Prof.dr Simon Nikolić
opšta medicina 1

Radiološka dijagnostika pluća



MMXV

Metode pregleda

Konvencionalne

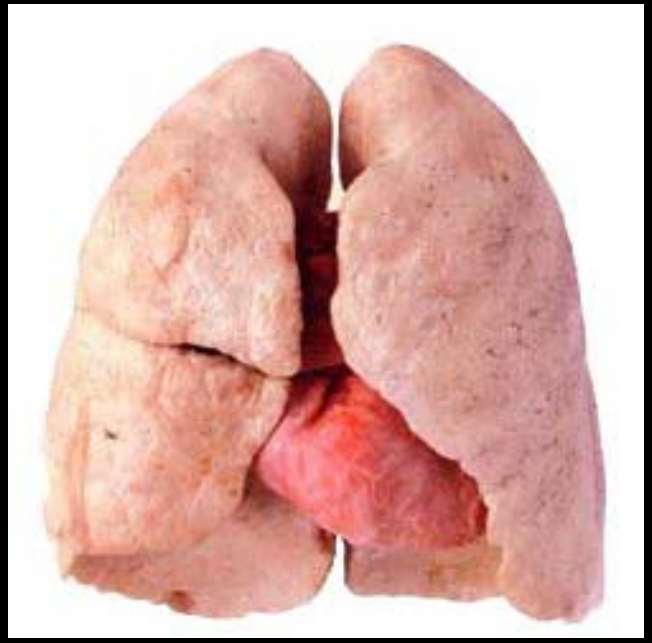
- Radgengrafija
- Rendgenskopija
- Tomografija

Nerendgenološke metode

- Kompjuterizovana tomografija
- Ehokardiografija
- Magnetna rezonancija
- Perfuziona scintigrafija

