Use of Echocardiography in Cardiac Arrest

Sanjay Dhar, MD, FACP, FCCP

Director, Pulmonary Critical Care Ultrasound and Research

Associate Professor of Medicine

Section on Pulmonary, Critical Care and Sleep Medicine

University of Kentucky

UK UNIVERSITY OF KENTUCKY
College of Medicine

Faculty Disclosures

None for this talk

Objectives

- Knowledge of Echocardiography in cardiac arrest
- Outline on Image acquisition and Interpretation
- Operational and Technical Challenges & Solutions
- Clinical Cases

How to best utilize echo during Codes

- Differentiate between true PEA and Pseudo PEA
- Care during code and post code
- Evaluate adequacy and optimize position of CPR
- Help during pulse check assessment

Assess during Code

PEA

Electromechanical Dissociation

5H's and 5 T's

Pseudo PEA

Cardiac activity present but

without palpable pulse

Cardiac tamponade

Severe hypovolemia

Pulmonary embolism

Severe cardiomyopathy

UK UNIVERSITY OF KENTUCKY College of Medicine

ELSEVIER

Resuscitation 67 (2005) 81–87

RESUSCITATION

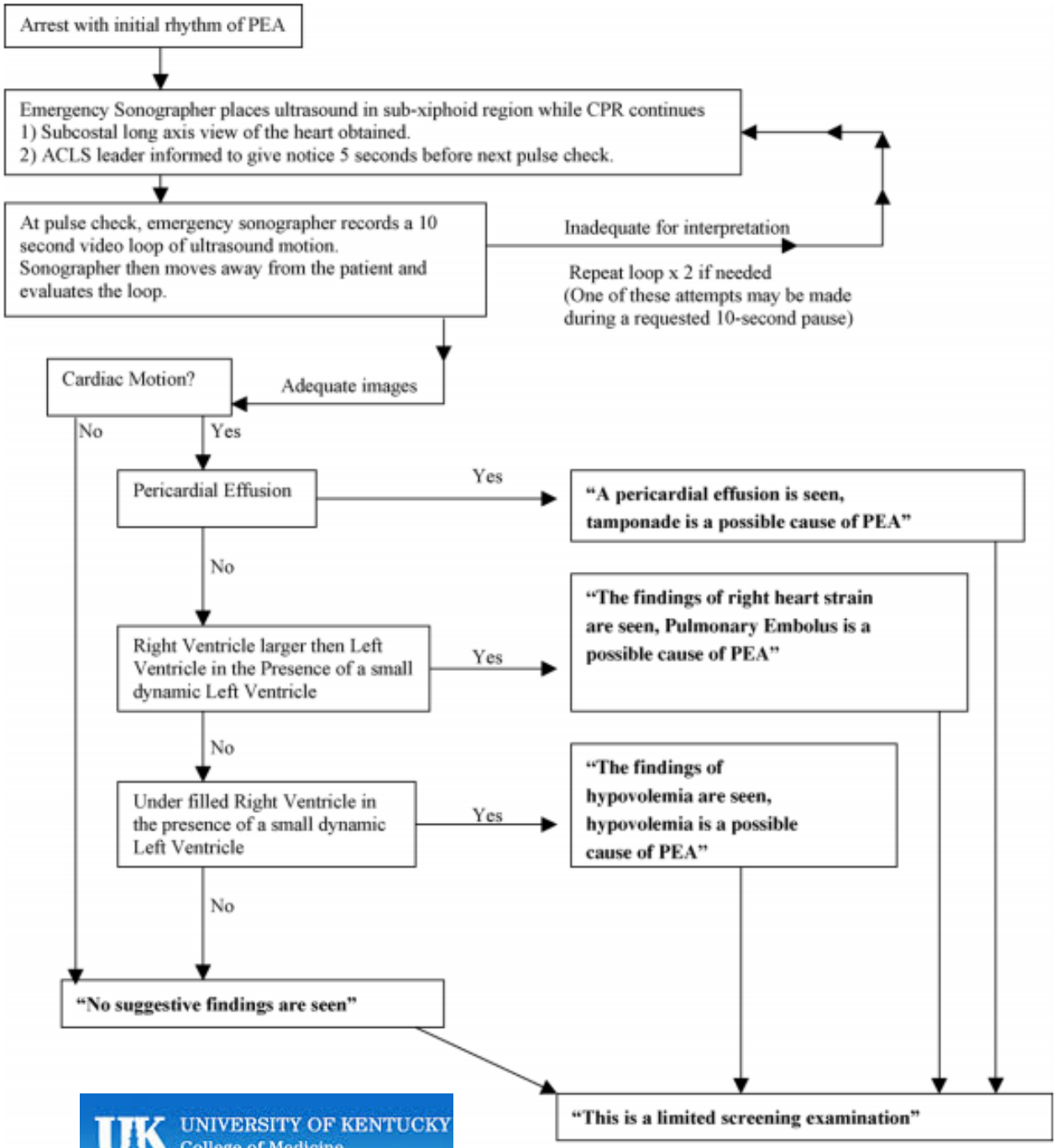
www.elsevier.com/locate/resuscitation

Rapid cardiac ultrasound of inpatients suffering PEA arrest performed by nonexpert sonographers☆

Daniel F. Niendorff*, Athos J. Rassias, Robert Palac, Michael L. Beach, Salvatore Costa, Mark Greenberg

Departments of Anesthesiology, Cardiology, and Internal Medicine, Dartmouth Hitchcock Medical Center, USA

Received 26 January 2005; received in revised form 7 April 2005; accepted 7 April 2005



D.F. Niendorff et al. / Resuscitation 67 (2005) 81–87

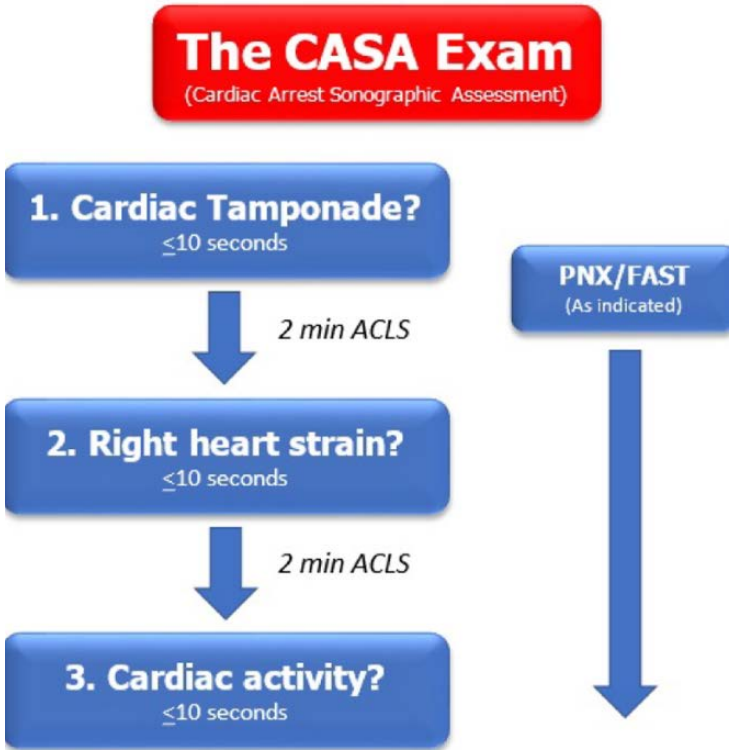
ELSEVIER

The American Journal of Emergency Medicine

Volume 36, Issue 4, April 2018, Pages 729-731

The Cardiac Arrest Sonographic Assessment (CASA) exam – A standardized approach to the use of ultrasound in PEA ☆

