cardiac imaging planes

planning basic cardiac & aortic views for MR

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Cardiac imaging planes

- Standard axial, sagittal and coronal views used to image other body parts are not used in cardiac imaging.

- Cardiac imaging planes are double oblique planes oriented to the heart chambers and valves.
  - Some planes mimic those seen using echocardiography and cardiac catheterization.
planning basic cardiac views

- initial localizing sequence in 3 planes
- plan direct axial, coronal & sagittal T1 or T2 W of the entire chest – include some of the liver & kidneys
planning basic cardiac views

- scroll through the axial images to find the left ventricular apex & the mitral valve
- in most patients these structures are not seen on the same image so scroll through the images to localize both structures
- plan a sagittal oblique image along this axis of the LV apex & the MV
planning basic cardiac views

- The resulting image is a vertical long axis or 2 chamber view through the LV apex & the MV.
- Depending on the ‘lie’ of the heart in the chest, the LV apex will face to the L or R on this view.

- Plan an axial oblique image through the LV apex & the MV – on the end diastole image.
planning basic cardiac views

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planning basic cardiac views

- the result is a view through the LV & RV – called a short axis scout

- plan a coronal oblique image through the base of the LV chamber

- look for the snowman!
  
  (AV – LVOT – MV)

**cine:** wall motion — myocardial thickness, pericardial effusion
planning basic cardiac views

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Cine: wall motion — myocardial thickness, pericardial effusion
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cine: wall motion — myocardial thickness, pericardial effusion
planning basic cardiac views

- the result is a view through the LV apex, LVOT & MV – known as the left ventricular outflow view

- plan an axial oblique image through the MV & LV apex using the LVOT & the LV apex

cine: wall motion — myocardial thickness, pericardial effusion
planning basic cardiac views

- The result is a view through the LV apex, LVOT & MV – known as the left ventricular outflow view.

- Plan an axial oblique image through the MV & LV apex using the LVOT & the LV apex.

Cine: wall motion — myocardial thickness, pericardial effusion.
planning basic cardiac views

- the result is a horizontal long axis (HLA) view through the LV & RV

- from the HLA view, several more cardiac views are planned
  - stack of SA for function
  - LV 2 CH
  - RV 2 CH

  cine: wall motion — myocardial thickness, pericardial effusion, MV & TV
planning basic cardiac views

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planning basic cardiac views

- the short axis stack through the LV & RV should be planned parallel to the atrioventricular valve plane

The MV lies slightly more cephalad than the TV

ejection fraction, wall motion, contractility — perfusion, viability
The short axis stack through the LV & RV should be planned parallel to the atrioventricular valve plane.

The MV lies slightly more cephalad than the TV.

Ejection fraction, wall motion, contractility — perfusion, viability.
planning basic cardiac views

- use a coronal, LVOT and either a coronal view of the ascending aorta or a short axis through the LV to plan en face views of the aortic valve

aortic valve insufficiency, regurgitation and stenosis
planning basic cardiac views

- from the 2 CH view of the LV
- en face views of the MV
planning basic cardiac views

- From the HLA view, several more cardiac views are planned.
  - LV 2 CH
  - RV 2 CH

contractility, wall motion — MV & TV
planning basic cardiac views

- from the RV 2 chamber view
- en face views of the TV
planning basic cardiac views

- select the axial image which shows the right ventricular outflow tract at the level of the right pulmonary artery

- plan a sagittal image through the RVOT

- plan an axial oblique through the pulmonic valve
select axial images showing

- ascending and descending aorta at the level of the right pulmonary artery
- origins of the brachiocephalic, left common carotid and left subclavian arteries
- transverse aortic arch
planning basic aortic views

- The resulting images show the thoracic aortic and brachiocephalic vessel origin lumina.

- You may need more than one slice to achieve this if the aorta is tortuous.

- Brachiocephalic vessel origins, ascending and descending thoracic aorta, aneurysm, dissection.
Select the view of the structure of interest and cut through it one or more times in order to get an accurate view of the structure from other angles.

- pulmonary arteries
- shunts
- conduits

Cross cut view of any vessel or structure
There is another way to accomplish anatomically correct cardiac views –

VLA – pseudo SA – pseudo 4CH HLA – SA – 4CH HLA

Cut through the MV and LV apex in several planes in order to create TRUE 4CH HLA and TRUE SA views!