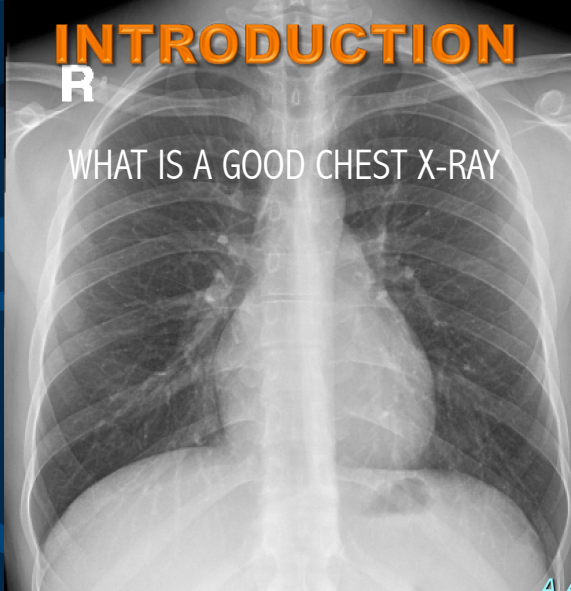



**INTRODUCTION**  
R  
WHAT IS A GOOD CHEST X-RAY



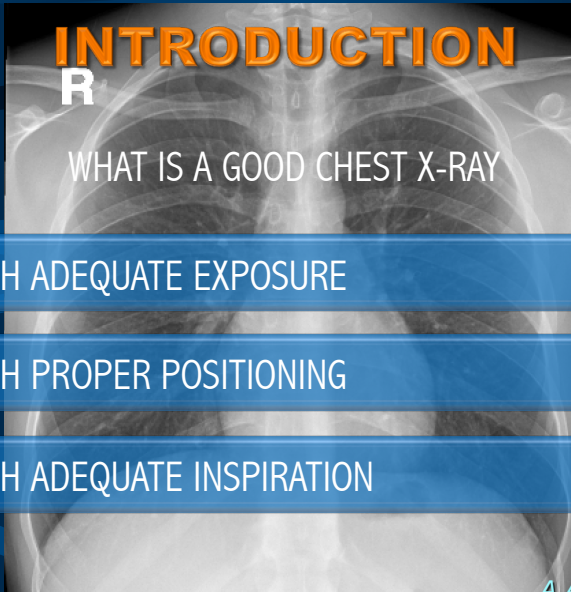
A A AI-BOUKAI-2

This slide features a blue background with a white logo in the top left corner. The main content is a central chest X-ray image. Overlaid on the top left of the X-ray is the word "INTRODUCTION" in large, bold, orange letters, followed by a white "R" marker. Below this, the text "WHAT IS A GOOD CHEST X-RAY" is written in white. The X-ray itself shows a clear view of the lungs, heart, and ribs. In the bottom right corner, the text "A A AI-BOUKAI-2" is displayed.




**INTRODUCTION**  
R  
WHAT IS A GOOD CHEST X-RAY

- CXR WITH ADEQUATE EXPOSURE
- CXR WITH PROPER POSITIONING
- CXR WITH ADEQUATE INSPIRATION



A A AI-BOUKAI-2

This slide is identical to the one above, but with three blue horizontal bars overlaid on the bottom half of the X-ray image. Each bar contains white text: "CXR WITH ADEQUATE EXPOSURE", "CXR WITH PROPER POSITIONING", and "CXR WITH ADEQUATE INSPIRATION". The rest of the slide, including the logo, title, and footer, remains the same.




# INTRODUCTION

THE BASIC TECHNICAL FACTORS AFFECTING IMAGE QUALITY

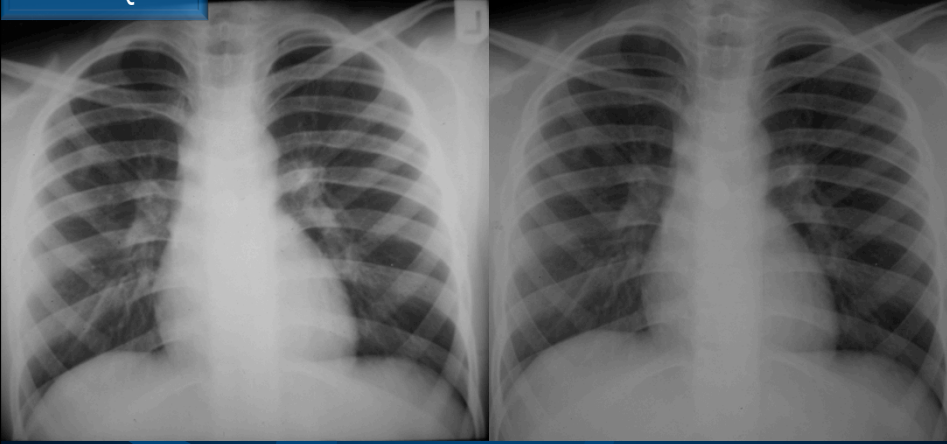
EXPOSURE

A A AI-BOUKAI-2




# INTRODUCTION

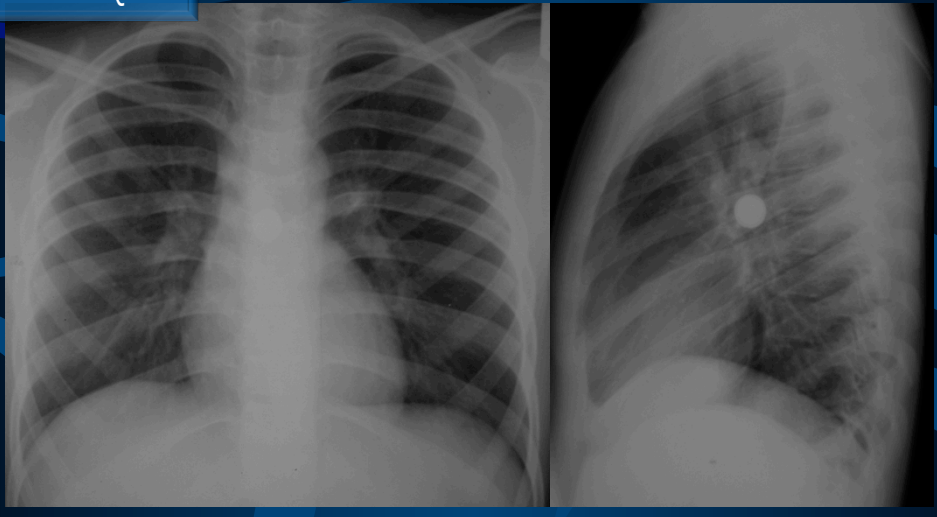
TECHNIQUE ✦ EXPOSURE




✦ INADEQATE ✦ ADEQATE

 **INTRODUCTION**

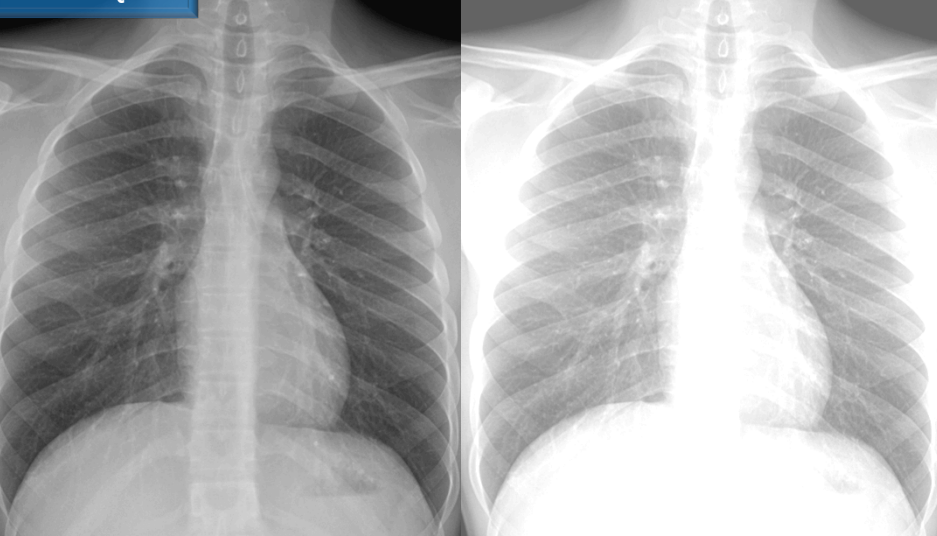
**TECHNIQUE** ✦ EXPOSURE




This slide illustrates the technique for chest X-ray exposure. It features two side-by-side images. The left image is a standard posteroanterior (PA) view, showing the lungs, heart, and ribs in a clear, balanced manner. The right image is a lateral view, showing the profile of the chest and lungs. The text 'TECHNIQUE' and 'EXPOSURE' is displayed in a blue box at the top left, and the word 'INTRODUCTION' is in large orange letters at the top center.

 **INTRODUCTION**


**TECHNIQUE** ✦ EXPOSURE




This slide illustrates the technique for chest X-ray exposure, focusing on the effect of overexposure. It features two side-by-side images of a posteroanterior (PA) view. The left image is a standard, well-exposed PA view. The right image is an overexposed PA view, where the image is significantly brighter and less detailed, with the ribs and heart appearing washed out. The text 'TECHNIQUE' and 'EXPOSURE' is displayed in a blue box at the top left, and the word 'INTRODUCTION' is in large orange letters at the top center.

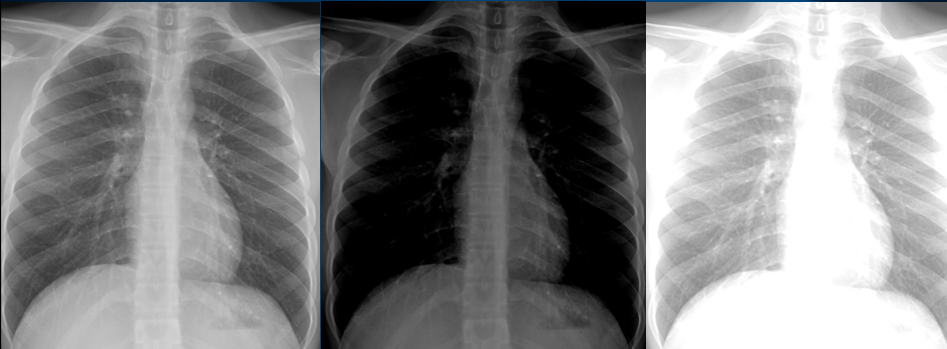
 **INTRODUCTION**

TECHNIQUE ✦ EXPOSURE




 **INTRODUCTION**

TECHNIQUE ✦ EXPOSURE



ADEQUATE                  OVER                  UNDER




# INTRODUCTION

THE BASIC TECHNICAL FACTORS AFFECTING IMAGE QUALITY

POSITIONING

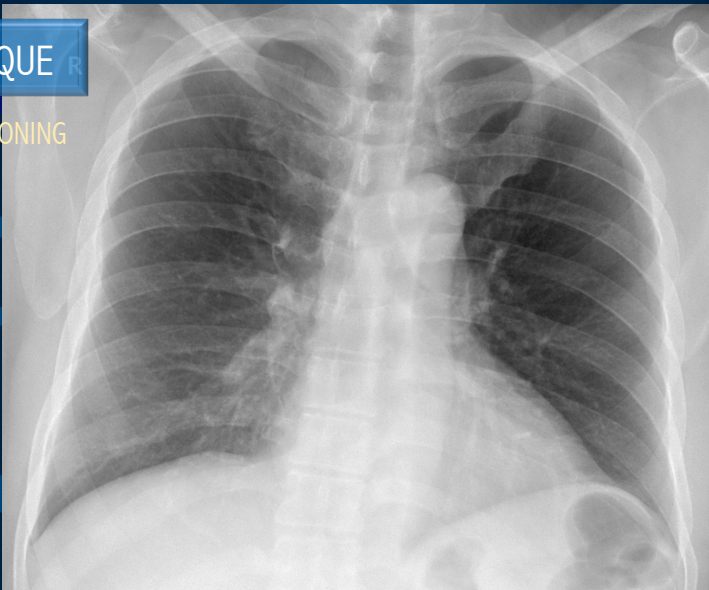
A A AI-BOUKAI-2




# INTRODUCTION

TECHNIQUE

- ◆ POSITIONING

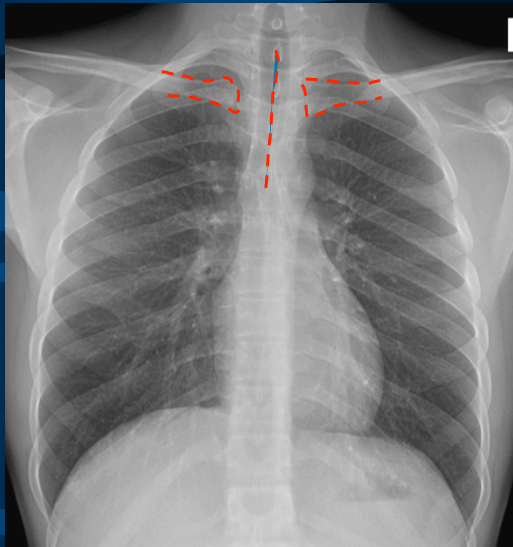





# INTRODUCTION

**TECHNIQUE**

- ◆ POSITIONING

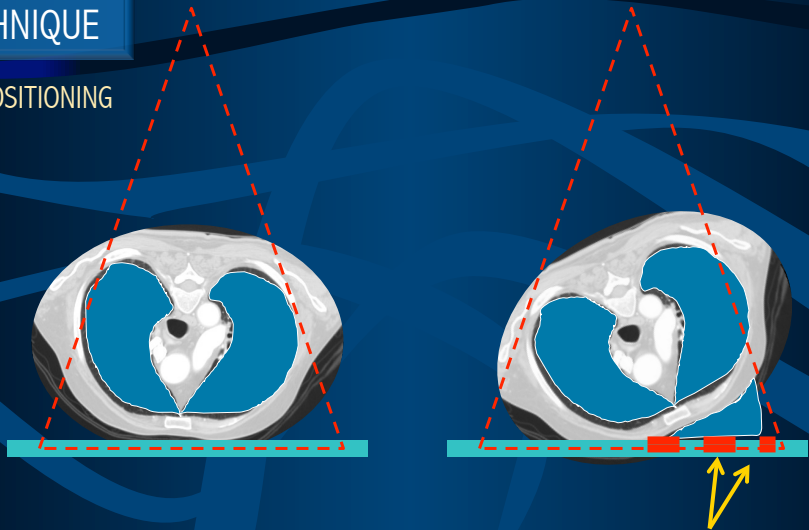





# INTRODUCTION

**TECHNIQUE**

- ◆ POSITIONING

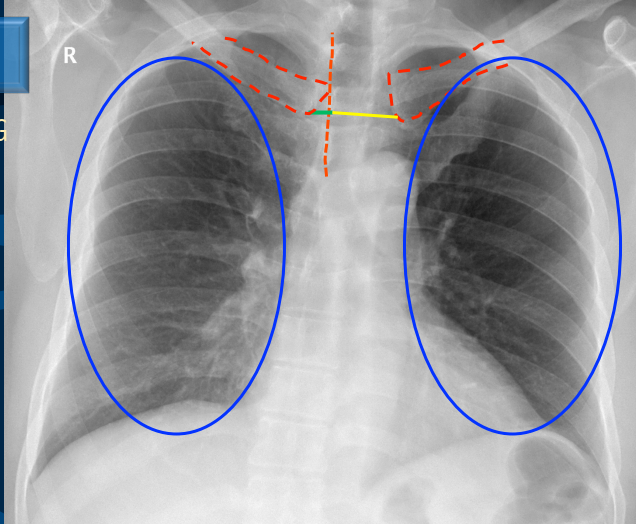





# INTRODUCTION

TECHNIQUE

- ◆ POSITIONING



R




# INTRODUCTION

THE BASIC TECHNICAL FACTORS AFFECTING IMAGE QUALITY

INSPIRATION

*A A AI-BOUKAI-2*

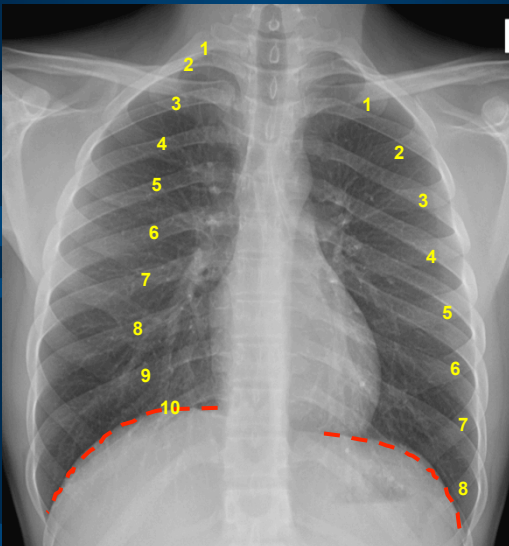





# INTRODUCTION

**TECHNIQUE**

- ◆ INSPIRATION



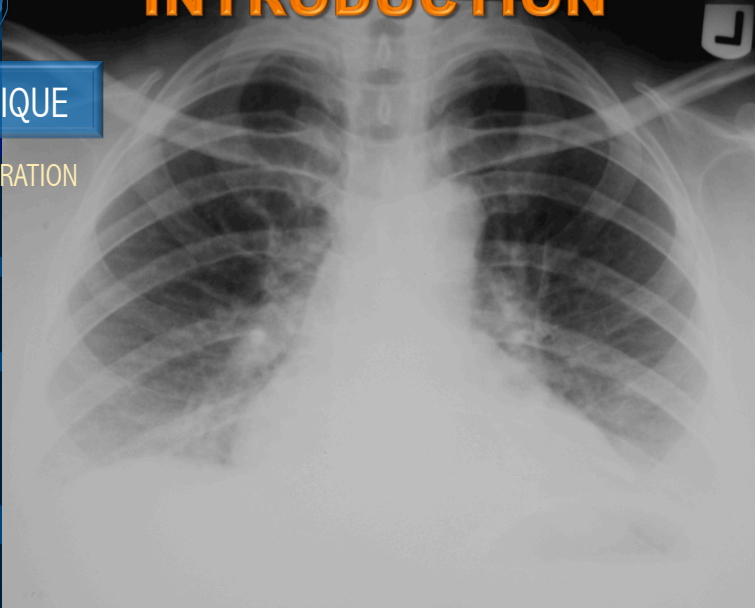
A frontal chest X-ray with yellow numbers 1 through 10 marking the ribs on both sides. A dashed red line is drawn across the lower chest area, representing the diaphragm. The background is dark blue with wavy patterns.



