

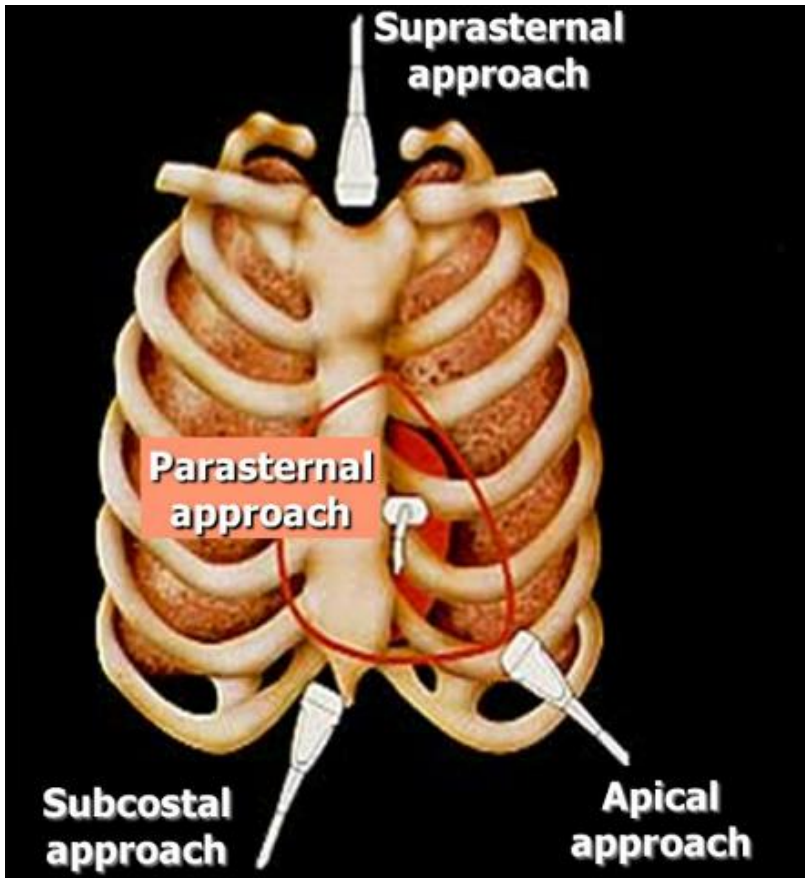
# Basic Echocardiography (basic view)

계명대학교 동산병원  
흉부외과/중환자학과  
김재범

# Critical Care Ultrasonography

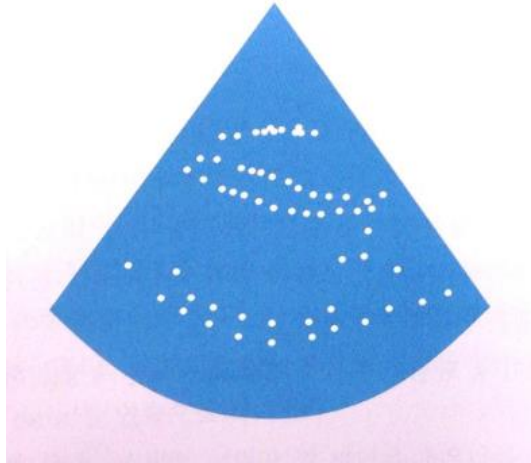
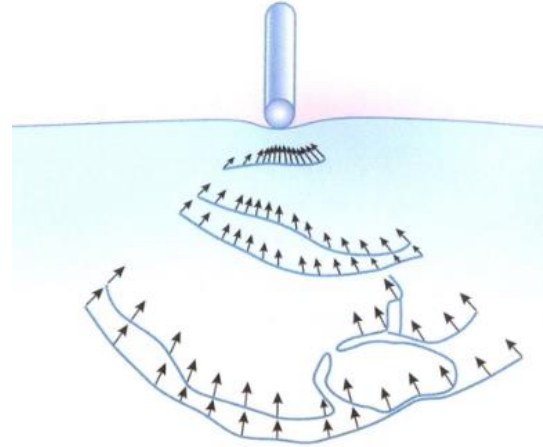
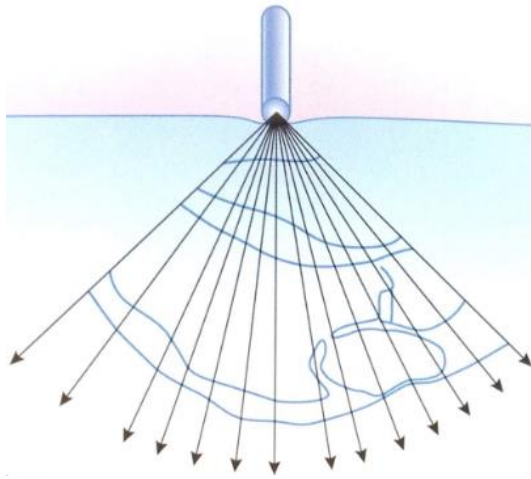
- Echocardiography
  - TTE, TEE
- Ultrasonography
  - Lung, abdomen, peripheral vascular system
- E-FAST (Whole body ultrasonography)
- SONO guided procedures (vessel, drainage,..)

# Echocardiography window

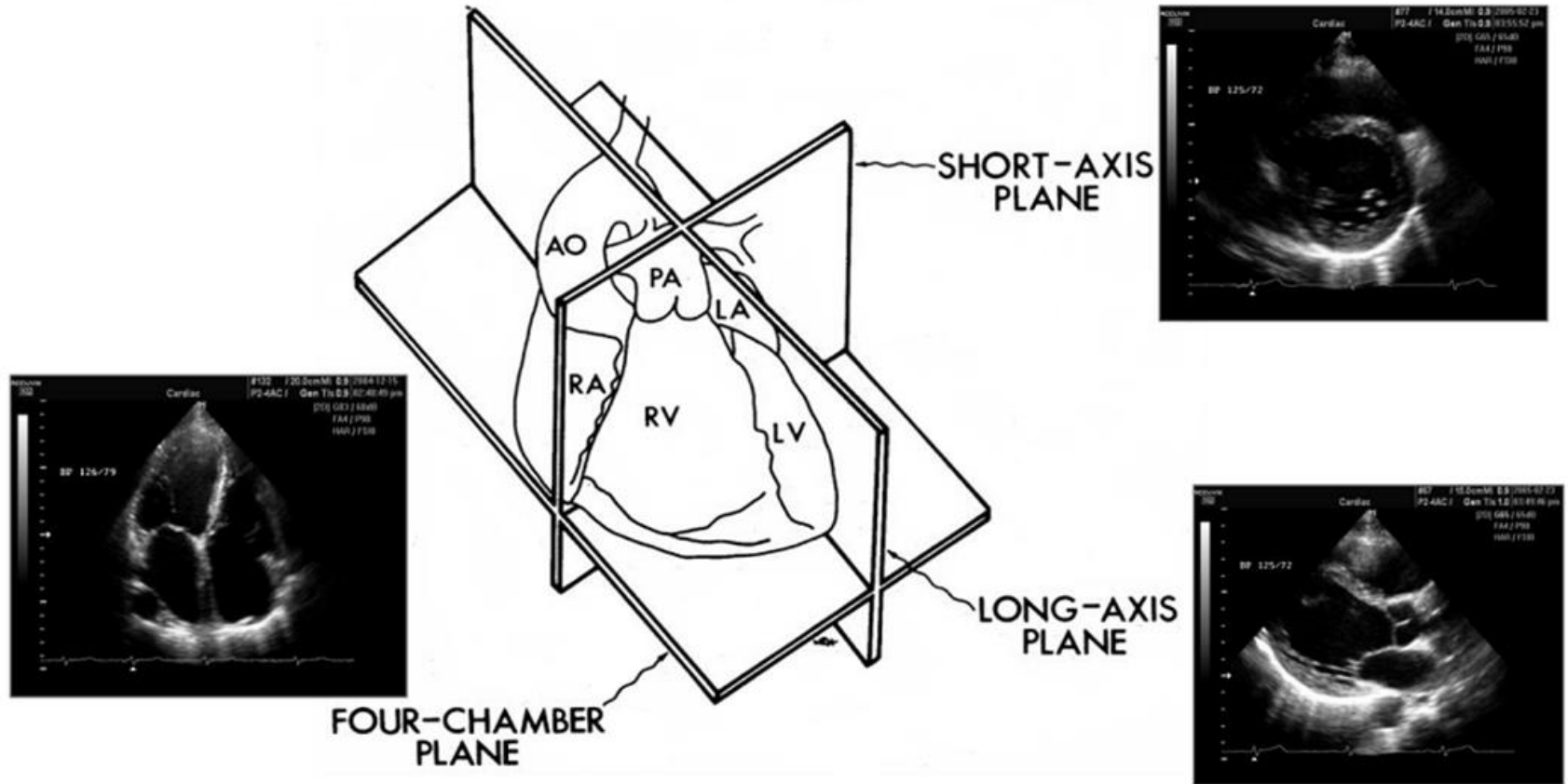


- Parasternal
- Apical
- Subcostal (Subxiphoid)
- Suprasternal

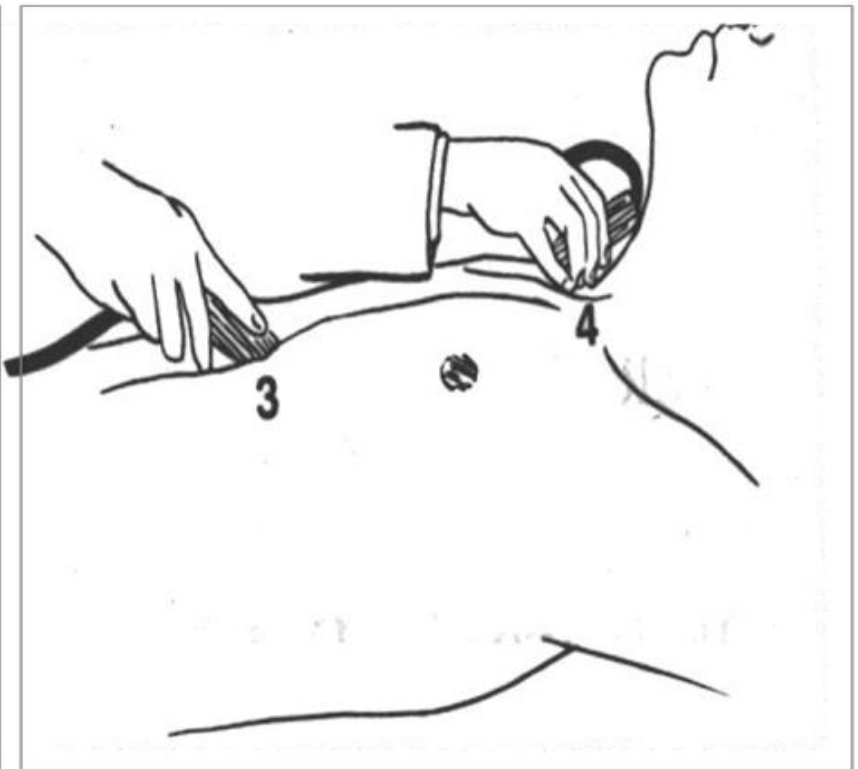
# Echocardiography window



# Echocardiography window



# Basic view of Echocardiography



# Patient positioning

- Parasternal & apical view: left lateral position
- Subcostal view: supine position (c knee bending)
- Suprasternal notch view: supine position (c head tilting)

