ASE, ACEP Tout Benefits of Cardiac Ultrasound

BY JEFFREY S. EISENBERG

FROM THE JOURNAL OF THE AMERICAN SOCIETY OF ECHOCARDIOGRAPHY

ST. LOUIS – Focused cardiac ultrasonography, or FOCUS, can expedite the diagnostic evaluation of cardiac symptoms at the patient's bedside – allowing for earlier, possibly life-saving interventions – and has become a fundamental tool in the emergency department, according to a joint consensus statement of the American Society of Echocardiography and American College of Emergency Physicians.

FOCUS enables clinicians to determine whether pericardial effusion is present, assess global cardiac systolic function, identify marked right and left ventricular enlargement, and assess intravascular volume, according to the statement (J. Am. Soc. Echocardiogr. 2010;23:1225-30). It can provide guidance for pericardiocentesis and confirm the placement of transvenous pacing wire.

The statement outlines specific clinical scenarios in which FOCUS can affect clinical decision making and patient care:

► **Cardiac trauma.** Performed as part of the FAST (focused assessment with sonography in trauma) exam, FOCUS can help identify possible cardiac injury, such as cardiac hemorrhage, that requires surgical intervention by looking for the presence of pericardial effusion as well as the presence or absence of organized ventricular contractility. FOCUS also can help diagnose cardiac contusions by looking for depressed wall motion and decreased myocardial contractility.

► **Cardiac arrest.** Clinicians can improve the outcome of cardiopulmonary resuscitation by using FOCUS to distinguish among asystole, pulseless electrical

activity (PEA), and pseudo-PEA. FOCUS also can help identify causes of PEA, allowing for earlier treatment and the return of spontaneous circulation.

FOCUS can improve outcomes by determining a cardiac cause of the cardiac arrest and by guiding lifesaving procedures at the patient's bedside.

► **Hypotension/shock.** FOCUS can help the clinician determine if the shock is cardiogenic, thus allowing for aggressive early intervention to prevent organ dysfunction. In this case, the exam looks for the presence of pericardial effusion and evaluates global cardiac function, right ventricular size, and inferior vena cava size/collapsibility as a marker of central venous pressure.

FOCUS can determine the presence, size, and functional relevance of a pericardial effusion as a cause of hemodynamic instability. Also, it can expedite pericardiocentesis while reducing complications and increasing the success rate.

► **Dyspnea/shortness of breath.** FOCUS can help rule out pericardial effusion, identify global left ventricular systolic dysfunction, and assess the size of the right ventricle as a proxy for indicating the presence or absence of a hemodynamically significant pulmonary embolus. Still, a complete evaluation of these patients should include comprehensive echocardiography to evaluate diastolic function and pulmonary artery pressures, and to help diagnose pericardial and valvular heart disease.

► **Chest pain.** FOCUS may be helpful in the evaluation of patients with a hemodynamically significant pulmonary embolus or the screening of patients for aortic dissection. When aortic dissection is suspected, the clinician can use FOCUS to look for pericardial or pleural effusions and to assess the diameter of the aortic root. (An aortic root diameter greater than 4 cm is suspicious for type A dissection.) The authors caution that a negative FOCUS exam does not definitively rule out aortic dissection; additional imaging and diagnostic studies are necessary.

FOCUS training should include the presentation of positive and negative cases of various cardiac pathologies. Any program that uses FOCUS should have a quality assurance program that reviews scan quality by comparing interpretations with pathological and surgical data, clinical outcomes, and final diagnoses. ■