# INTRODUCTION

**TECHNIQUE**

- ◆ INSPIRATION



A frontal chest X-ray showing the lungs and heart silhouette. The background is dark blue with wavy patterns.

# INTRODUCTION

## TECHNIQUE

### INSPIRATION

65%  
Inadequate inspiration

46%  
Adequate inspiration

*(Note: The 46% label in the image appears to be a typo for 96% based on the visual evidence of adequate inspiration.)*

# INTRODUCTION


## TECHNIQUE

SUPINE  
R

AP

✓ Scapula  
✓ Clavicle  
✓ Heart


PA



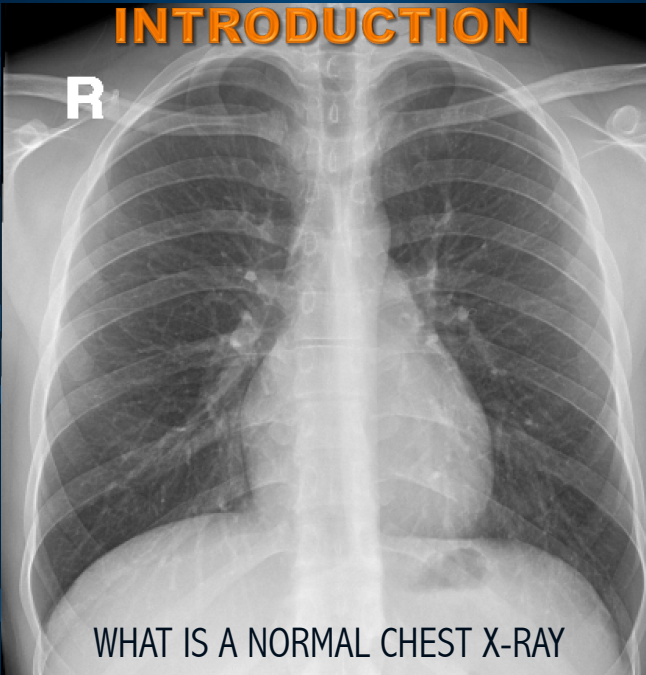
# INTRODUCTION

WHAT IS A NORMAL CHEST X-RAY


*A A AI-BOUKAI-2*

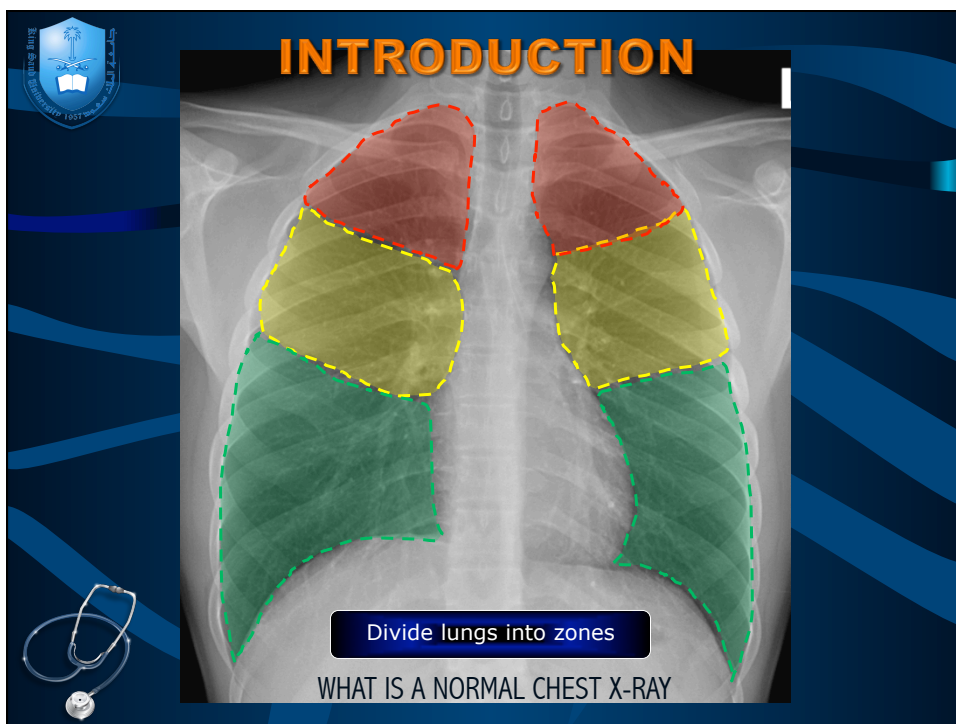
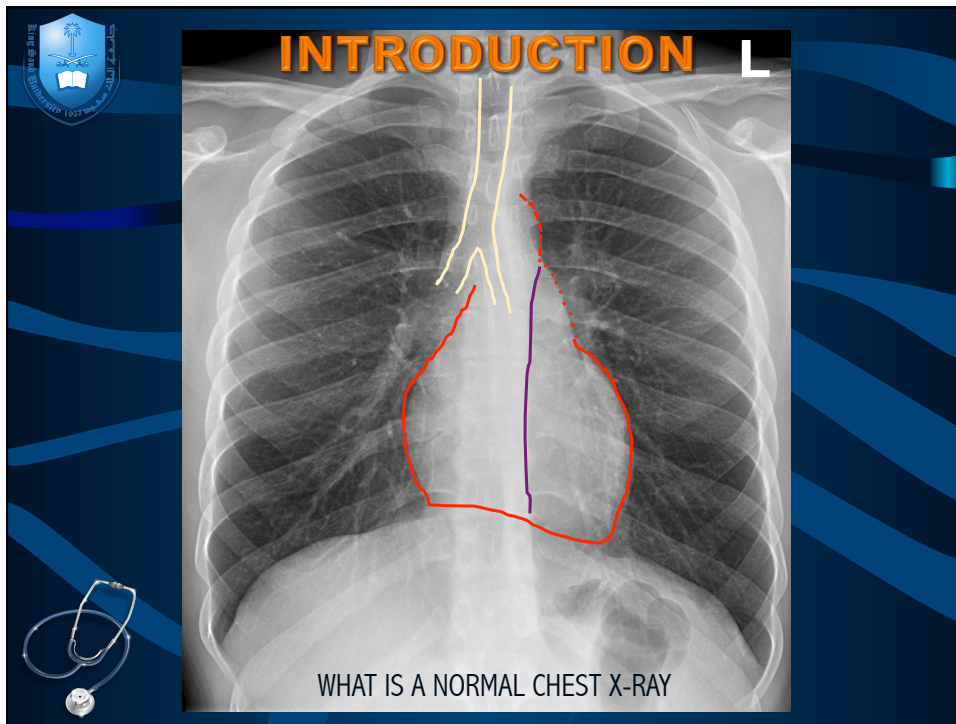


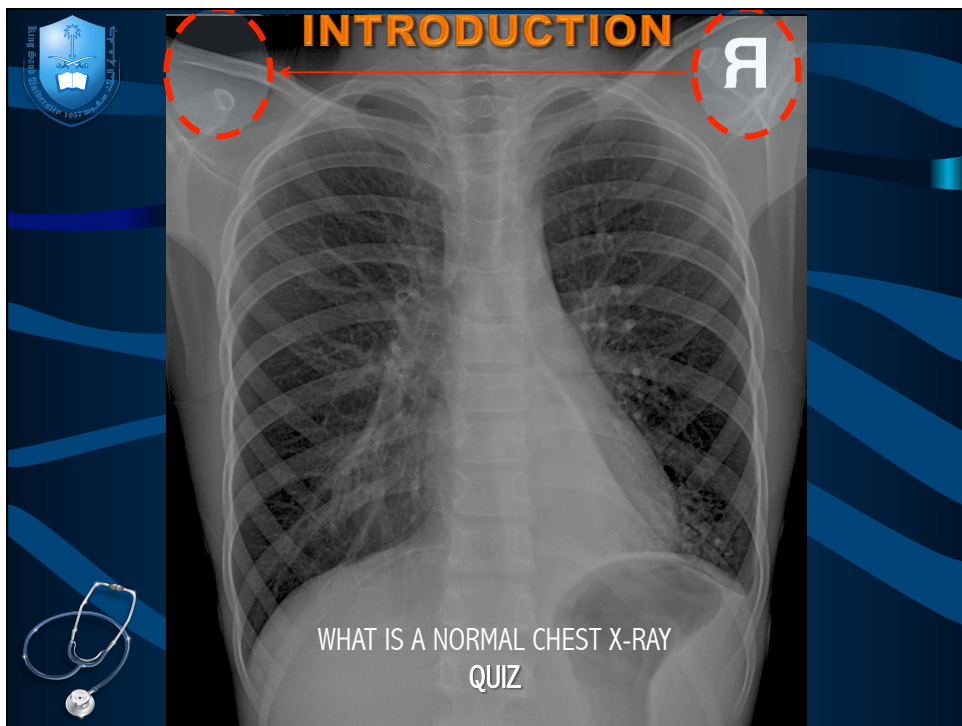
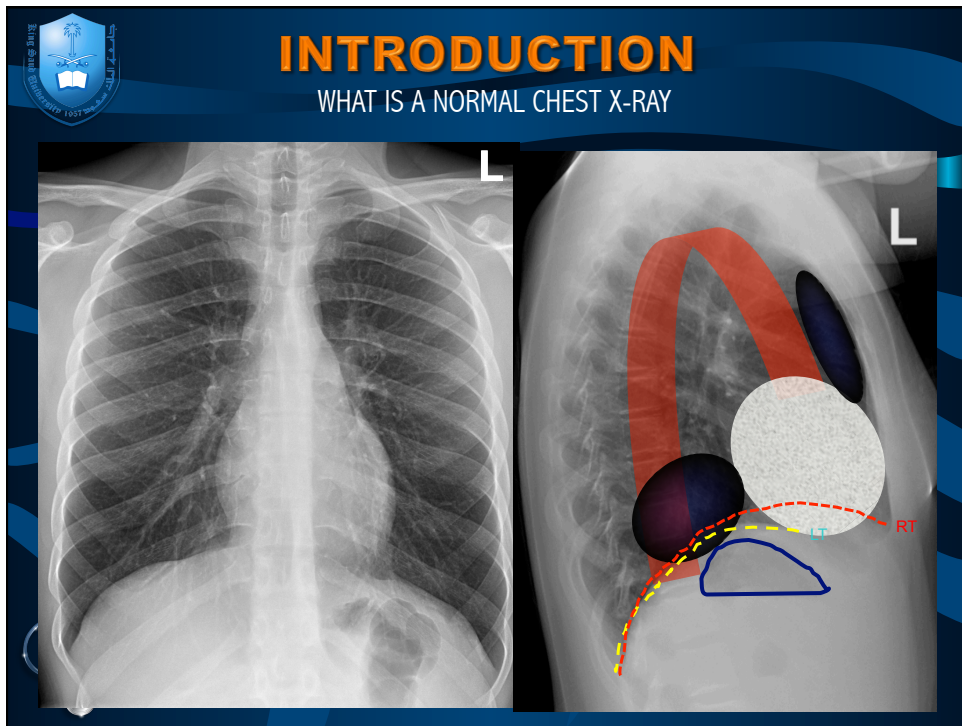
# INTRODUCTION

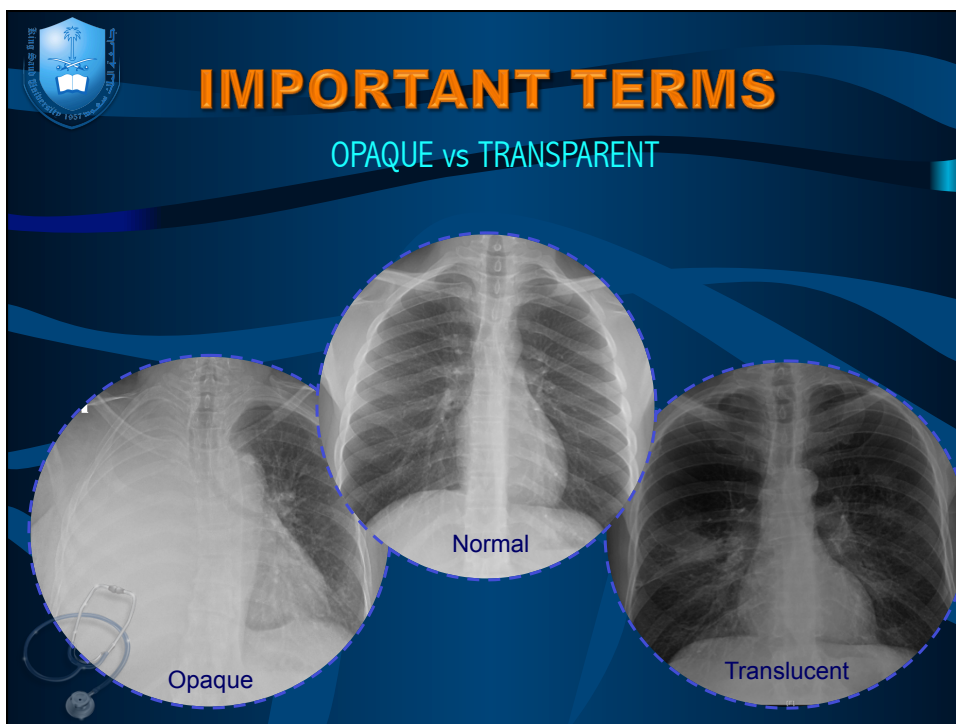



WHAT IS A NORMAL CHEST X-RAY







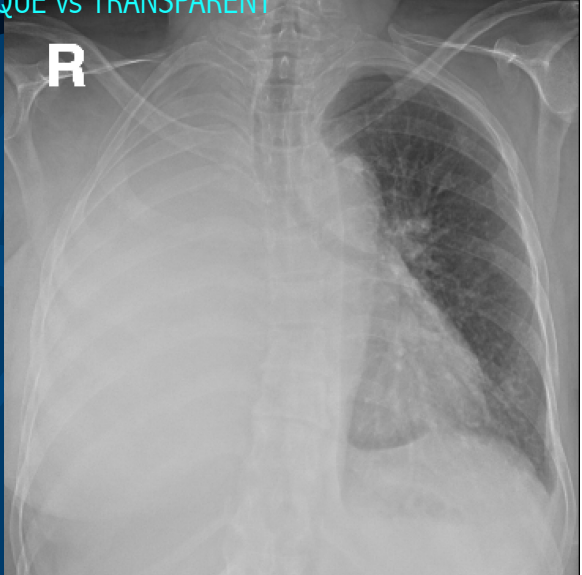






# IMPORTANT TERMS

OPAQUE vs TRANSPARENT

**R**

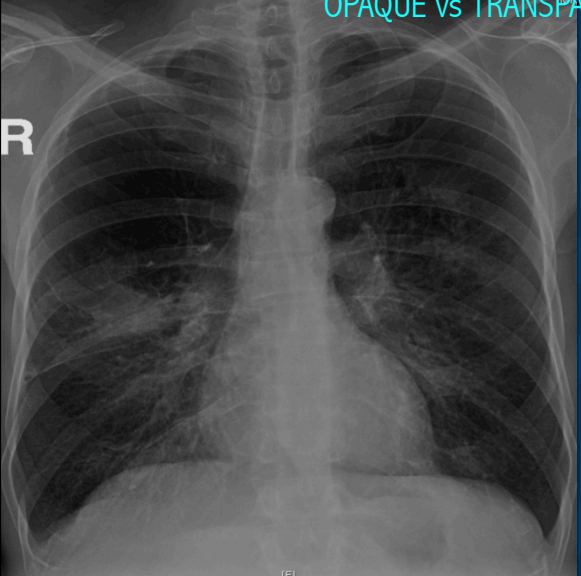


**Increased Density (Opaque)**  
Chest wall : Mass lesion  
Pleural : Pleural effusion  
Lung : Consolidation/Collapse  
Agnesis/pneumonectomy  
Outside : D Hernia