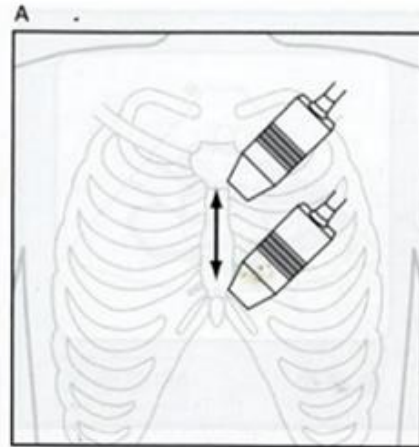
# Transducer



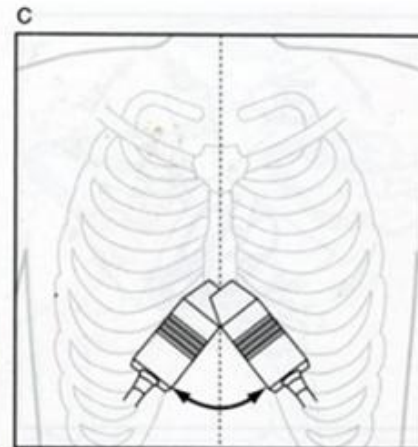


# Transducer

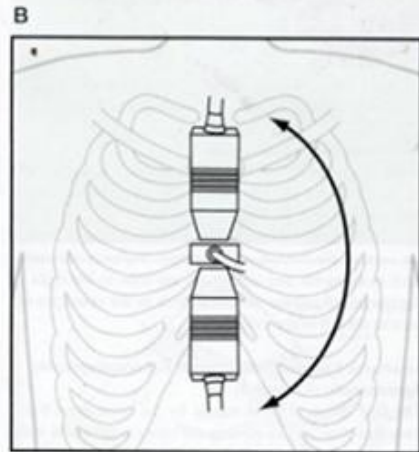
Movement



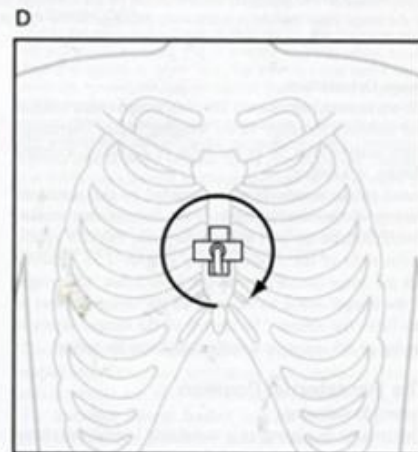
Angulation



Tilting



Rotation

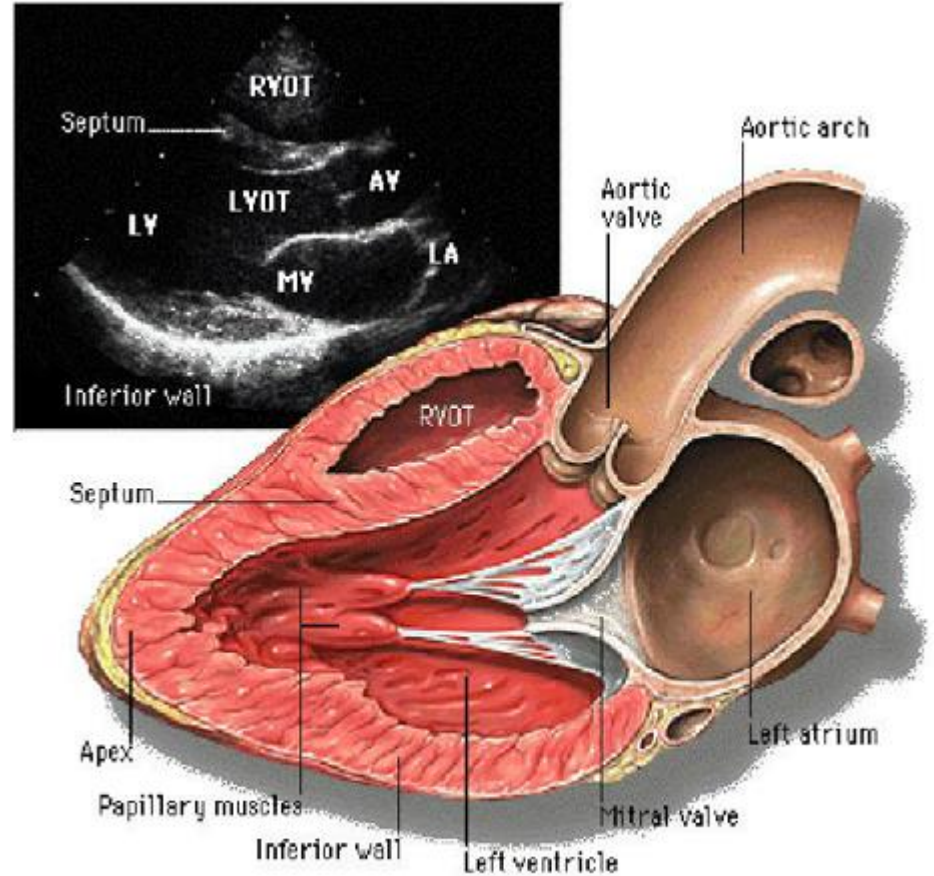
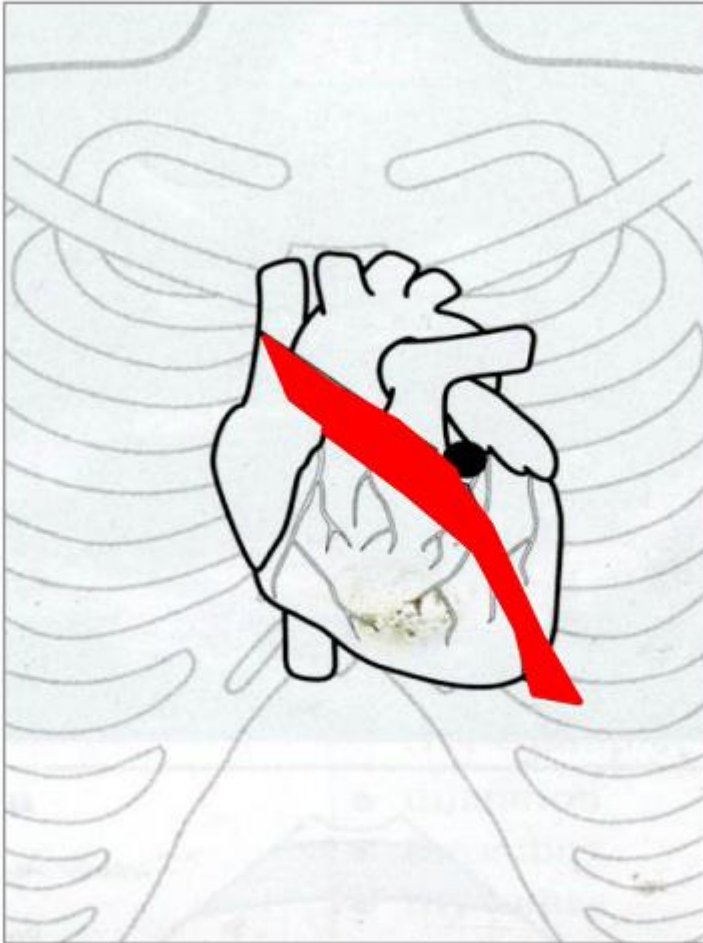


# Parasternal long axis view

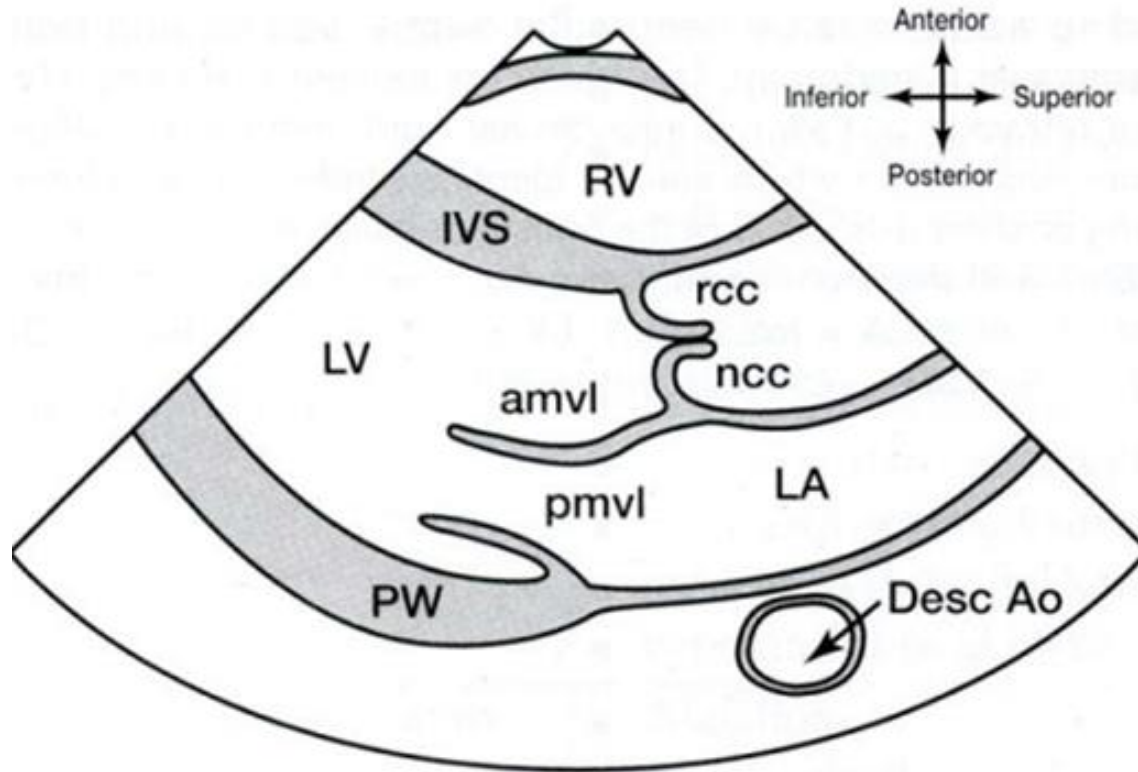


2~4번째 늑간 사이, marker를 환자의 오른쪽어깨나 머리쪽으로

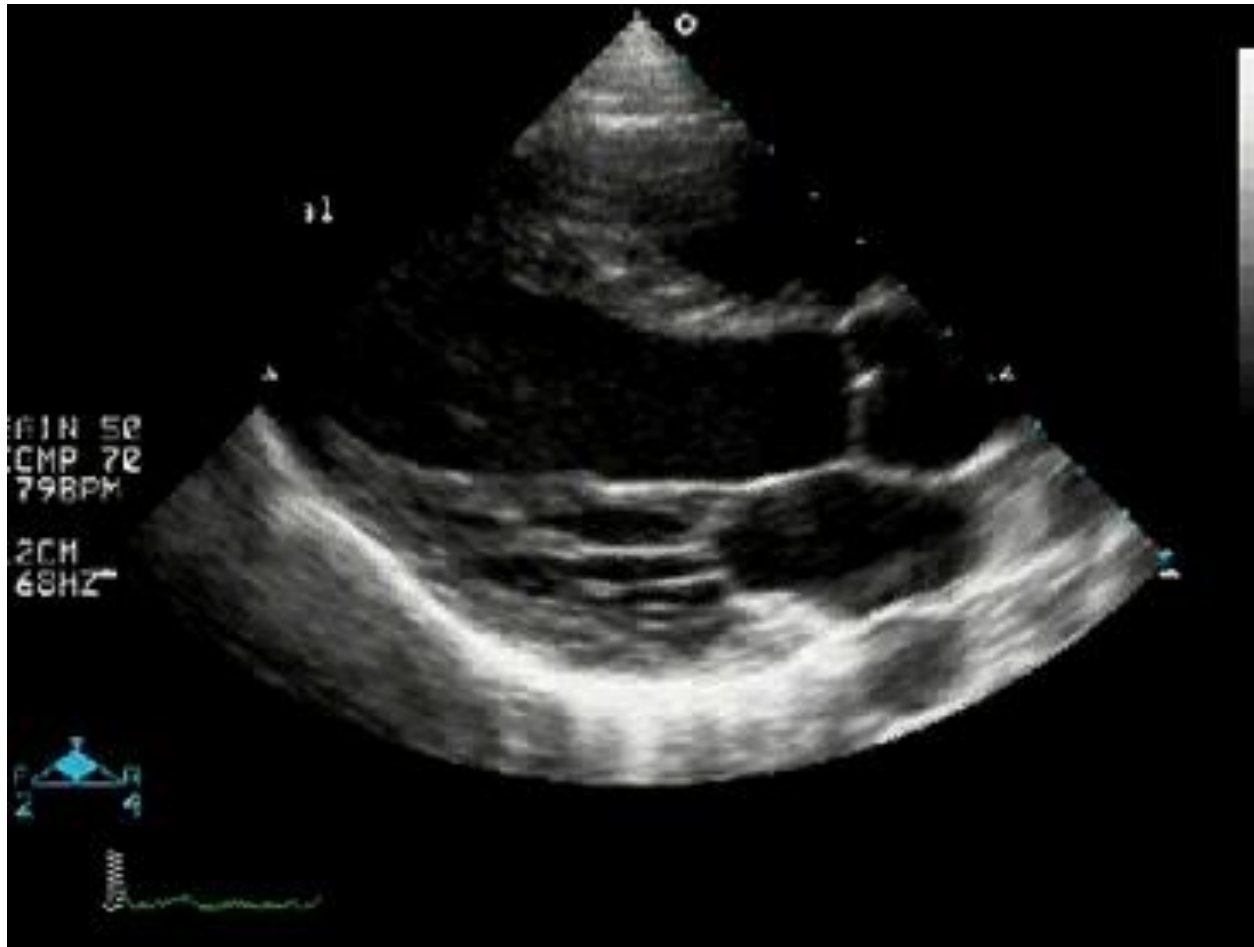
# Parasternal long axis view



# Parasternal long axis view



# Parasternal long axis view



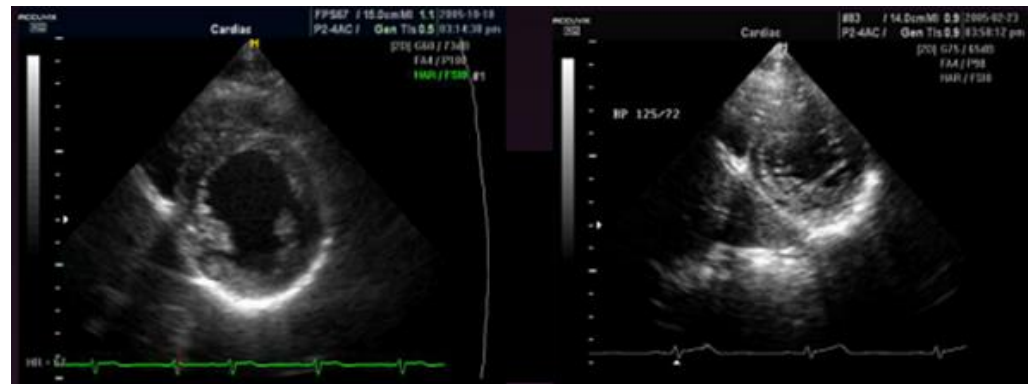
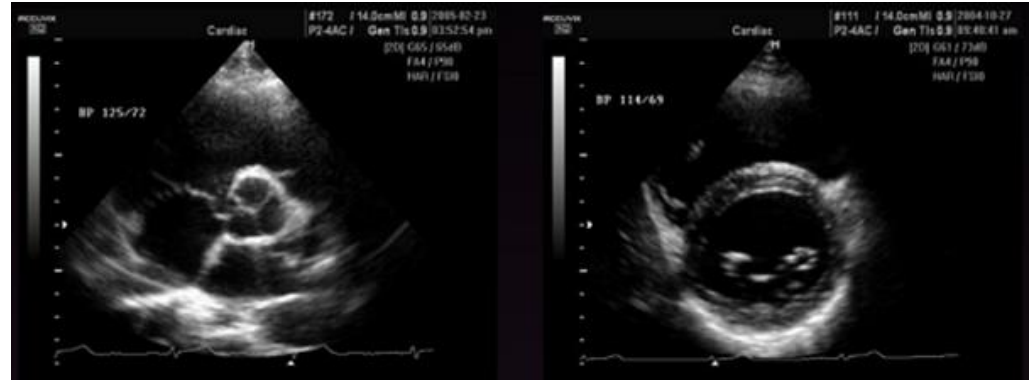
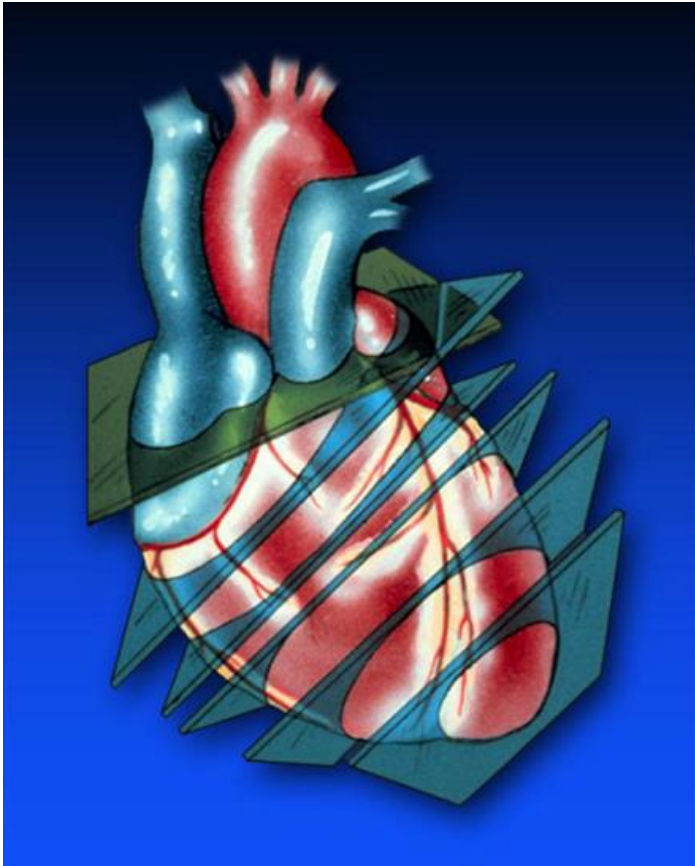