Kevin F. Gardner MD [a] ✉, Eben J. Clattenburg MD, MPH [a], Peter Wroe MD [a], Amandeep Singh MD [a], Daniel Mantuani MD [a], Arun Nagdev MD [a, b]



UK UNIVERSITY OF KENTUCKY College of Medicine

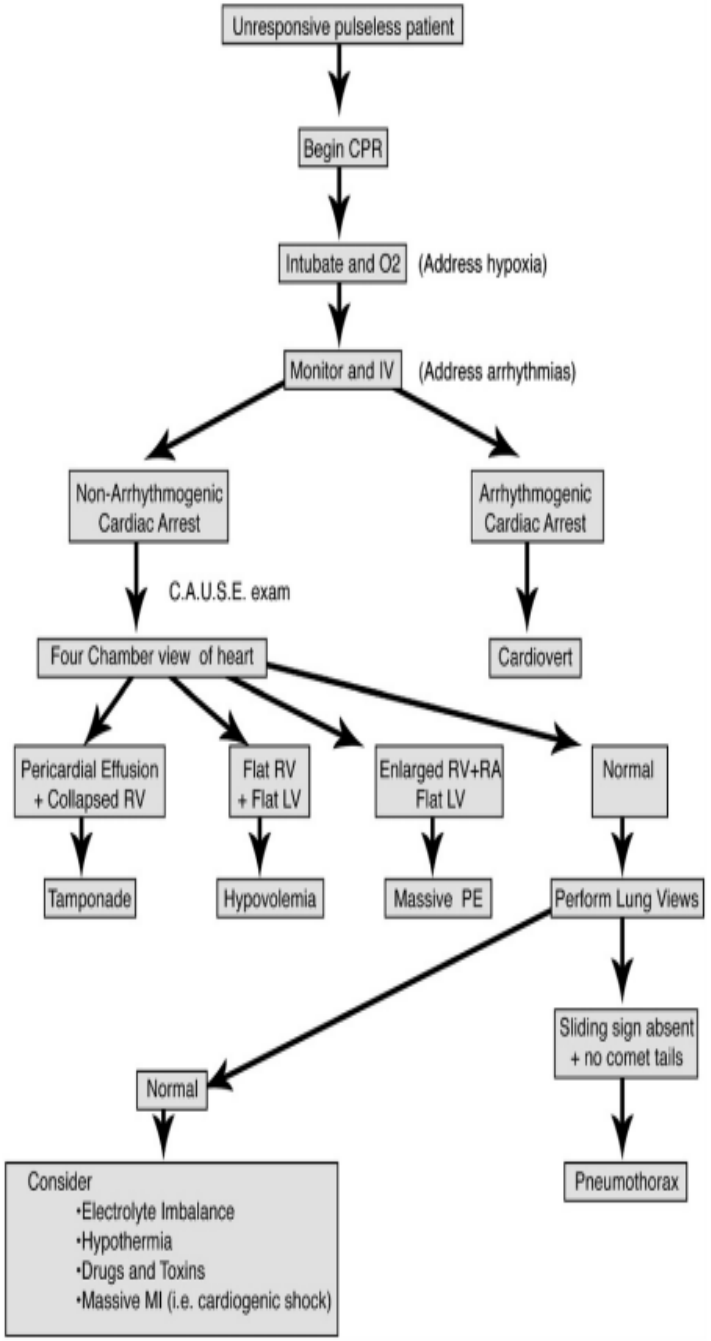
CLINICAL PAPER

C.A.U.S.E.: Cardiac arrest ultra-sound e
A better approach to managing patients
non-arrhythmogenic cardiac arrest☆

Caleb Hernandez[a], Klaus Shuler[a], Hashibul Hannan[a], Chi
Antonios Likourezos[a,*], John Marshall[a,b]

[a] *Department of Emergency Medicine, Maimonides Medical Center, 4802 Tenth Avenue, Brooklyn,*
[b] *Mount Sinai School of Medicine, One Gustave L. Levy Place, New York, NY 10029, United States*

Received 23 February 2007; received in revised form 21 June 2007; accepted 25 June 2007



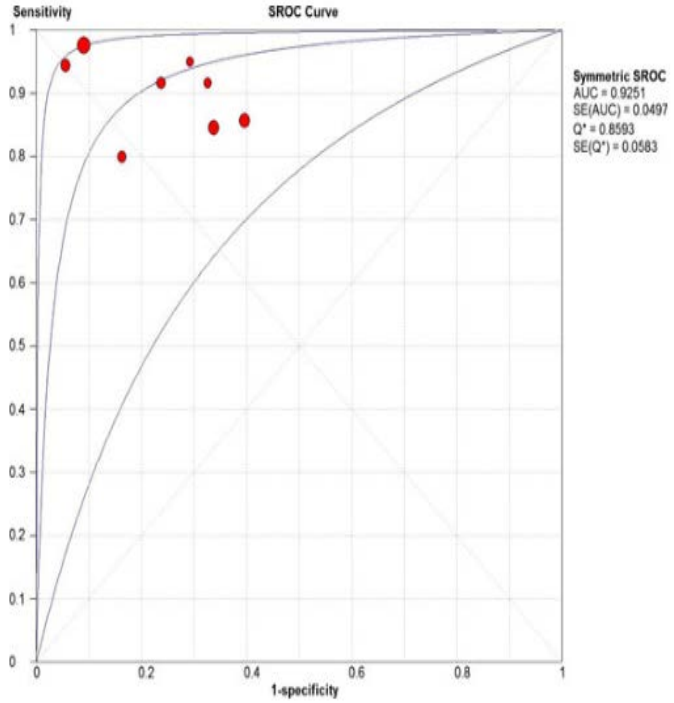
UK UNIVERSITY OF KENTUCKY College of Medicine

Bedside Focused Echocardiography as Predictor of Survival in Cardiac Arrest Patients: A Systematic Review

Lacey Blyth, Paul Atkinson MB, BCh, BAO, BSc(Hons), MA(Cantab), MRCP, FCEM, Kathleen Gadd, MLIS, and Eddy Lang, MD, CCFP(EM)