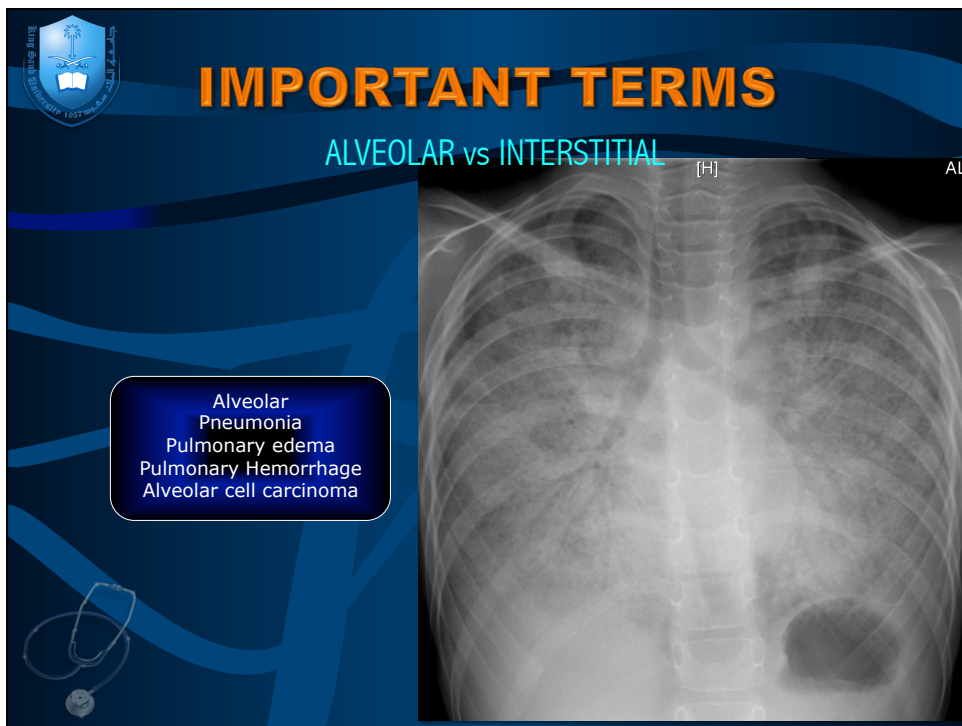
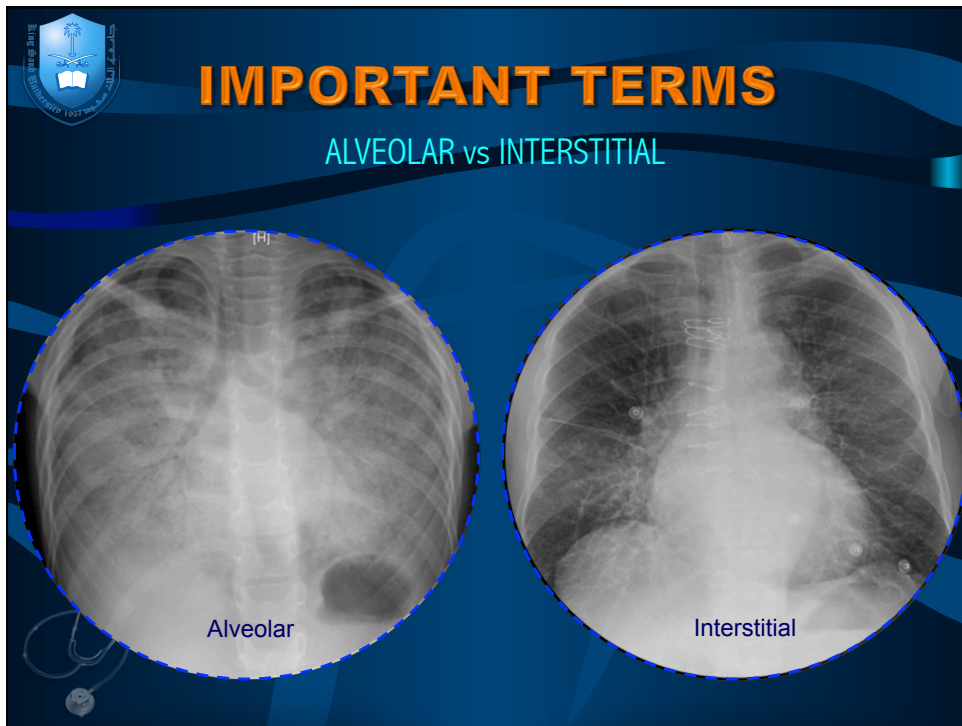
# IMPORTANT TERMS

OPAQUE vs TRANSPARENT




**R**

**Translucent**  
Technique  
Chest Wall (Mastectomy)  
Pneumothorax  
Emphysema

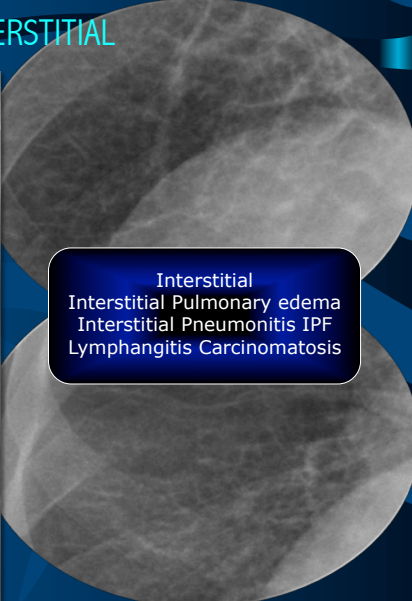
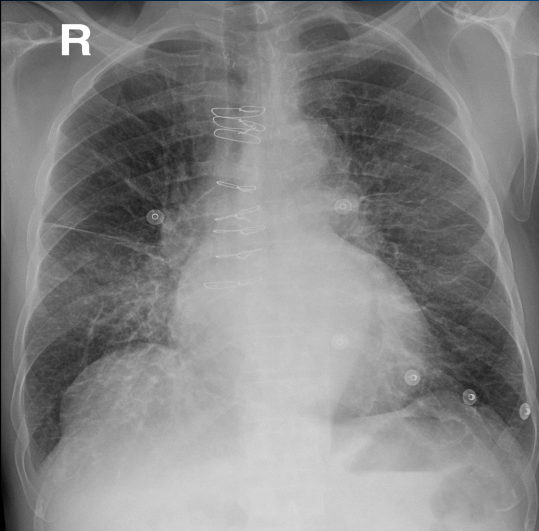







# IMPORTANT TERMS

## ALVEOLAR vs INTERSTITIAL




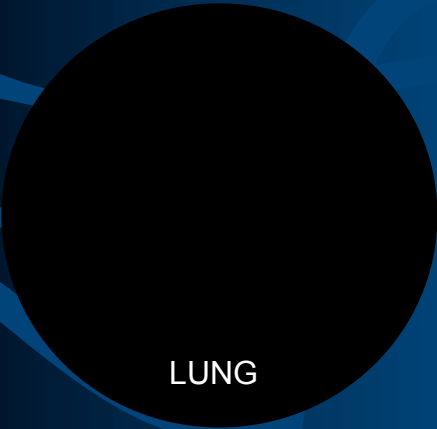
Interstitial  
Interstitial Pulmonary edema  
Interstitial Pneumonitis IPF  
Lymphangitis Carcinomatosis



# IMPORTANT TERMS


## AIRBRONCHOGRAM

Alveolar or Airspace disease



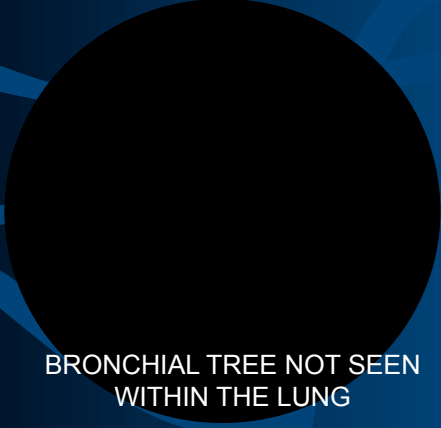
LUNG

BRONCHIAL TREE




# IMPORTANT TERMS


AIRBRONCHOGRAM  
Alveolar or Airspace disease



BRONCHIAL TREE NOT SEEN  
WITHIN THE LUNG

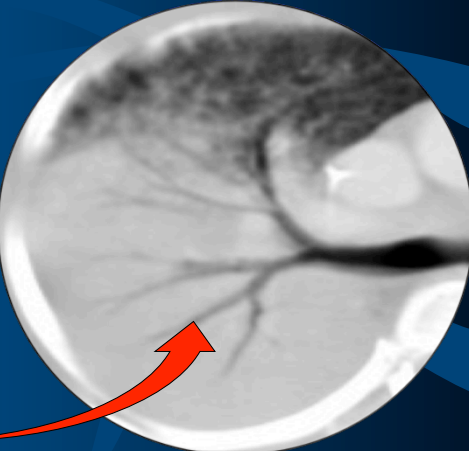
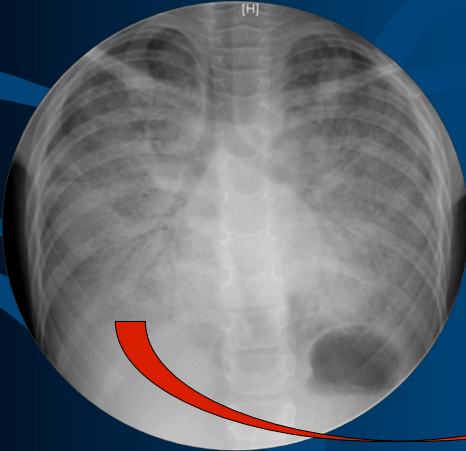


BRONCHIAL TREE WITHIN THE  
CONSOLIDATED LUNG

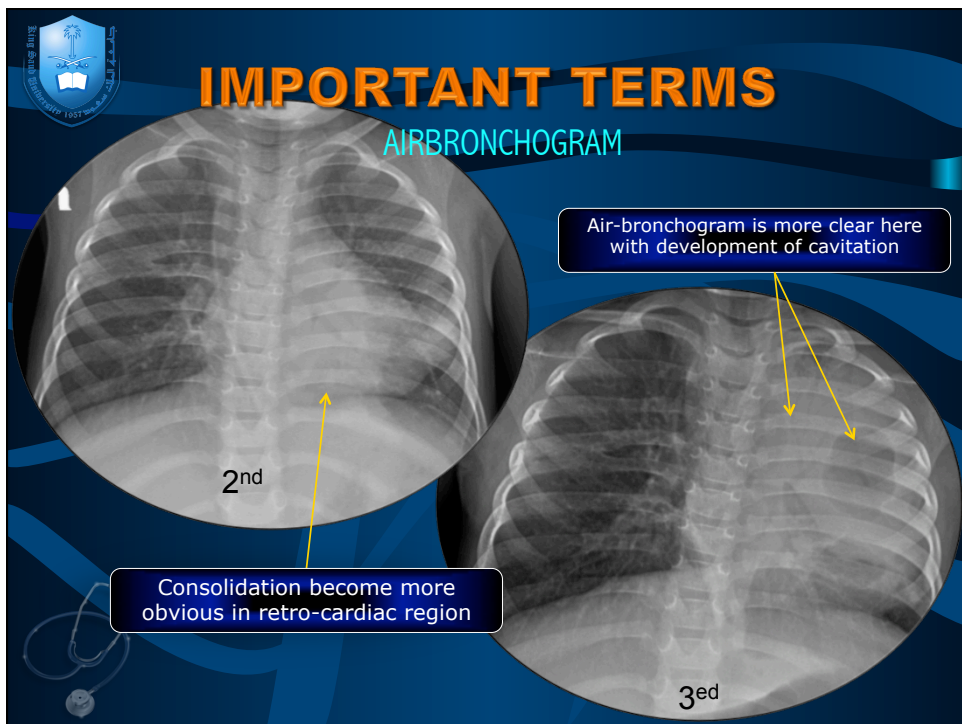
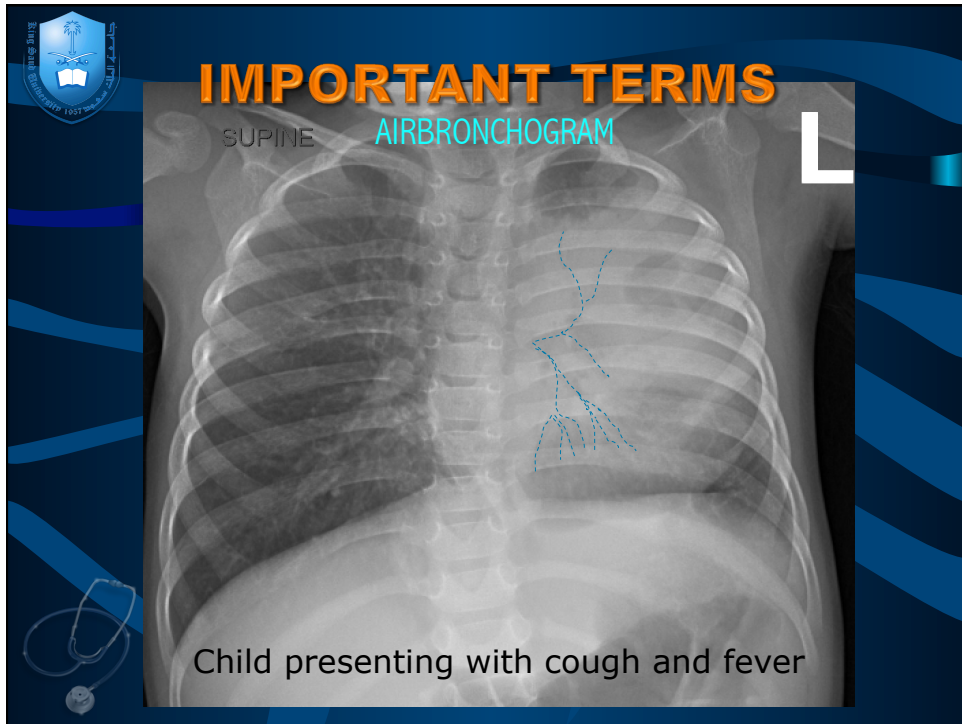