# Parasternal short axis view



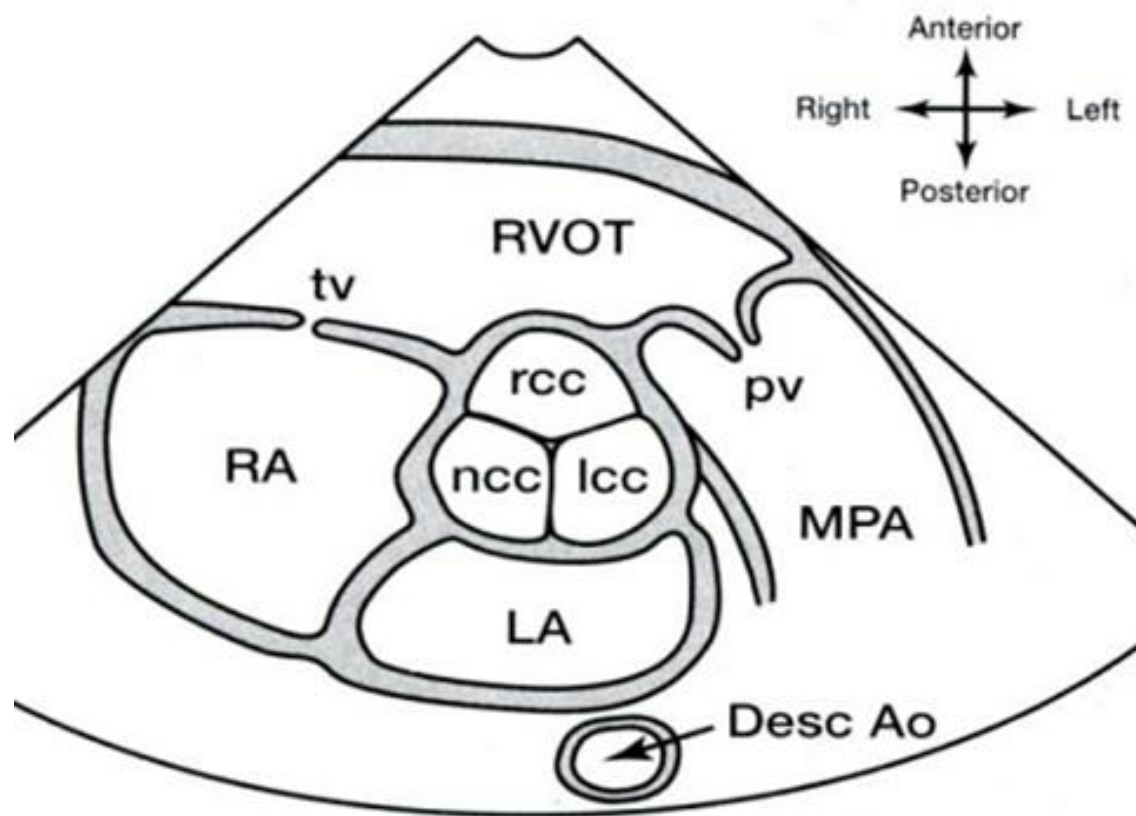
PLA에서 marker가 환자의 왼쪽어깨로 향하도록 90도 rotation