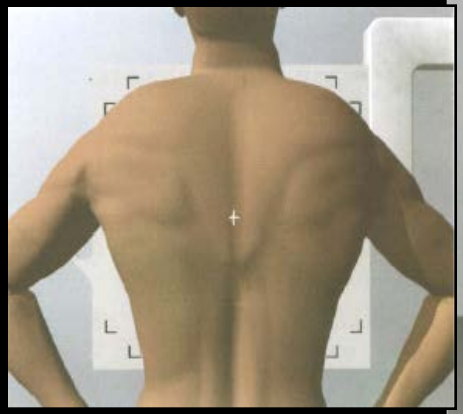
Specijalne metode

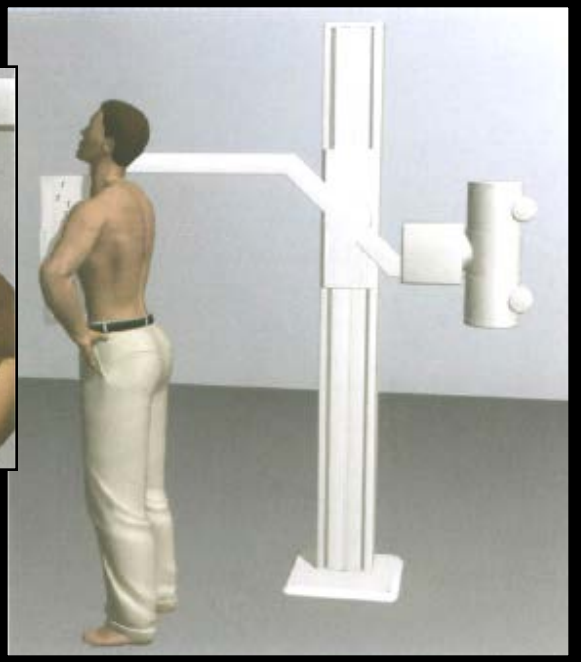
- Bronhografija
- Angiopulmografija



- **Rendgenografija pluća**

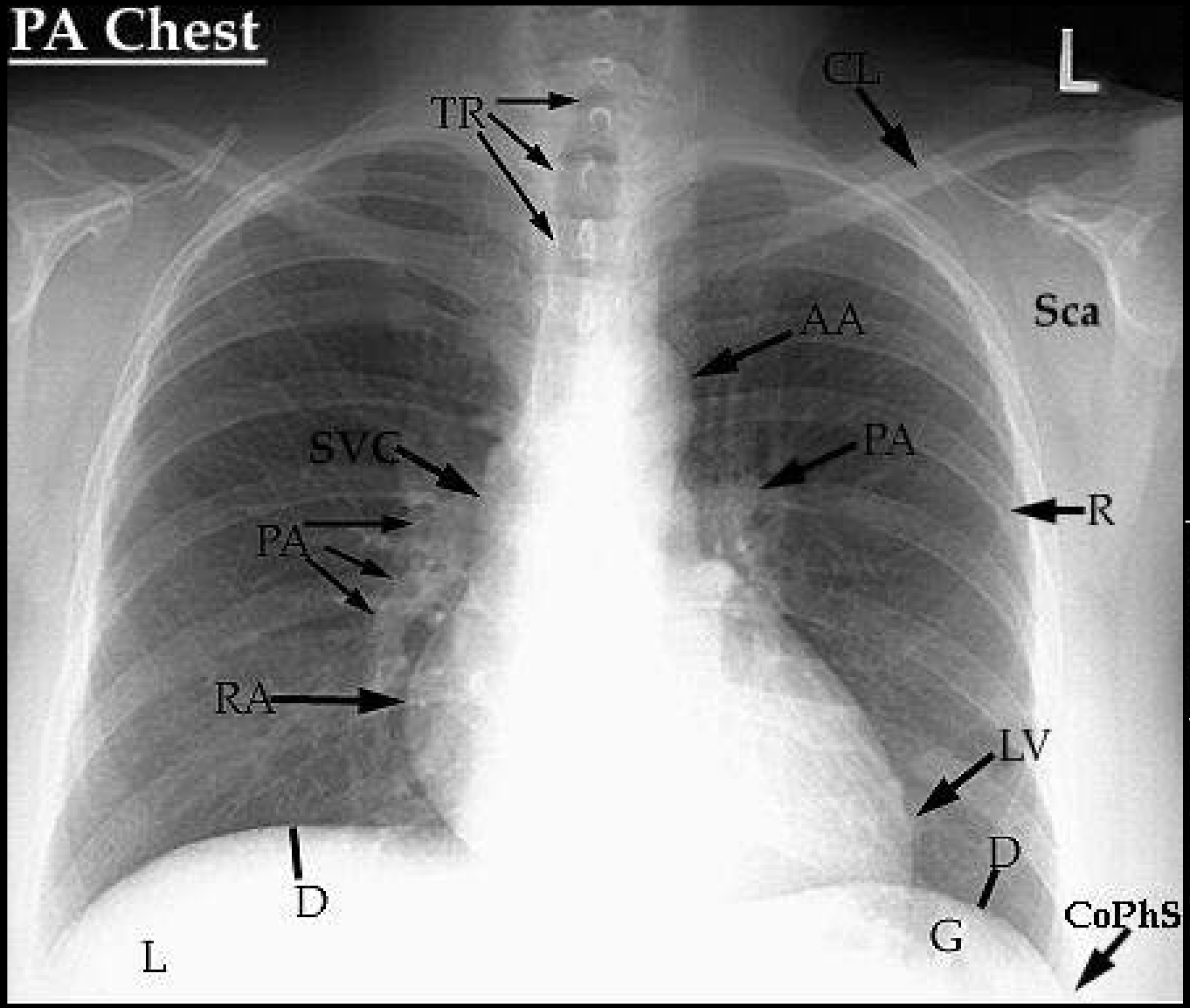






Fo - Fi 180 cm

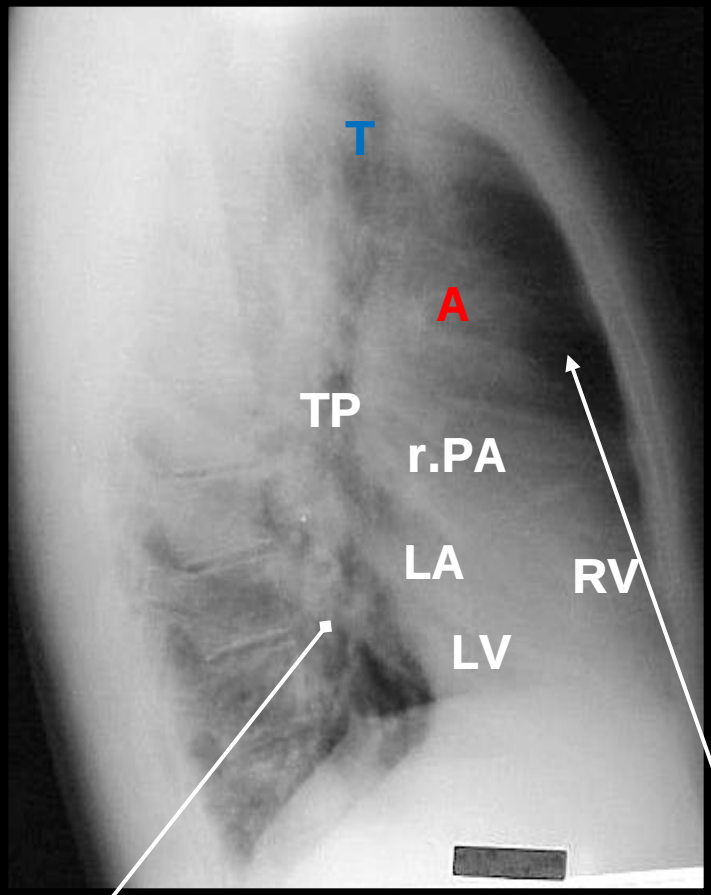
PA Chest

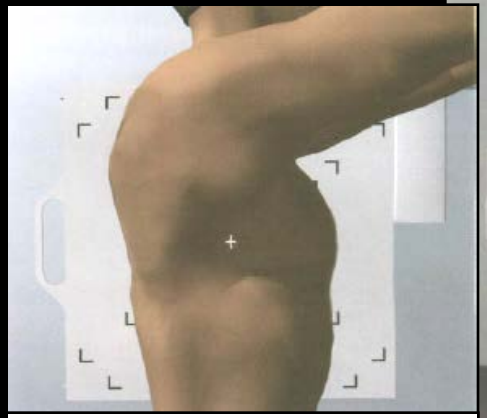


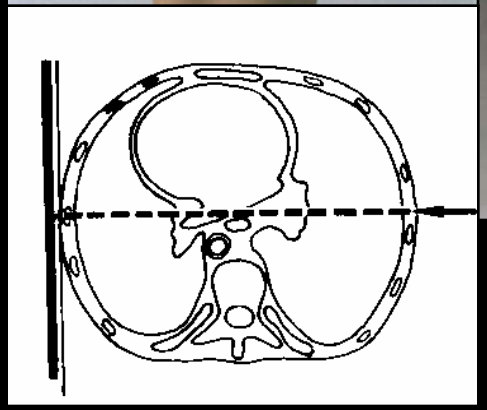
LV=Left Ventricle
D=Diaphragm
G=Gastric Air Bubble
L=Liver
Sca=Scapula
R=Rib

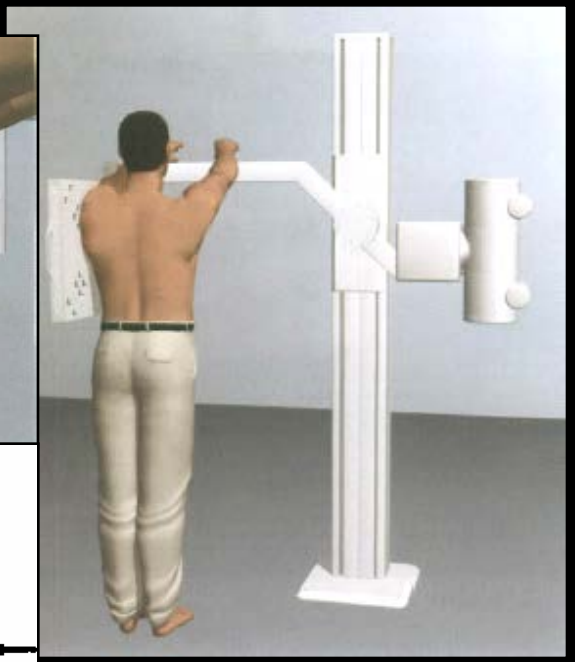
PA=Pulmonary Artery
TR=Trachea
CL=Clavicle
AA=Aortic Arch
SVC=Superior Vena Cava
RA=Right Atrium
CoPhS=Costophrenic Sulcus

LL







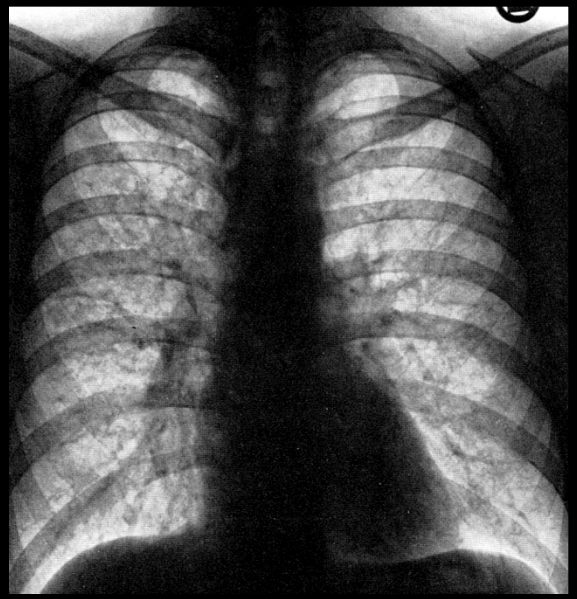


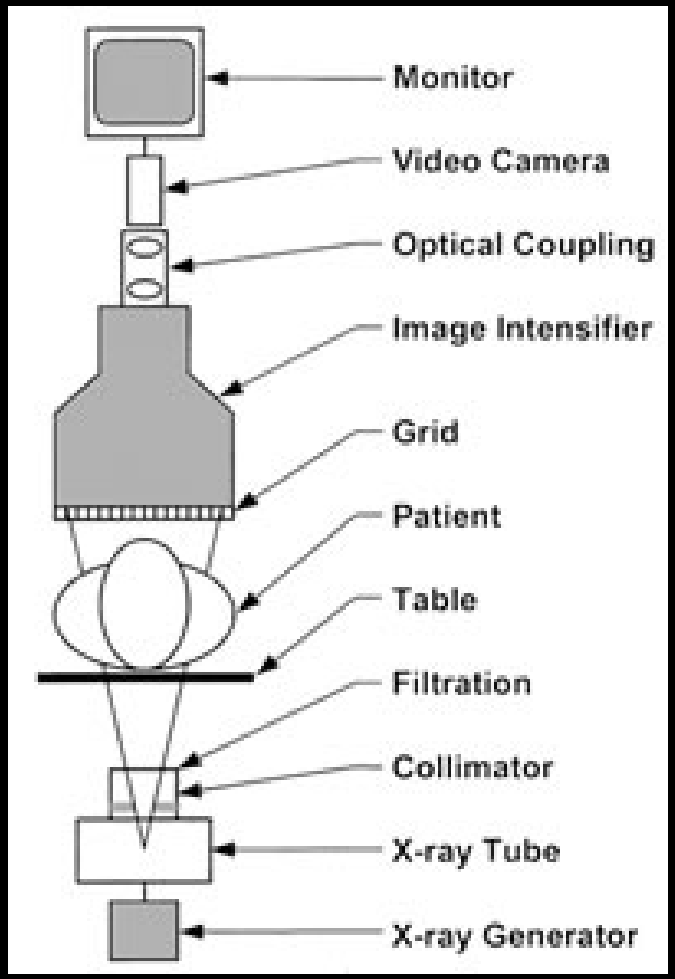
Retrokardijalni prostor

Retrosternalni prostor

- **Rendgenoskopija pluća**

fluoroskopija





Dopunska dg.metoda.
Indikacije:
-Procena prostorne lokalizacije promene, i odrede njeni topografski odnosi
-Dopuna funkcionalnom ispitivanju pluća, medijastinumskih organa i prečage.