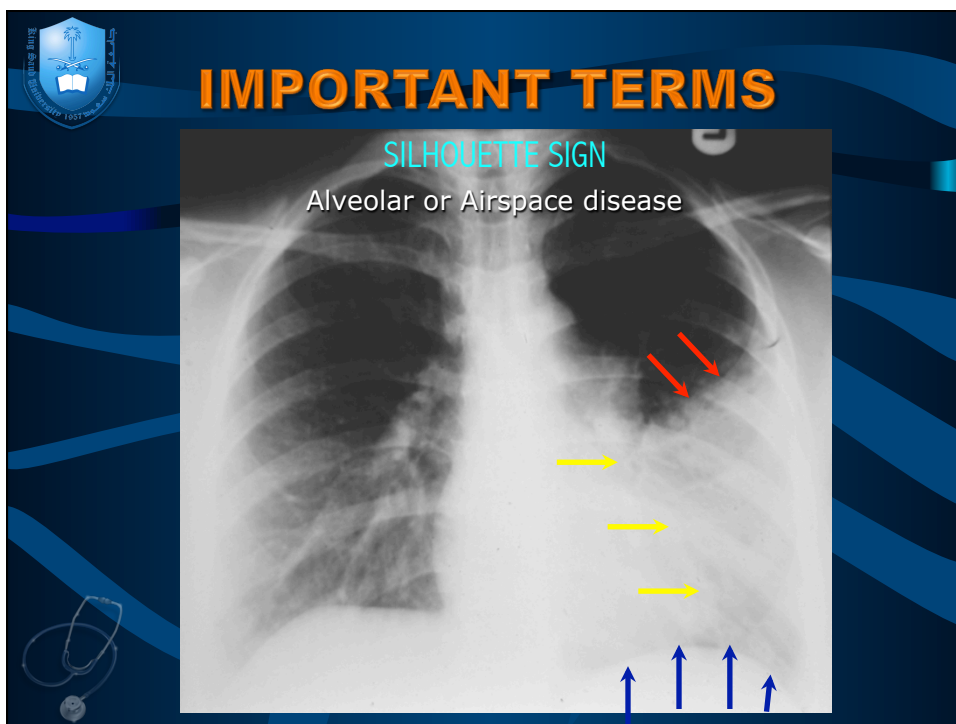
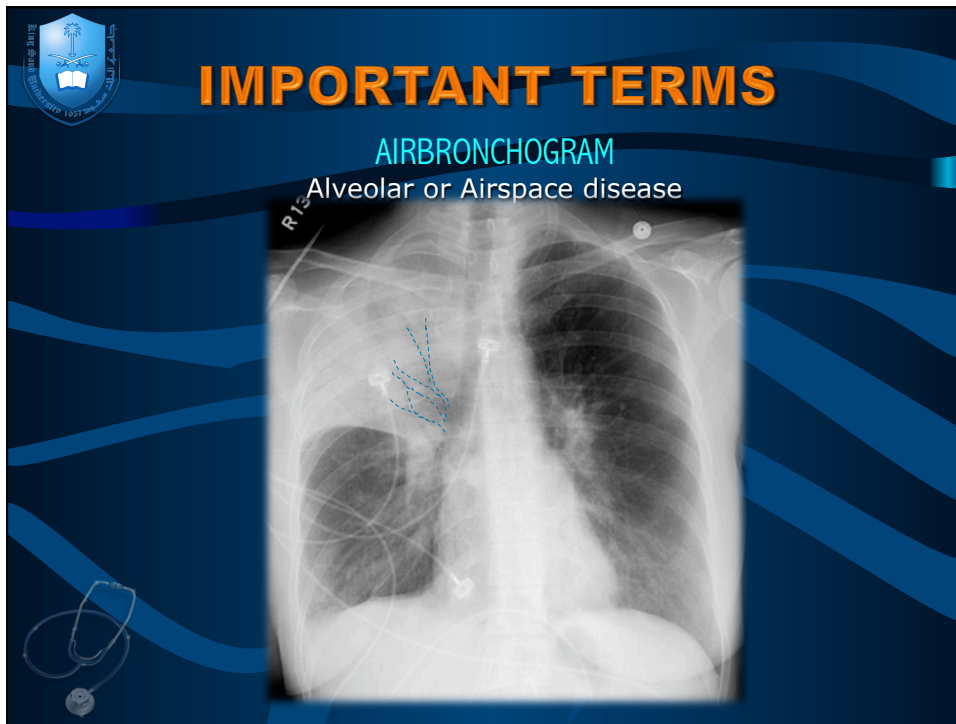
# IMPORTANT TERMS

AIRBRONCHOGRAM  
Alveolar or Airspace disease



A red curved arrow points from the consolidation area on the X-ray to the corresponding area on the CT scan.



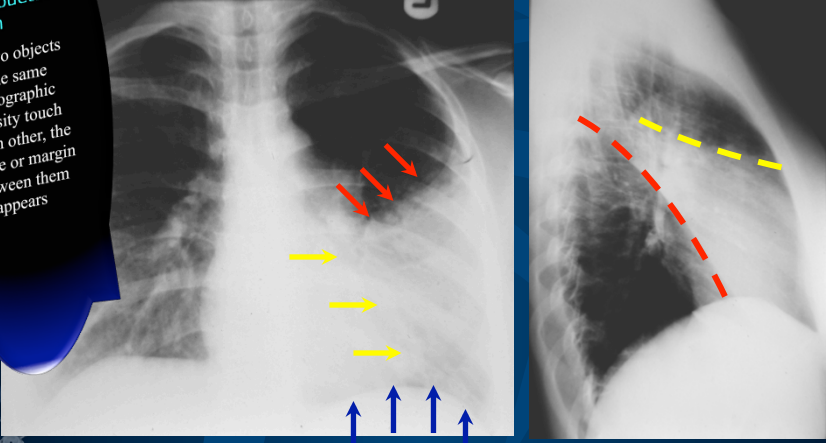


# IMPORTANT TERMS

## SILHOUETTE SIGN

Alveolar or Airspace disease

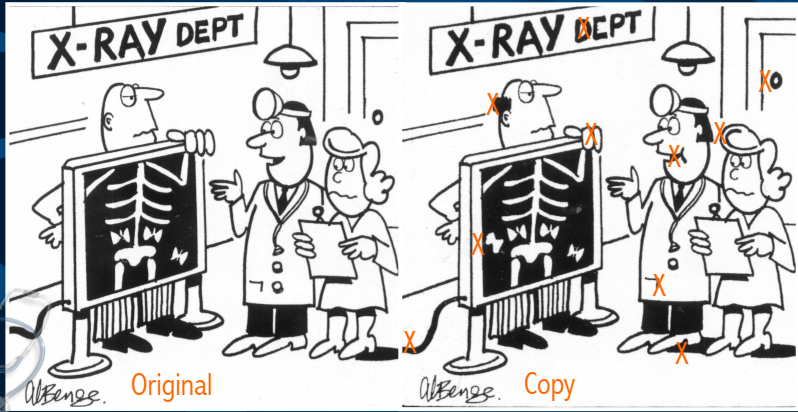
**Silhouette Sign**  
If two objects of the same radiographic density touch each other, the edge or margin between them disappears



The slide features a dark blue background with a university logo in the top left corner. The title 'IMPORTANT TERMS' is in large orange letters, followed by 'SILHOUETTE SIGN' in cyan and 'Alveolar or Airspace disease' in white. A blue oval on the left contains the definition of the silhouette sign. Two chest X-rays are shown: a frontal view on the left with red arrows pointing to the heart border and yellow arrows pointing to the diaphragm, and a lateral view on the right with a dashed red line and a dashed yellow line indicating the silhouette sign.

# Interpretation

Reading X-rays is like those quizzes in the newspaper where they say:  
“Our artist made ten changes when copying the picture. Can you spot them?”



The cartoon is signed 'Absence.' and shows two X-ray departments. The left department shows an 'Original' X-ray of a skeleton. The right department shows a 'Copy' of the same X-ray with several orange 'X' marks indicating changes made by the artist.

In Radiology the original is not given for comparison?

X-RAY DEPT

X-RAY DEPT

mental image

No one to say how many changes there are?


Systematic approach in analyzing the radiograph

Original

Copy



## CHEST PATTERNS

- Define the pattern of abnormality seen on the chest X-ray.
- Develop appropriate differential for such pattern recognized.
- Decrease your differential by
  - \* Careful analysis of the findings
  - \* Consider evaluation of previous exams
  - \* Correlate with clinical and laboratory data
- Decide for the next step



## CHEST PATTERNS

- INCREASED PULMONARY DENSITIES
- INCREASED NODDULAR PULMONARY DENSITIES
- DECREASED PULMONARY DENSITIES
- CAVITARY/CYSTIC PULMONIC LESIONS
- MEDIASTINAL MASSES




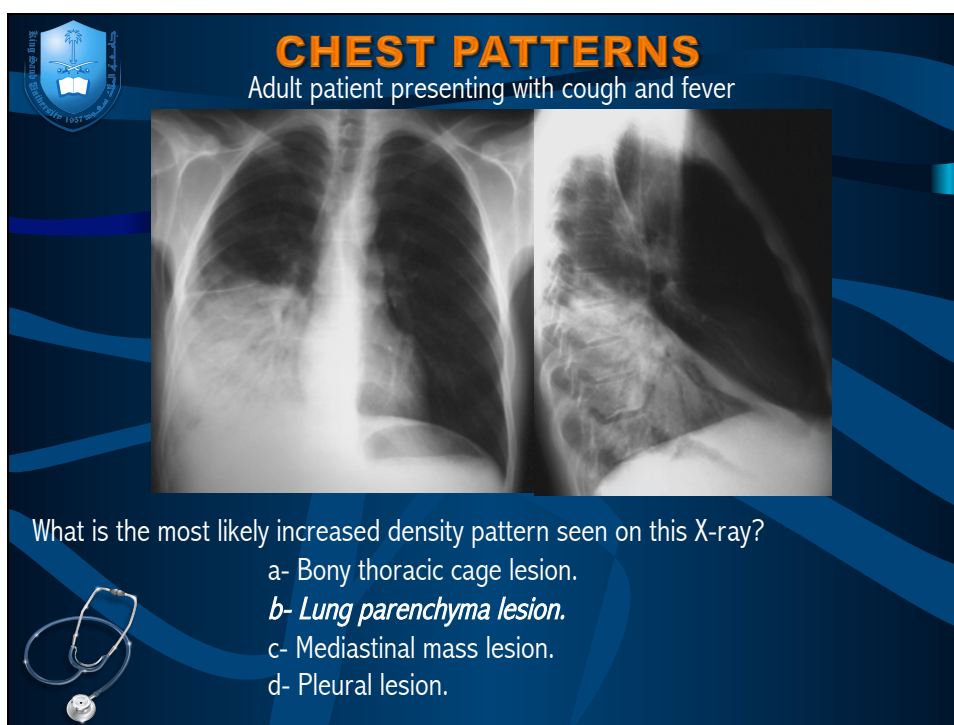
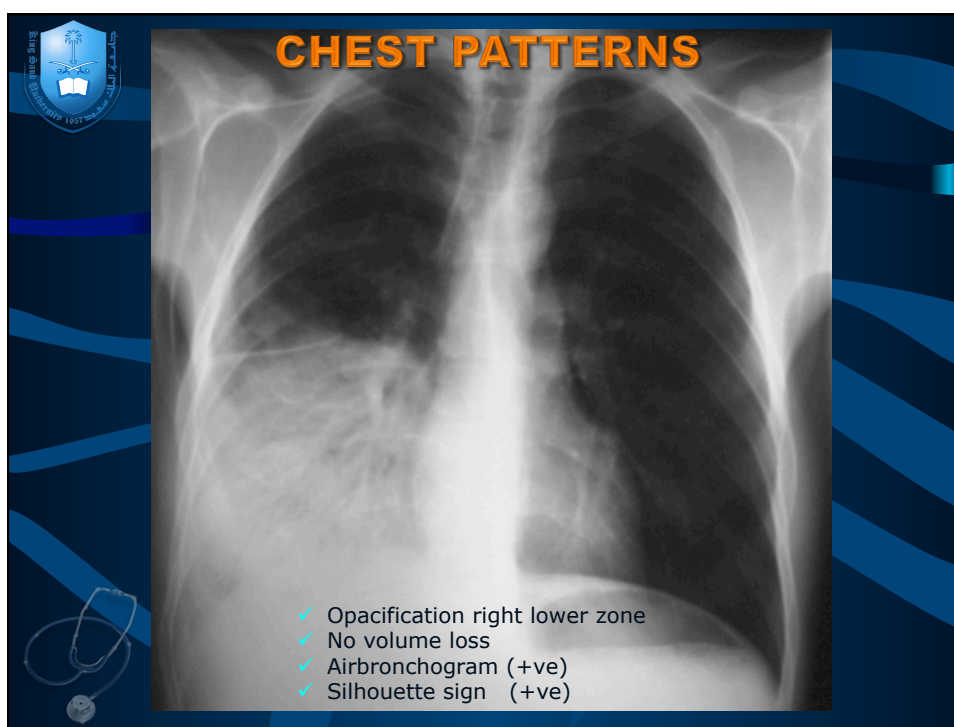
## CHEST PATTERNS

### CASE 1

Adult patient presents with cough and fever for the last 3 days. His blood workup shows WBC of  $18 \times 10^9/L$  (mainly neutrophils). Chest X-ray was done.

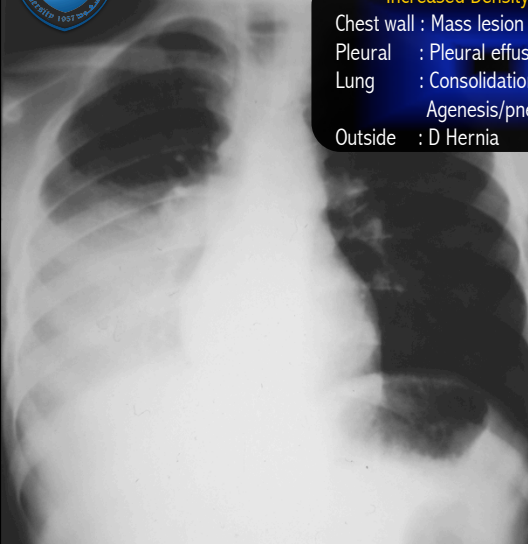
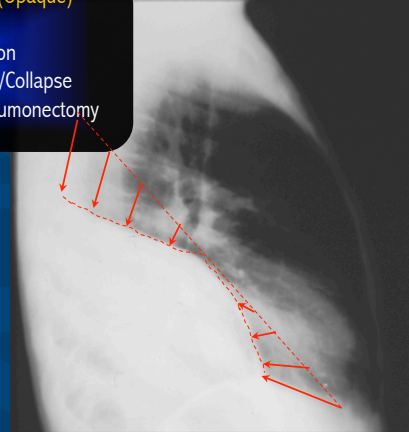
What is the most likely increased density pattern seen on this X-ray?







## CHEST PATTERNS

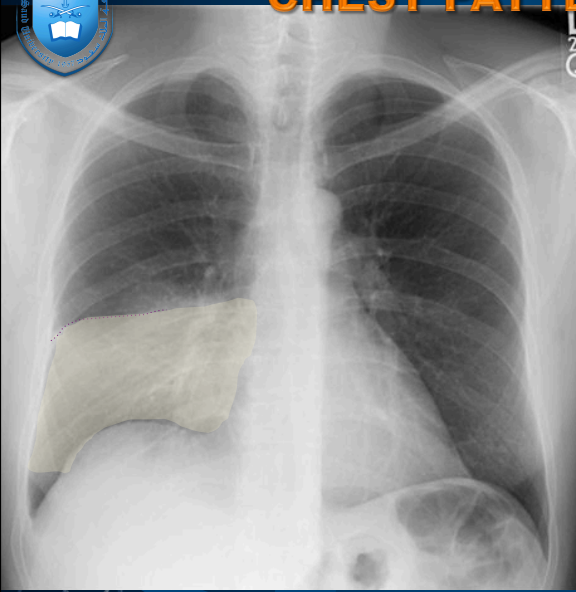
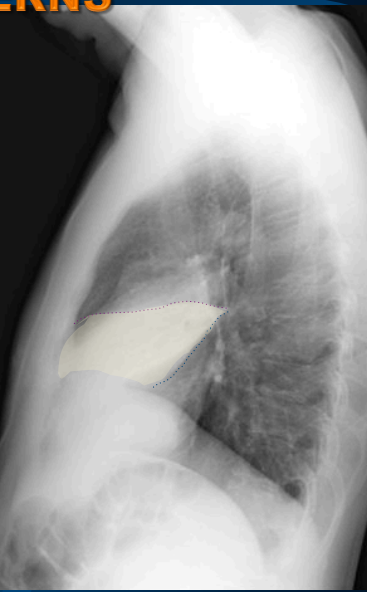
Increased Density (Opaque)

Chest wall : Mass lesion  
 Pleural : Pleural effusion  
 Lung : Consolidation/Collapse  
           Agensis/pneumectomy  
 Outside : D Hernia