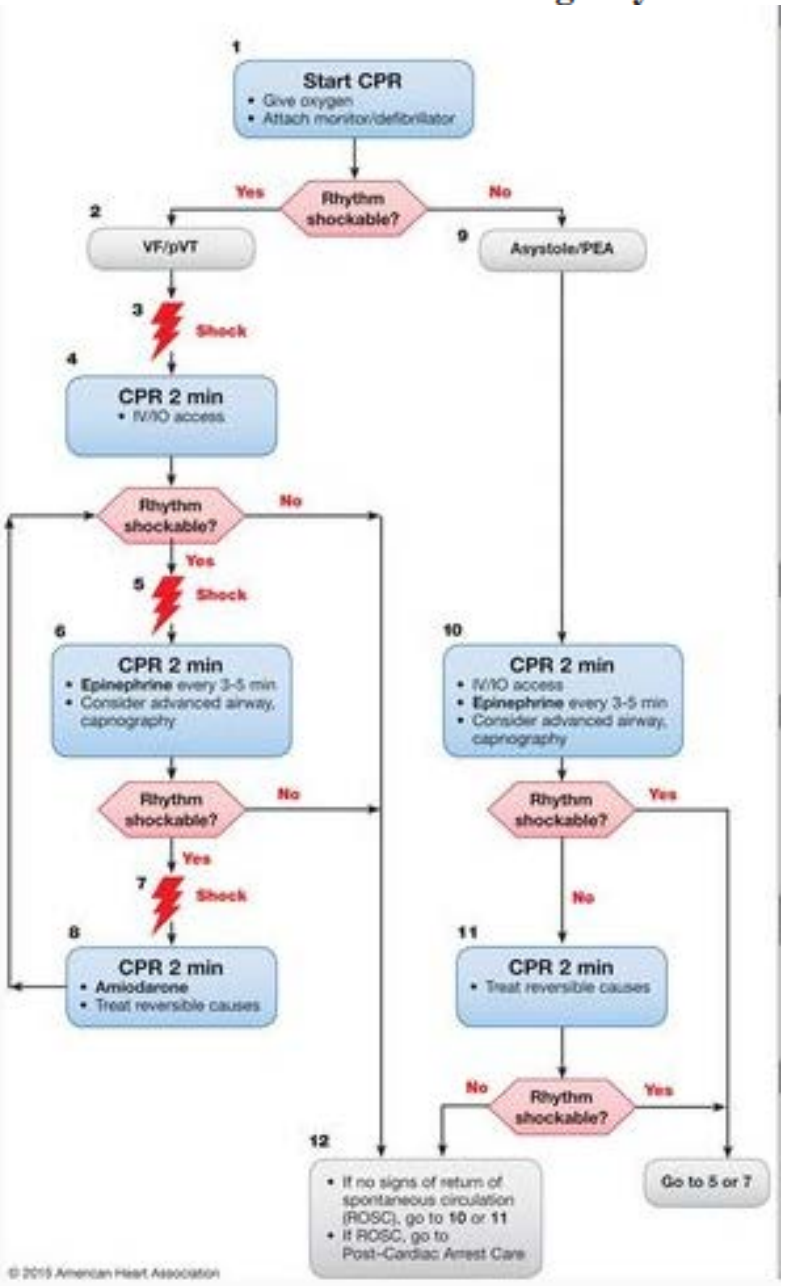
Table 3
Two-by-Two Table Showing Summary of Pooled Results

	ROSC (Positive Outcome)	No ROSC (Negative Outcome)
Cardiac contractility seen on echo (positive test)	98	92
No cardiac contractility seen on echo (negative test)	9	369



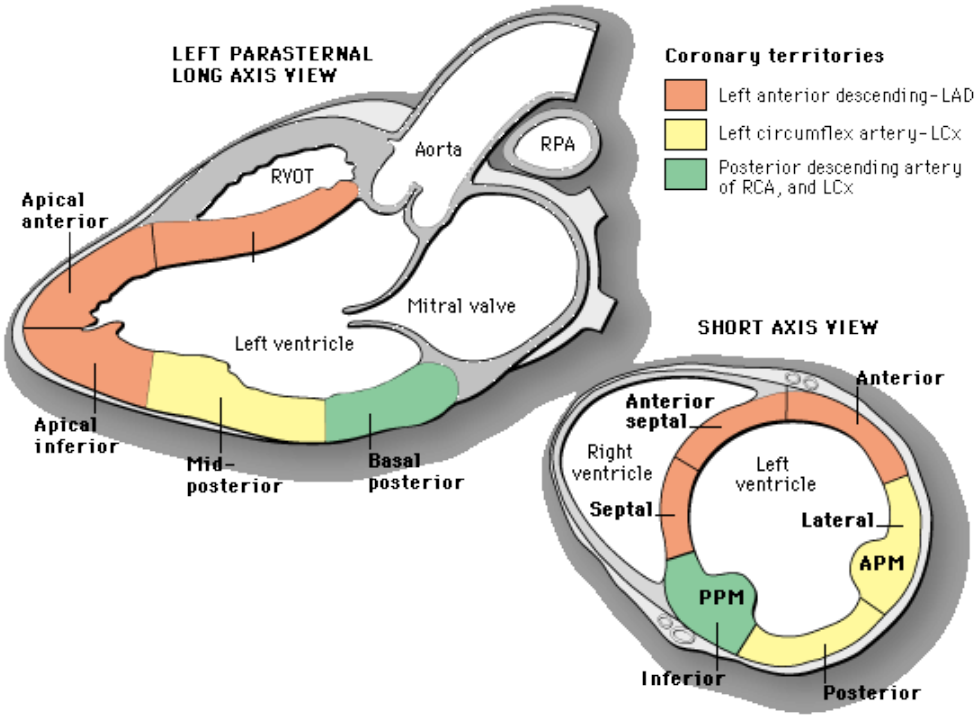
UK UNIVERSITY OF KENTUCKY College of Medicine

