Global Applications of the LSTAT™ Patient Care Platform

David D. Hood; Todd D. Kneale; Matthew E. Hanson, PhD; Steven B. Alexander
Integrated Medical Systems, Inc, Signal Hill, California, USA

This presentation reviews current use of the LSTAT™ platform in military and civilian environments (from Los Angeles to Kosovo), caregiver feedback, clinical and economic benefits, and projected applications (including natural and man-made mass disaster scenarios). The LSTAT™ patient-care platform is a portable intensive care unit only 13 cm. thick, and is the first and only integrated suite of medical and data devices ever cleared by the U.S. Food and Drug Administration.

The LSTAT™ supports early, continuous, and flexible medical care in both pre-hospital and in-hospital applications. The LSTAT™ platform includes a ventilator, defibrillator, suction, physiological monitor, three-channel fluid/drug infusion pump, and blood chemistry analyzer, as well as onboard power, oxygen, and a network-ready data storage and transmission capability. The LSTAT™ can accept off-board international power and oxygen sources. Accessories include a patient isolation and environmental protection canopy for use in biochemical hazardous environments. As an integrated medical and data system that leverages aerospace systems integration and information technology, the LSTAT™ platform supports early, continuous, and flexible care at less cost, weight, volume, and caregiver time.

The LSTAT™ platform has contributed to saving lives around the world — aboard air, ground and sea-based vehicles, as well as in fixed medical facilities — demonstrating a new, valuable capability for emergency and disaster response.

Keywords: disaster; intensive care; portable medical facility
Prehosp Disast Med 2002;17(s2):s55.

Prehospital Echocardiography — A New Diagnostic Tool for Pulselessness and Resuscitation Management

R. Breitkreutz;[1] F.H. Seeger;[2] N. Fürbeth;[1,3] T. Kirschning;[3,4] S. Kortüm;[3] F. Walcher[4]
1. Department of Internal Medicine, Medical Clinic II
2. Medical Clinic IV, University Hospital Frankfurt
3. Institute for Rescue Medicine, Frankfurt am Main, Germany
4. Trauma Surgery, University Hospital Frankfurt
Frankfurt, Germany

According to the Frankfurt algorithm, pulselessness (s.o.) or shock of unknown origin first requires a clinical neurological assessment (GCS) and second basic diagnostic tools including the electrocardiography (ECG). These steps lead to treatment decisions including defibrillation, administration of drugs, and/or mechanical resuscitation. When an ECG demonstrates electronic activity and no central pulse is palpable, there are two important questions: (1) Is the left ventricle working?; and (2) Do applied catecholamines result in adequate blood pressure support?

In this ongoing project, a portable ultrasound device (Handyscan, Metrax, Rottweil, Germany) with a 3.5-5 MHz ultrasound probe is used. Three standard 2D-scans (left sided trans-thoracical parasternal, apical, and subxiphoidal) were used to evaluate left ventricular wall movement with "eye-balling". Furthermore, the morphology of the right ventricular cavum can be visualized easily. Therefore, signs of an acute cor pulmonale and/or the presence of fluid within the pleural space and/or fluid in the pericardium can be detected. In this project, the investigative procedure is performed by a paramedic who is trained by an experienced physician.

In two cases, ventricular stand-still was diagnosed either without electrical activity or with ventricular fibrillation during prolonged resuscitation which later was discontinued. In one case, during pulseless electrical activity (positive ECG, ventricular bradycardia), the preclinical echocardiography showed a clear finding of ventricular function and enabled further life support and treatment after admission.

Based on these first experiences, preclinical ultrasound is safe, fast, and has a beneficial effect in the prehospital setting. It is learned easily by paramedics and emergency physicians.

Keywords: cardiac arrest; resuscitation; ultrasound
Prehosp Disast Med 2002;17(s2):s55.

Echocardiography in Initial Assessment of Trauma Patients

John Maloney
Victorian Medical Desplan, Monesle Medical School, Melbourne, Victoria, Australia

Echocardiography can play a major role in the diagnosis of injuries for patients with major thoracic trauma. Pathophysiology that can be diagnosed and assessed include: (1) Hypovolaemia; (2) Tamponade; (3) Myocardial damage; (4) Valvular pathology; (5) Aortic injuries; and (6) Valve injuries. In addition, echocardiography can be used in the initial and ongoing assessment of: (1) Volume resuscitation; (2) Inotropic requirements; and (3) Cardiac function.

Transthoracic echocardiography is less invasive, but provides poorer quality images because of lower ultrasound wavelength frequency and air in the chest wall or pleural spaces. Trans-oesophageal echocardiography provides higher quality images because of higher frequency and proximity to the heart and aorta, without intervening air containing tissues/spaces.

Emergency physicians and trauma surgeons increasingly are using ultrasound for the diagnosis of intra-abdominal pathology. It is important that this technology is extended to the care of patients with actual or suspected thoracic injuries.

Keywords: echocardiography; emergency physician; injuries; surgeons; thorax; trauma
Prehosp Disast Med 2002;17(s2):s55.