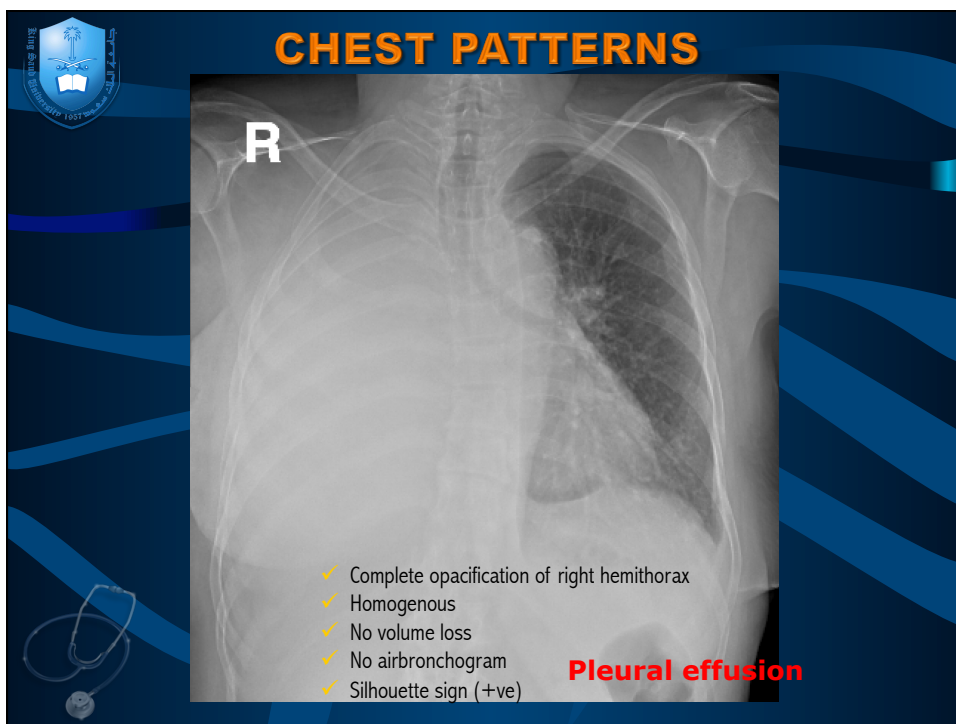
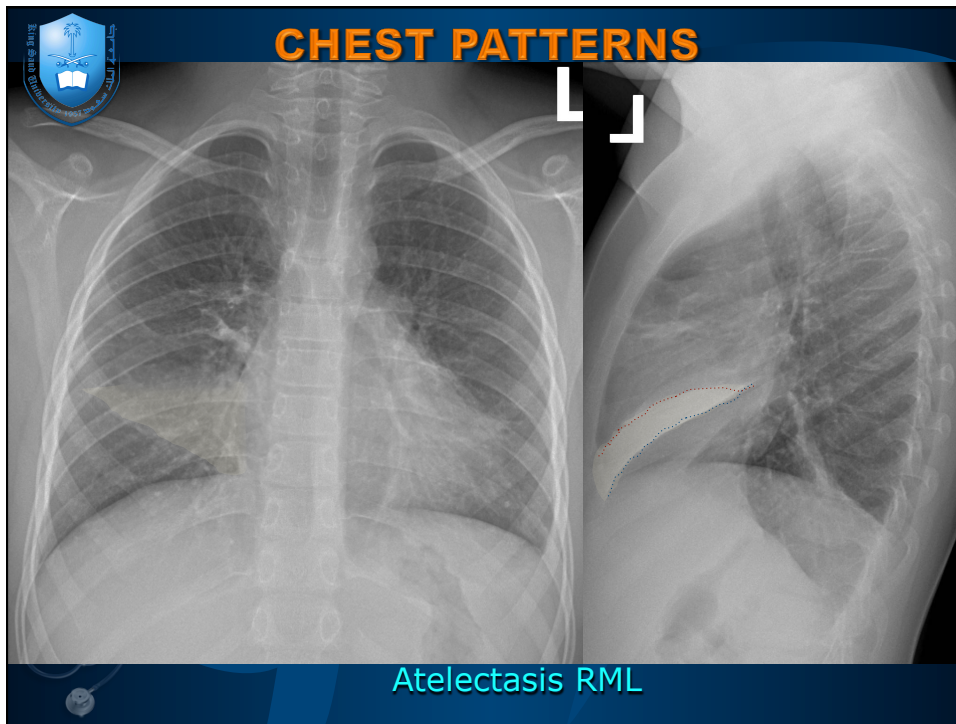
- ✓ Opacification right mid-lower zone
- ✓ No airbronchogram
- ✓ Silhouette sign (+ve)
- ✓ Mediastinal shift = Volume loss


Right lower lobe collapse

## CHEST PATTERNS

Consolidation RML







# CHEST PATTERNS



## CASE 2

16 Years-Old with History of Respiratory Distress




# CHEST PATTERNS

Study Case: 11/01/14  
Study: Chest X-ray  
Name: M. A. 11/01/14  
DOB: 11/01/14  
Sex: M

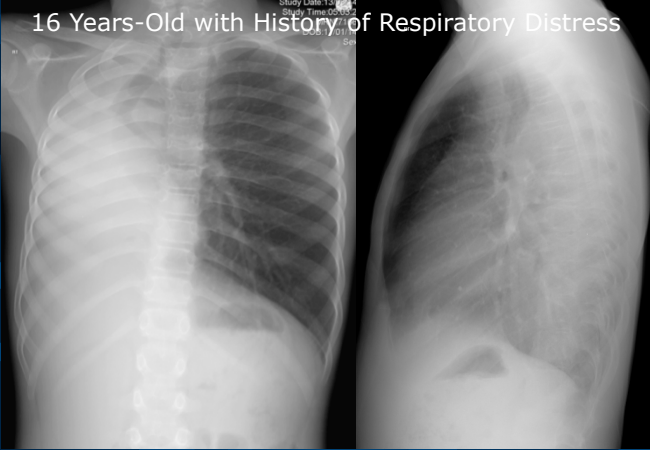


- ✓ Complete opacification of right hemithorax
- ✓ Homogenous
- ✓ No airbronchogram
- ✓ Silhouette sign (+ve)
- ✓ Volume loss



**CHEST PATTERNS**

16 Years-Old with History of Respiratory Distress

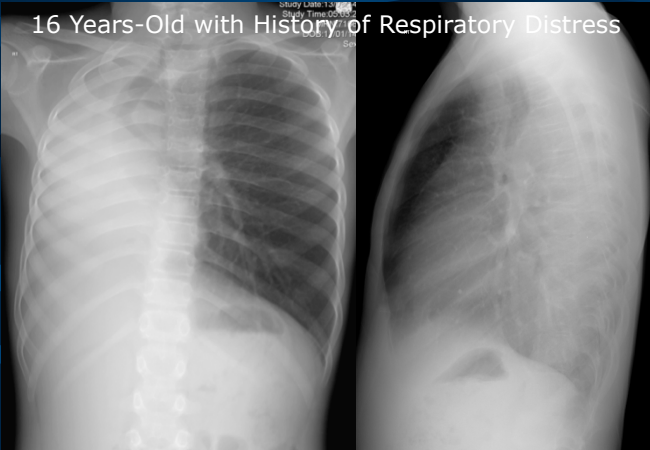


What is the most likely cause for the increased density pattern seen on this X-ray?

- a- *Right lung collapse.*
- b- Right lung consolidation (pneumonia).
- c- Chest wall mass lesion.
- d- Pleural effusion.

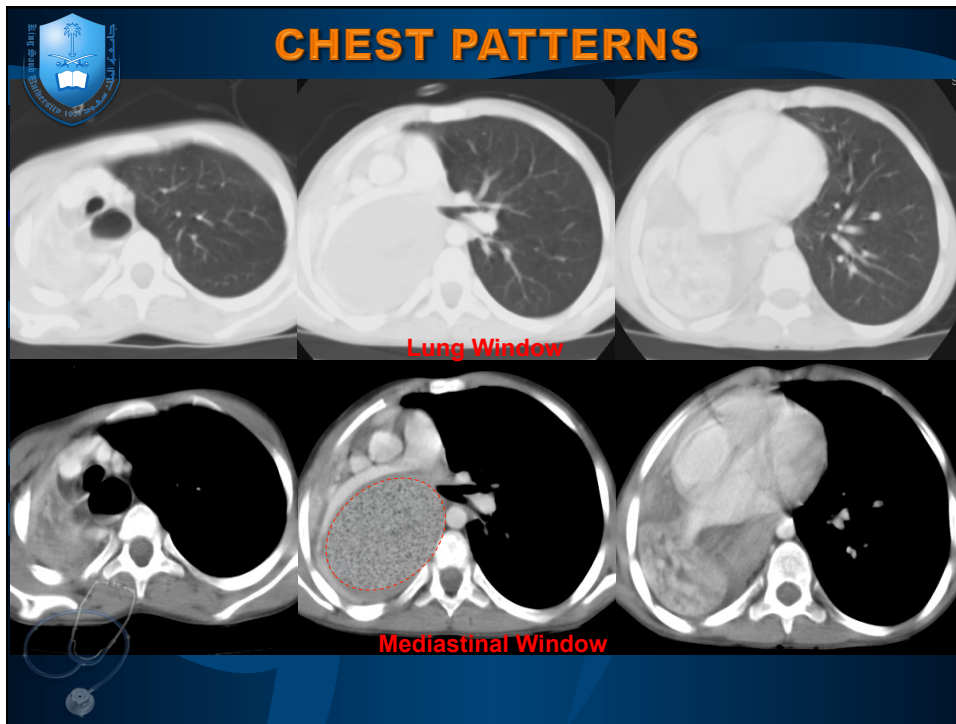
**CHEST PATTERNS**

16 Years-Old with History of Respiratory Distress



What would be the best modality to do next for the evaluation of this X-ray findings?

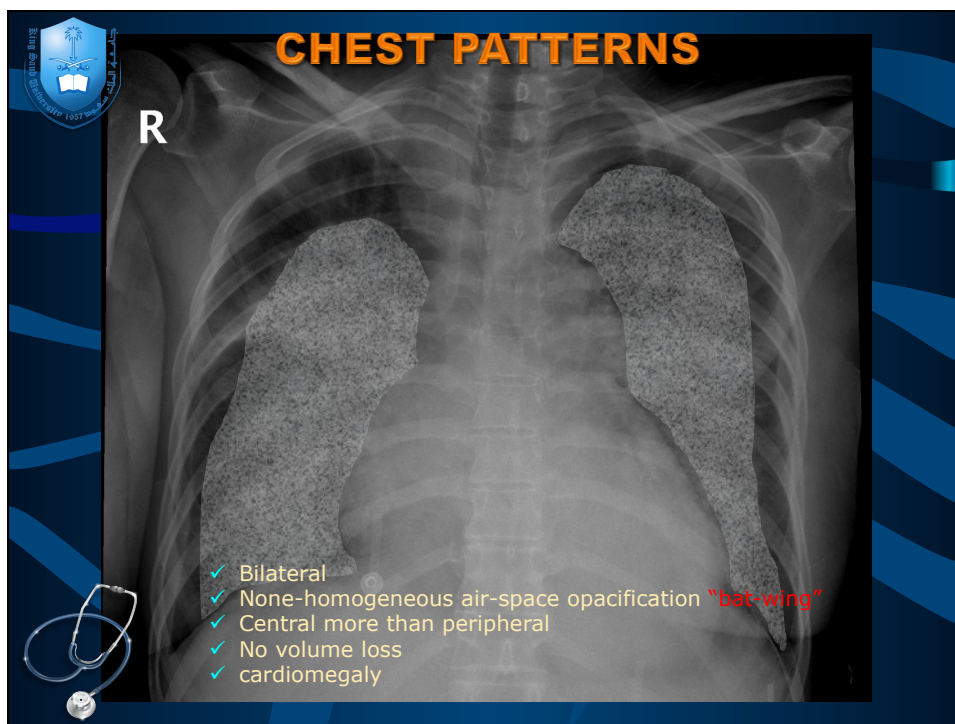
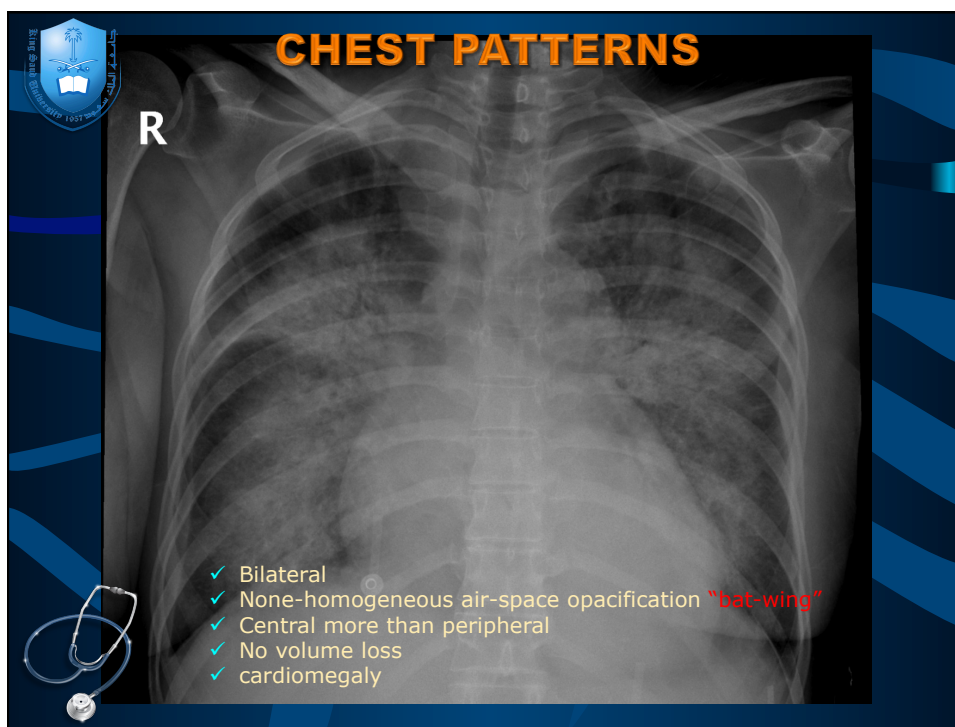
- a- Expiratory chest X-ray.
- b- Ultrasound of the chest.
- c- *CT scan of chest.*
- d- Cardiac MRI.

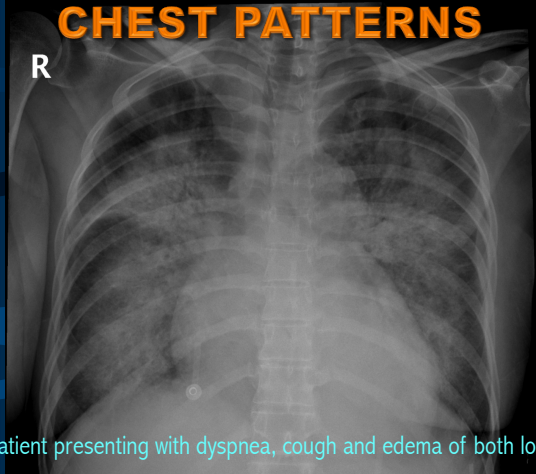


**CHEST PATTERNS**

**CASE 3**

Elderly patient presenting with dyspnea, cough and edema of both lower limbs





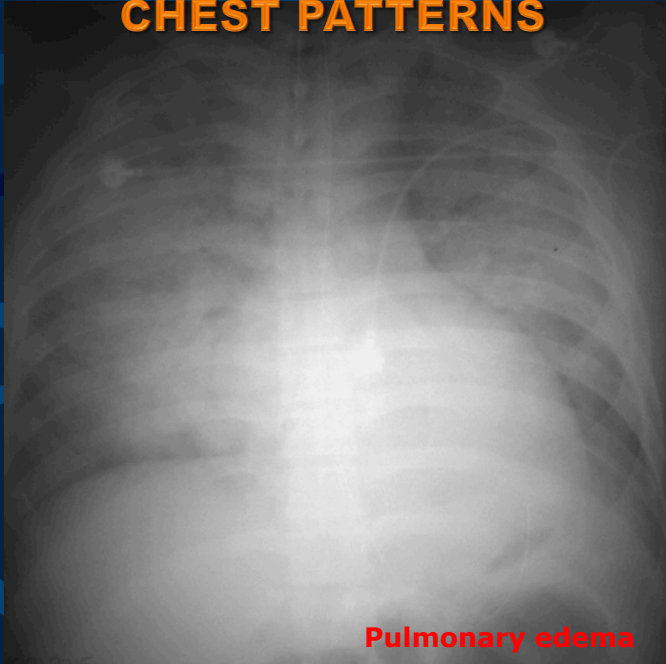

**CHEST PATTERNS**

R

Elderly patient presenting with dyspnea, cough and edema of both lower limbs


What is the most likely cause of the findings seen on this X-ray?


- a- Pneumonia.
- b- Interstitial pneumonitis.
- c- Pulmonary edema.**
- d- Pleural lesion.