2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care

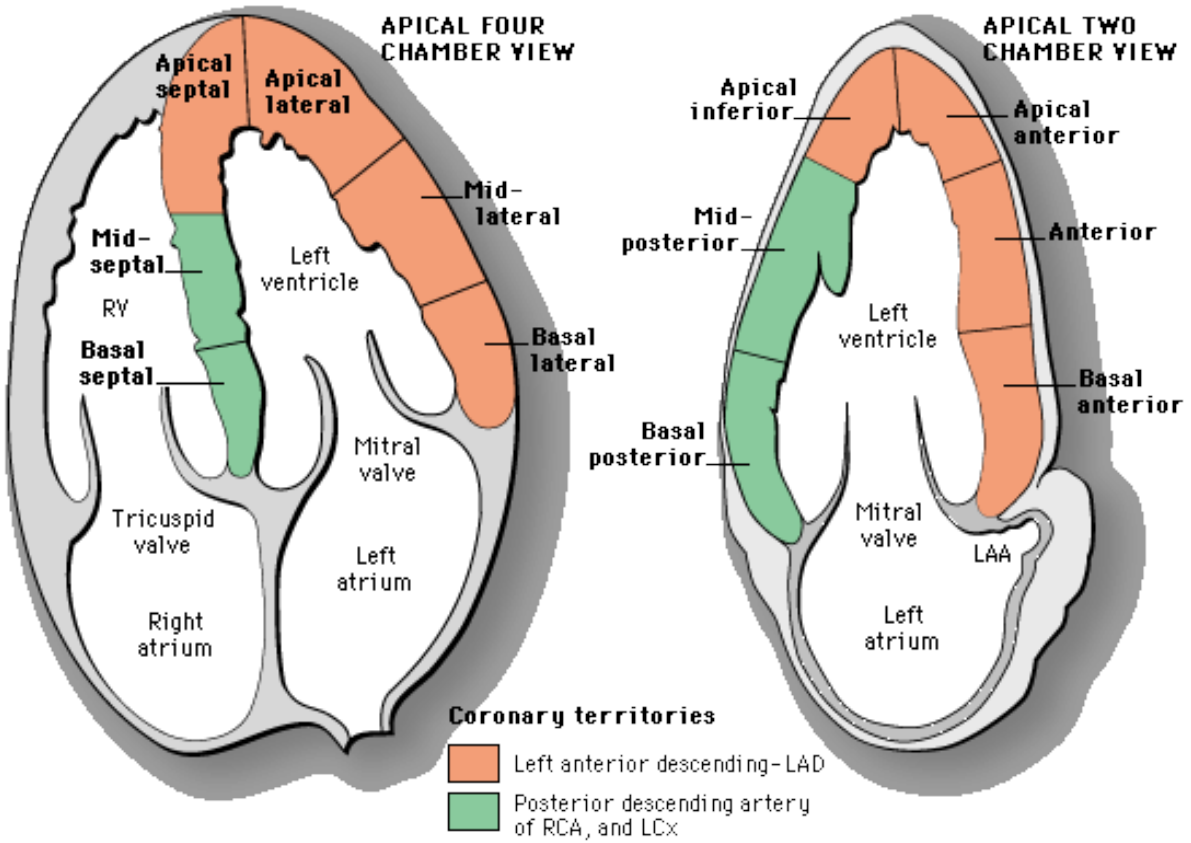


UNIVERSITY OF KENTUCKY
College of Medicine

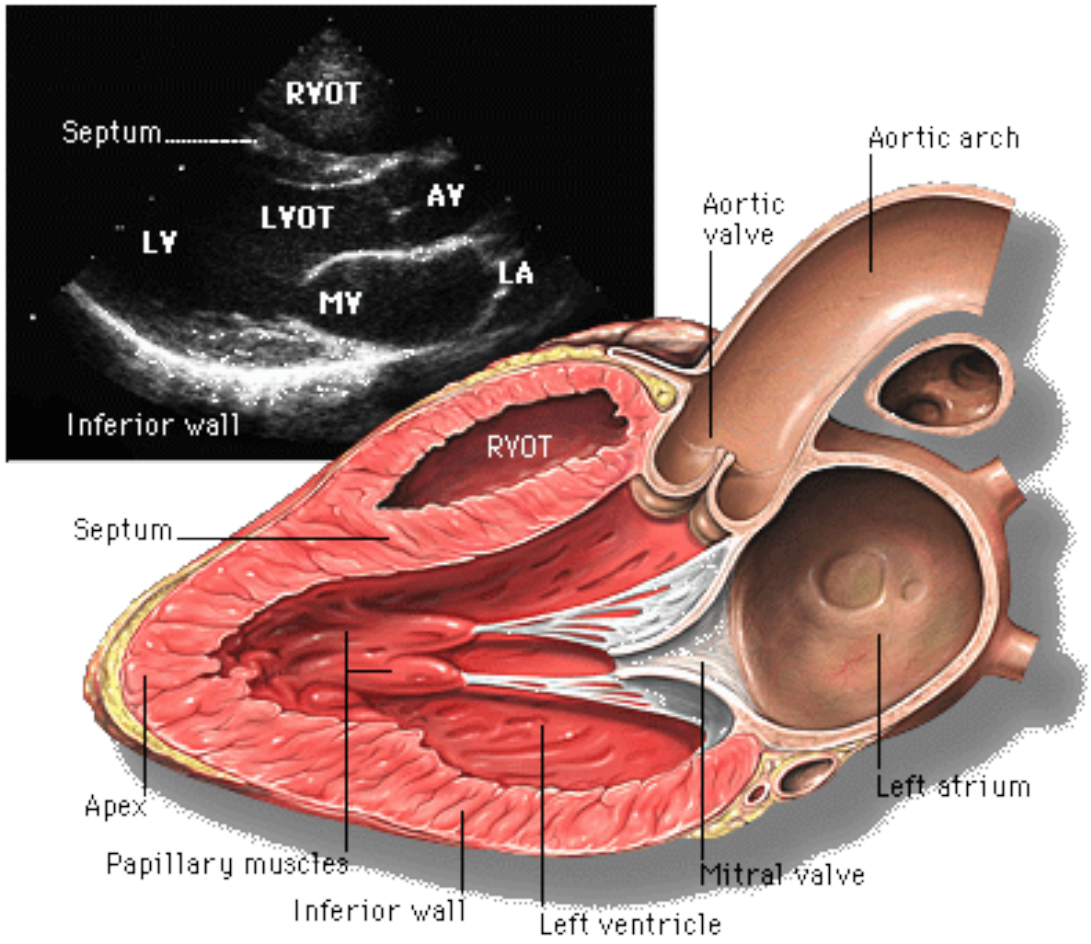
IBUS


LEFT PARASTERNAL
LONG AXIS VIEW
Coronary territories
Left anterior descending-LAD
Left circumflex artery-LCx
Posterior descending artery of RCA, and LCx
Aorta
RPA
RVOT
Apical anterior
Mitral valve
Left ventricle
Apical inferior
Mid-posterior
Basal posterior
SHORT AXIS VIEW
Anterior
Anterior septal
Right ventricle
Left ventricle
Septal
Lateral
APM
PPM
Inferior
Posterior

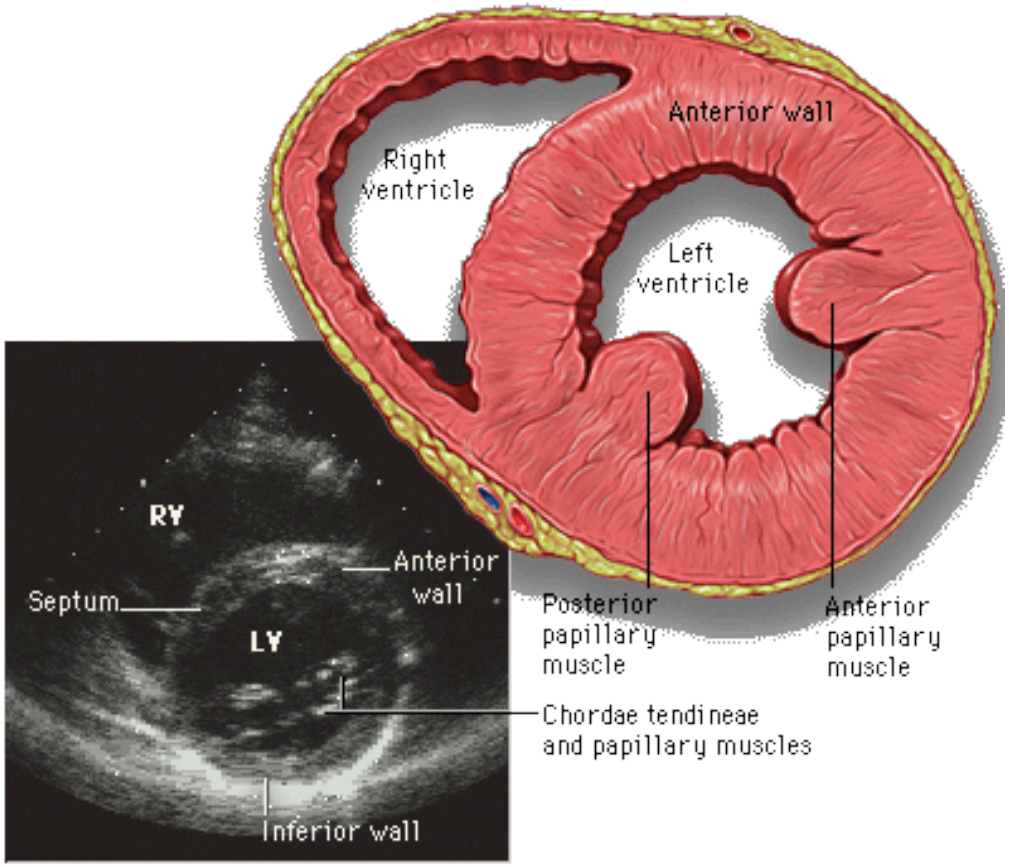
IBUS


APICAL FOUR CHAMBER VIEW
Apical septal
Apical lateral
Mid-lateral
Mid-septal
Left ventricle
RV
Basal lateral
Basal septal
Mitral valve
Tricuspid valve
Left atrium
Right atrium
APICAL TWO CHAMBER VIEW
Apical inferior
Apical anterior
Mid-posterior
Anterior
Left ventricle
Basal anterior
Basal posterior
Mitral valve
LAA
Left atrium
Coronary territories
Left anterior descending- LAD
Posterior descending artery of RCA, and LCx