# Parasternal short axis view



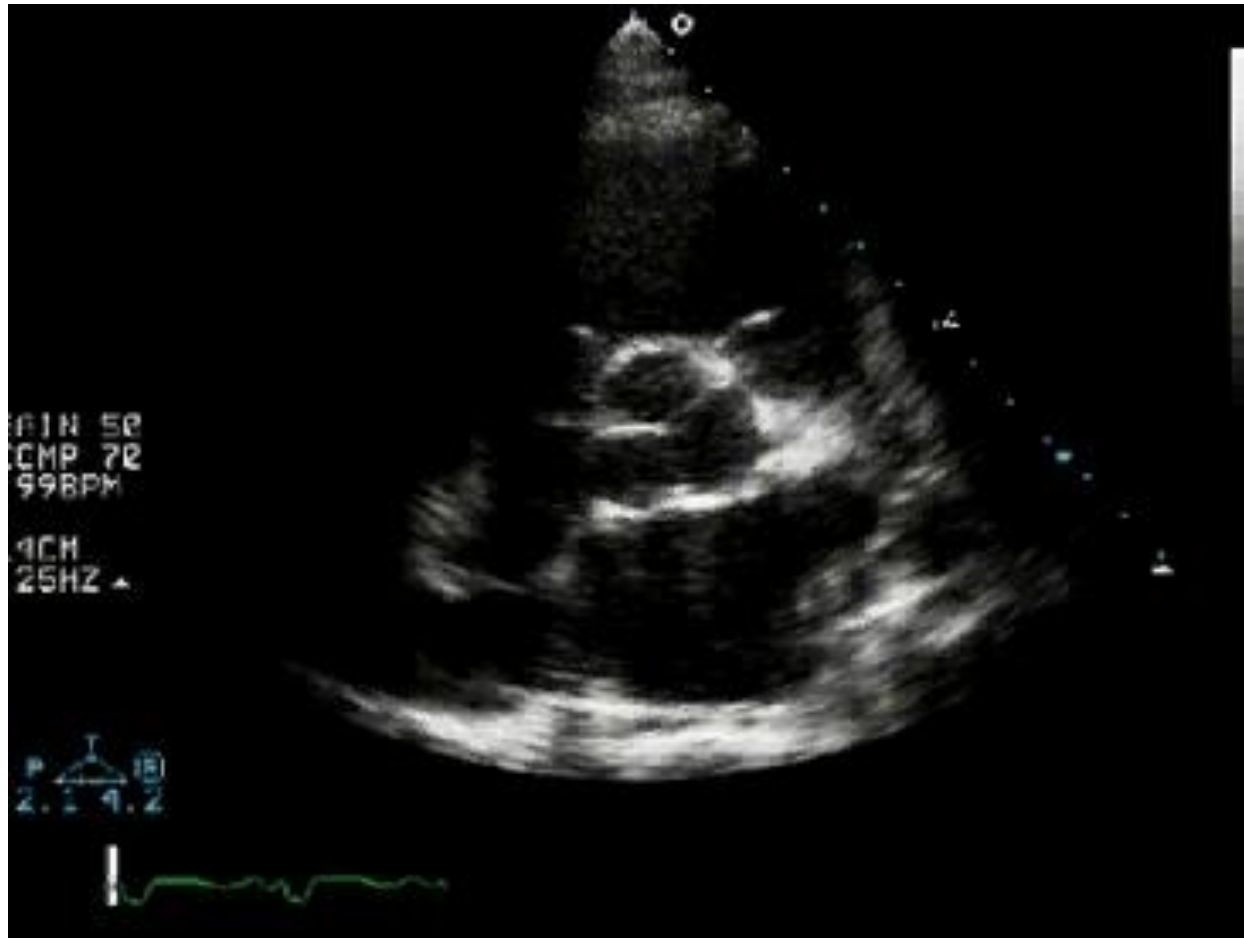
Transducer를 movement시키거나 tilting시키면서 관찰

# Parasternal short axis view

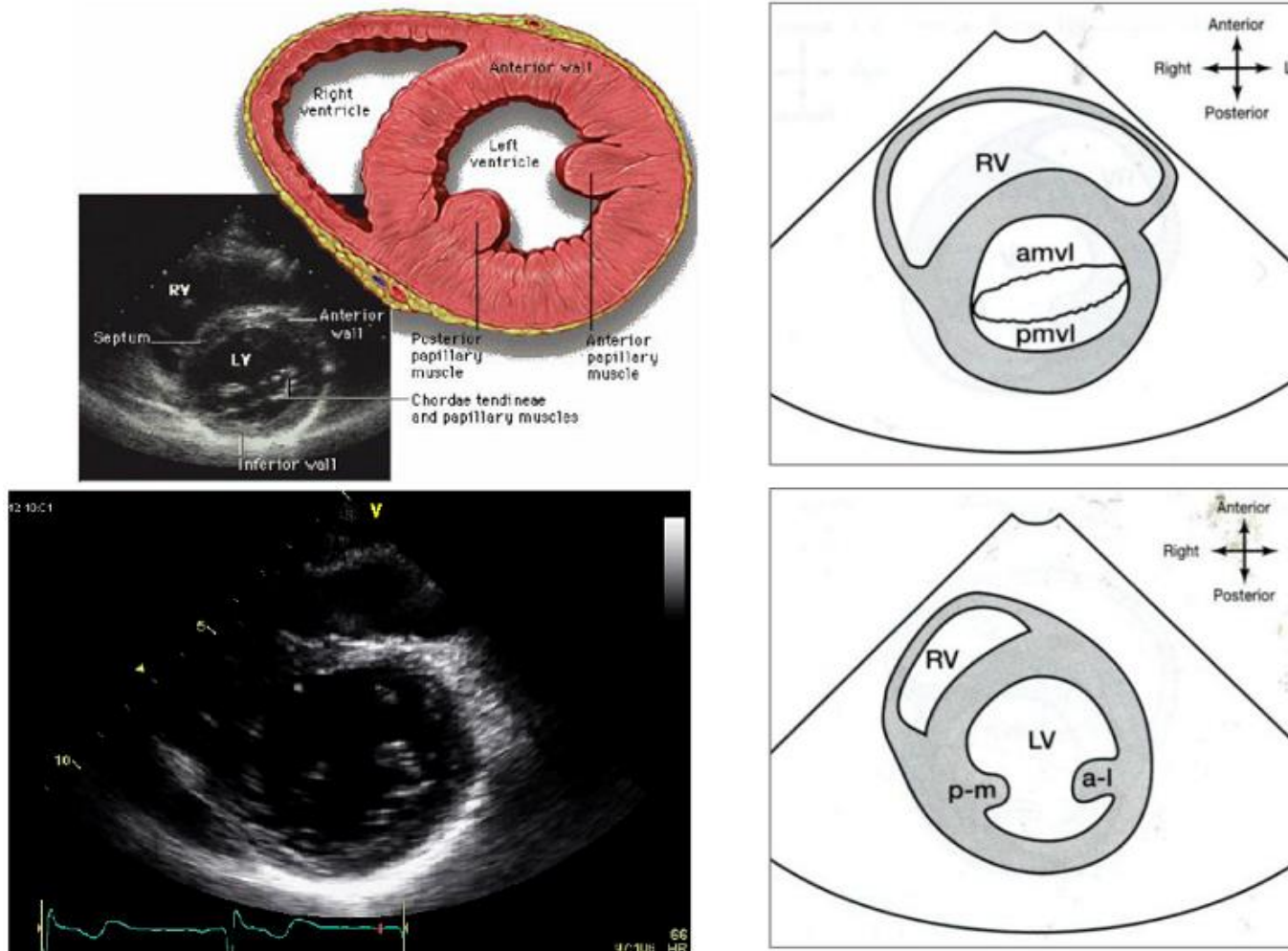




# Parasternal short axis view



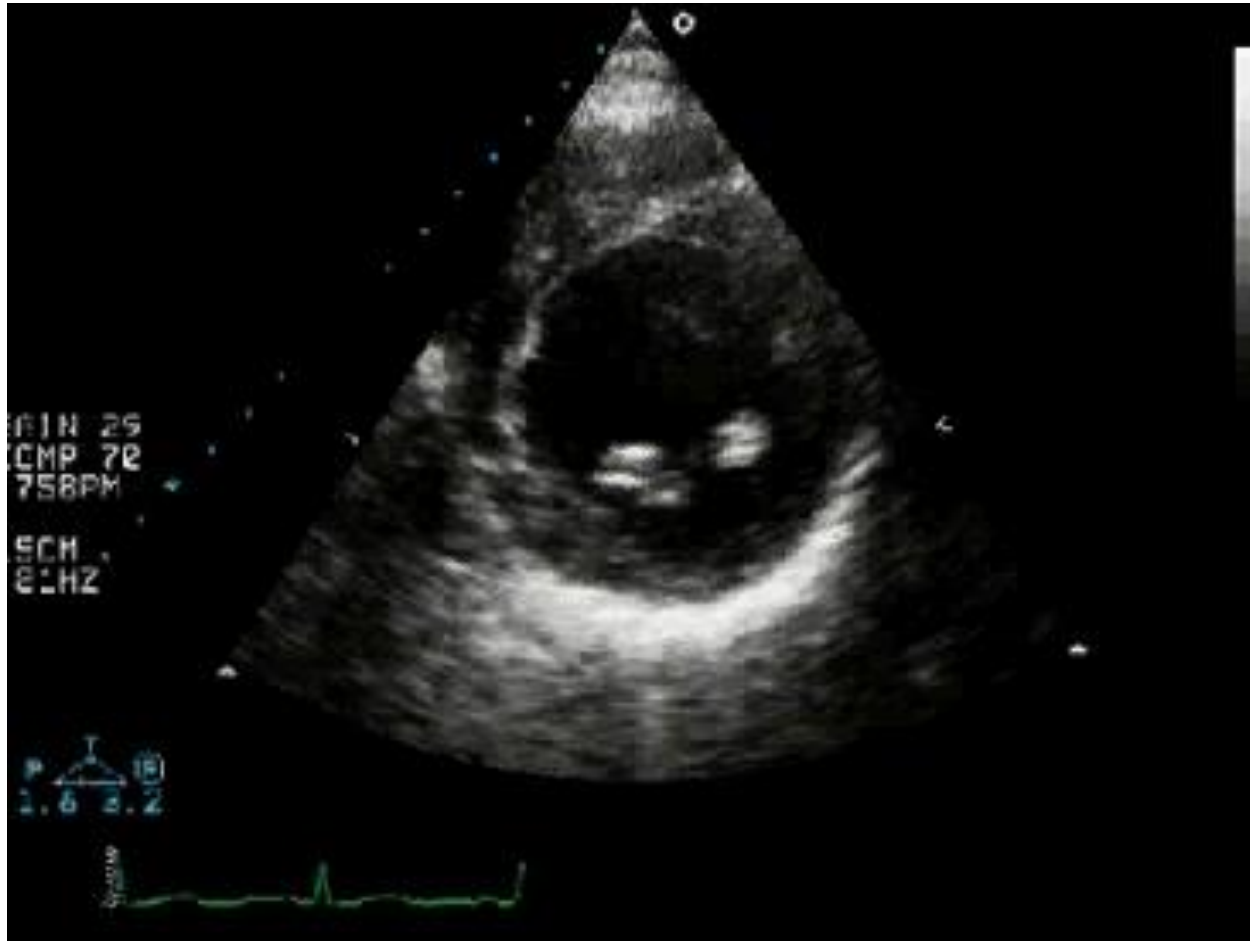
# Parasternal short axis view



# Parasternal short axis view



# Parasternal short axis view



# Apical view

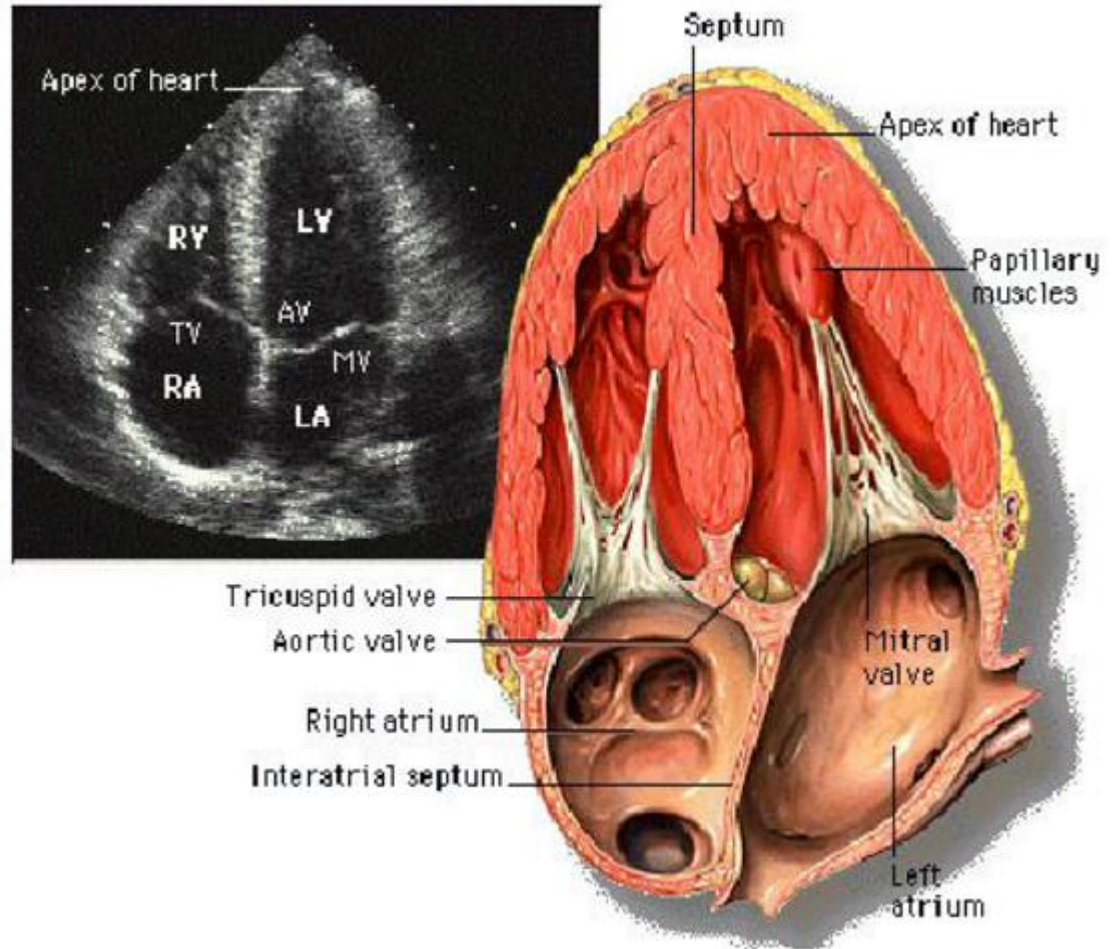
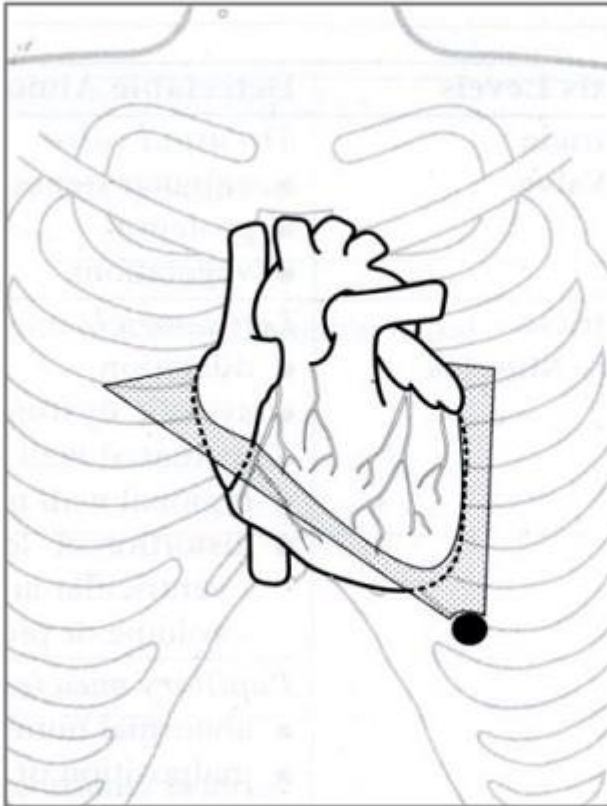


심첨부의 약간 바깥쪽에 transducer가 위치하는게 좋음

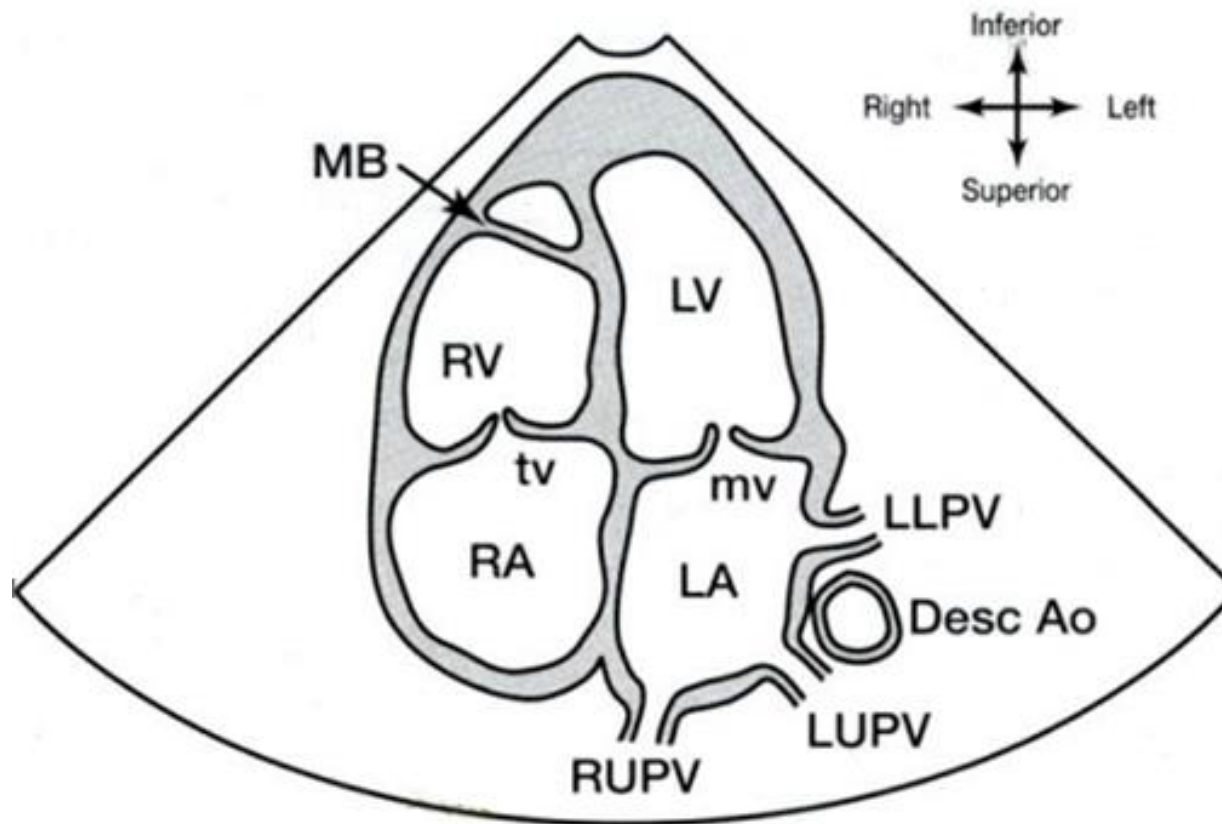
Marker는 환자의 왼쪽을 향하게 한다.(화면의 왼쪽에 좌심실이 나옴)