**CHEST PATTERNS**

**Pulmonary edema**







# CHEST PATTERNS

## INCREASED PULMONARY DENSITIES

Increased Density (Opaque)


- Chest wall : Mass lesion
- Pleural : Pleural effusion
- Lung : Consolidation/Collapse  
Agenesis/pneumonectomy
- Outside : D Hernia



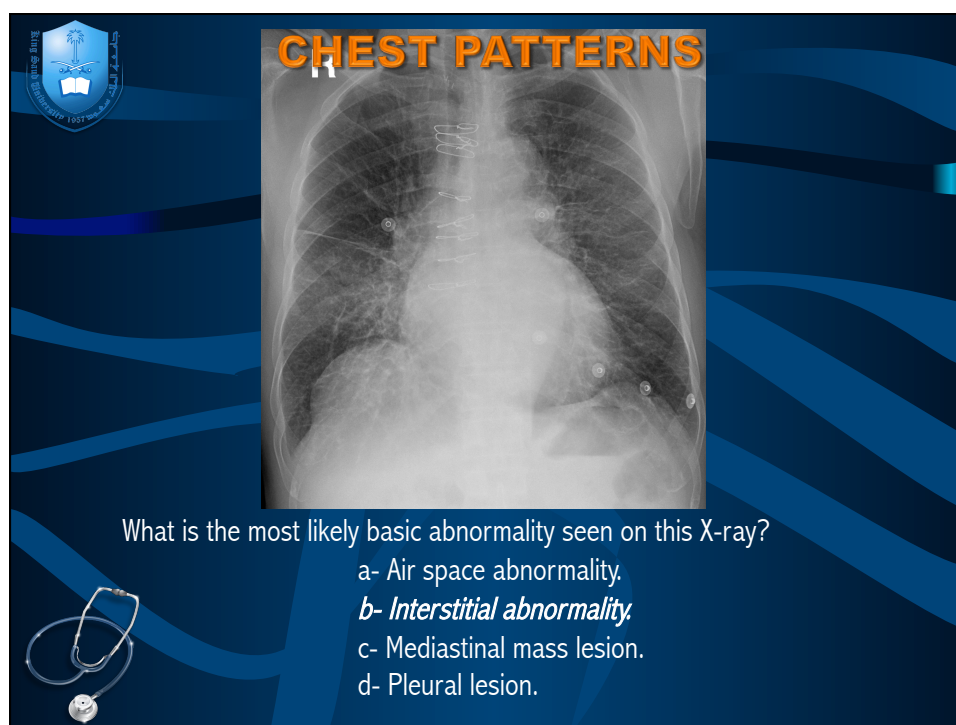
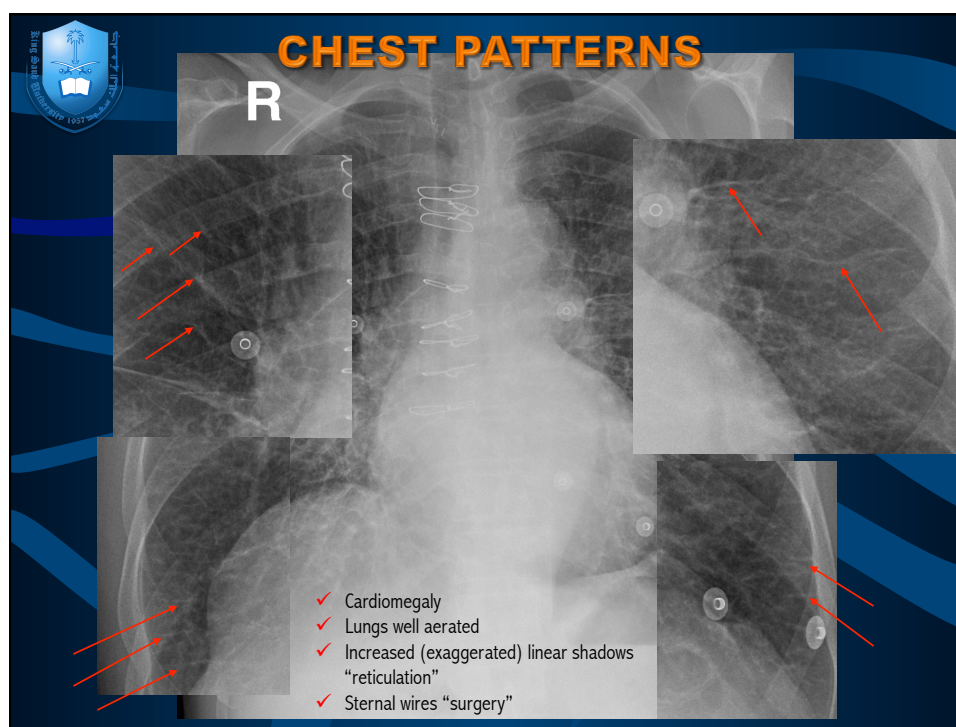
# CHEST PATTERNS

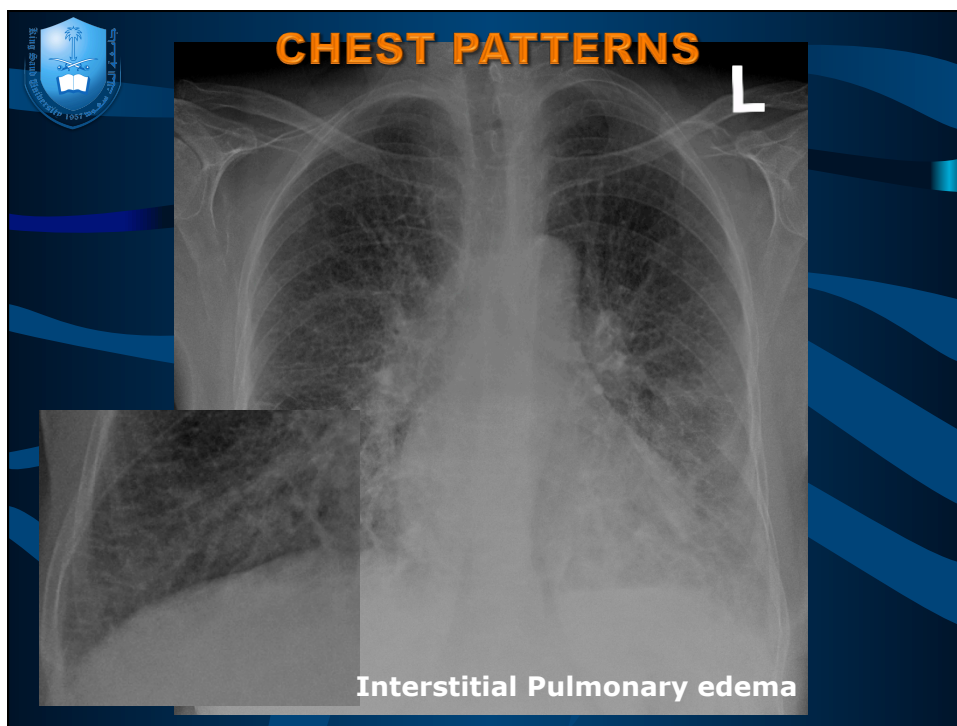
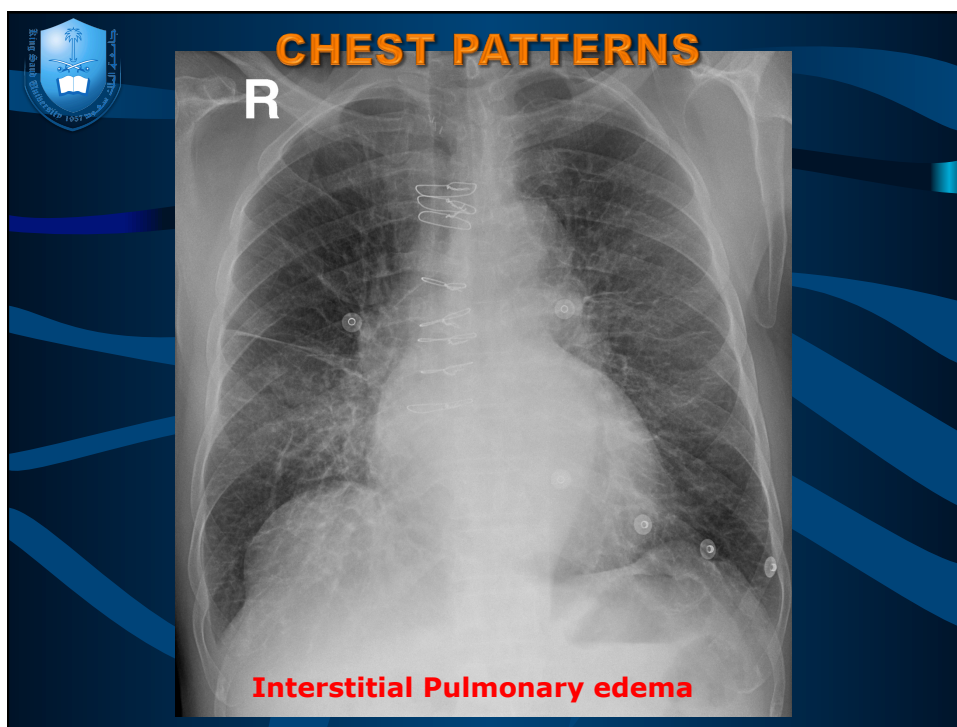
## CASE 4

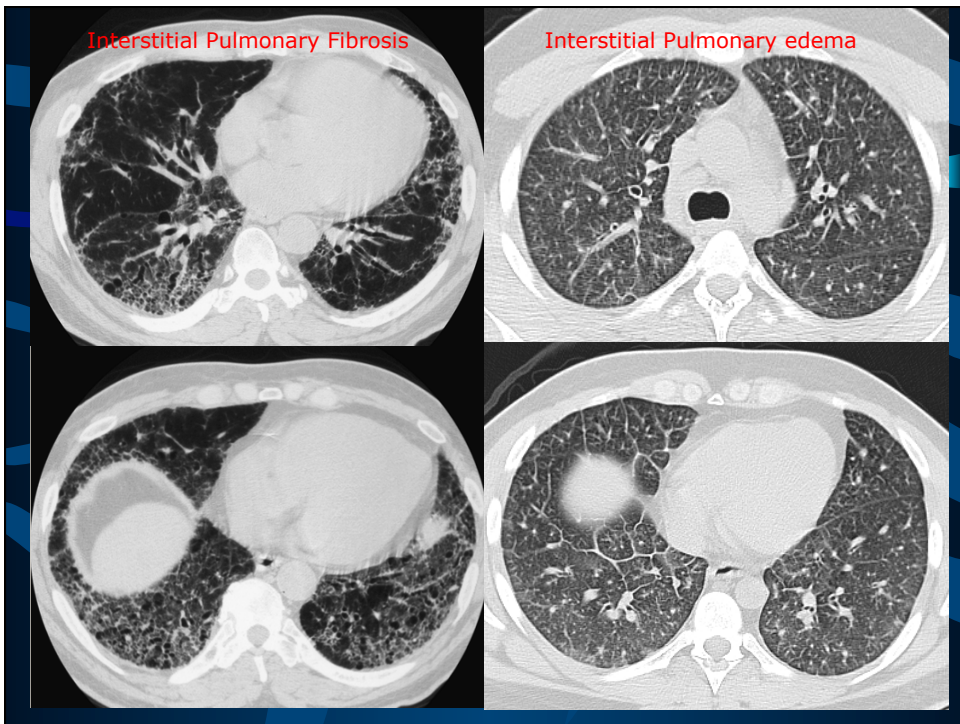
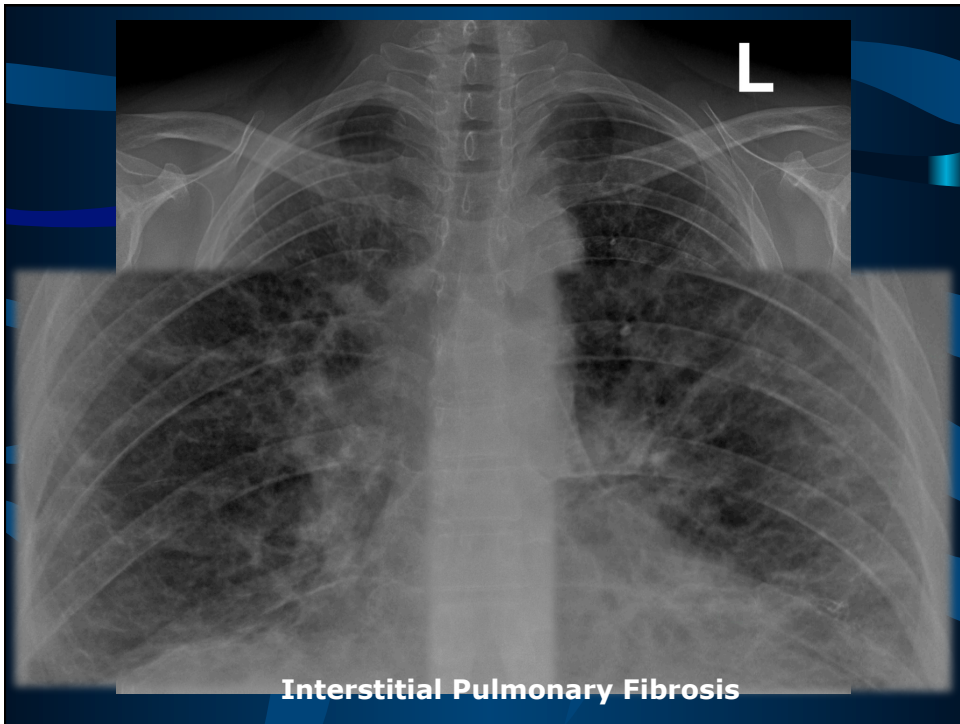
Adult patient had cardiac surgery "coronary graft"  
presenting with dyspnea

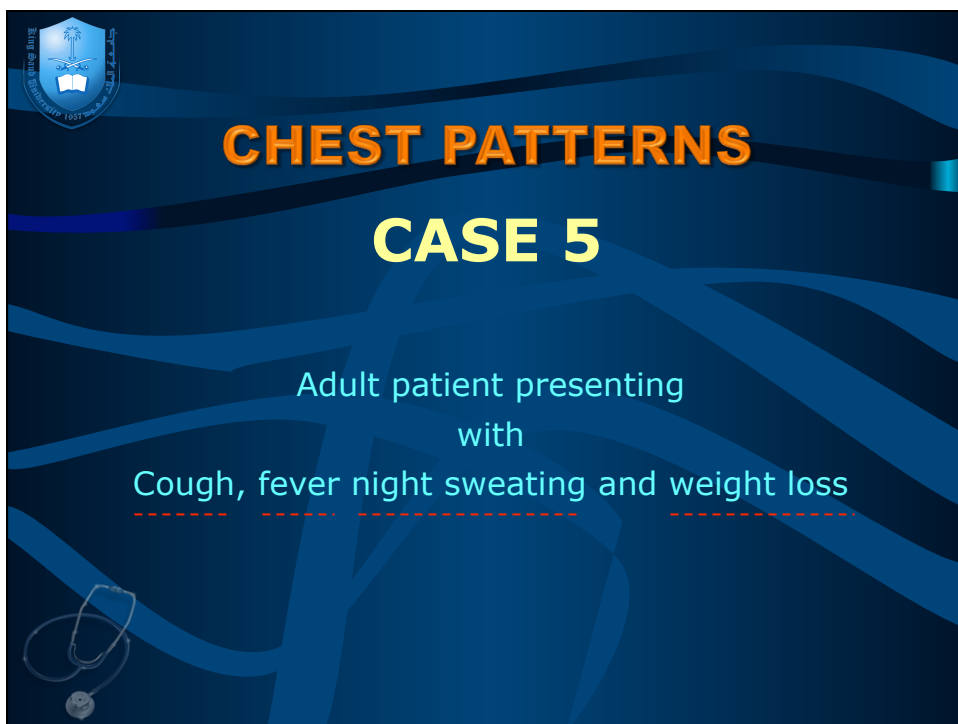
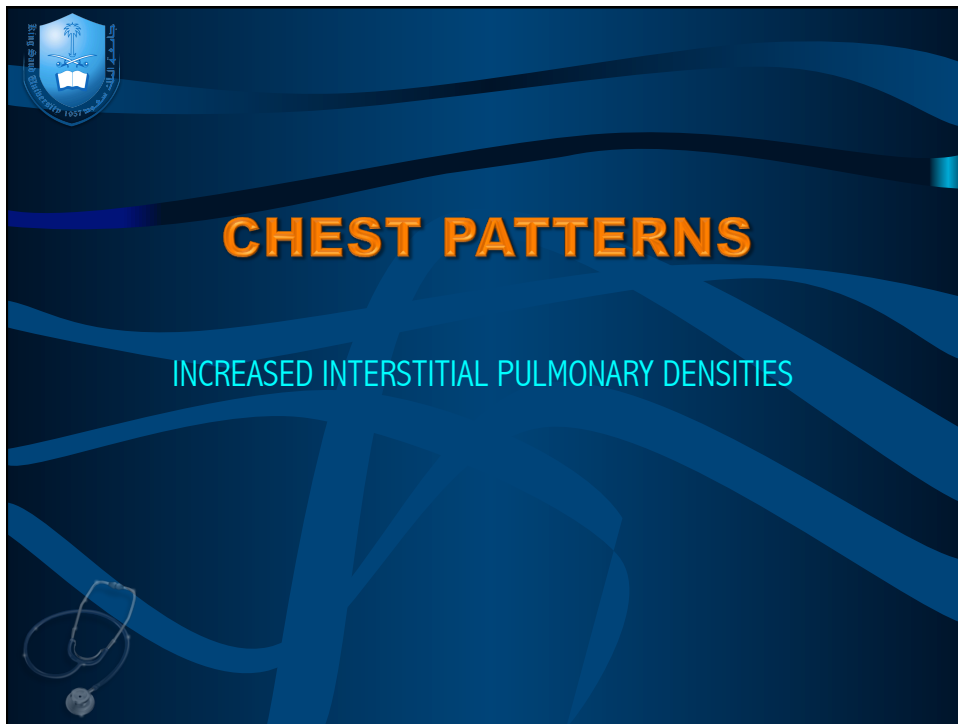