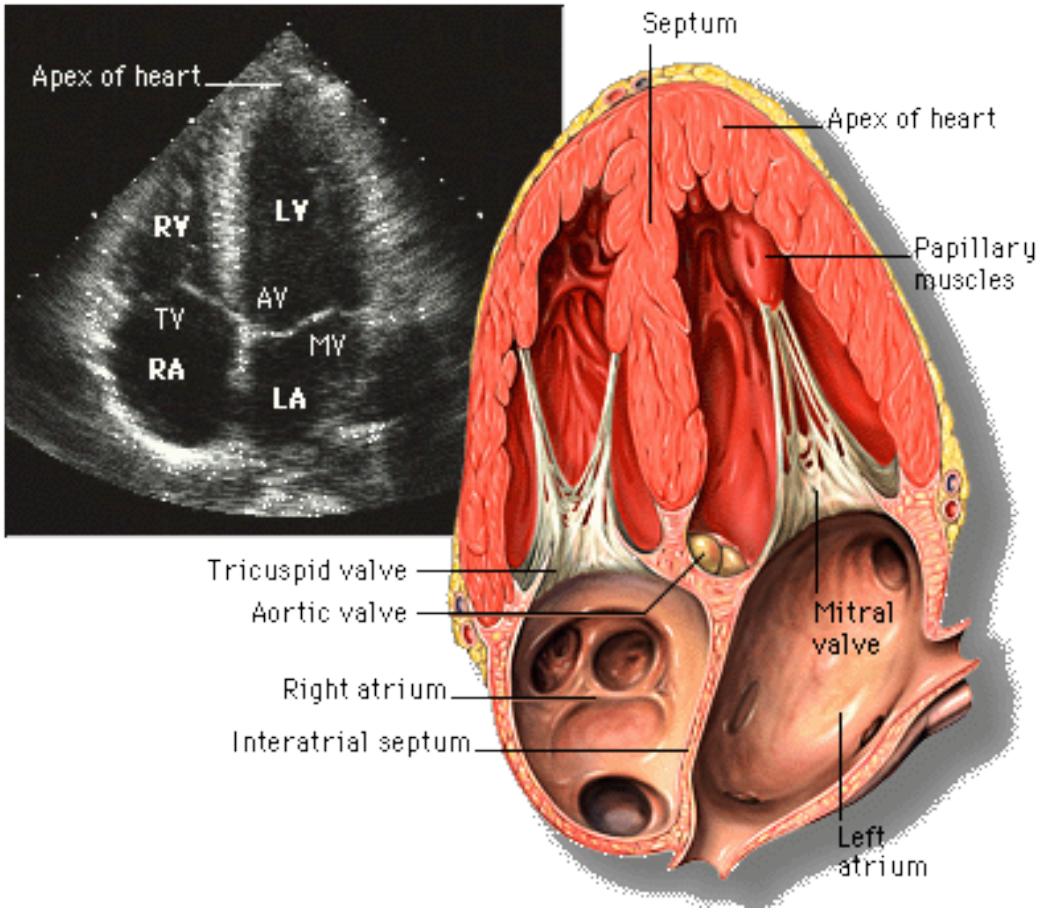
IBUS


RVOT
Septum
LVOT
AV
LV
LA
MV
Inferior wall
Aortic arch
Aortic valve
RVOT
Septum
Apex
Papillary muscles
Inferior wall
Left ventricle
Mitral valve
Left atrium

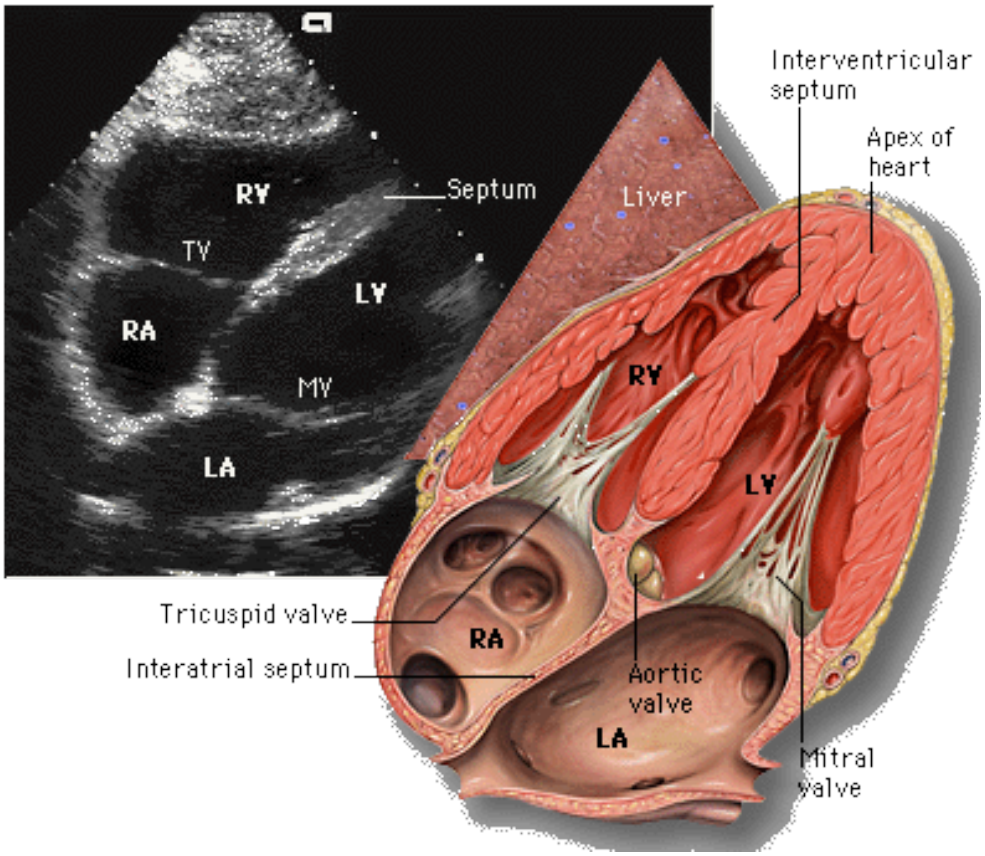
IBUS


Anterior wall
Right ventricle
Left ventricle
RV
Anterior wall
Septum
LV
Posterior papillary muscle
Anterior papillary muscle
Chordae tendineae and papillary muscles
Inferior wall