Grafija

- Rtg film osteljiviji od oka
- 10x više detalja od Rtg skopije
- Metod izbora – deca, trudnice

Skopija

- Metod izbora u praćenju dinamike
- Prostorna lokalizacija
- Mogućnost izvođenja različitih ogleda

Grafija - Skopija

TABLE 1. Suggested Exposure Ranges[6] and the Mayo Clinic Exposures*

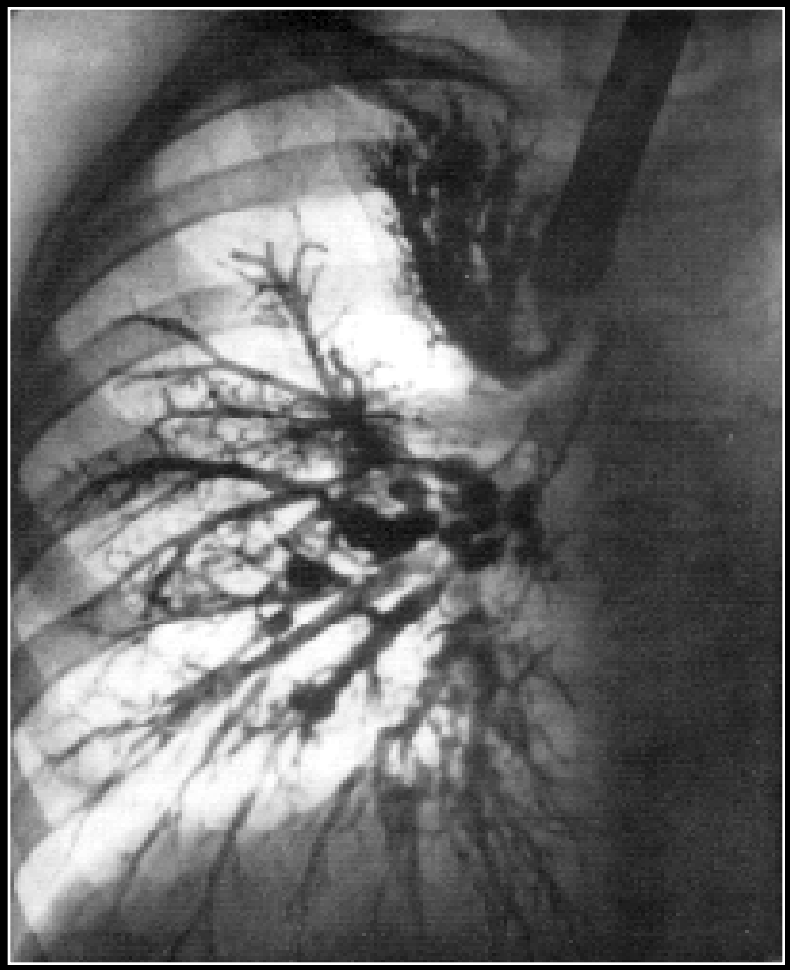
	Suggested Exposure[1] Range (mR)	Mayo Clinic Exposure (mR
PA chest	8-30	24
AP lumbar spine	500-750	280
Lateral skull	100-300	82
PA hand	5-30	9
Head CT	2,200-6,850†	6,500
Abdomen CT		6,000
Fluoroscopic exposure rate‡		2,300 mR/minute
Cine exposure rate§		25,000 mR/minute
CC mammogram	200-1,200	540‖
Dental bitewing£	270-415* 145-190††	256**

95 grafija za minut skopije

- **Bronhografija**
  Angiopulmografija

Specijalne metode





- **UZ**

Ima ograničenu dijagnostičku vrednost

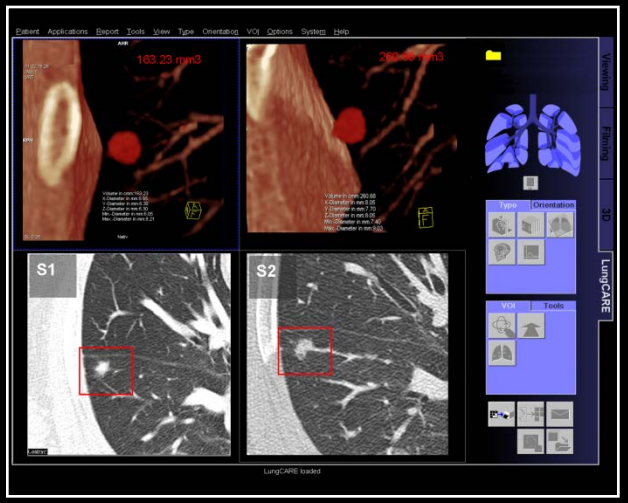
- Oboljenja torakalnog zida
- Oboljenja pleure (transudat, eksudat, empiem)
- Lezije lokalizovane periferno u plućnom parenhimu
- Diferenciranje solidnih od zapaljenskih promena
- Vođenje biopsije i troakar drenaže





• CT - MSCT





<u>Standardni CT</u> pregled aksijalni preseci od vrhova pluća do završetka fc sinusa. U apneji.

Bez i sa ks.

Post procesing – virtuelna bronhoskopija.

Indikacije:

- Procena uznapredovanosti Ca bronha
- “neme zone”
- Pleuralne promene
- Patologija mekih tkiva i košt.-zgl. Sistema
- Diferencijacija promena u medijastinumu
- Ciljana biopsija

- **Magnetna rezonancija**

Prikaz bez upotrebe jonizujućeg zračenja.

Povoljnost u oštrini slike pri velikom mekotkivnom kontrastu.

Odabir željenog preseka bez pomeranja pacijenta.

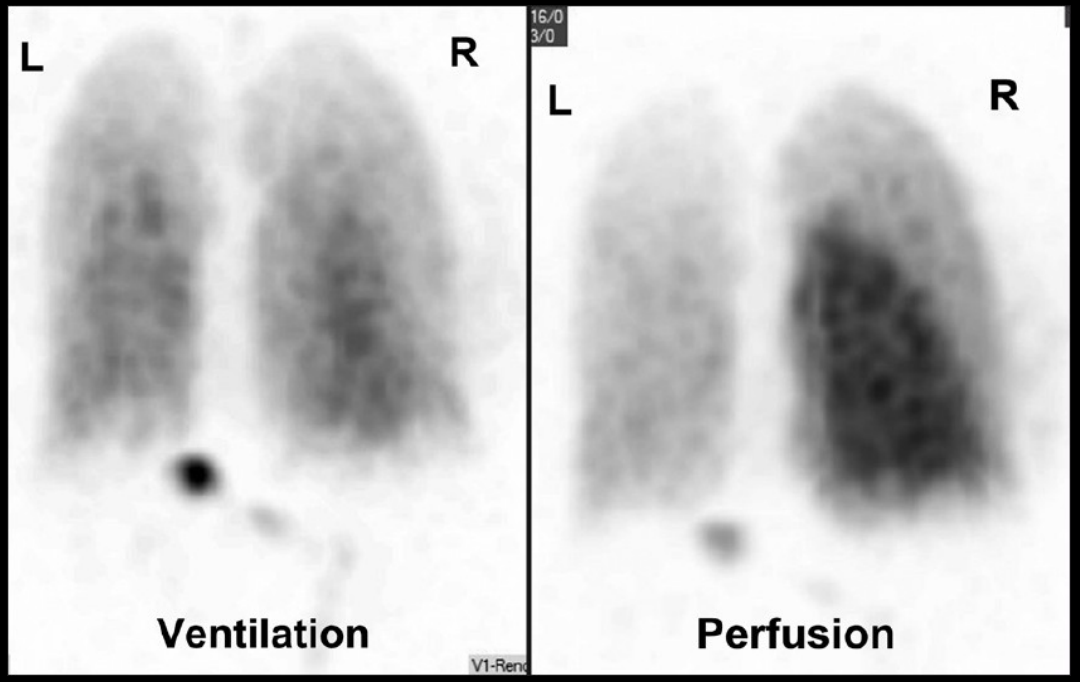




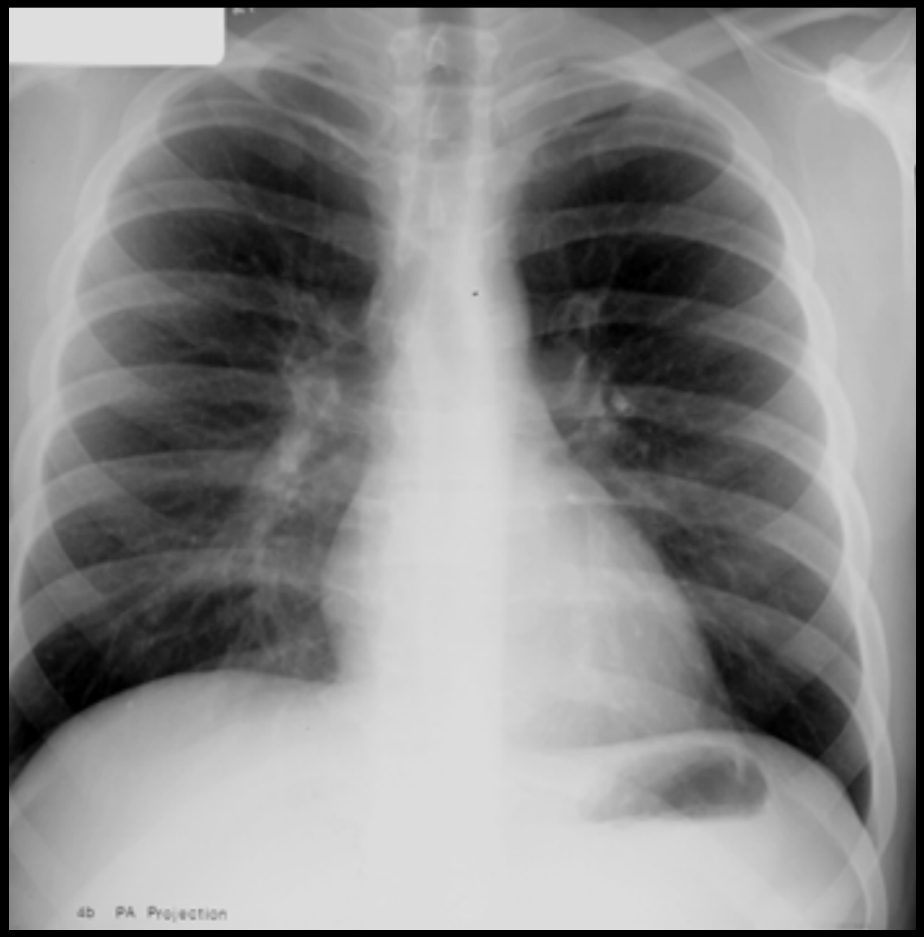
• Perfuziona i ventilaciona scintigrafija