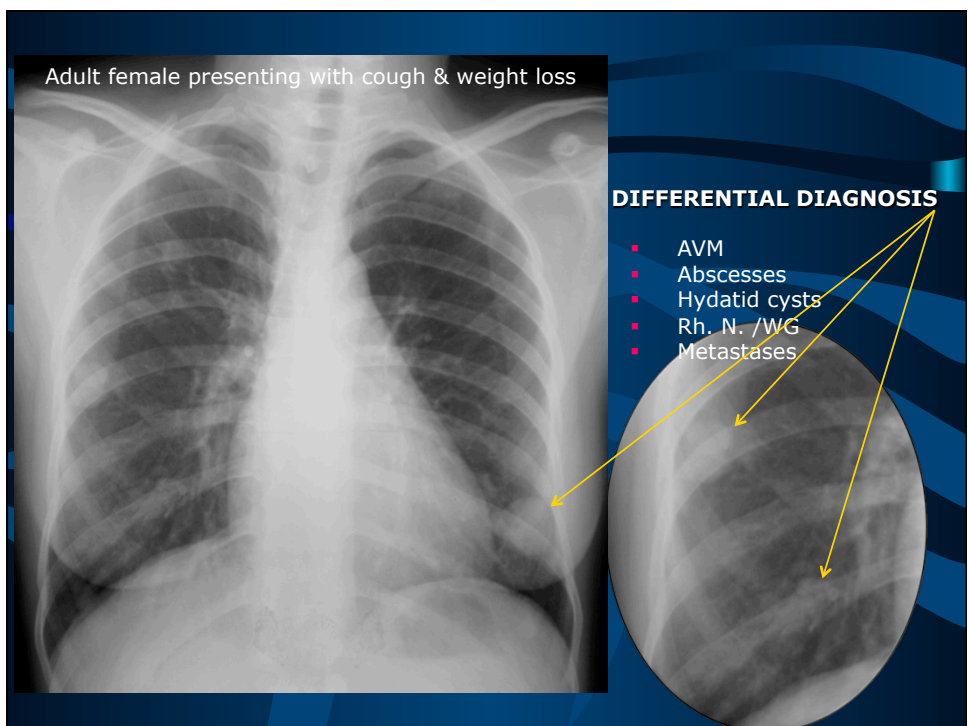
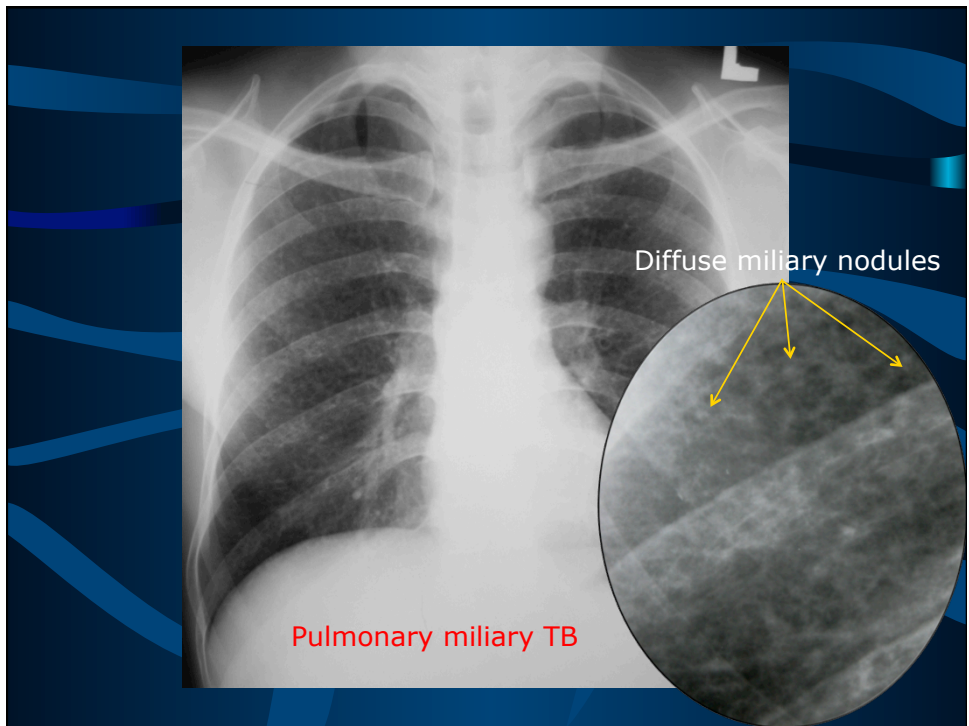


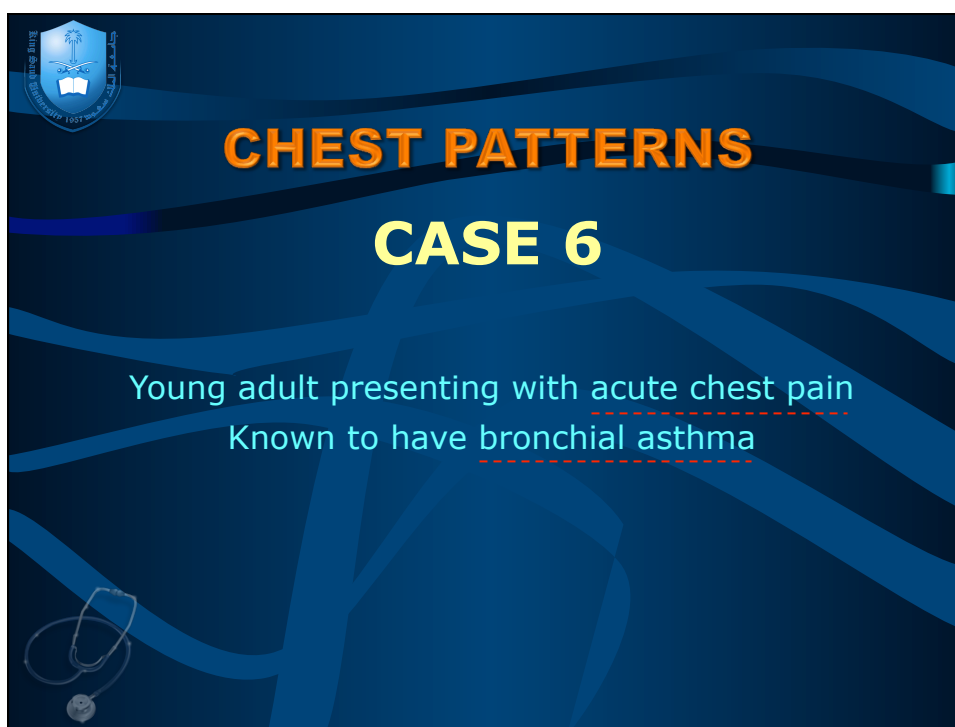
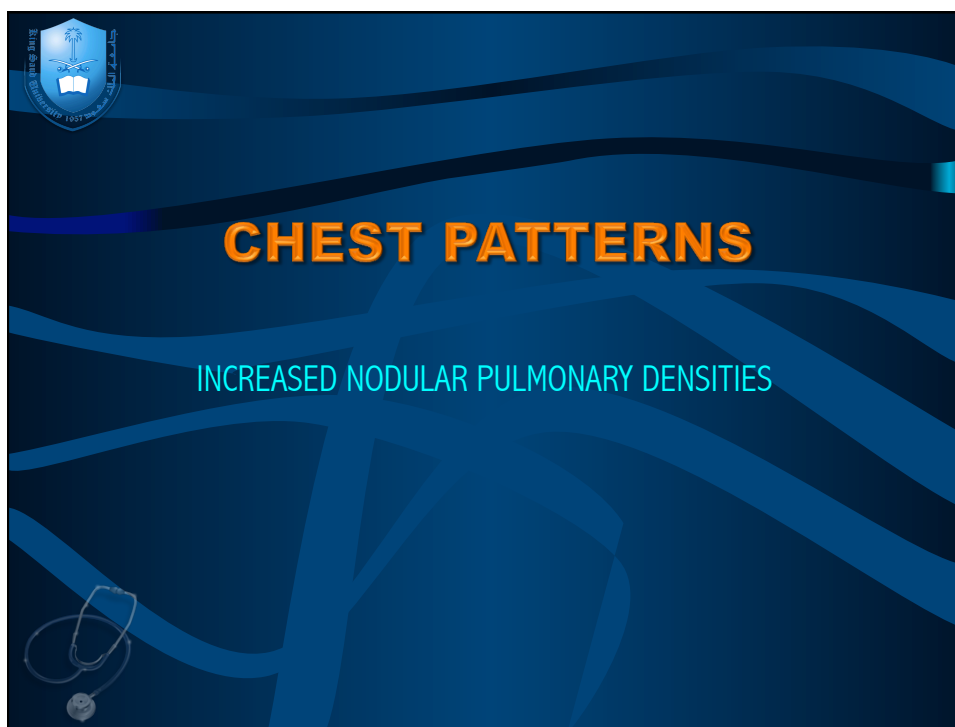


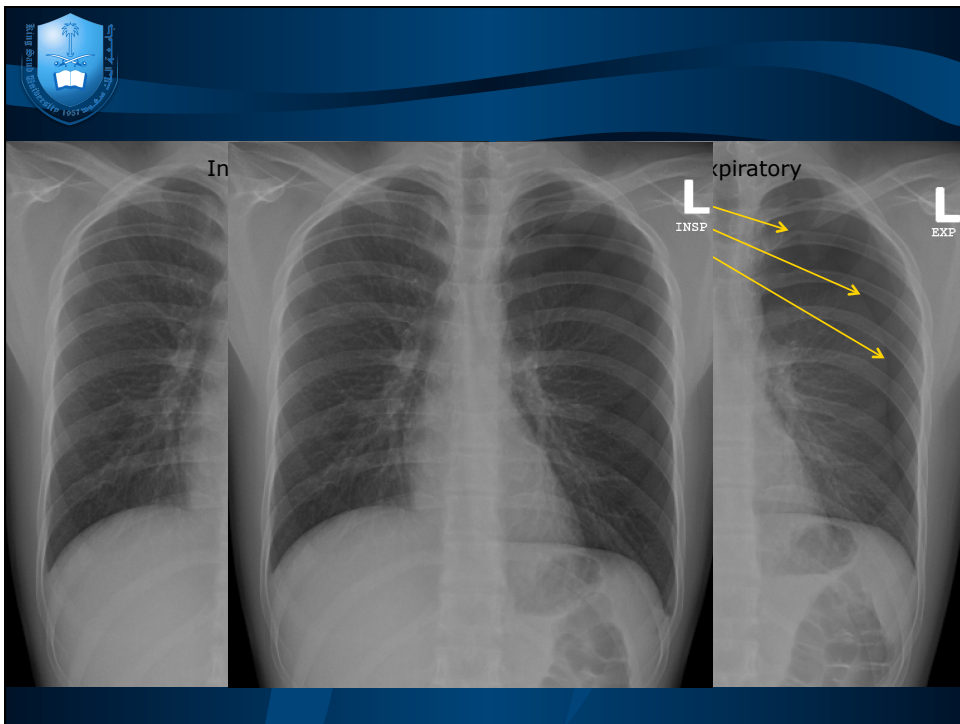
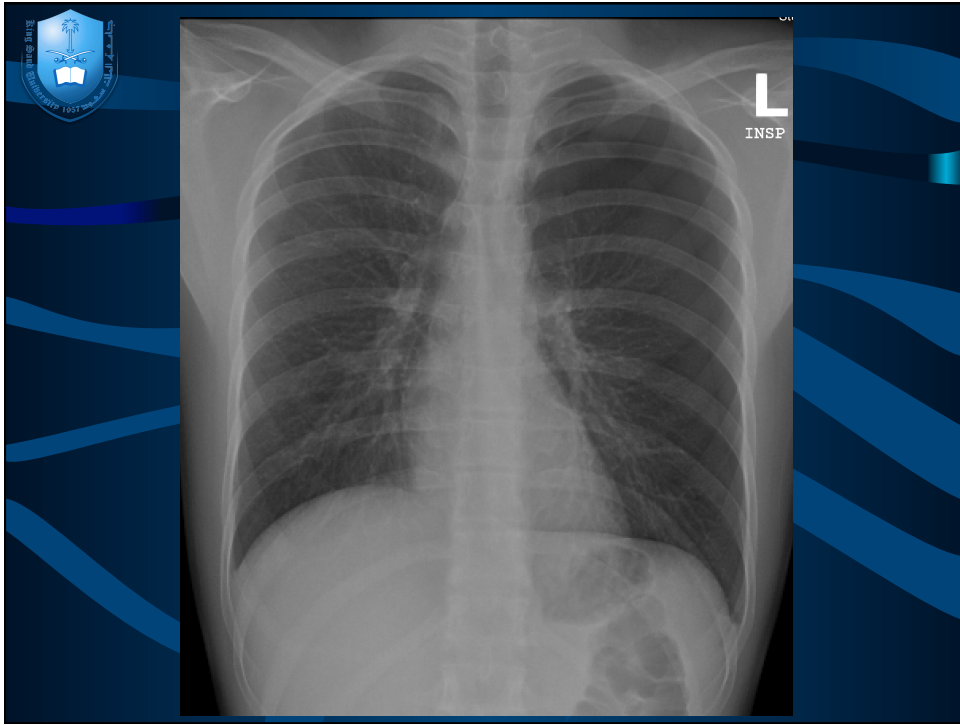


















