

## **SAMPLE**

**University of XXXXX Hospital  
Echo Town, XX**

### **PROTOCOL FOR PERFORMING COMPLETE TRANSTHORACIC ECHOCARDIOGRAMS**

**PURPOSE:** To provide standards for performing quality echocardiograms.

#### **General Guidelines:**

- No echocardiograms will be performed without a written order (for stat requests, a verbal order is sufficient; obtain the written order ASAP). Examine the order for type of exam and indication.
- All echocardiograms should contain the images and Doppler measurements listed under "Routine Echocardiograms". In addition, the sonographer should obtain any images and/or Doppler measurements pertinent to the patient's particular pathology. If the sonographer is unable to obtain an image, the attempt must be documented.
- All echocardiograms will be captured digitally and stored in the XXXXX digital reading system. Two-beat loops will be obtained; for A-fib cases, obtain five-beat loops of the PLAX, PSAX at pap level, A4C and A2C.
- Two-beat digital captures will be obtained of each view, 2D measurement, color Doppler view, spectral waveform and waveform measurement. For each measurement, calipers and tracings must be visible.
- Images will be obtained from standard on-axis imaging planes; measurements will be made from standard orthogonal views.
- Machine settings, transducer selection and patient position will be adjusted as needed to optimize images (including valvular morphology and endocardial border definition), color Doppler and spectral Doppler.

#### **Patient Preparation:**

- Introduce yourself to patient.
- Verify patient identity according to hospital procedure.
- Explain the test.
- Allow privacy for [out] patient to change into hospital gown. (An inpatient will usually have a gown on.)
- Attach EKG leads from the echo machine to the patient.

- Position patient in the left lateral recumbent position.
- Use gown or towel to cover female patient's chest area during scanning.

## **ROUTINE ECHOCARDIOGRAMS:**

### **Parasternal long axis view (PLAX) and related views:**

- 1) Obtain a **PLAX view**.
- 2) Use increased depth to rule out effusions, and then decrease depth.
- 3) Measure the following in M-mode or 2D:
  - In **end-diastole**, measure the **anterior septum, left ventricular (LV) internal diameter, and posterior wall**.
  - In **systole**, measure the **LV internal diameter**.
  - The **aortic root** will be measured at **end-diastole**.
  - The **left atrium** will be measured in **end-systole**, at its greatest anterior-posterior dimension.
- 4) Interrogate the aortic and mitral valves with **color Doppler**.
- 5) Interrogate the pulmonic valve with **color Doppler**.
- 6) Obtain a **right ventricular inflow view (RVIT)**.
- 7) Interrogate the tricuspid valve with **color Doppler**.
- 8) If tricuspid regurgitation (TR) is present, use **continuous wave (CW) Doppler** to obtain the RA/RV gradient, to calculate the **pulmonary artery pressure**.

### **Parasternal short axis view (PSAX):**

- 9) Obtain a **PSAX** at the level of the aortic valve. Demonstrate aortic, pulmonic and tricuspid valve leaflet morphology.
- 10) Use **color Doppler** to individually interrogate the pulmonic, aortic and tricuspid valves. If TR is present, obtain the gradient with CW Doppler.
- 11) Obtain pulsed **wave (PW) spectral Doppler** of the **tricuspid valve** inflow and the **pulmonic valve** outflow.
- 12) Obtain a **PSAX** of the LV at the level of the mitral valve.
- 13) Interrogate **interventricular septum** with **color Doppler**.
- 14) Obtain a **PSAX** of the LV at the level of the papillary muscles.
- 15) Obtain a **PSAX** of the LV at the level of the apex.

### **Apical four chamber and five chamber views (A4C and A5C)**

- 16) Obtain an **A4C** from the apex of the heart. Take care not to foreshorten the image.
- 17) Obtain an **apical 5C** view to image the aortic valve.
- 18) Use **color Doppler** to individually interrogate the mitral, aortic and tricuspid valves.
- 19) If **TR** is present, obtain the **gradient** with CW.
- 20) Obtain **spectral Doppler of the AV** with CW.
- 21) Obtain **spectral Doppler of the LVOT** with PW.
- 22) Obtain **spectral Doppler of MV** with PW at the leaflet tips.

### **Apical two chamber view (A2C)**

- 23) Obtain an **A2C** view. Take care not to foreshorten the image.
- 24) Interrogate the mitral valve with **color Doppler**.

### **Apical long axis view**

- 25) Obtain an apical long axis.
- 26) Interrogate the mitral and aortic valves with **color Doppler**.

### **Subcostal view**

- 23) Obtain a **subcostal four-chamber view**.
- 27) Interrogate the **mitral and tricuspid valves** with **color Doppler**.
- 28) If **TR** is present, obtain the **gradient** with CW.
- 29) Interrogate the **interatrial and interventricular septa with color Doppler**, to look for a shunt.
- 30) Obtain **subcostal short axis views** if the parasternal short axis views were suboptimal.
- 31) Image the **inferior vena cava (IVC) entering the right atrium**, with and without respiration.

### **Suprasternal Notch view (SSN) – When Indicated**

- 32) Reposition patient on back with pillow under shoulders/neck to optimize SSN images.
- 33) Obtain **suprasternal notch view** to image **aortic arch**. Visualize branches if possible.
- 34) Interrogate arch with **color Doppler**.
- 35) Obtain **spectral Doppler of descending aorta** with PW.

**In addition to the above protocol, we are responsible for obtaining additional images, measurements and Doppler for aortic stenosis.**

### **Aortic Stenosis:**

- 1) **Zoom on AV** in PLAX and PSAX for valve morphology.
- 2) On zoomed PLAX AV, **measure LVOT diameter** (in systole).
- 3) In A5C, obtain **CW of aortic outflow**. Trace multiple waveforms.
- 4) In A5C, obtain **PW in LVOT**. Trace multiple waveforms.
- 5) In apical long, obtain **CW of aortic outflow**. Document velocity, but enter data into analysis package only if higher velocity obtained.
  
- 6) Interrogate aortic outflow with the dedicated CW probe from the apical SSN area and in right parasternal area (**2 views must be obtained, with at least one clear envelope**) Document velocity, but enter data into analysis package only if higher velocity obtained.