1. Iv ubrizga radiofarmak (MAA+Tc^{99})
2. Udiše uz zadržavanje daha Xe^{127} - ^{133}

- plućna embolija
- opstruktivne bolesti pluća
- karcinom bronha
- sarkoidoza



Opis snimka pluća



- **Postavljanje filma na negatoskop**

  kao da se bolesnik nalazi naspram nas

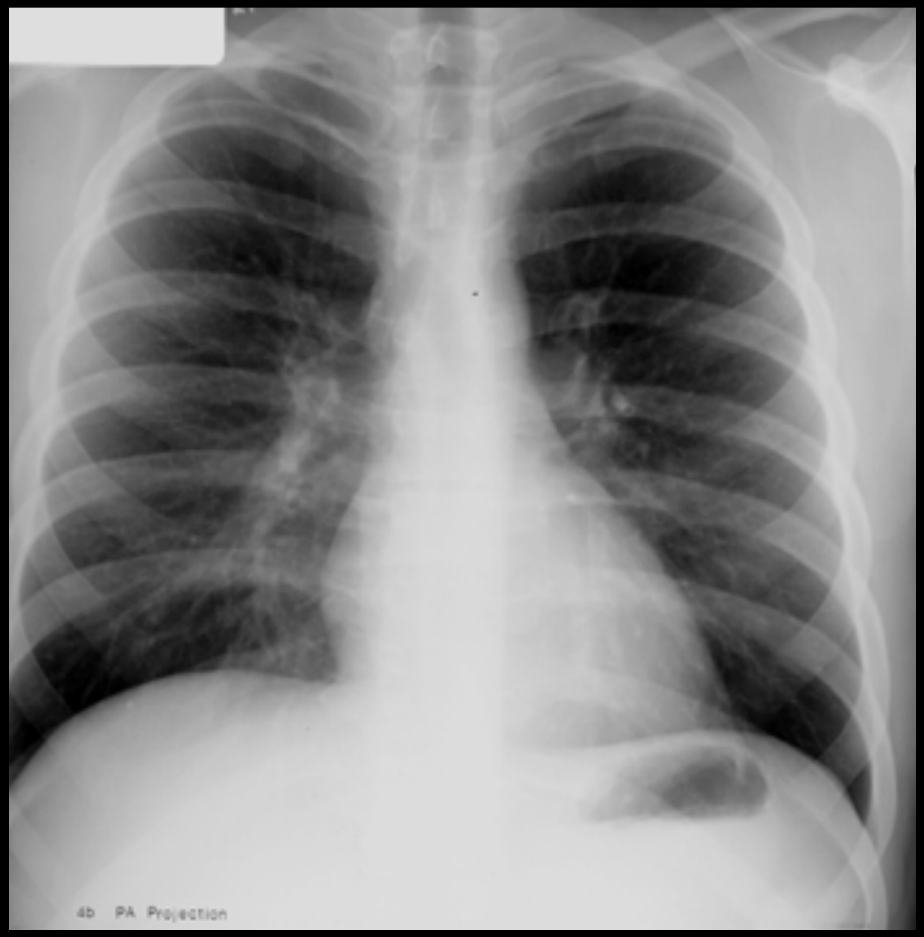
- **Provera tehničkih parametara**

  Doza

  prva 4 torakalna pršljena i njihovi iv. prostori

  Pozicija pacijenta

  glave klavikula podjednako udaljene od linije koja prolazi kroz proc. spinozuse



- **Meka tkiva**

  pored toraksa, axila, supraklavikularno

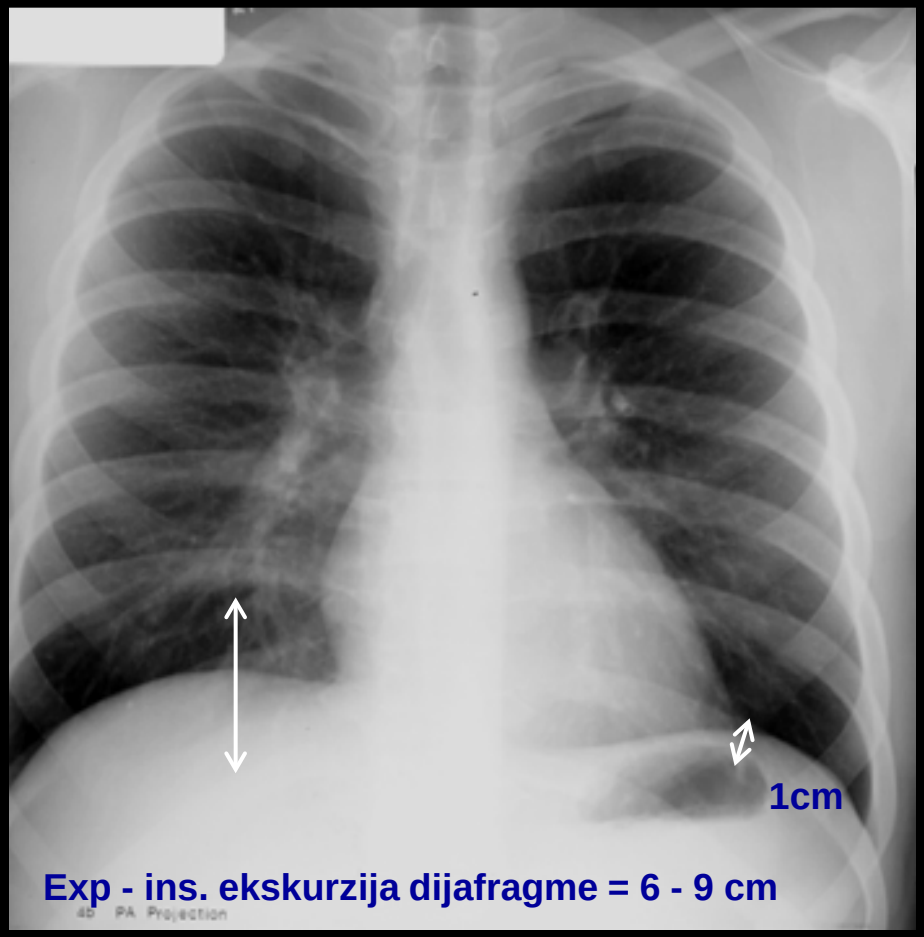
  - “linija propratnica” klavikule
  - “fossa rhomboidea”
  - “linija propratnica” II rebra
  - znak v. azygos

