upon Duke and Northern New England survival models. Pre-post changes were evaluated with McNemar's test for matched-pair data or the sign test as appropriate.
Results: We enrolled 200 patients (mean age 64.6 years, 56.5% male, 66.5% white, 32% with more than high school education) during the study period. Prior to viewing the SDP, 89% of patients wanted more information about IHD. After viewing the SDP, 39% (26/66) of patients who were initially undecided about a treatment choice were able to select a treatment (p=0.001). Patients reported greater comfort in selecting a treatment (p=0.0002), greater confidence in their chosen treatment (p=0.0002), and less anxiety with the decision process (p=0.0001). In addition, patients reported greater comfort with their knowledge (p=0.0002) and less desire to know more about IHD (p=0.0002). 64% of patients rated the SDP as "very helpful" or "most helpful" in the decision process.
Conclusion: The majority of patients considering coronary revascularization report a need for more information. These data demonstrate that provision of information through an electronic format can address this need and consequently enable patients to take a more active role in their care. With rising time constraints on health care providers, evolving technologies have the potential to supplement physicians in informing major treatment decisions.

3:48 p.m.

1144MP-125 Use of Wireless Local Area Network Systems in Coronary Care Units in Canadian Hospitals

Kok-Swang Tan, Wayne Tymchak, Irwin Hinberg, Richard F. Davies, *University of Ottawa Heart Institute, Ottawa, Canada, Medical Devices Bureau, Health Canada, Ottawa, Canada.*

Computer-based wireless local area network (LAN) systems have the potential to provide real time access to medical information at the bedside. The purpose of this study was to address concerns about the susceptibility of electromedical devices in a coronary care unit (CCU) to electromagnetic interference (EMI) from wireless LAN systems. It was conducted as a collaboration between the Medical Devices Bureau of Health Canada, the University of Ottawa Heart Institute, and University of Alberta Hospitals as part of the Acute Care Extended Surveillance (ACES) project.
The system tested consisted of a PC server linked to a Lucent Wavepoint II fixed emitter located centrally in the CCU just below ceiling level, which communicated with Fujitsu Stylistic LT mobile pen based computers equipped with a Lucent Silver Turbo PCMCIA transceivers. Output from both fixed and mobile transceivers was measured at varying distances. The susceptibility to EMI from both was evaluated for a total of 41 medical devices from 22 different device classes in the CCU of both hospitals. Each device was tested 1) at the usual operating distances and 2) as close as possible to the transceivers. The power output of the Wavepoint II transceiver was less than 100 mW and generated an electrical field strength of 0.1 V/m at one meter, compared to the background electric field strength of <0.5 V/m at each test site. The mobile transceiver produced mild distortion of a diagnostic ultrasound image when held within 0.2 meters of the ultrasound probe. Otherwise, no interference was seen with the functioning of any medical device, even at minimal distances. No tested medical device interfered with RF LAN functioning. All wireless LAN technology should be tested for interference with potentially susceptible devices by the hospital before implementation. These findings suggest that wireless LAN systems may be acceptable for use in most hospitals. This technology may reduce the cost of computerization by eliminating the need for hard wiring and by allowing each mobile workstation to be used for several patients.

4:00 p.m.

1144MP-126 New Uses of the VA's Multimedia Electronic Patient Record in Patient Care, Research, and Education

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Background: The VA multimedia electronic patient record, which is available at over 1500 workstations throughout the Washington VA Medical Center, presents the entire patient record using a GUI based patient chart, with all diagnostic images, including ECGs, and cine loops. The electronic patient record is available remotely and, using the VA's HealtheVet initiative, includes a Web based record a patient can share with third party physicians. System: Using standard off-the-shelf components, the VA has built a distributed network that manages all aspects of the clinical record. Capture stations collect images, which are saved to an optical jukebox and linked to the legacy text based database. A fiber optic backbone distributes information to the data closets. A 10/100-MB link ensures the timely display of large image files such as x-rays and cineangiograms. Cardiology images include echoes, coronary arteriograms, ventriculograms, MUGA, thallium studies, X-rays, and ECG tracings, as well as other multispecialty images. The Cardiology database includes records of over 7,272 Caths; 7,494 Holters; 86,264 ECGs; 22,786 Echocardiograms; 11,213 ETTs; and 1,934 EPs. Results: Non-patient care duties have been significantly streamlined as all notes, orders, reports, and discharge summaries are written directly into the workstation. Delinquent charts have all but been eliminated. Lab values can be compared and plotted. Diagnostic images are available with the chart at any point of care. All patient data is on-line and can be used for reminders, which directly order necessary tests. The database is being mined for research purposes, which has resulted in new treatment protocols being developed and tested for diabetes and hypertension. Patient education is improved since the patient chart can be explained in the doctor's office. Patients participate in their treatment using the Health-eVet web based chart by entering home based measurements and treatments by third party physicians. Conclusions: Clinicians have a tool that provides complete Cardiologic and other patient information, which enhances their productivity and provides better patient care.

4:12 p.m.

1144MP-127 Can Two-Dimensional Echocardiography Accurately Measure Pericardial Effusion Volume?