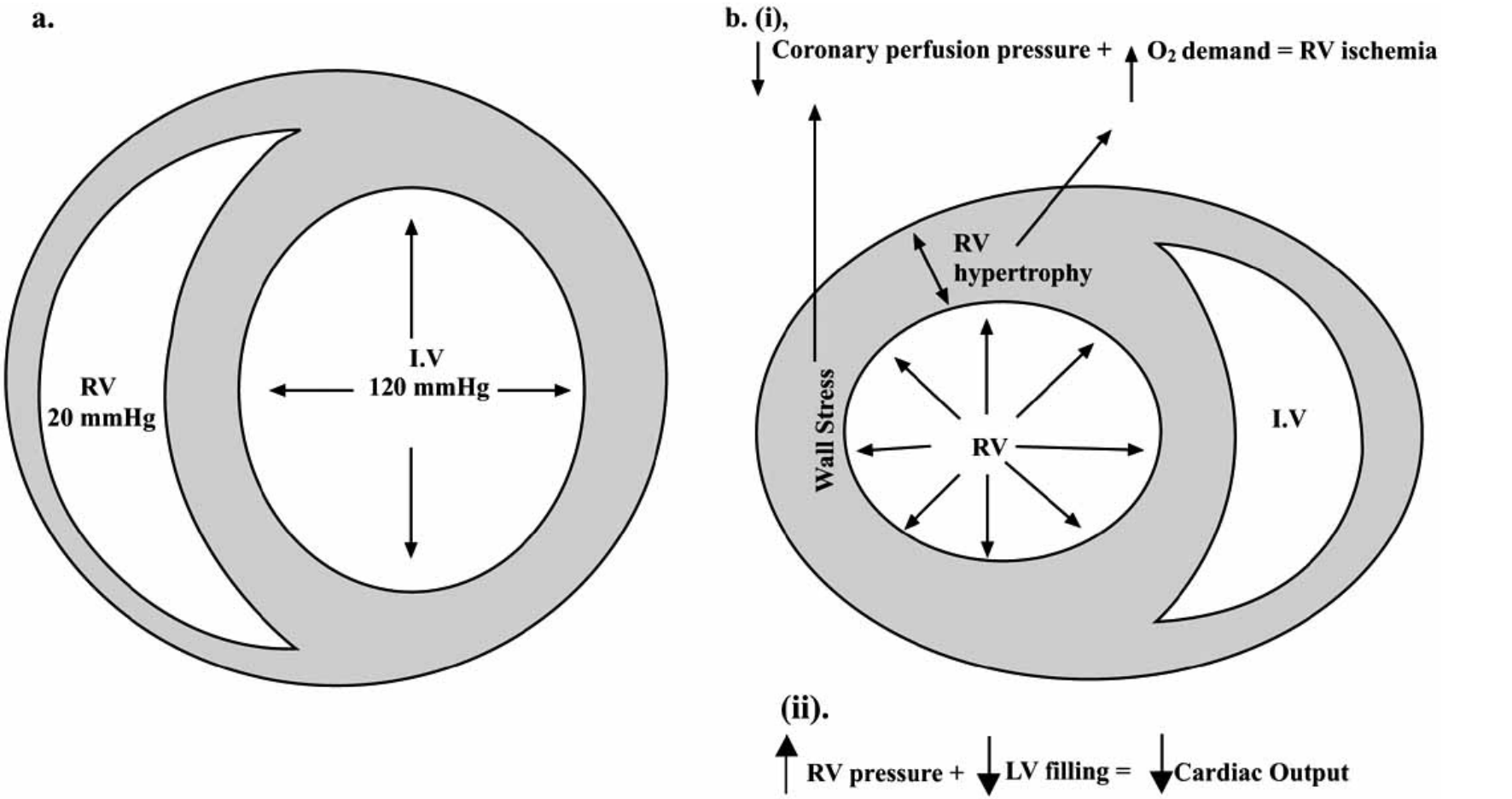
IBUS


Apex of heart
RV
LV
AV
TV
MV
RA
LA
Septum
Apex of heart
Papillary muscles
Tricuspid valve
Aortic valve
Mitral valve
Right atrium
Interatrial septum
Left atrium

IBUS

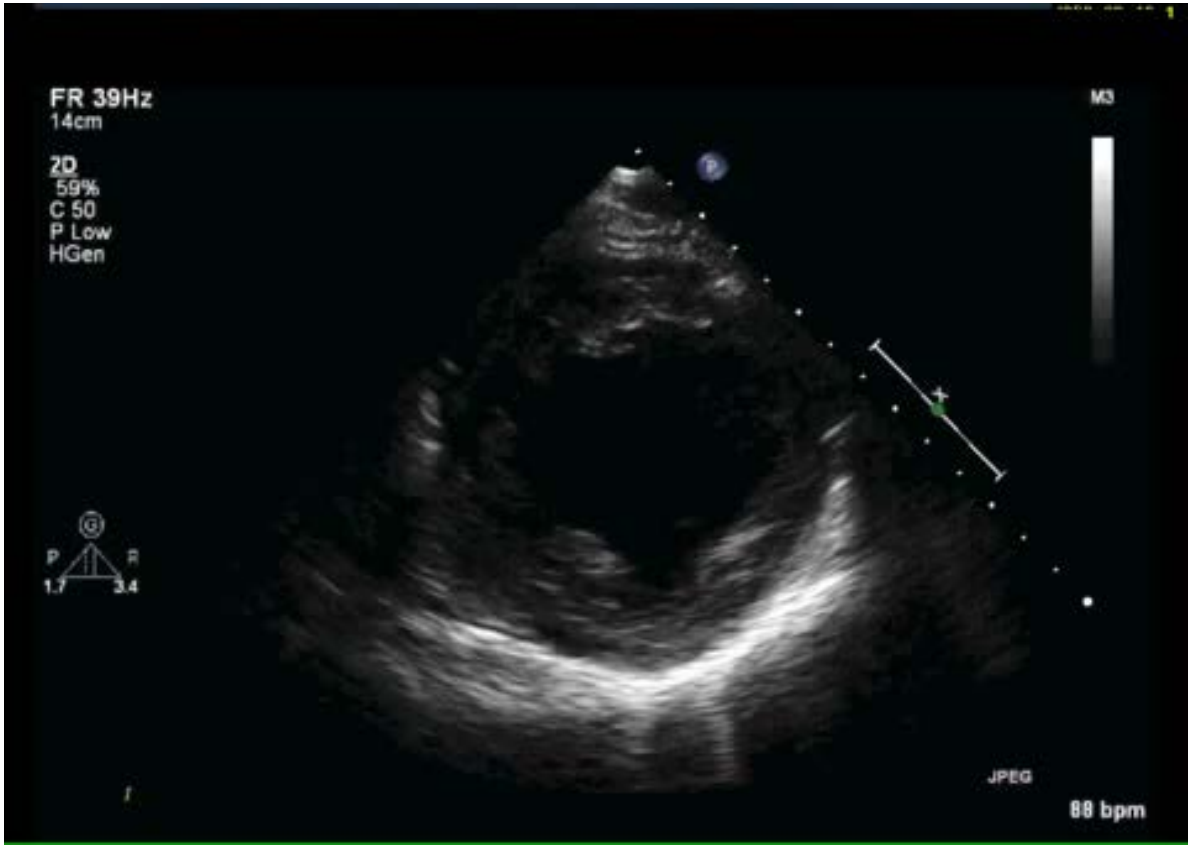

RV
Septum
TV
LV
RA
MV
LA
Liver
Interventricular septum
Apex of heart
RV
LV
Tricuspid valve
RA
Interatrial septum
Aortic valve
LA
Mitral valve