- **Koštanozglobni sistem**

  oblik toraksa, rebra i međurebarni prostori

  - vratno rebro, sinostoza
  - okoštavanje hrskavice

*prednji okrajci rebara



- **Dijafragma**

  položaj: desna hemidijafragma gornja ivica 5 do donje ivice 6 *

  leva hemidijafragma jedan međurebarni prostor niže

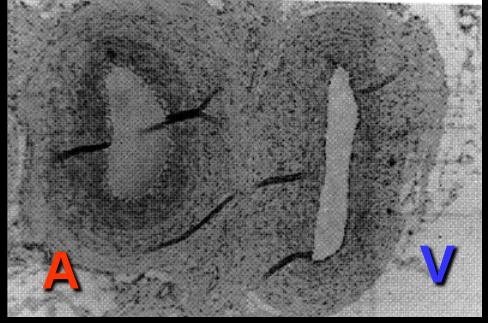
  oblik: kupole

  konture: jasne i oštre

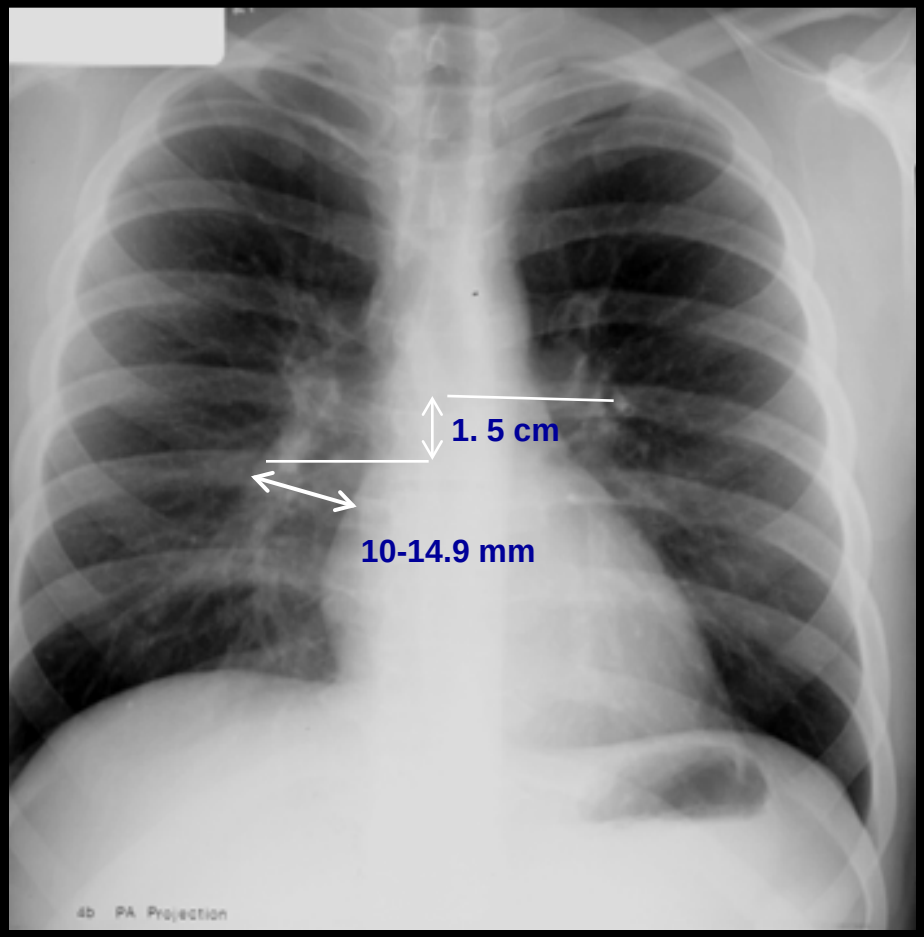
- **FC sinusi**

  oblik: oštrougaoni

  intenzitet: transparentni



*prednji okrajci rebara



- **Hilusi**

  položaj: desni hilus od 2 do 4 * levi hilus u nivou 2 * oblik: desni - “šargarepe”

  levi - “gužva vate”

