulsions, symptomatic arrhythmias (atrial fibrillation, supraventricular tachycardia, ventricular tachycardia or fibrillation), hypotension, respiratory distress or cardiac ischemia (see ADVERSE REACTIONS). The risk for these reactions may be increased among patients with pulmonary hypertension or unstable cardiopulmonary conditions (acute myocardial infarction, acute coronary artery syndromes, worsening or unstable congestive heart failure, serious ventricular arrhythmias or respiratory failure, including patients receiving mechanical ventilation). In the absence of these underlying conditions, observe patients closely during and following DEFINITY® administration.

Always have cardiopulmonary resuscitation personnel and equipment readily available prior to DEFINITY® administration and monitor all patients for acute reactions.

About Lantheus Medical Imaging, Inc.

Lantheus Medical Imaging, Inc., a worldwide leader in diagnostic medicine for the past 50 years, is committed to advancing the field of diagnostic imaging. The company's proven success in discovering, developing and marketing innovative medical imaging agents provides an unparalleled platform from which to bring forward breakthrough new tools for the diagnosis and management of disease. The company is home to leading diagnostic imaging brands, including Cardiolite® (Kit for the Preparation of Technetium Tc99m Sestamibi for Injection), DEFINITY® Vial For (Perflutren Lipid Microsphere) Injectable Suspension, and TechnoLite® (Technetium Tc99m Generator) and has nearly 700 employees worldwide with headquarters in North Billerica, Massachusetts, and offices in Puerto Rico, Canada, and Australia. For more information, visit www.lantheus.com.

¹ Source: *The Echocardiography Monthly Monitor: United States, October 2001-September 2007*, Arlington Medical Resources, Inc., Malvern, PA.

² Kitzman DW et al. Efficacy and safety of the novel ultrasound contrast agent perflutren (definity) in patients with suboptimal baseline left ventricular echocardiographic images. *AM J Cardiol*. 2000; 86: 669-674.

³ Data on file, Lantheus Medical Imaging, Inc.