

INTERNATIONAL SOCIETY FOR COMPUTERIZED ELECTROCARDIOLOGY
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Before 1 December 2004 email the abstract and submitter information as an attachment in MSWord format (*.doc) or Rich Text format (*.rtf).

REGULAR SUBMISSIONS:

Dr. Charles Antzelevitch
Email: ca@mmrl.edu
Phone: 315-753-3217

JOS WILLEMS YOUNG INVESTIGATORS COMPETITION

Dr. Janice M. Jenkins
Email: jenkins@umich.edu
Phone: 312-540-9697

1. Robert A. Warner
PRINT- Name of presenting author -PRINT
2. Inovise Medical, Inc.
Institution
3. 10565 SW Nimbus Ave. Ste. 100
Address
4. Portland _____ 5. OR _____
City State
6. USA _____ 7. 97223-4311 _____
Country Postal Code / Zip
8. 503-431-3856 _____
Telephone
9. 503-431-3801 _____
Fax
10. warnerb@inovise.com _____
Email

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Using Simultaneous ECG and Acoustical Data to Evaluate and Monitor Patients with Cardiac Disease

Robert A. Warner, Eunyoung Lee, Patricia Arand,
Andrew D. Michaels, Barbara J. Drew
University of California, San Francisco, and Inovise Medical, Inc.
San Francisco, CA and Portland OR, USA

Background: Acute myocardial ischemia is associated with hemodynamic as well as ECG abnormalities. For example, impaired left ventricular (LV) systolic function can produce a third heart sound (S3) that previous research, as reflected in the ACC/AHA Practice Guidelines, has shown to be associated with increased clinical risk.

Methods: We obtained ECG and acoustical data from 89 patients prior to cardiac catheterization using Audicor™, a device that records and algorithmically interprets simultaneous 12-lead ECG and electronic cardiac sound recordings. In an additional patient, we recorded continuous Audicor™ data immediately before and during the early phase of an acute ST elevation anterior myocardial infarction (MI). We displayed these continuous data using a method that reveals statistically significant changes in diagnostic parameters from their respective baseline values.

Results: In the 89 pre-cath patients, the recorded S3 had a sensitivity /specificity for detecting an LV ejection fraction <50% and LV end-diastolic pressure >15mmHg of 13/21 (sens, 62%); 60/68 (spec, 88%). In the acute MI patient, acoustical changes preceded ECG changes and a new S3 appeared shortly after the onset of the acute MI.

Conclusions: Electronically recorded S3 identifies patients with impaired LV systolic function and recorded heart sounds can be added to multi-parameter monitoring of patients with suspected acute MI.