- **Plućna šara**

  do na 1 cm od lateralnog zida toraksa i do donje ivice klavikule

  -hilobazalna +++

  -hilolateralna

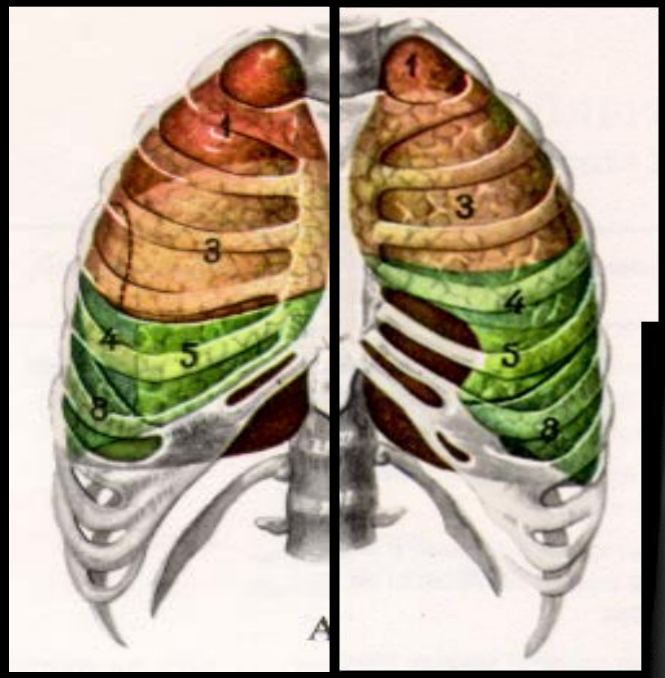
  -hiloapikalna ++

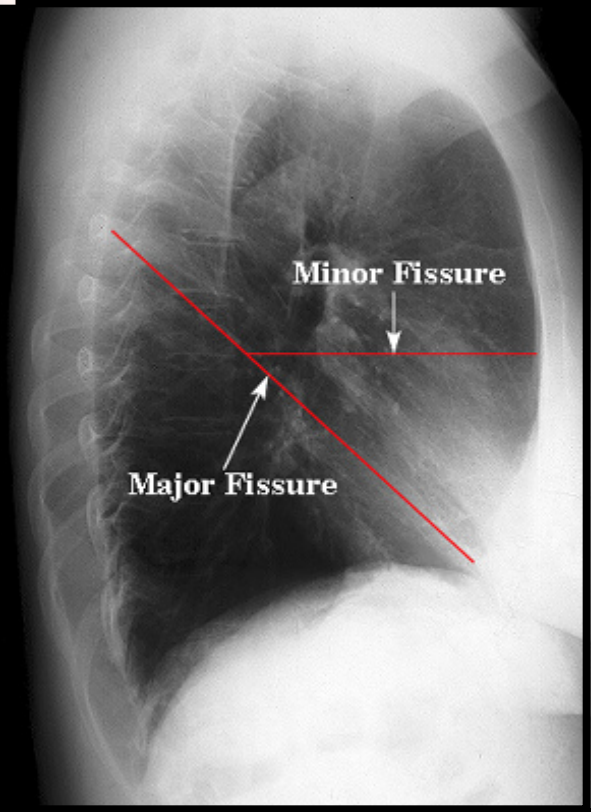
Opis promena u plućima

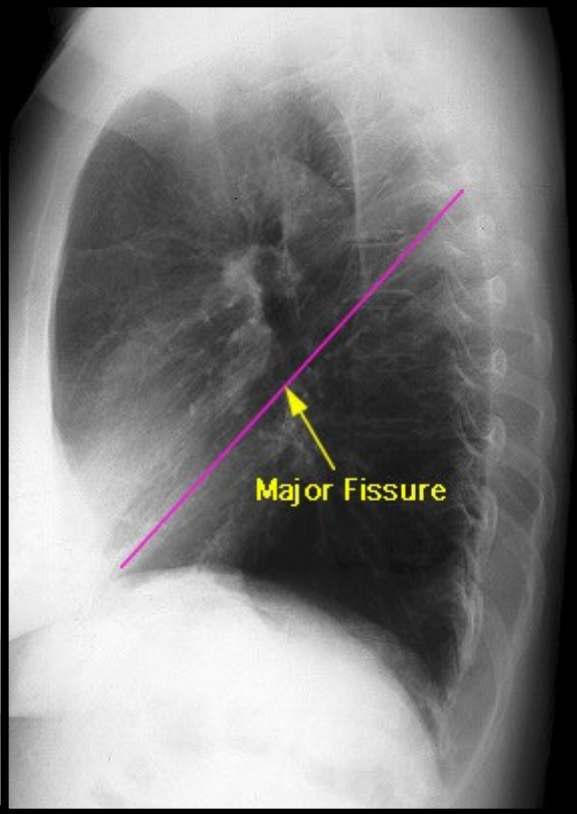


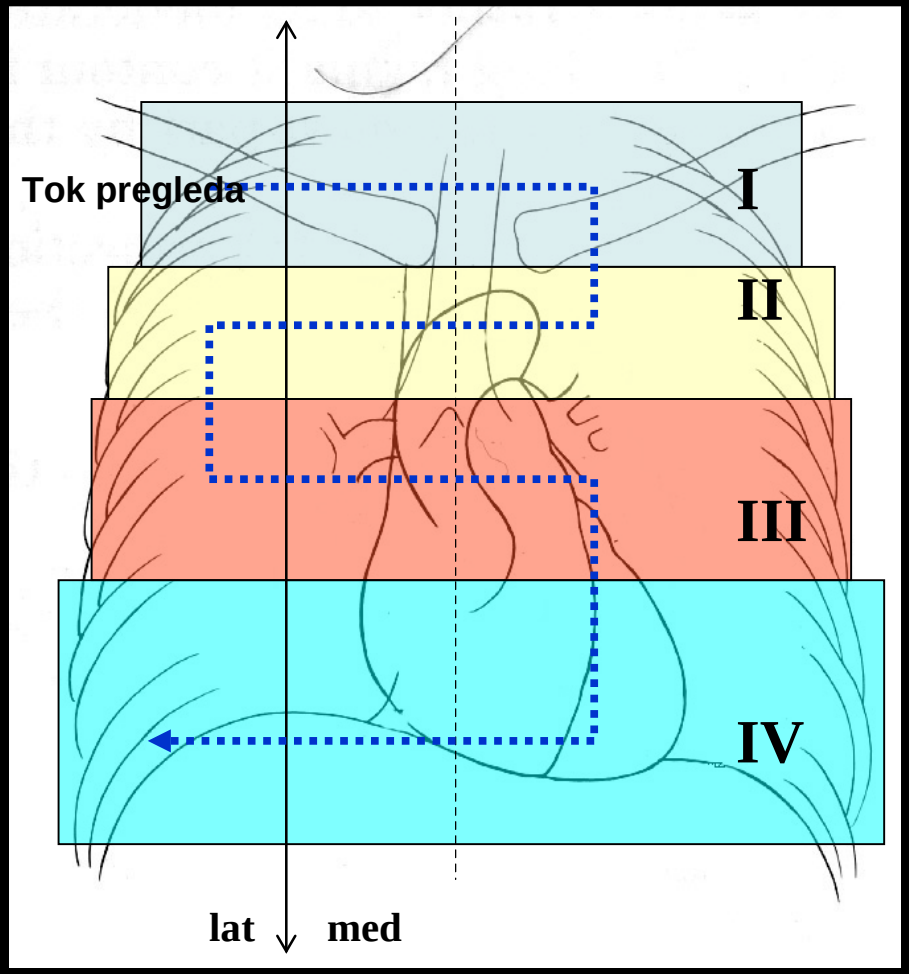
- L okalizacija
- O blik
- V eličina
- I ntenzitet
- H omogenost
- O graničenost

Lokalizacija









I. Vrh pluća

tuberc.costae II - donji rub clavcl.

II. Gornje plućno polje

d.rub clv - d.rub prednjeg okrajka 2 rb.

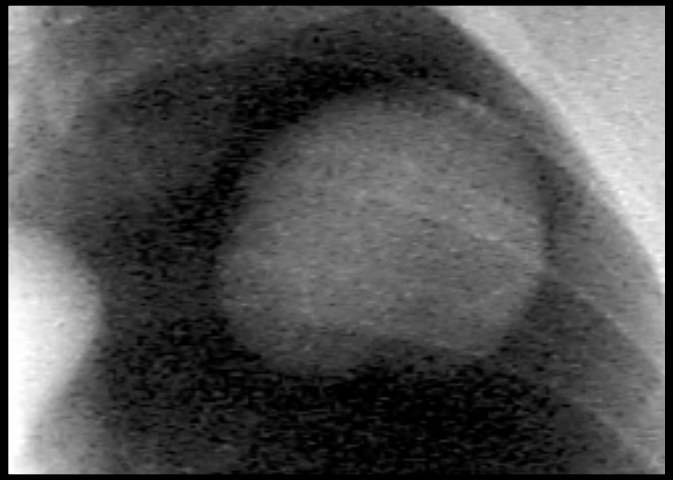
III. Srednje plućno polje

d.rub prednjeg okrajka 2 rebra -
d.rub prednjeg okrajka 4 rebra

IV. Donje plućno polje

d.ruba prednjeg okrajka 4 rebra -
do dijafragme

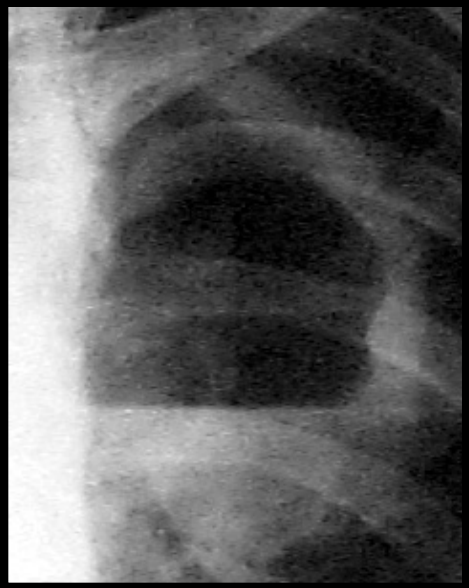
Oblik



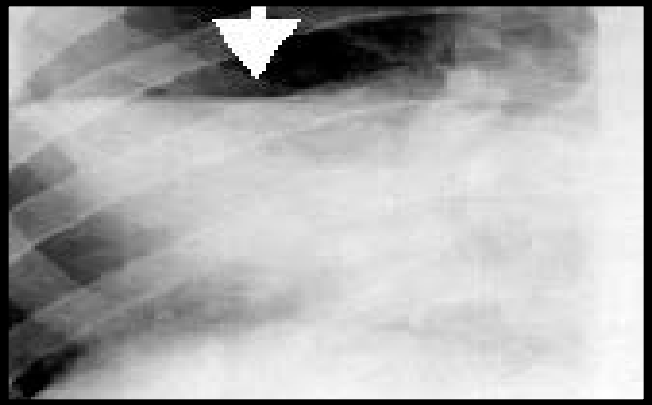
Kružne, Ovalne



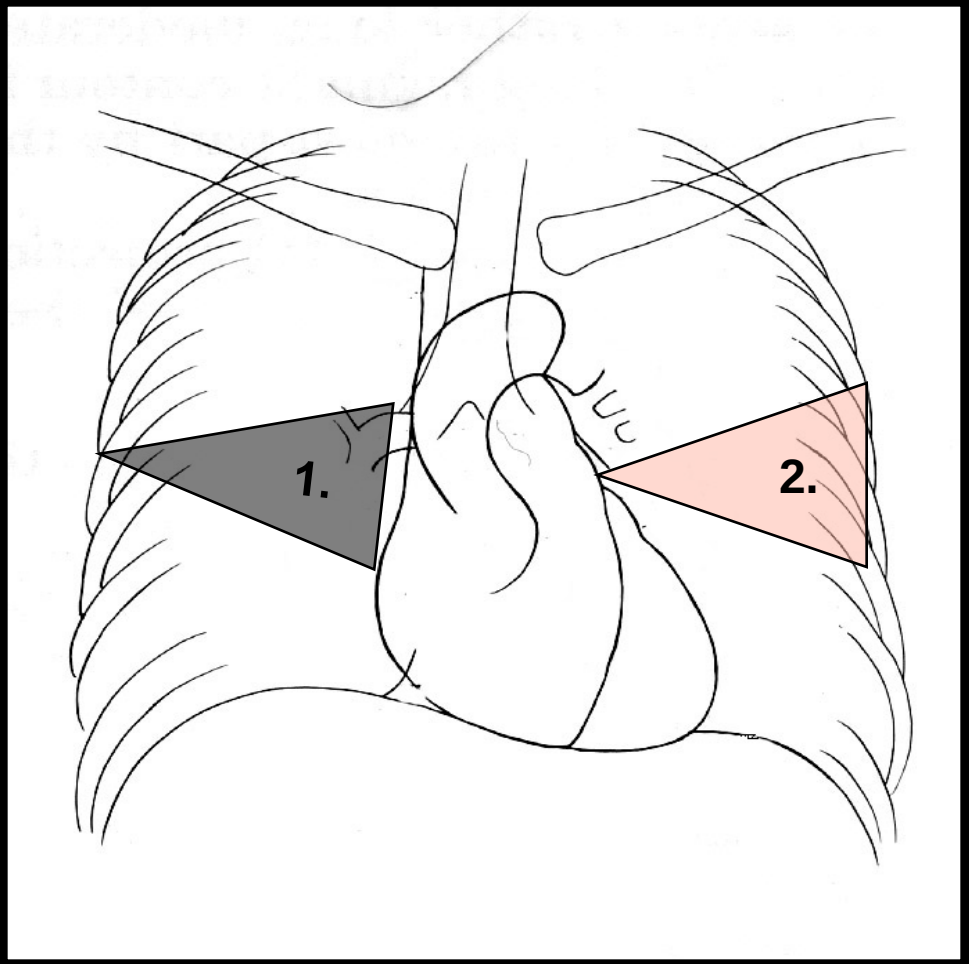
Trakaste



Prstenaste



Trouglaste



1. pleuralni trougao
(medijastino-interlobarni izliv)

2. parenhimski (plućni) trougao
(pneumonija, atelektaza, infarkt pluća)