Anita M. Prakash, Ying Sun, Salvatore A. Chiaramida, Jiang Wu, Richard J. Lucariello, *Our Lady of Mercy Medical Center, Bronx, New York, University of Rhode Island, Kingston, Rhode Island.*

Background: Assessing the severity of pericardial effusion is an important clinical problem and has been based on qualitative or semi-quantitative approaches. A computer algorithm was developed previously for measuring pericardial effusion volume (PEV) with 2D echocardiography. This study was conducted to assess its accuracy for clinical use. Methods: Pericardial and epicardial borders were manually traced on digitized 2D echocardiograms. Each border was used to estimate a volume by use of the proposed 3D-disk method. The conventional area-length method was also used for comparison. The PEV, determined by the difference between the pericardial and cardiac volumes, was compared to the surgically drained volume of pericardial fluid. To assess the intrinsic error of the computational methods, an in-vitro study was conducted by use of a phantom consisting of two latex balloons, one positioned inside the other to mimic the geometry of the pericardium. The balloons were filled with known amounts of water and imaged by use of a 2D echocardiography system. The intra-observer and inter-observer variabilities of the border tracing were evaluated with two clinical cases, each measured 10 times by 10 different observers. Comparison between the estimated PEV (y) and the known PEV (x) was done by linear regression and the Bland-Altman analysis. Results: The clinical study included 20 pericardial window procedures among 19 patients. The drained PEV ranged from 100 cc to 1200 cc. With the 3D-disk method the linear regression resulted in: $y = 0.81 x + 120$ cc; $r = 0.91$, $p < 0.0001$. The limits of 95% confidence from the Bland-Altman analysis were between -243 cc and 278 cc. The percent error, determined by the standard error of the estimate (114 cc) over mean (548 cc), was 20%. By contrast, the phantom study showed a correlation coefficient of 0.98 and a percent error of 6%. The intra-observer variability was 1.5% and inter-observer variability was 3%. The area-length method was less accurate than the 3D-disk method and generally underestimated the PEV. Conclusion: The 3D-disk method and 2D echocardiography provide quantitative assessment of PEV in the clinical situations with accuracy within 20%.

4:24 p.m.

1144MP-128 Automated Analysis of Phase-Contrast Magnetic Resonance Images in the Assessment of Endothelium-Dependent Flow-Mediated Dilation

Ping Tan, *Wake Forest University, School of Medicine, Medical Engineering Dept, Winston-Salem, North Carolina.*

Measurement of flow mediated arterial dilation (FMAD) provides information regarding the status of peripheral arterial endothelial function. Although phase-contrast magnetic resonance imaging (PC-MRI) can be used to measure FMAD, the manual analysis of 1 study (tracing regions of interest and processing data on 100 images) can require 6 or more hours. To enhance the clinical utility of PC-MRI assessment of FMAD, we hypothesized that an automated technique (Multi-Stage Intensity Thresholding or MSIT) for determining femoral arterial area and flow before and after cuff inflation over the thigh could be used to evaluate FMAD in a rapid, accurate, and reproducible manner. In both normal subjects (n=6) and in NYHA class III CHF patients (n=6), we measured the femoral artery cross-sectional area at 30 second intervals before, during and after an ischemic stimulus (5 minutes suprasystolic thigh cuff inflation) using PC-MRI. Image parameters included a 7 mm slice thickness, a 13 cm field of view (FOV), a 256x256 matrix, 40o flip angle, an 18 ms repetition time (TR), a 6.7 msec echo time (TE), a 150 cm/sec velocity encoding ration, and the incorporation of k-space segmentation so as to yield 7 or more frames (temporal resolution of 90 to 105 ms) per cardiac cycle. Compared with manual analysis, automated analysis detected a similar percentage change in FMAD between young healthy individuals (15.5% vs 16.7%) and patients with congestive heart failure (3.2% vs 3.0%). The correlation between percentage of FMAD traced manually and that analyzed automatically was good (r=0.89). Automated analysis time for 100 images averaged 10 minutes vs 6 hours for manual analysis. In conclusion, rapid, accurate assessments of femoral artery FMAD can be obtained using multi-stage intensity thresholding. This methodology allows for the rapid clinical assessment of peripheral arterial endothelial function in patients with cardiovascular disease.

4:36 p.m.

1144MP-129 Automatic Detection of Left Ventricular Contours From Contrast Echocardiography: Comparison With Cardiac Cine Magnetic Resonance

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Contrast agents are able to improve endocardial border delineation in echocardiography; however, manual outline of ventricular contours to derive LV volumes and ejection fraction remains subjective and time consuming. The aim of this study was to evaluate whether an automatic contour detection method of contrast echo images may provide reliable estimates of LV volumes as compared to cine Magnetic Resonance Imaging (MRI). In 11 patients with different degrees of ventricular dysfunction, LV volumes were measured by cine MRI and by transthoracic, second harmonic echocardiography after the administration of the contrast agent Levovist (Schering AG, 400 mg/ml I.V. in 2 minutes). Contrast echo images were analyzed bot manually (tracing the contours of LV cavity) and automatically. To increase signal to noise and contrast to noise ratio, the images