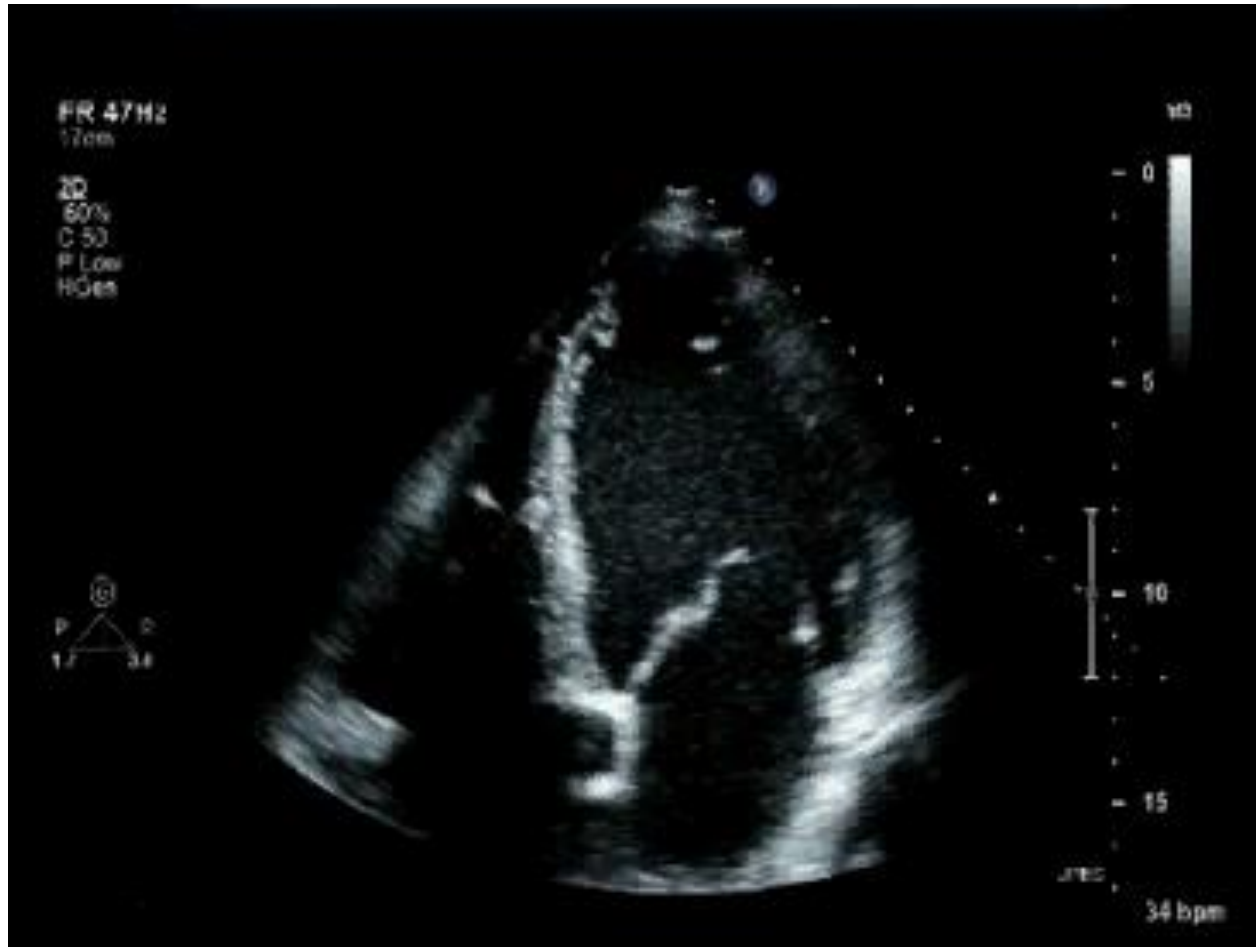
# Apical view



# Apical 4 chamber view

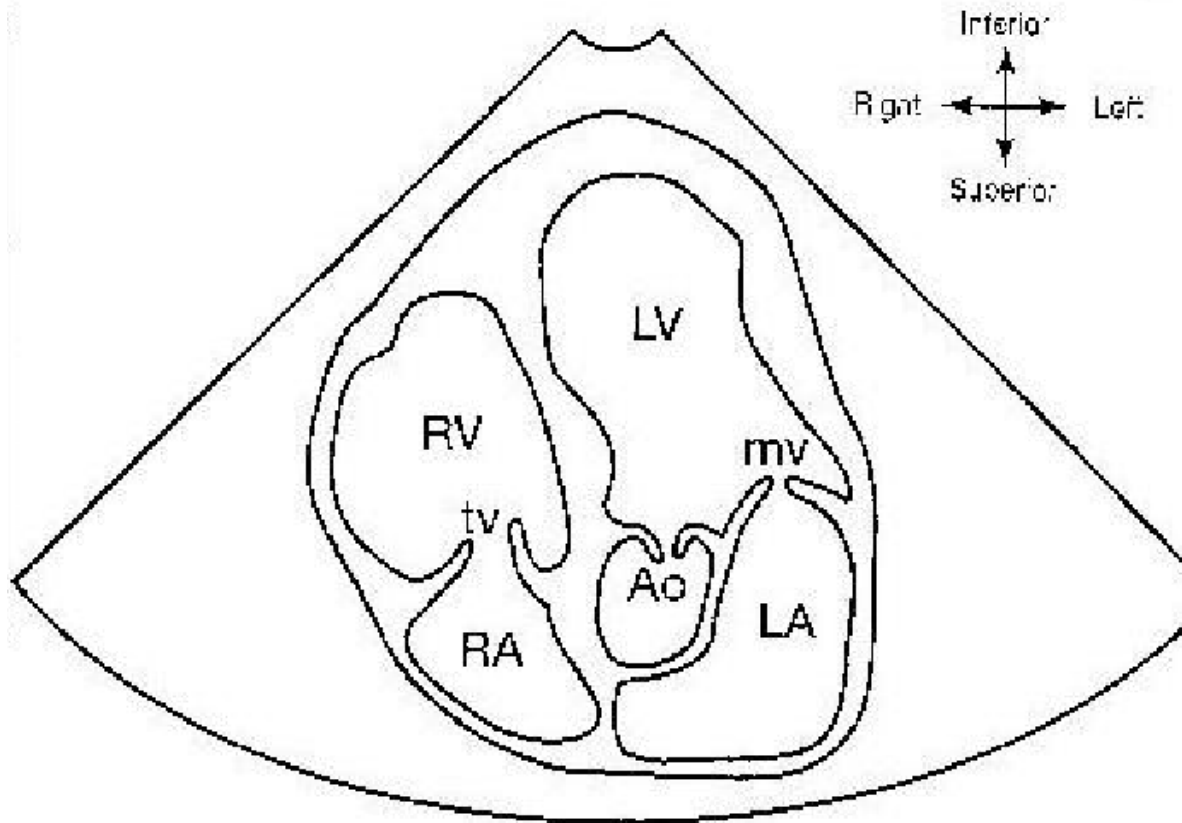


# Apical 4 chamber view



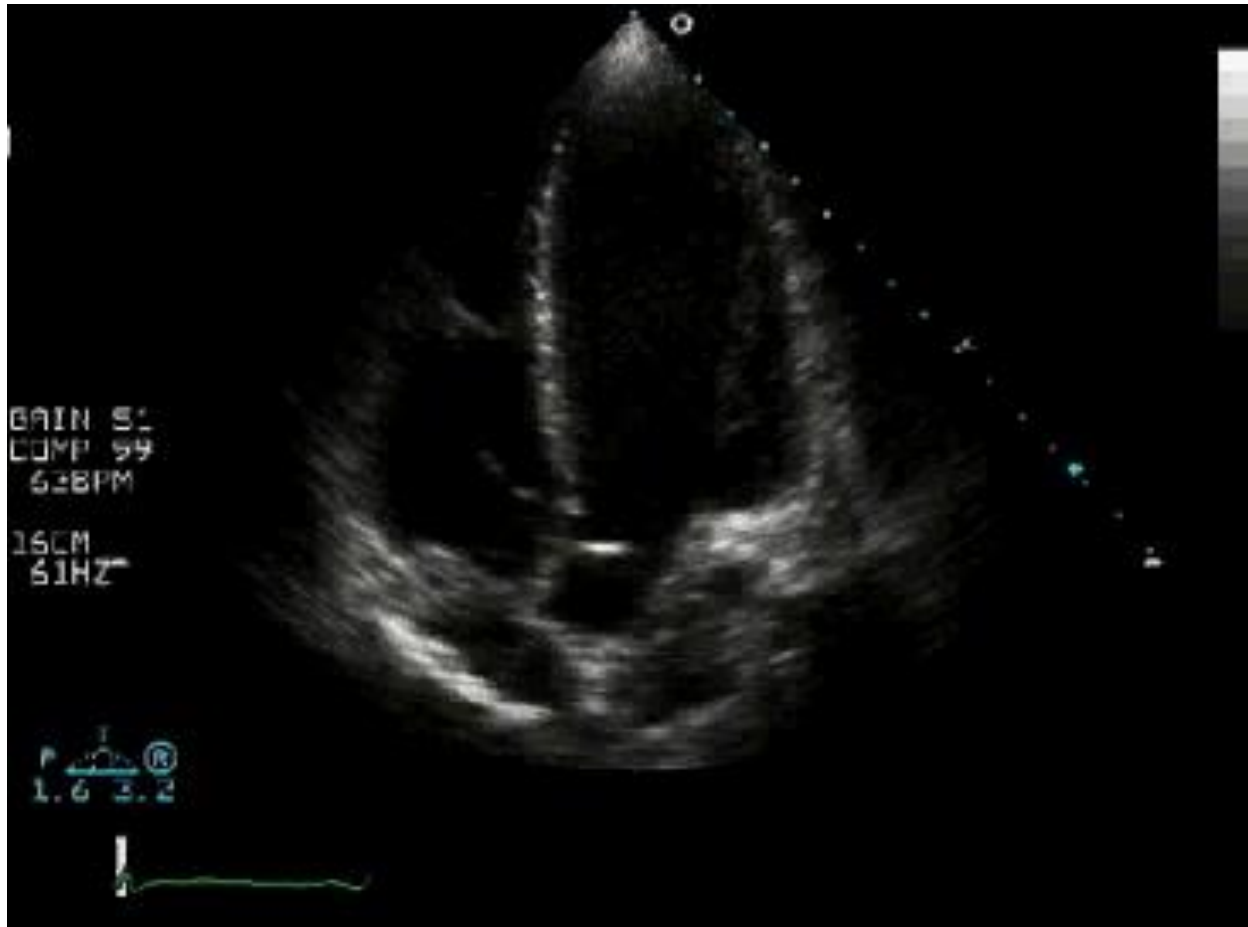


# Apical 5 chamber view

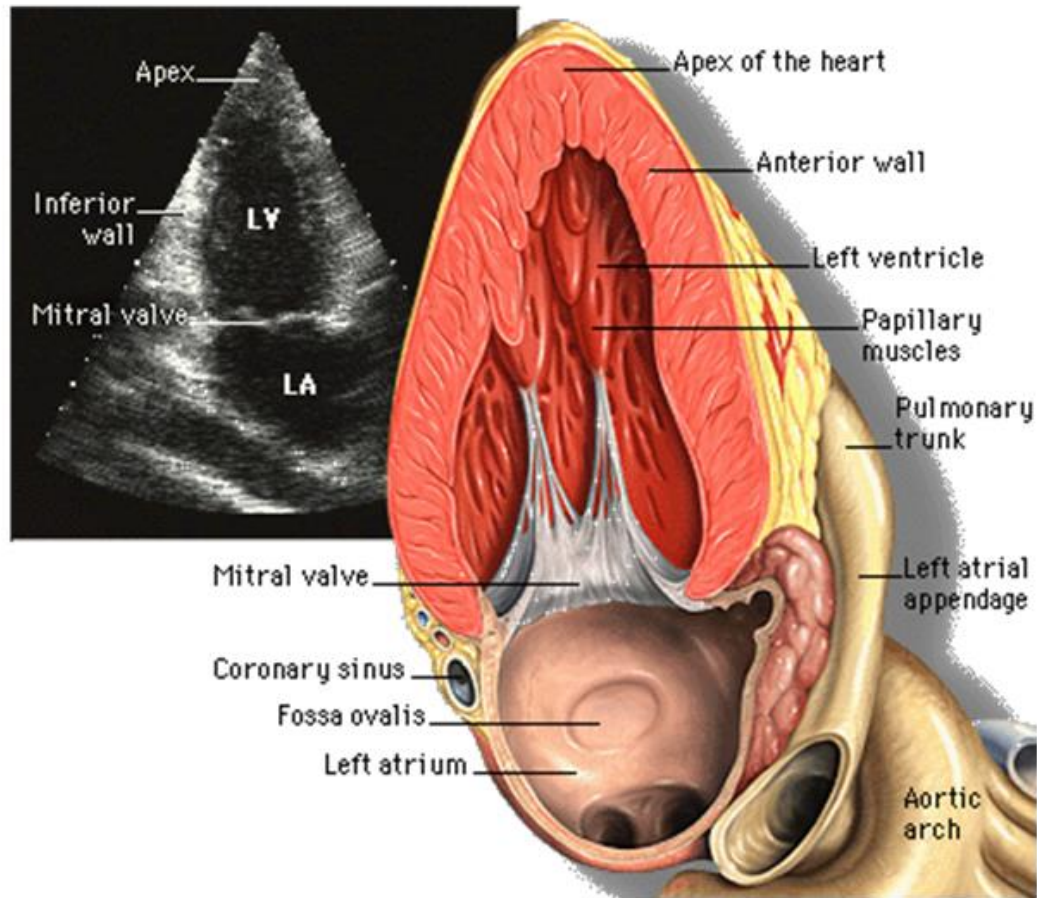


Apical 4-chamber view에서  
transducer의 머리부분을 환자의 앞쪽으로 기울이면 나타남

# Apical 5 chamber view

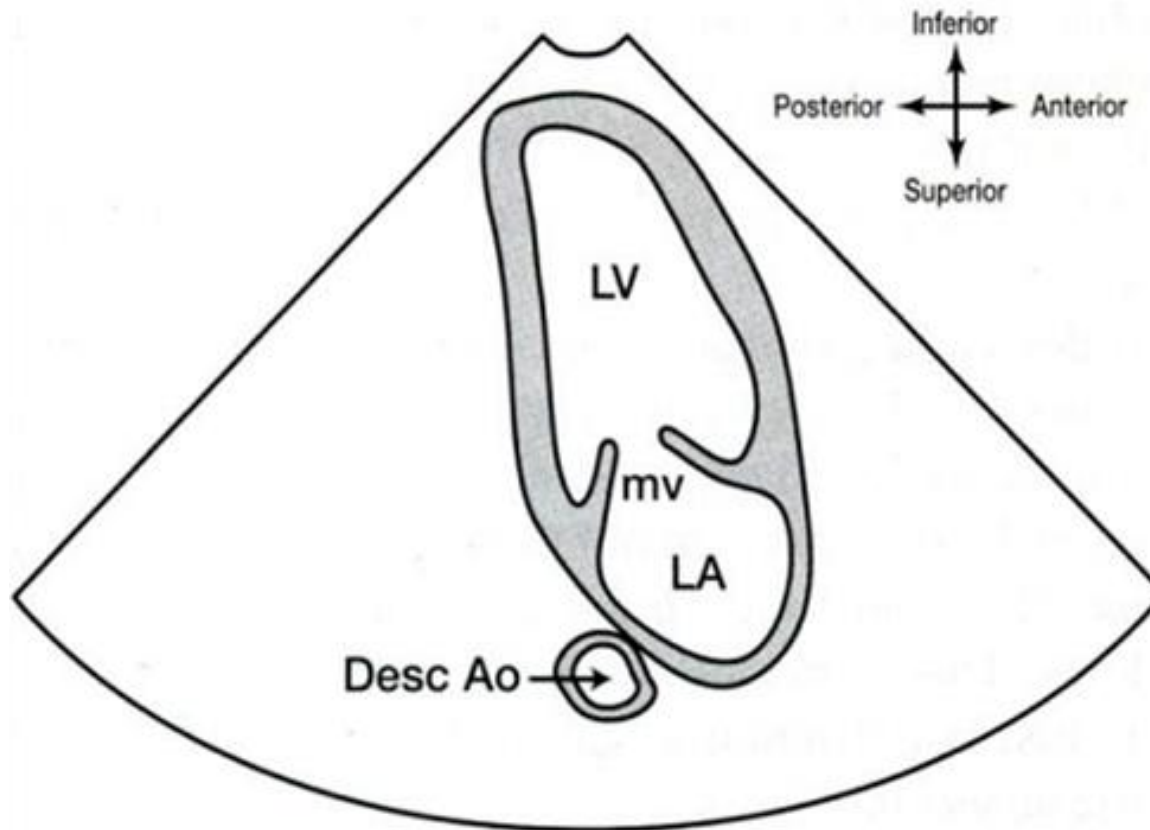


# Apical 2 chamber view

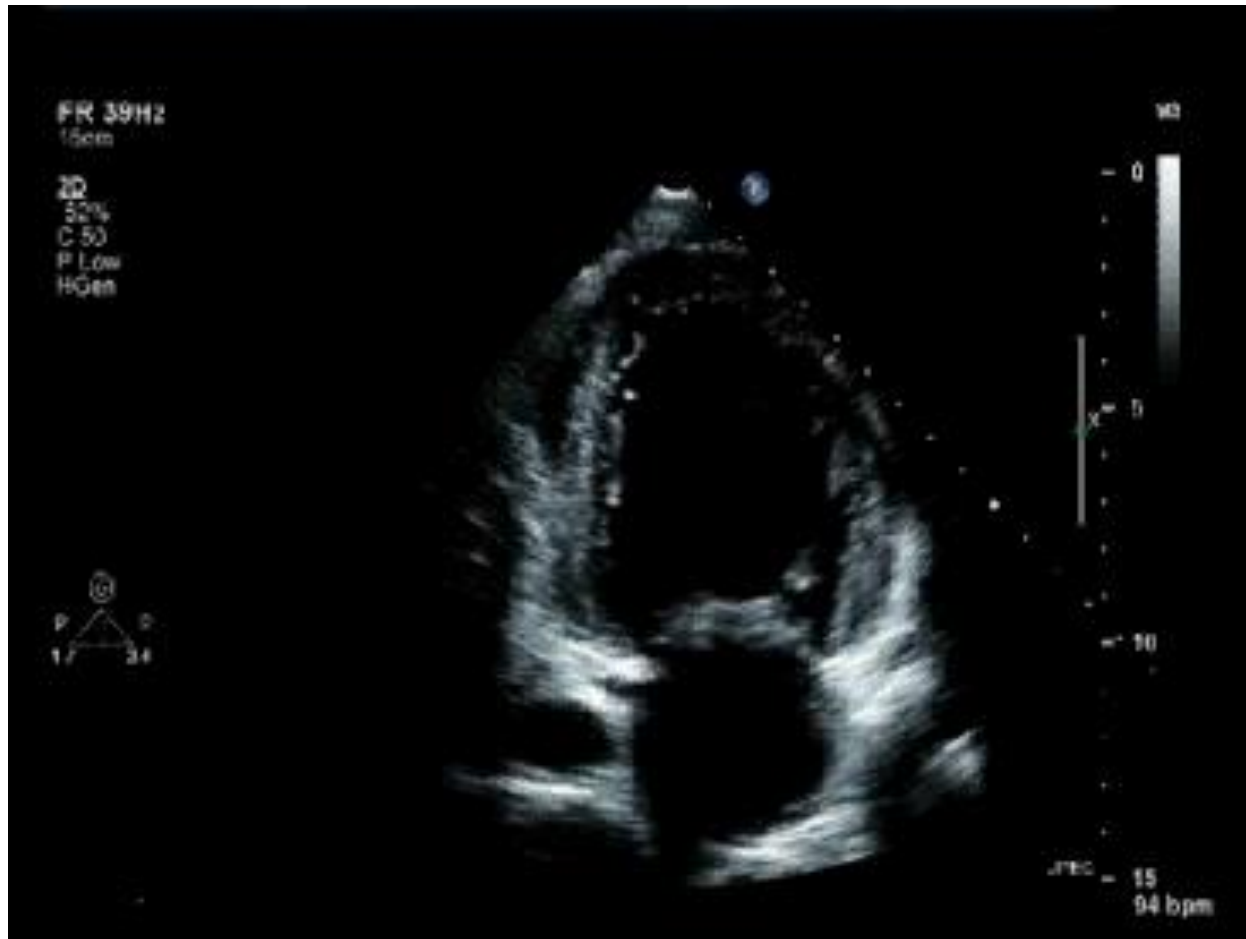


Apical 4-chamber view에서 transducer를 시계반대방향으로 60도 정도 rotation시키면 나타남.