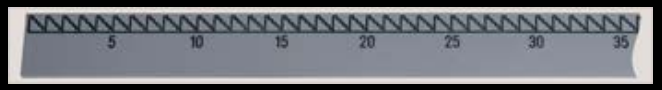
Veličina

do 3mm -*mikronodusne ili milijarne*

3-5 mm -*makronodusne*

5 mm - 3 cm -*kružne (coin)*

>3 cm -*tumorske*



mm - cm

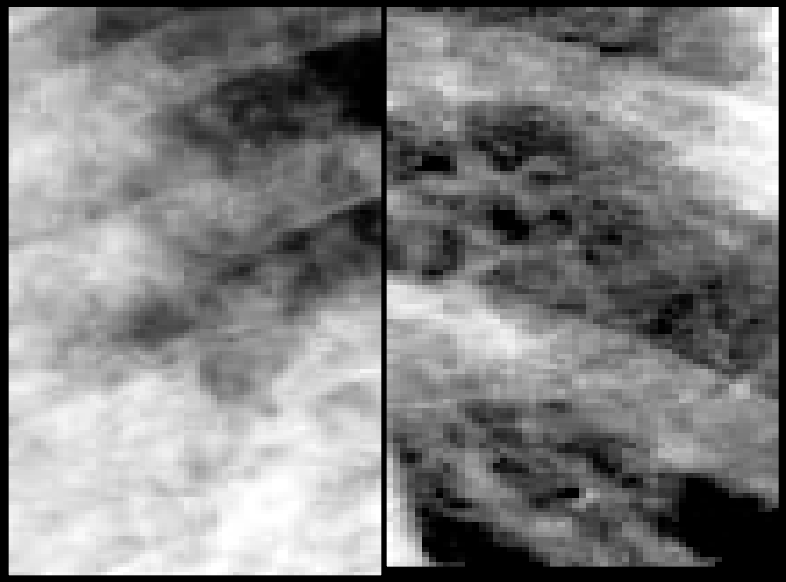


Intenzitet

- Svetlina vazduha i vazdušnih organa,
- Polusenka intenziteta masnog tkiva
- Senka intenziteta mekog tkiva
- Senka intenziteta kalcijuma
- Senka intenziteta metala

MRLJE poredi se sa mekim tkivima

PEGE poredi se sa kostima (kalcijumske gustine)



Alveolarni uzorak

Intersticijalni uzorak

Homogenost

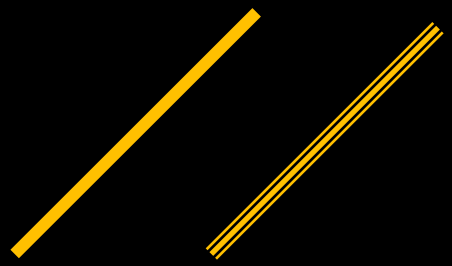
Homogeno – Nehomogeno



Ograničenost

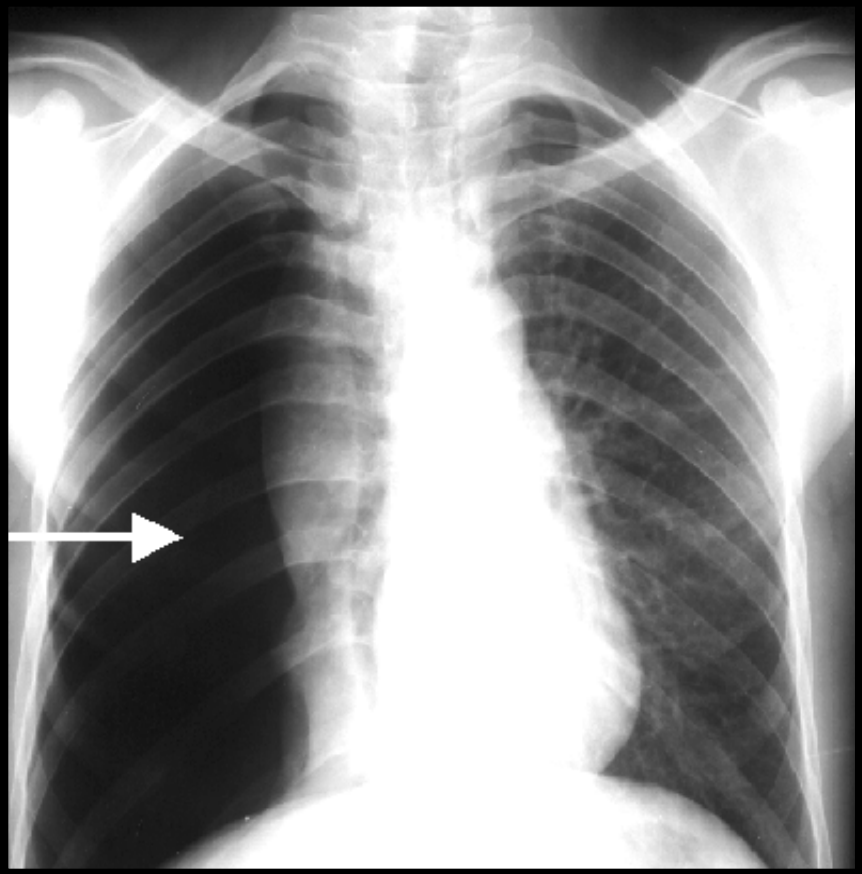
Oštro – Neoštro

Umbilikacija (sumnja na malignitet)



Pneumotoraks

prisustvo gasa u pleuralnom prostoru



Rtg:

avaskularna svetlina,
hemitorax proširen,
međurebarni prostori prošireni,
hemidijafragma spuštena,
medijastinum na zdravu stranu

