Canadian Society of Echocardiography

17TH ANNUAL CANADIAN ECHO WEEKEND
APRIL 23-25, 2015
TORONTO, ON

Session Title: Get with the Guidelines - How the 2015 ASE/EACVI Chamber Quantification Recommendations Change Our Practice –the LV

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OBJECTIVES: What questions or points will participants learn or discuss?

1. Understand current recommendations in the updated chamber quantification guidelines in assessing the left ventricle.

2. Understand strengths and limitations of 3D chamber volumetric calculations and global longitudinal strain for the assessment of left ventricular systolic function.

3. _____

DISCUSSION: Please provide a summary of the discussion and/or include 3 to 6 key presentation slides.

The aim of the current update to the Cardiac Chamber Quantification Guidelines is to provide reference values based large echo databases of normal patients and to account for differences in age, gender, ethnicity, and BSA. As well, since publication of the last guidelines in 2005, there have been significant technological developments in 3D echocardiography and strain. Reference values for measurements obtained from these methods have also been included. Cut-off values for severity of abnormalities are provided and are based on standard deviation, rather than percentile values, outcomes/prognosis, or consensus.

Guideline recommendations for LV assessment:
1) **Left ventricular linear measurements** should be obtained from 2D echocardiographic images over M-mode to avoid oblique sections of the ventricle.
2) **Left ventricular volume** calculations from linear measurements (Teichholz or Quinones methods) are no longer recommended. From 2D echocardiography, either the biplane disk summation or the area length method should be used. 2D echo derived LV EDV upper limits of normal are 74 mL/m2 for men and 61 mL/m2 for women and for LV ESVs are 31 mL/m2 for men and 24 mL/m2 for women. 3D echocardiographic measurement of LV volumes is preferred over 2D if possible.
3) The **2D LVEF** lower limit of normal has decreased in this guideline.

LVEF>52% for men (with biplane method) and LVEF>54% for women is now considered normal. Previously LVEF>55% was considered normal.

4) **LV global longitudinal strain** <-20% is normal**.** However, for long term follow-up, the same software maker, software version and vendor's equipment should be used. Use of **regional LV deformation** is not recommended.

5) **LV segmentation** should be performed using the 17-segment model for myocardial perfusion and the 16-segment model for routine wall motion assessment. Wall motion is scored using 4-grades: (1) normal or hyperkinetic, (2) hypokinetic (reduced thickening), (3) akinetic (absent or negligible thickening), and (4) dyskinetic (systolic thinning or stretching). The presence of aneurysm is no longer assigned with a separate wall motion score. This is because it is a morphologic entity with a wall motion abnormality that is already described by the other scores. It is a region of focal dilation and thinning secondary to remodeling that is associated with akinetic- or dyskinetic myocardial function.

6) **LV mass** can be assessed using M-mode or 2D echo. Normal values are unchanged from the previous document.

Three dimensional echocardiography is recommended for the assessment of LV volumes. This is because apical views can be foreshortened on 2D echocardiography, 3D echocardiography avoids geometric assumptions needed to calculate volumes using 2D echocardiography, and 2D echocardiography cannot account for regional wall motion abnormalities

CONCLUSIONS:

1. Reference ranges for left ventricular volumes and ejection fraction have changed in the recent guidelines due to the use of large echo databases.

2. Left ventricular wall motion scoring has changed to a 4-grade system.

3. Three-dimensional echocardiography is recommended for measurement of left ventricular volumes if possible.

4. If global longitudinal strain is being used to follow patients, it should be using the same vendors machine and analysis package.

REFERENCES: (journals, websites, etc.)

Lang et al. Recommendations for Cardiac Chamber Quantification by Echocardiography in Adults: An Update from the American Society of Echocardiography and the European Association of Cardiovascular Imaging. J Am. Soc. Echocardiogr. 2015;28:1-39.