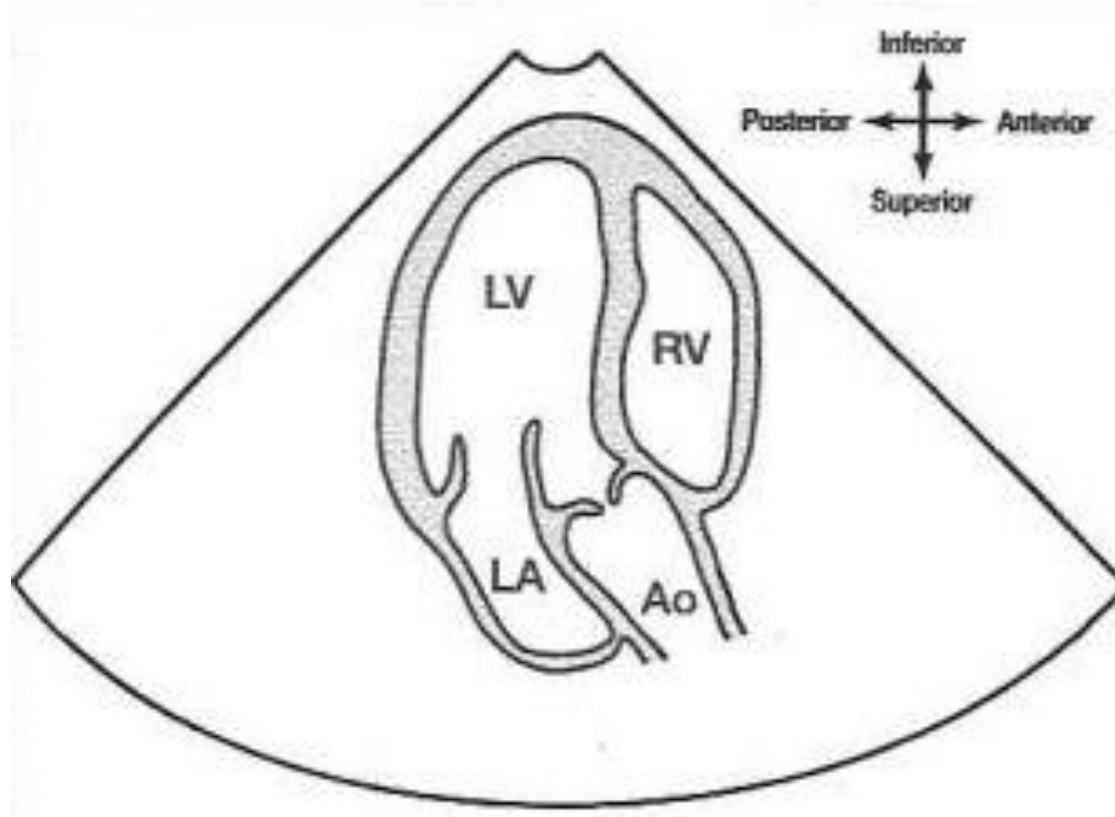
# Apical 2 chamber view



# Apical 2 chamber view

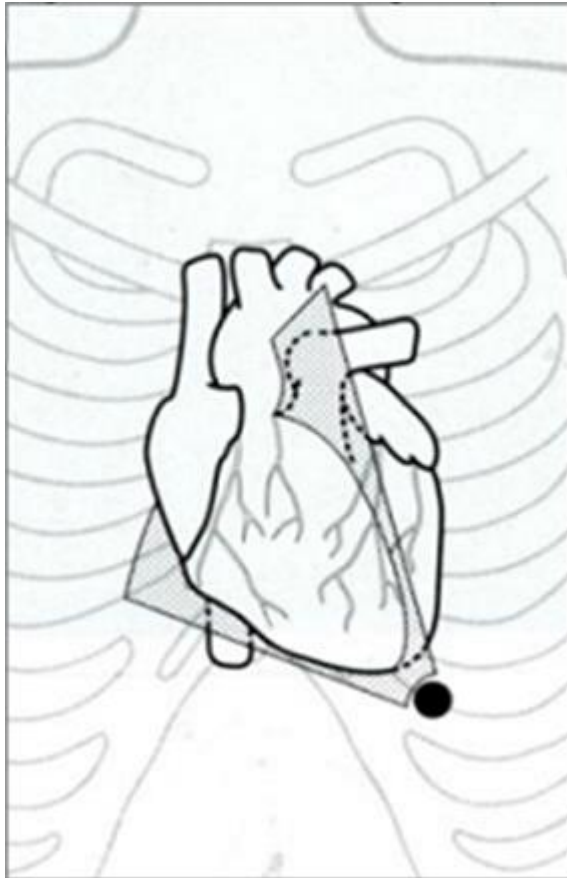


# Apical 3 chamber view

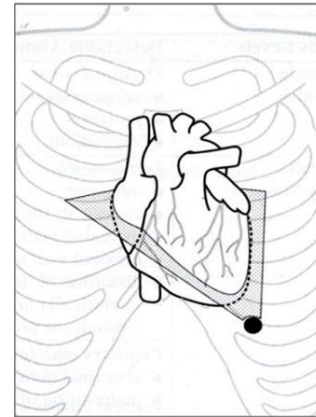


Apical 2-chamber view에서 transducer를 시계반대방향으로 60도 정도 rotation시키면 나타남.

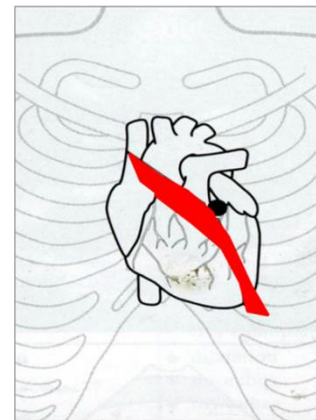
# Apical 3 chamber view



A3C

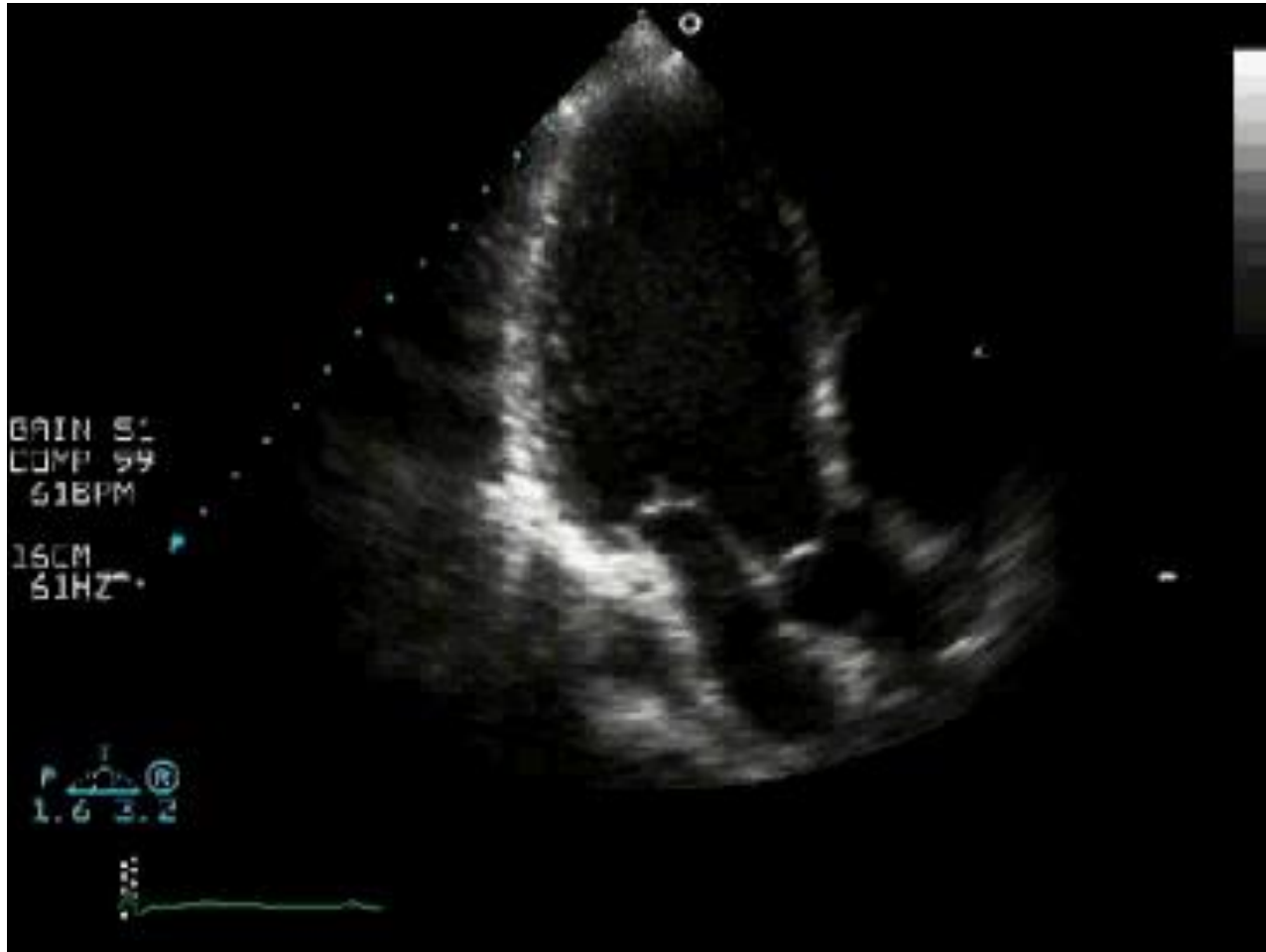


A4C



PLAX

# Apical 3 chamber view



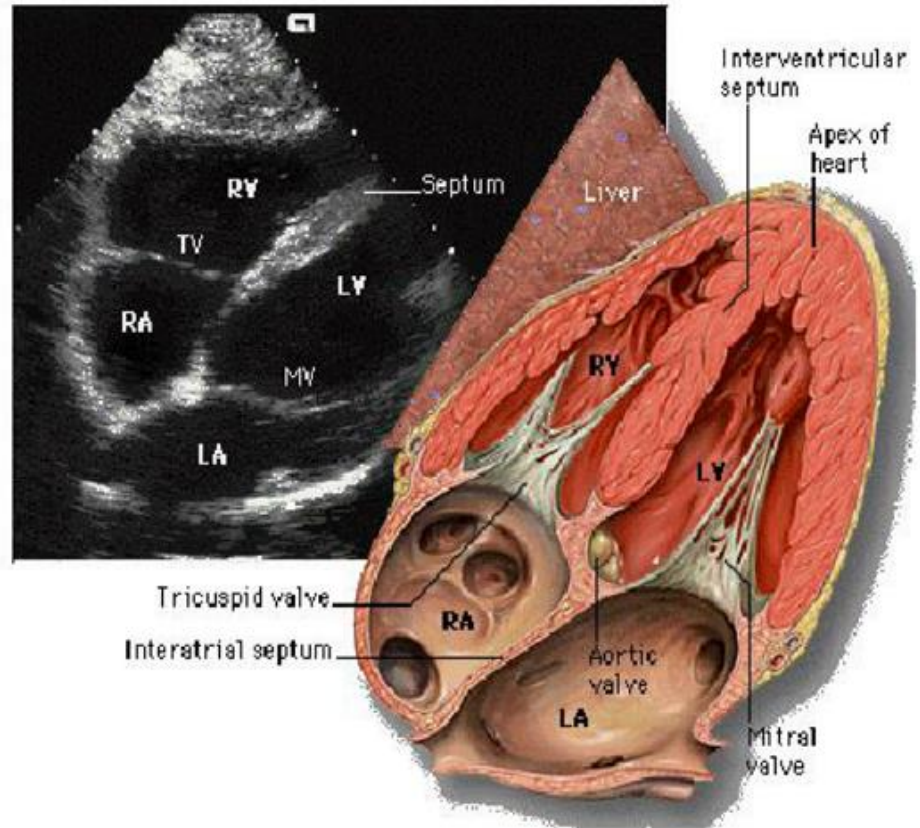
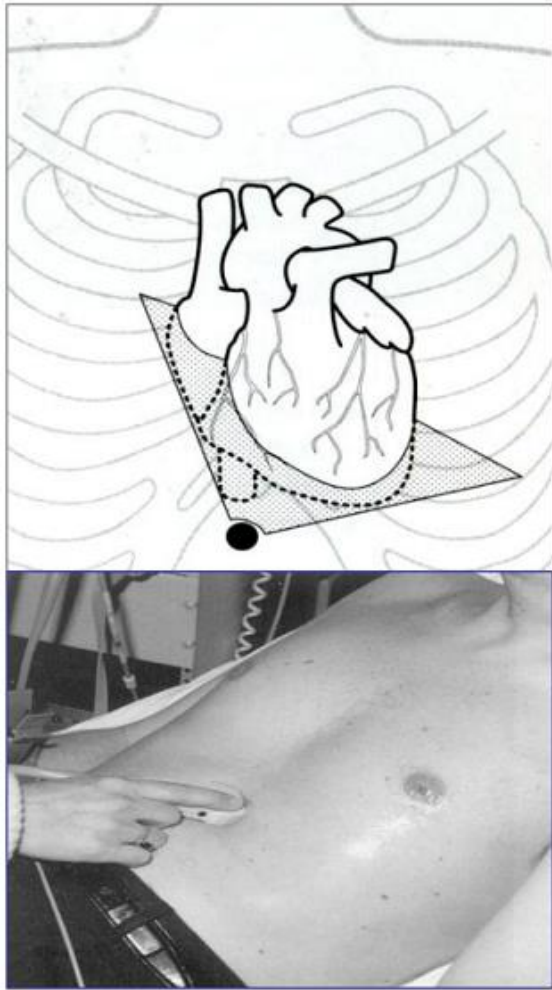