Short Axis views of the RV and LV

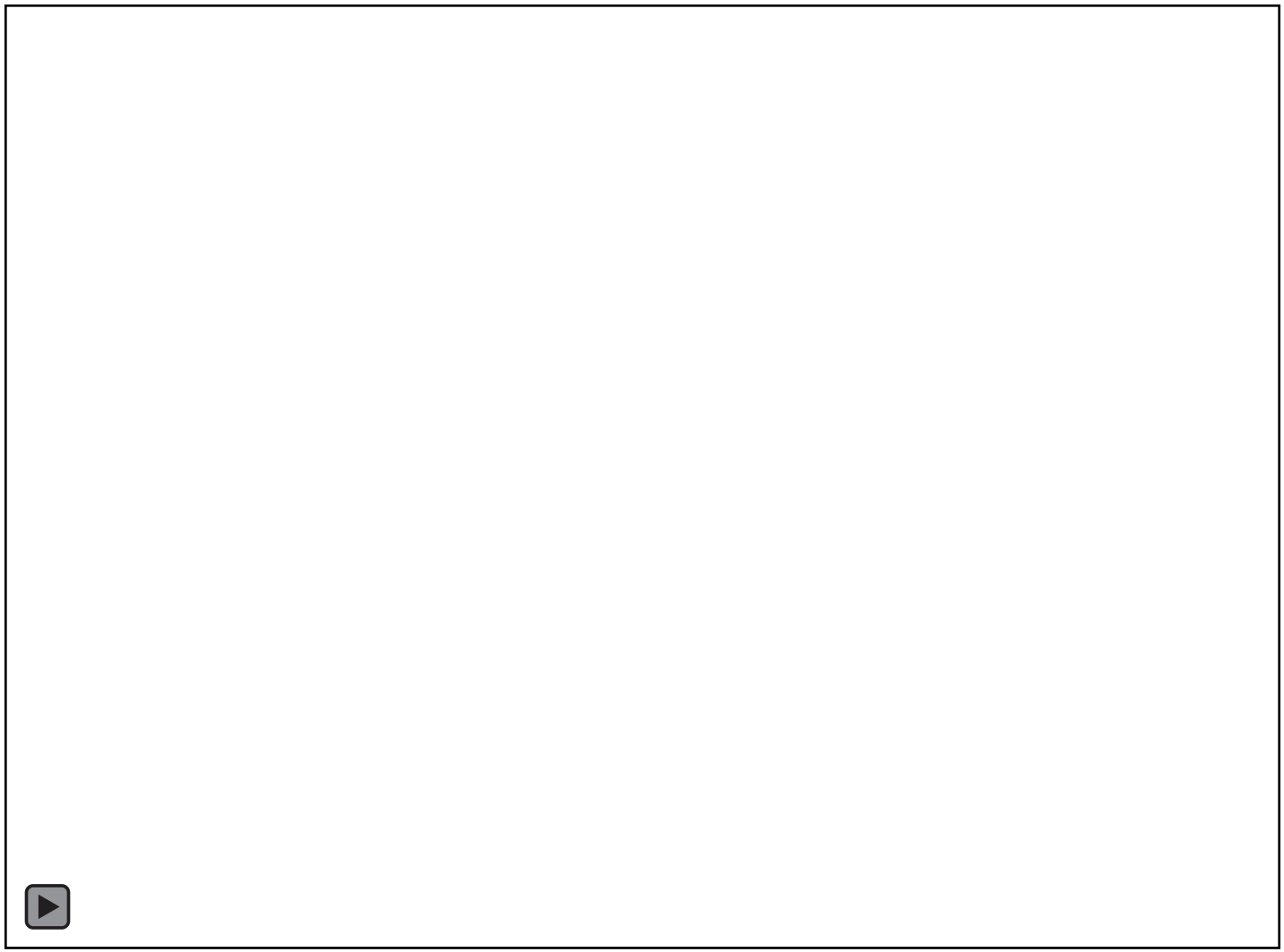


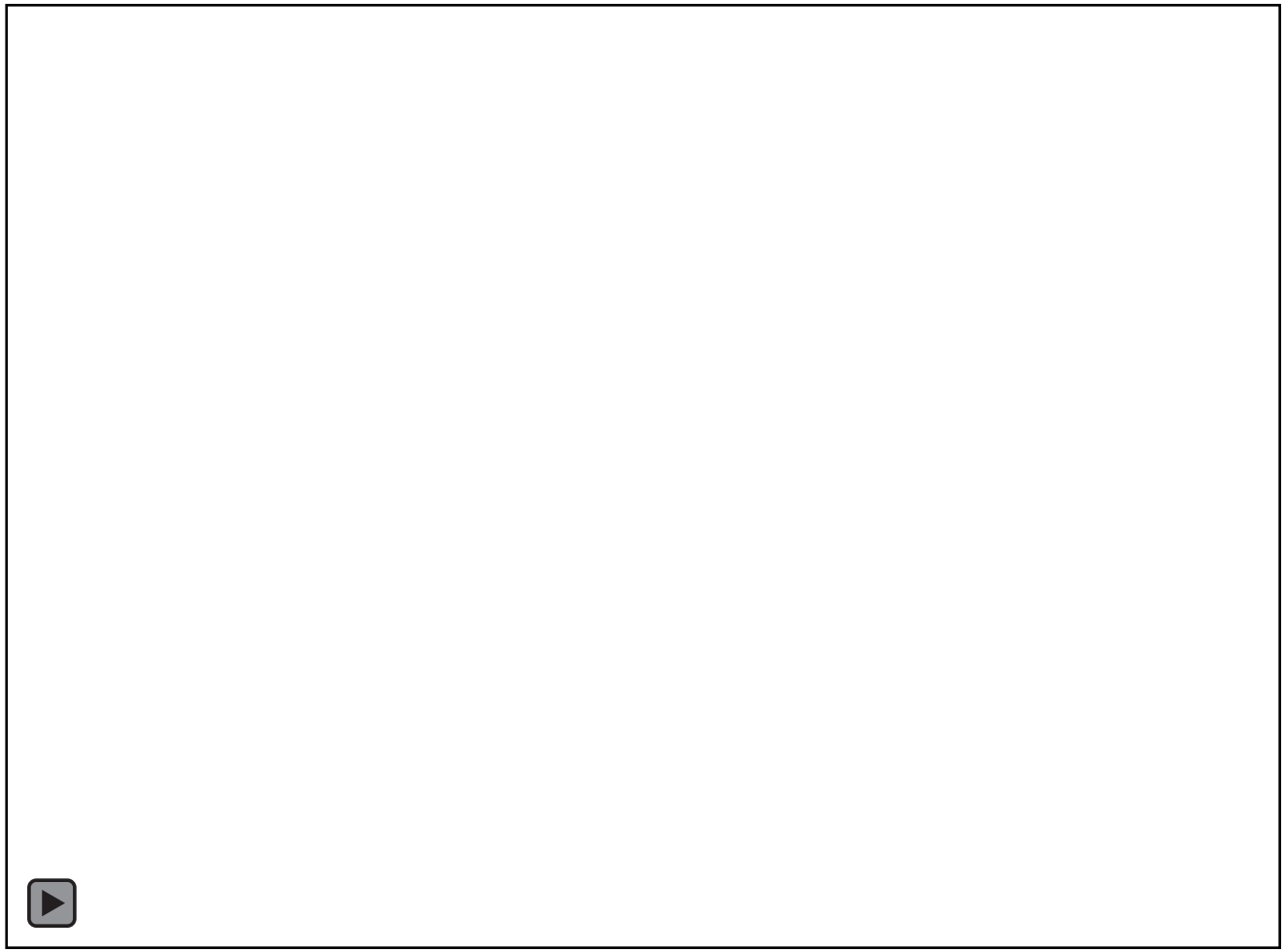
Current Cardiology Reviews, 2008, *Vol. 4, No. 1*