# CHEST PATTERNS

DECREASED PULMONARY DENSITIES



12 year-old child presenting with recurrent chest infection



Cystic Bronchiectasis

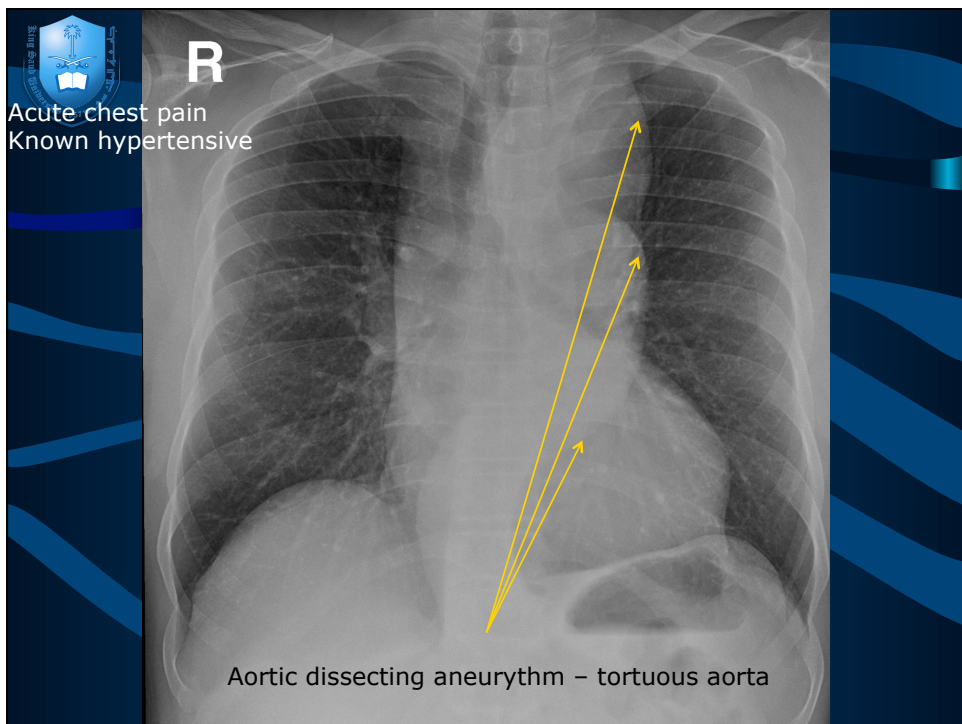
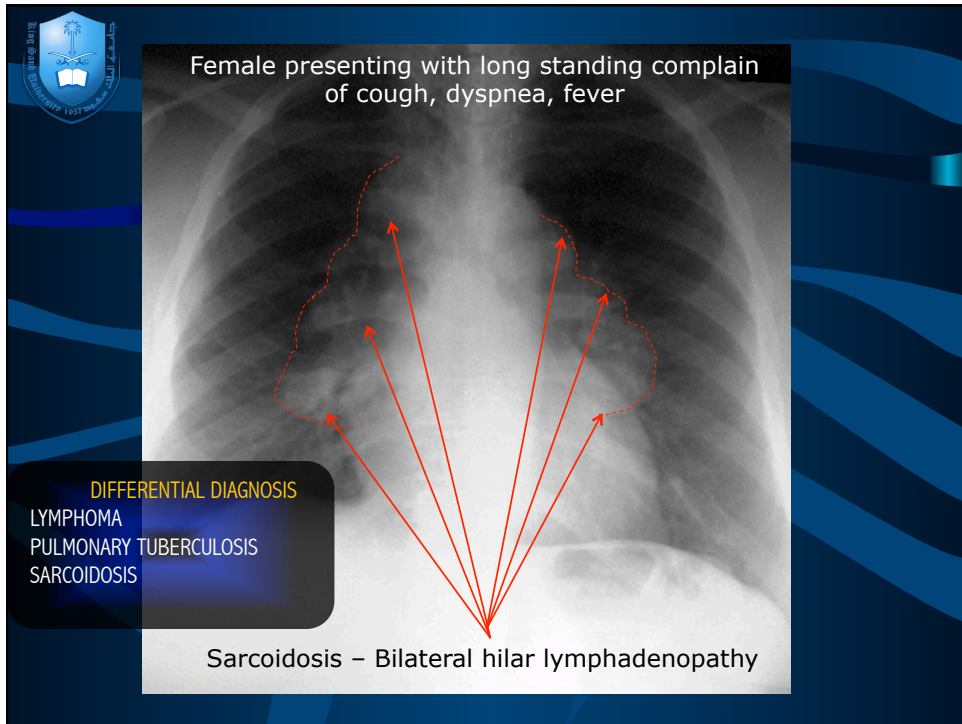


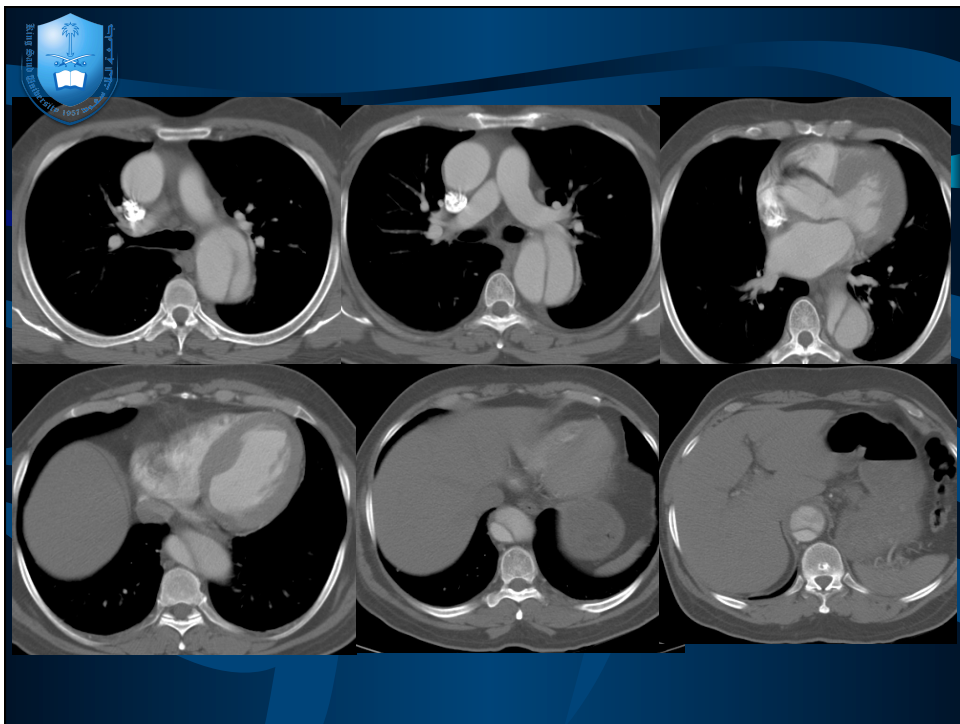
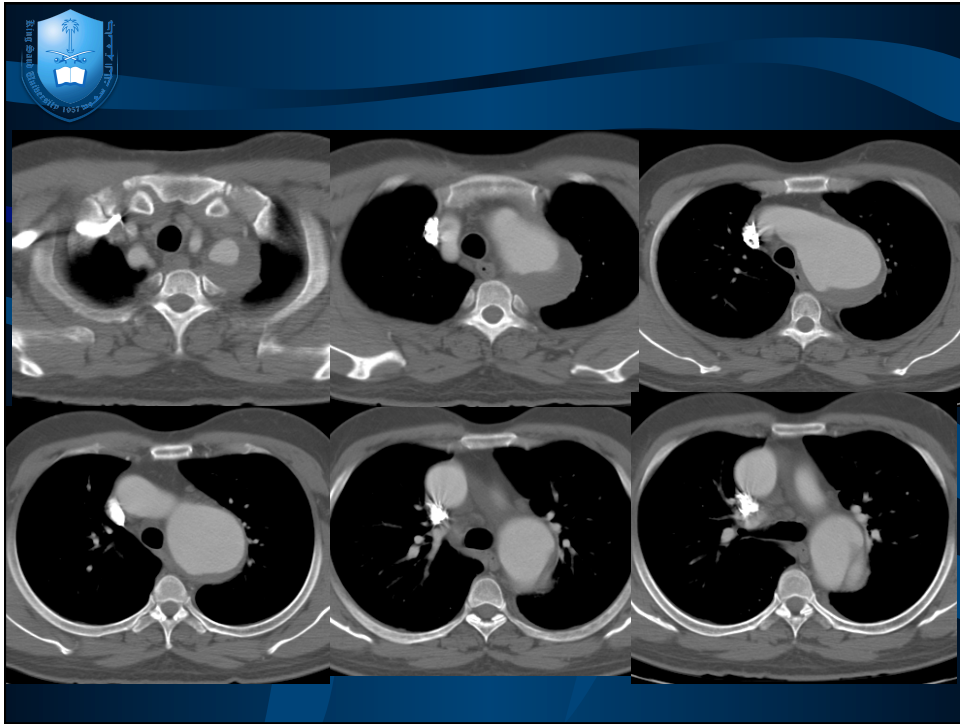


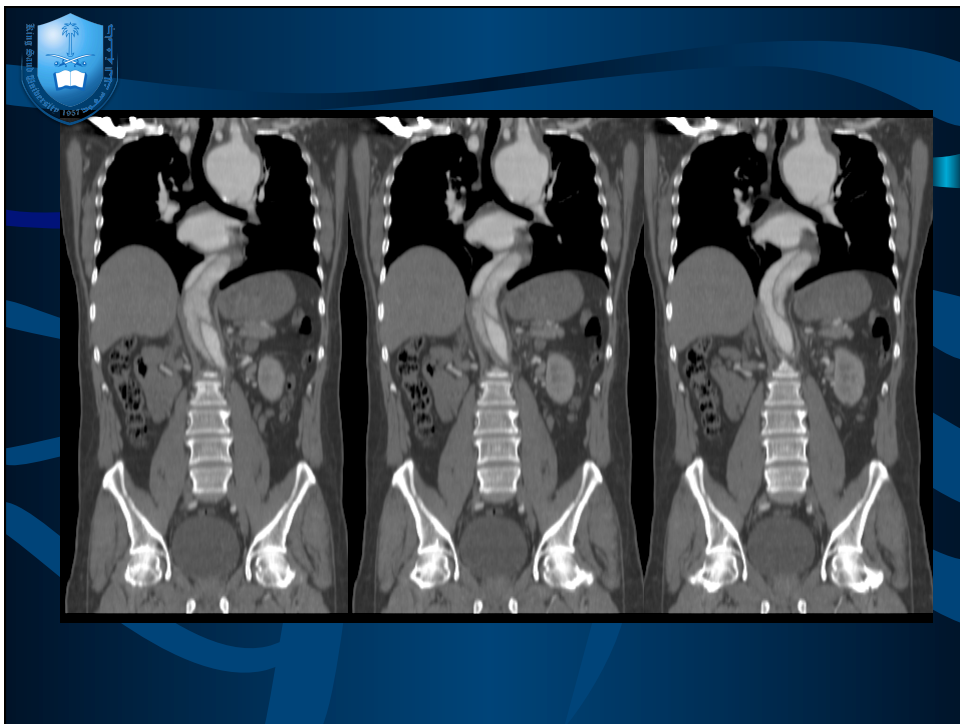
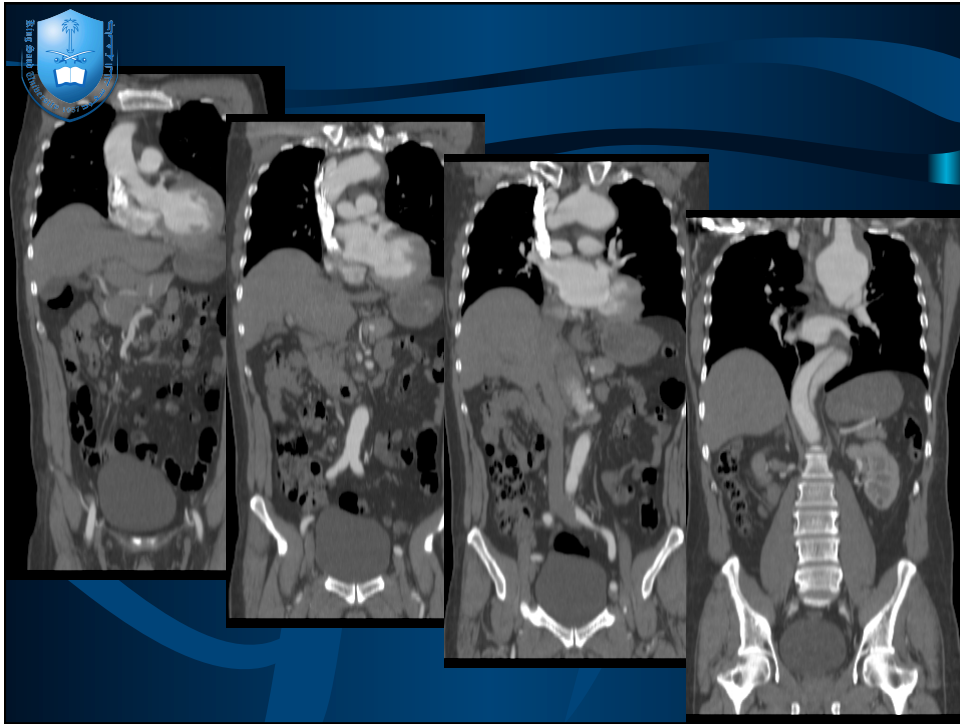
**CHEST PATTERNS**

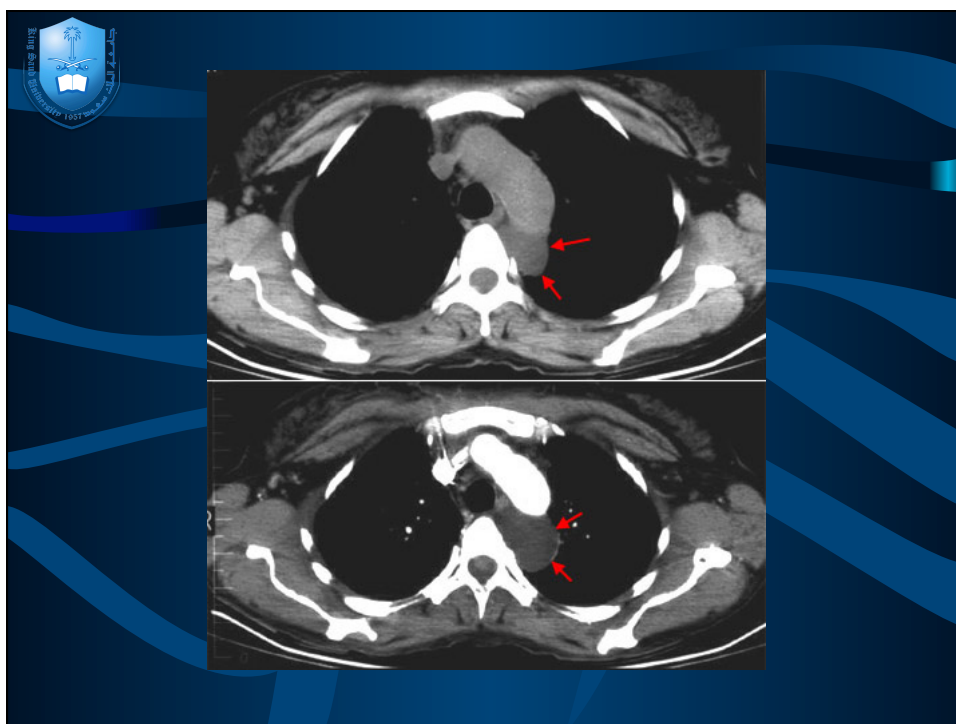
CYSTIC/CAVITARY PULMONARY LESIONS

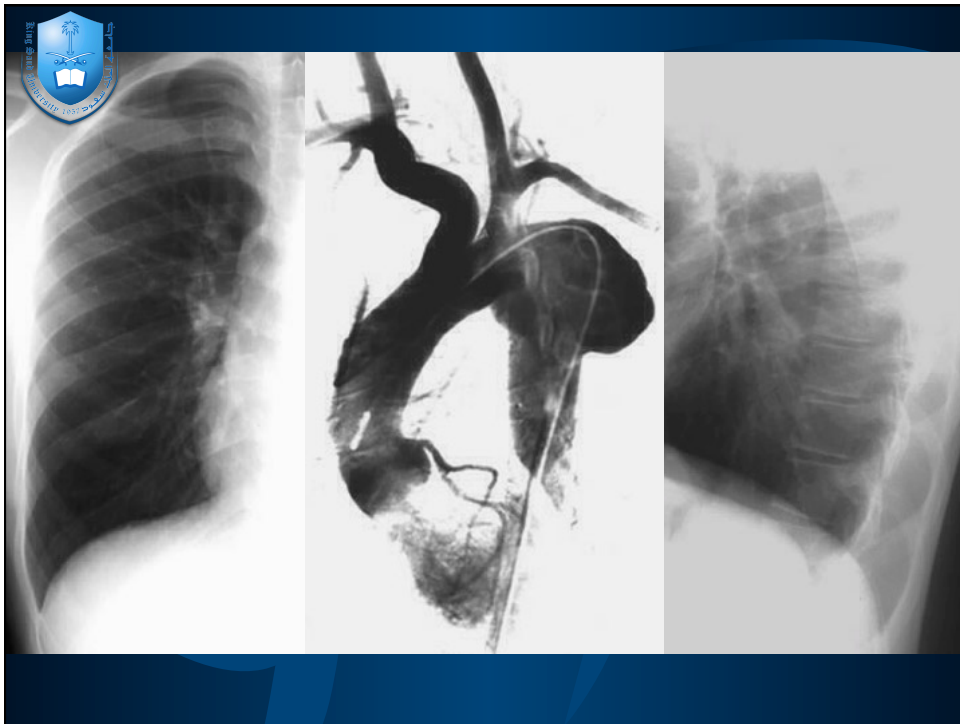
The slide features a dark blue background with abstract, lighter blue wavy patterns. In the top left corner, there is a circular logo of a university. In the bottom left corner, there is a small image of a stethoscope.












This is a presentation slide with a dark blue background featuring abstract, wavy patterns. In the top left corner, there is a circular logo with Arabic text and a central emblem. In the bottom left corner, there is a white stethoscope. The main text is centered: 'CHEST PATTERNS' is written in large, bold, orange letters, and 'MEDIASTINAL LESIONS' is written below it in smaller, light blue letters.



## REFERENCE BOOKS & OTHER RESOURCES

“Diagnostic Imaging” book by Peter Armstrong  
<http://www.med-ed.virginia.edu/courses/rad/cxr/>  
<http://www.radiologyanatomy.com/index.php>  
<http://eradiology.bidmc.harvard.edu/learninglab/>