# Subcostal view

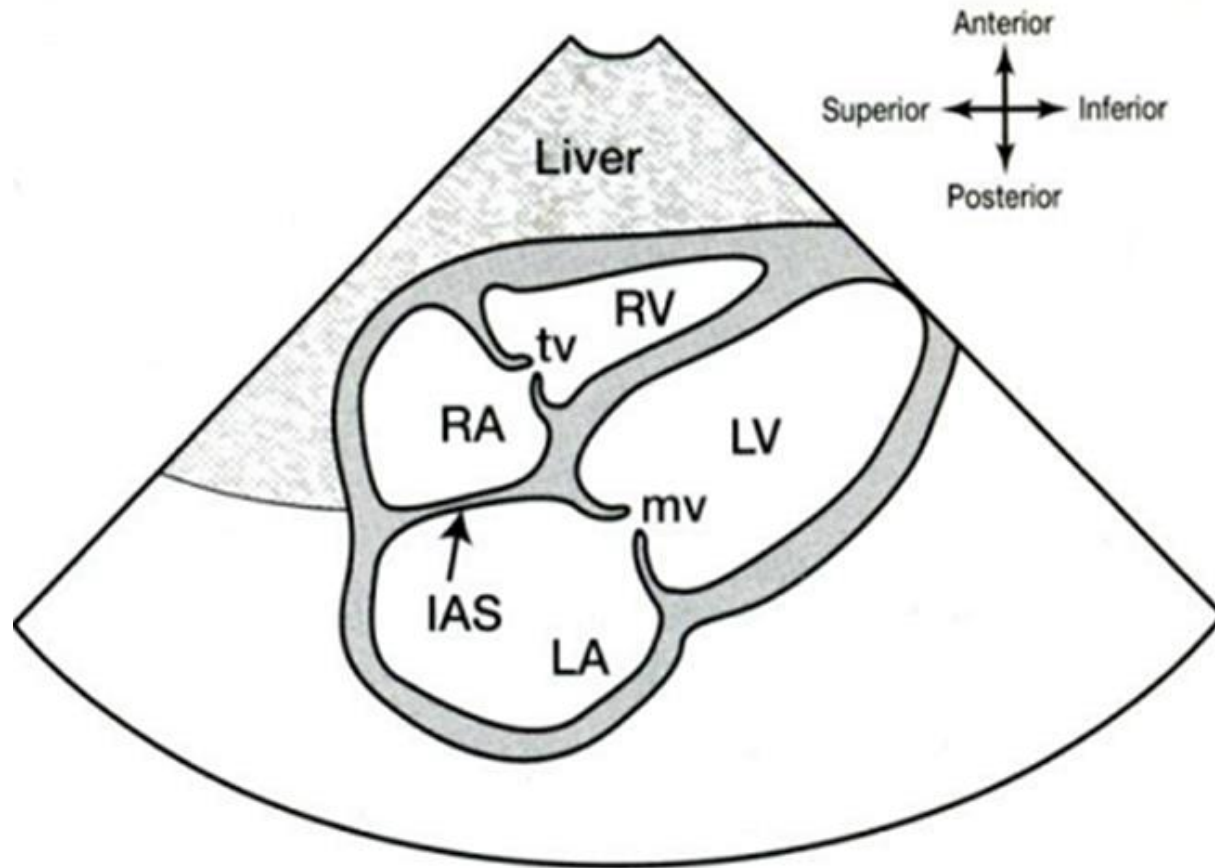


Transducer를 명치부위에 놓고 늑골하부로 누르면서 머리부분이 환자의 왼쪽쇄골부위로 가게 한다.