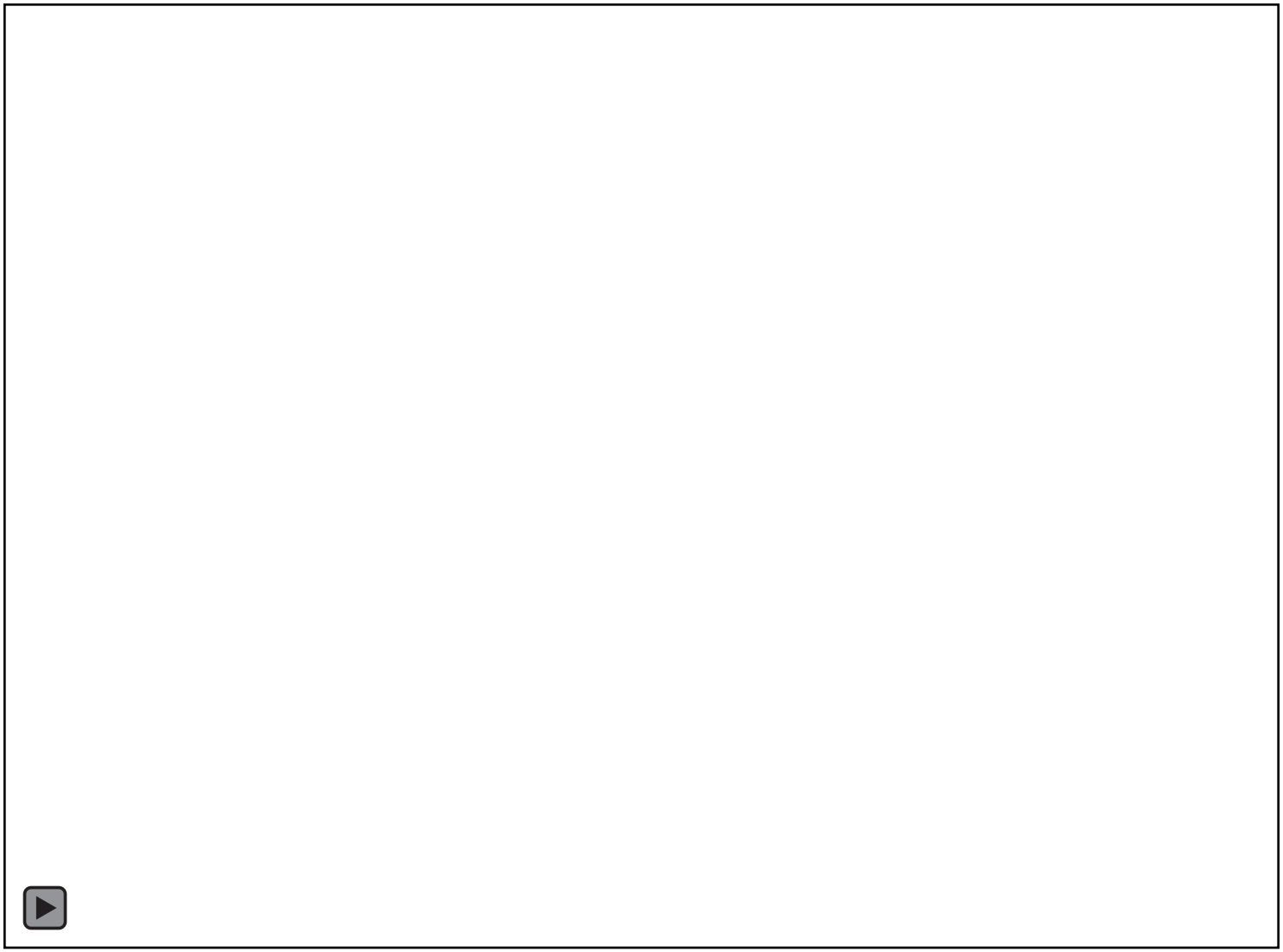
UK UNIVERSITY OF KENTUCKY
College of Medicine

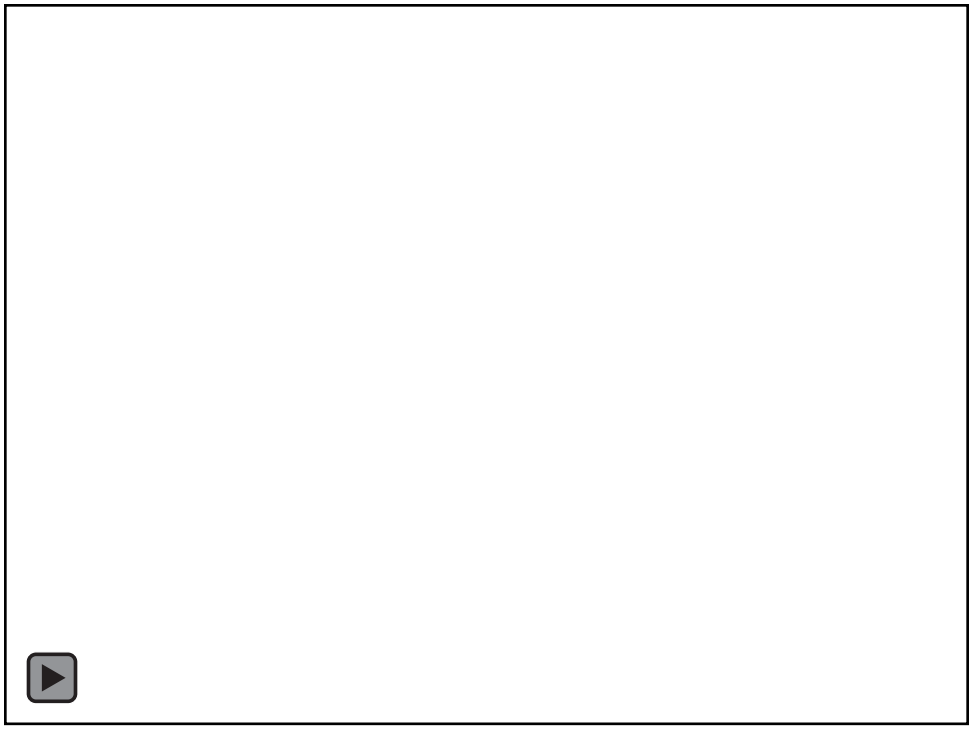


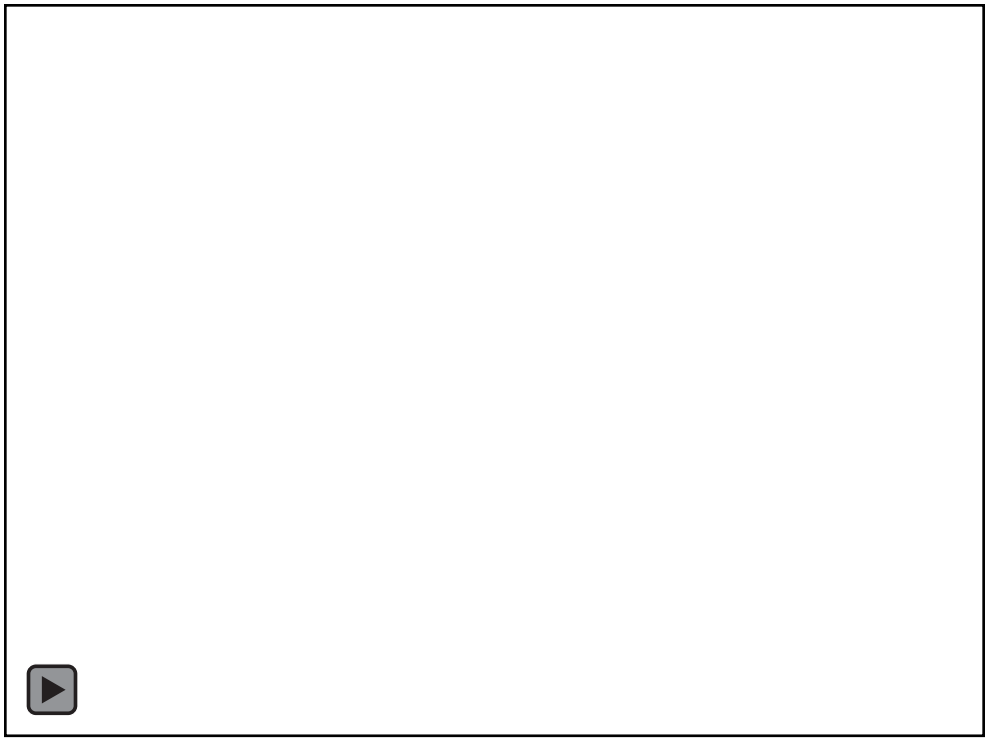
UNIVERSITY OF KENTUCKY
College of Medicine











Thank You

sdhar@uky.edu