# Subcostal view



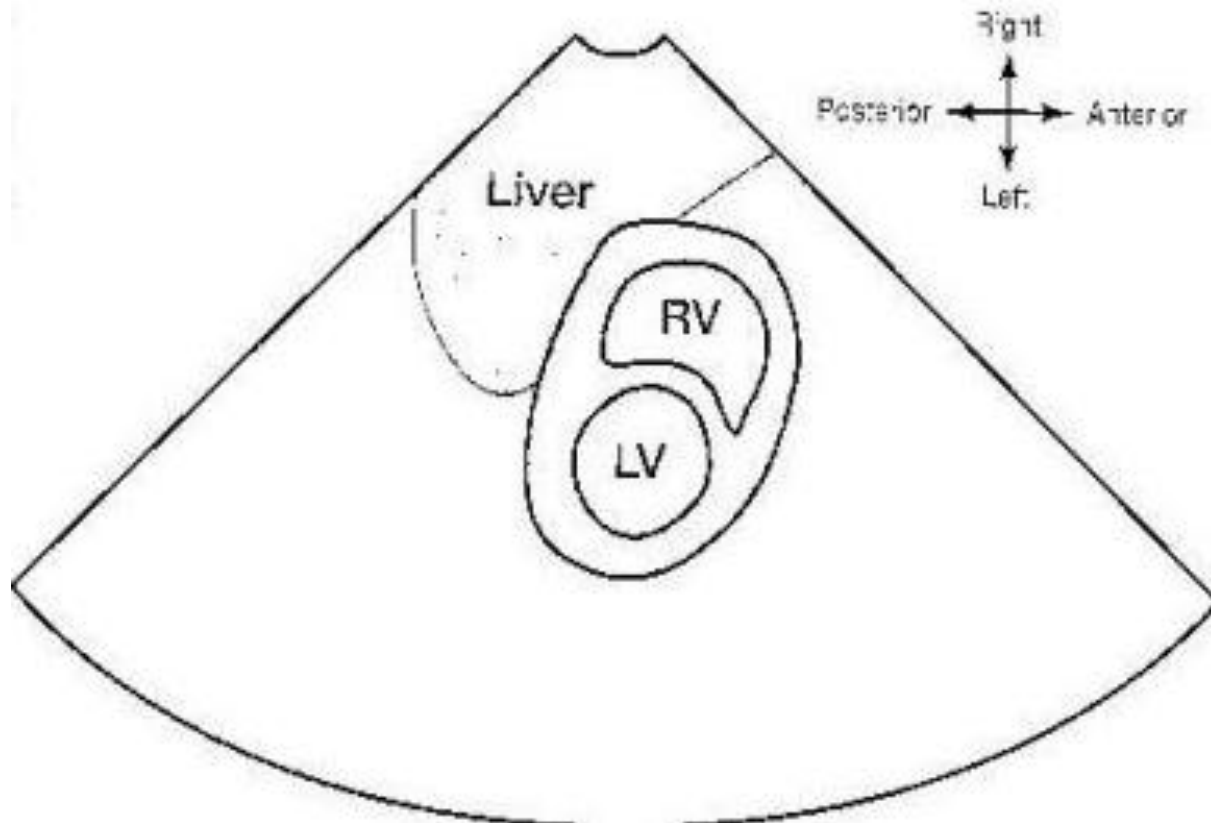
# Subcostal 4 chamber view



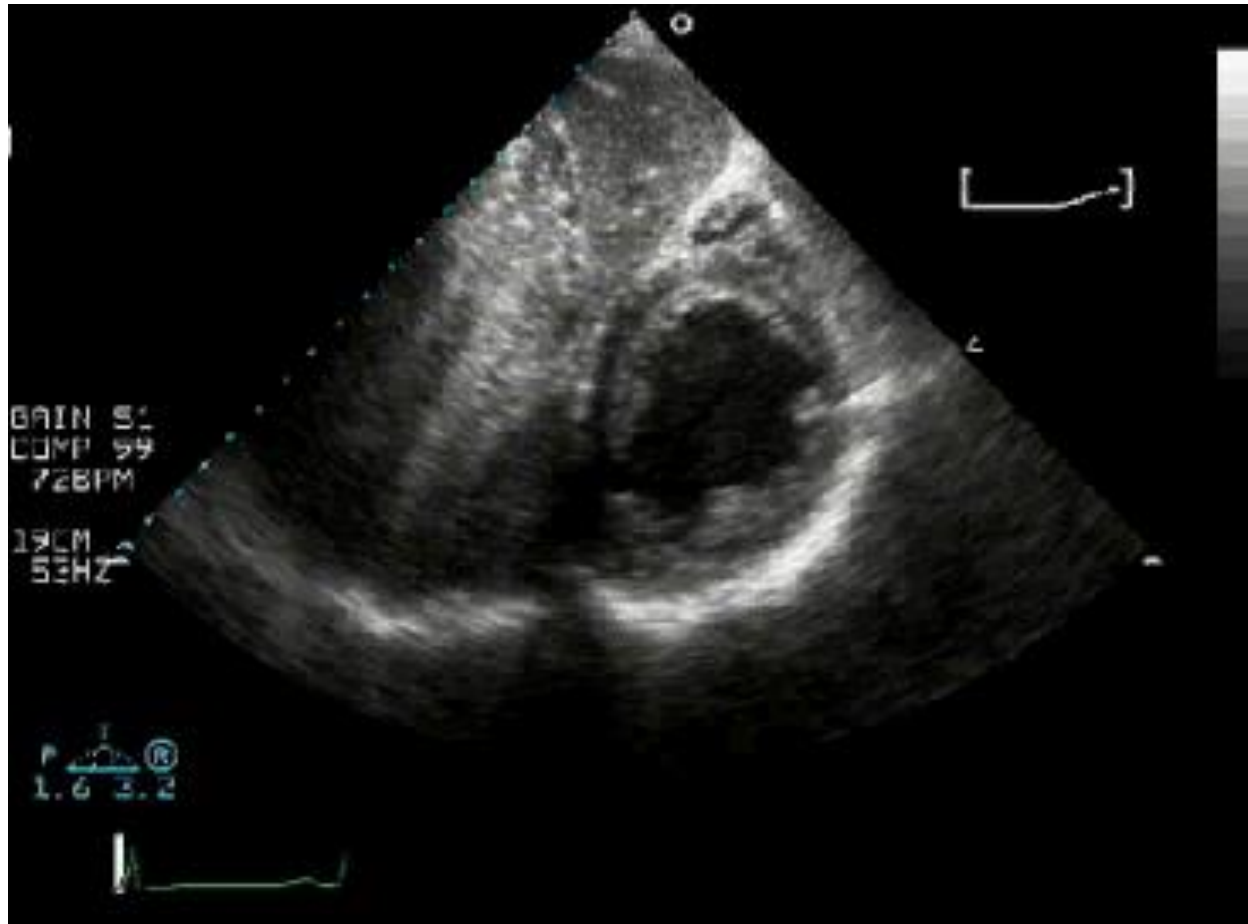
# Subcostal 4 chamber view



# Subcostal short axis view

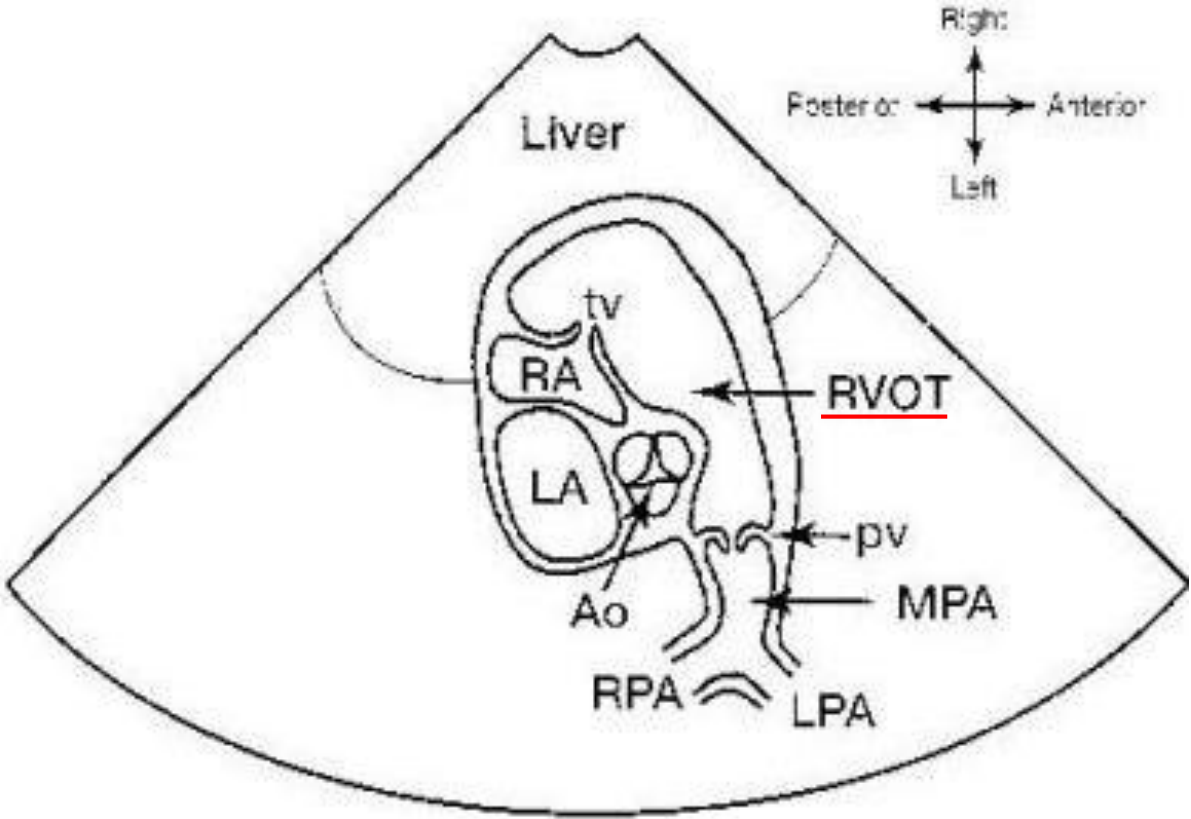


# Subcostal short axis view

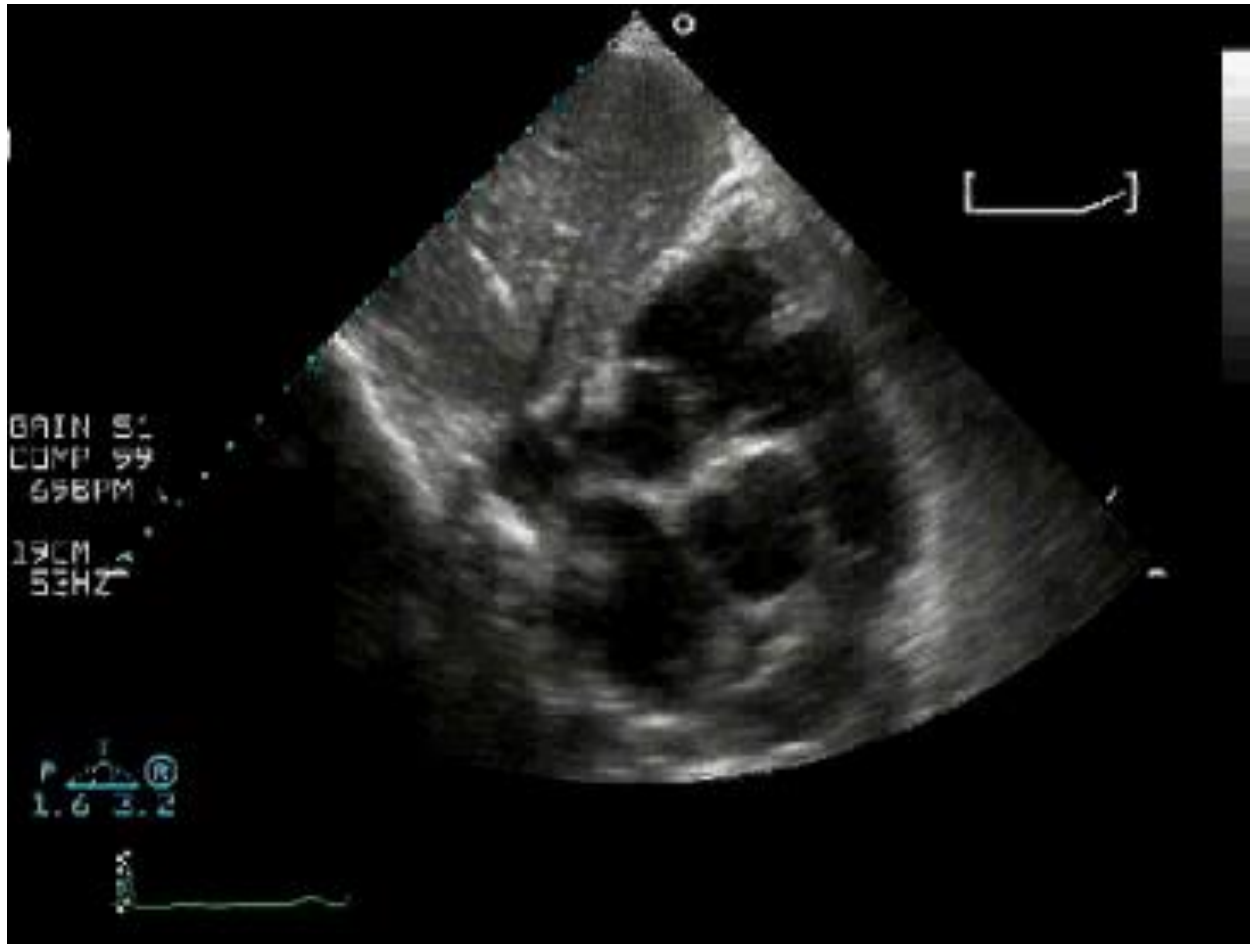




# Subcostal short axis view



# Subcostal short axis view



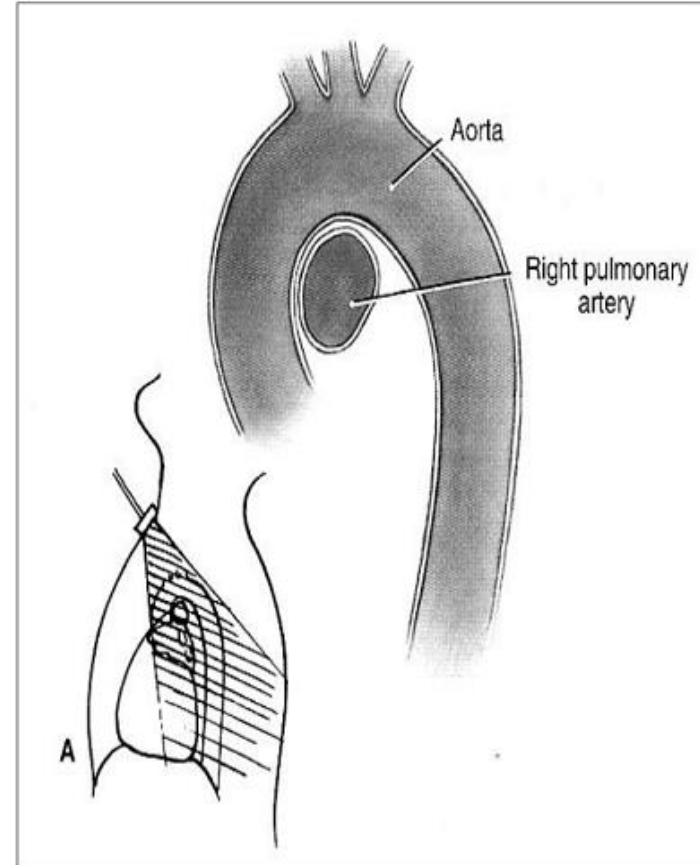
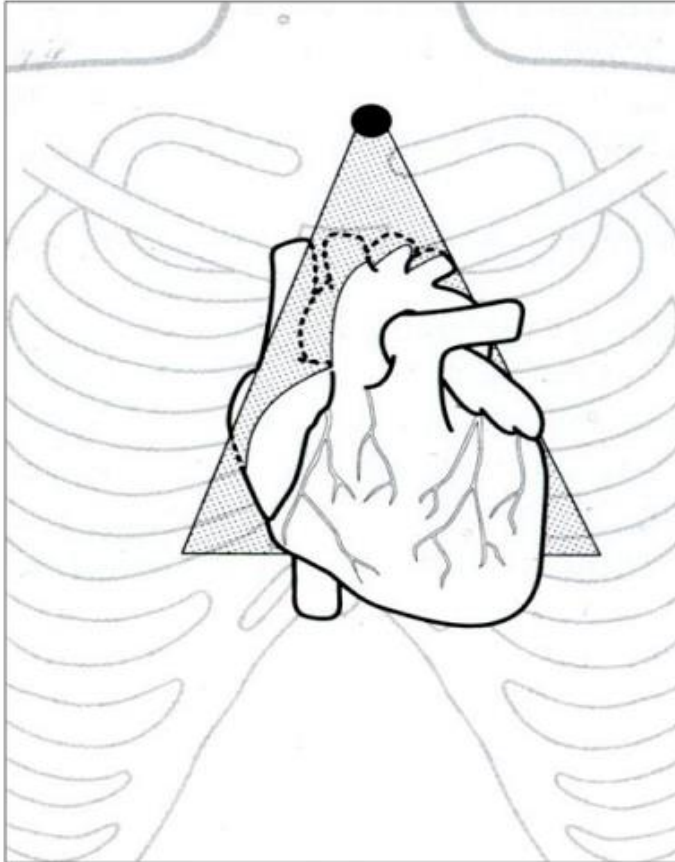


# Suprasternal view

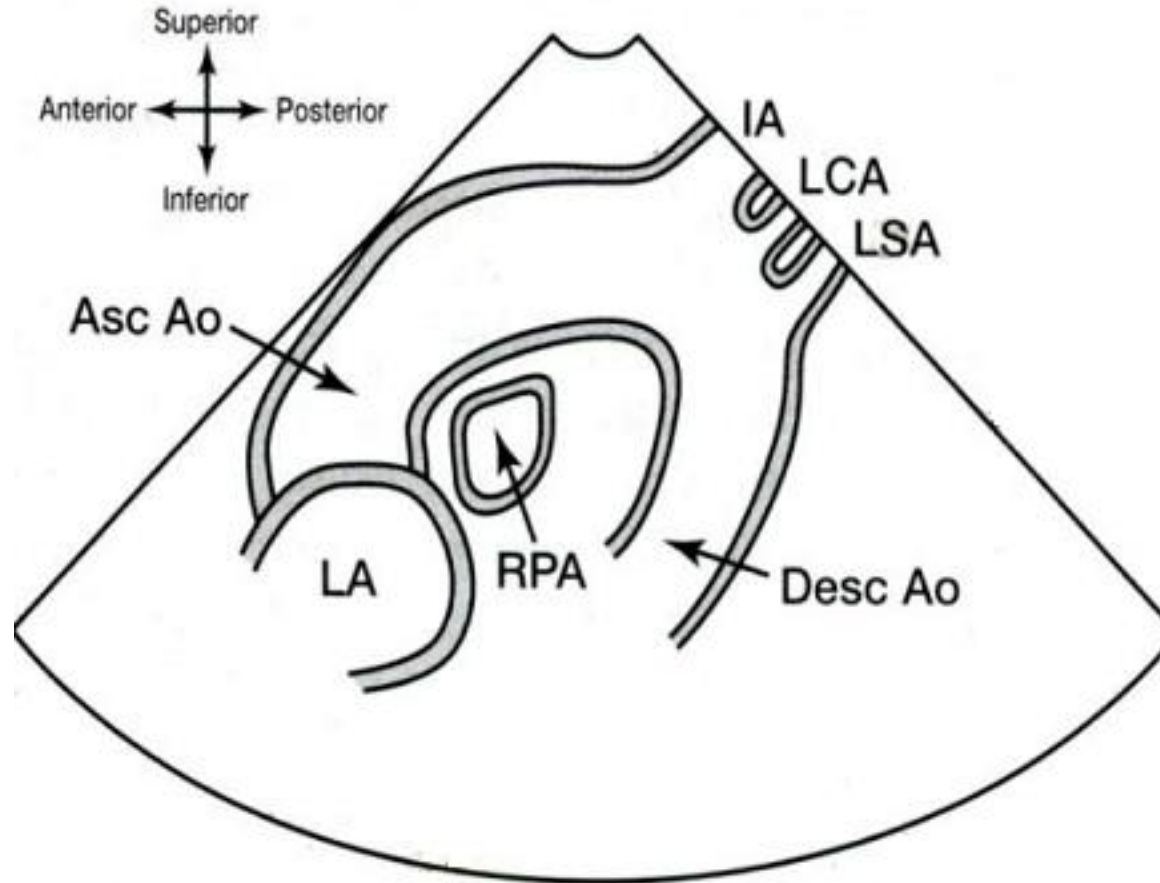


Transducer를 흉골상부에 놓고  
marker를 오른쪽 supraclavicular fossa로 하면 나타남

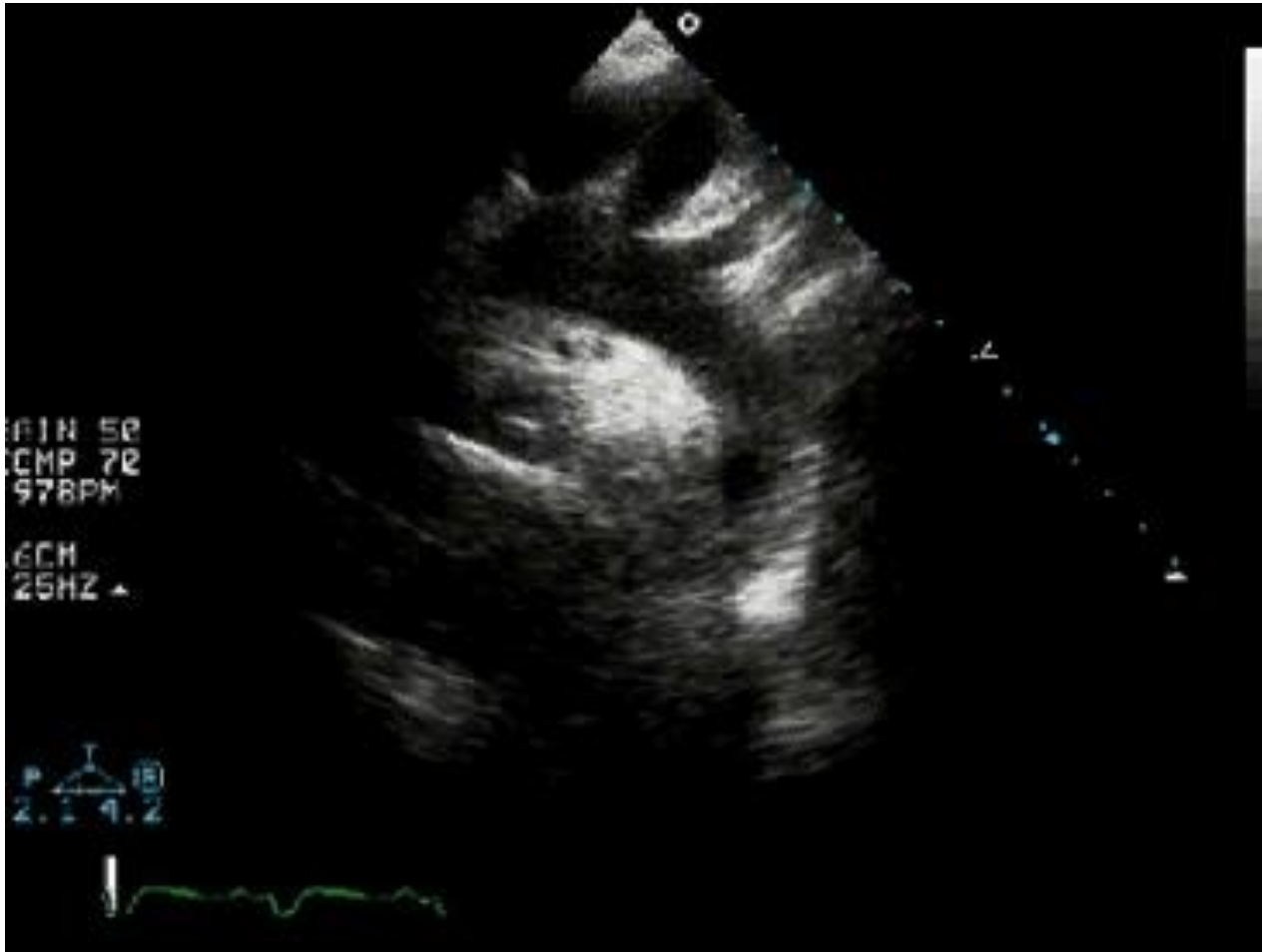
# Suprasternal view



# Suprasternal view



# Suprasternal view



# Doppler

## 1) CFD (Color Flow Doppler)

변환기로 다가오는 영상은 붉은색으로,  
멀어지는 혈류는 푸른색으로 표시

## 2) PW (Pulse Wave doppler, 간헐파 도플러)

특정지점의 속도를 측정가능, 저속측정에 주로 사용

## 3) CW (Continuous Wave doppler, 연속파 도플러)

고속측정에 주로 사용

# Summary

- Whole body ultrasonography
  - Essential tool for intensivists
- Echocardiography
  - Eye >> Hand
  - Interpretation >> Technique
  - It is supplementary tool
  - It will never replace clinical decision-making