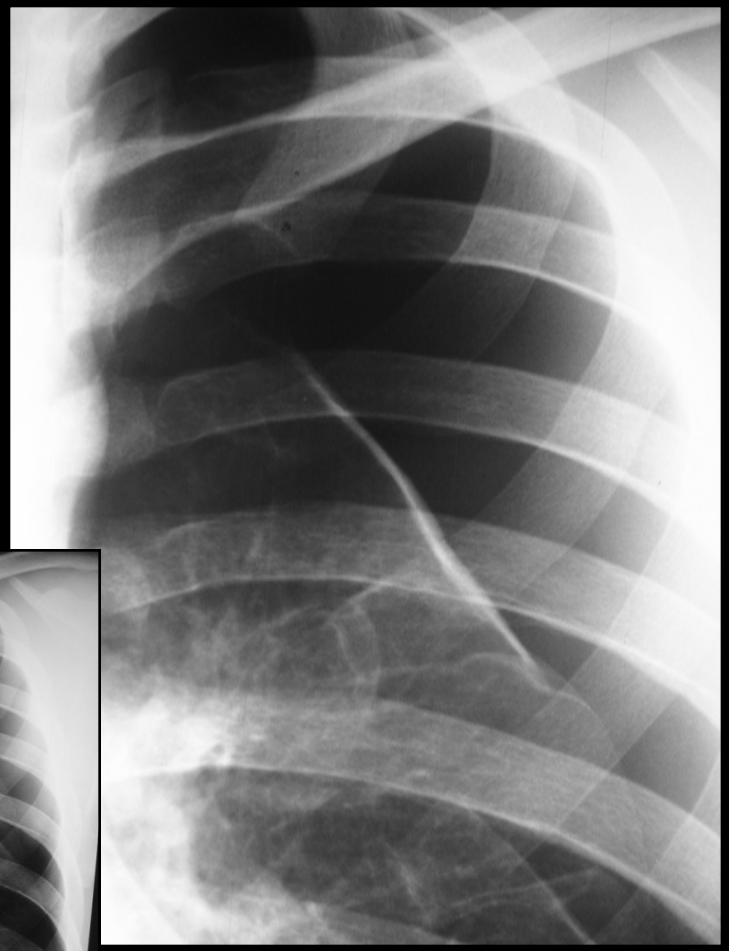
- Običan

ne komunicira sa atmosferom niti medijastinumom

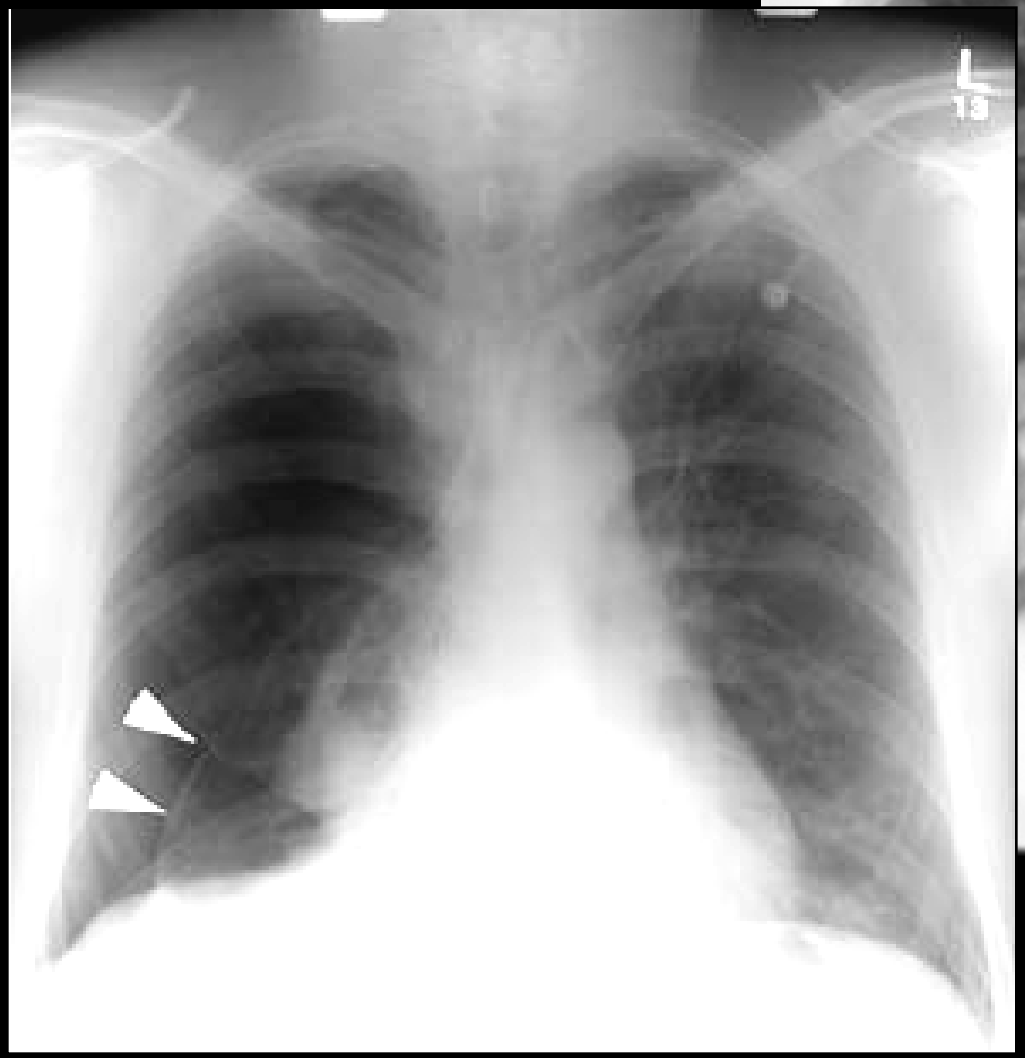
ne pomera medijastinum na suprotnu stranu

emfizemske bule

mehurasti apsces





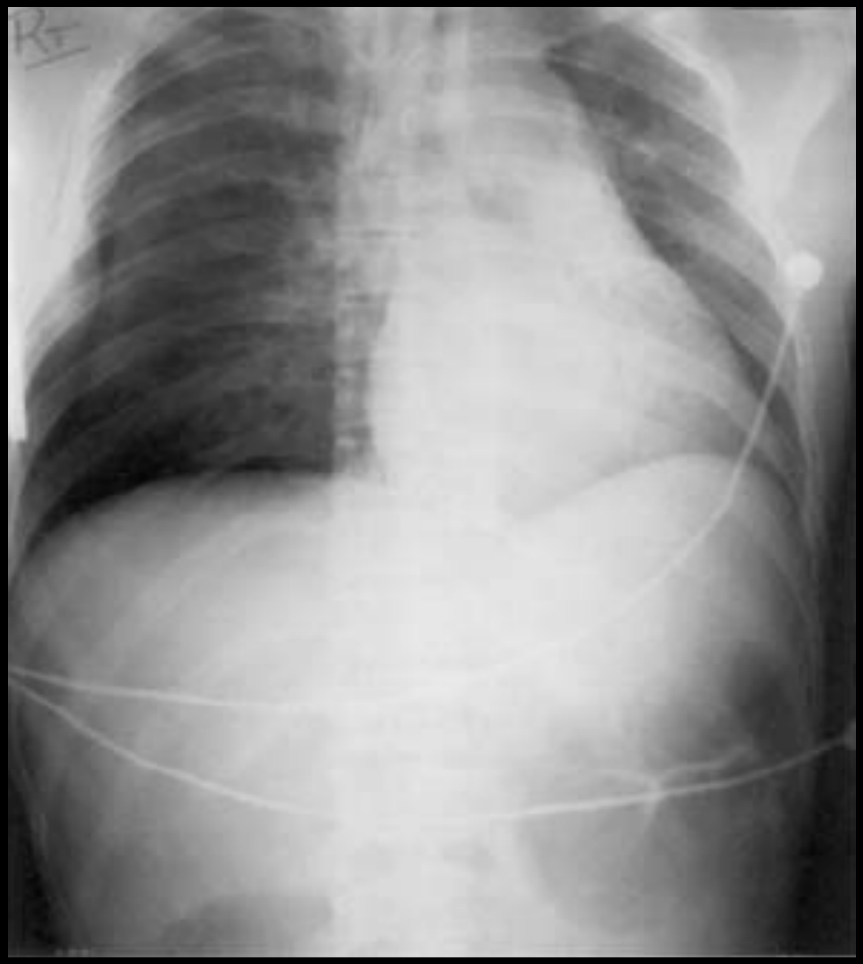


- Komunikativni

traumatski

otvoren komunicira sa atmosferom ili medijastinumom

pomera medijastinum na suprotnu stranu



- Tenzioni

  jatrogen

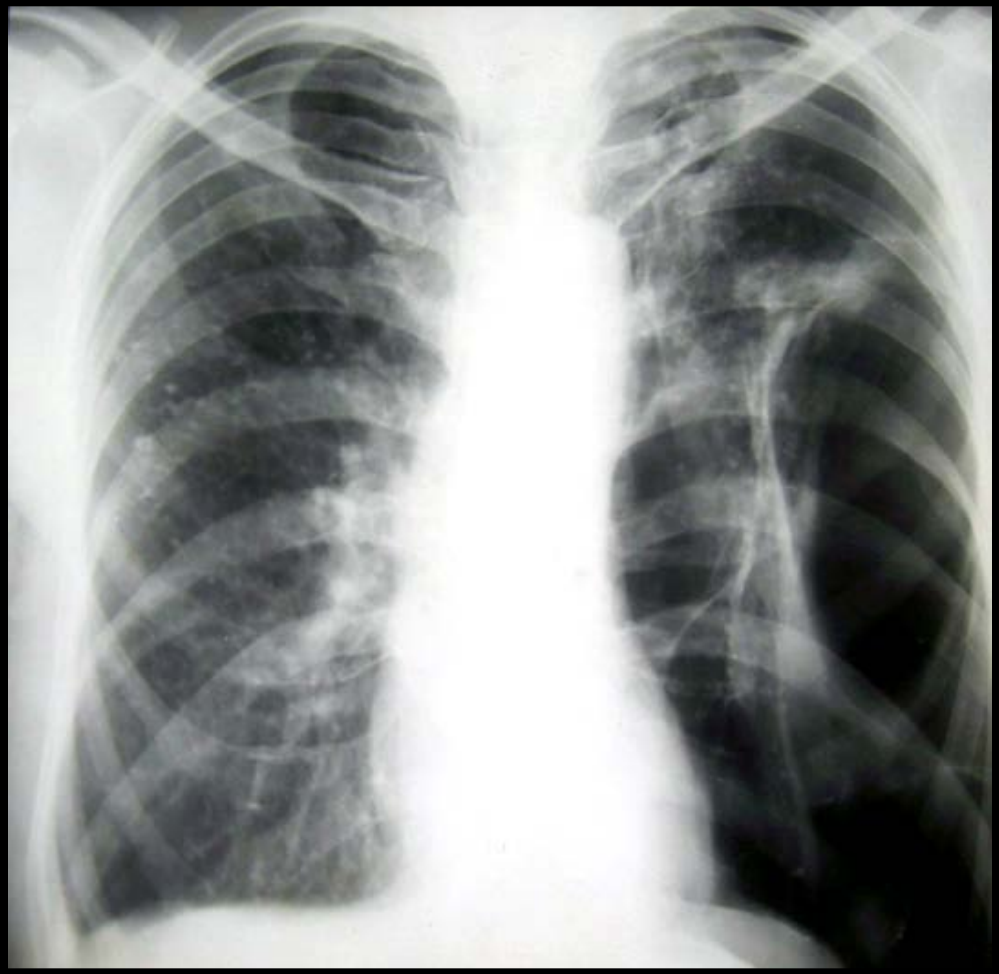
progresivna akulmulacija vazduha sa povećanjem pritiska

pomera medijastinum na suprotnu stranu

<u>To je klinička ne radiološka dijagnoza</u>

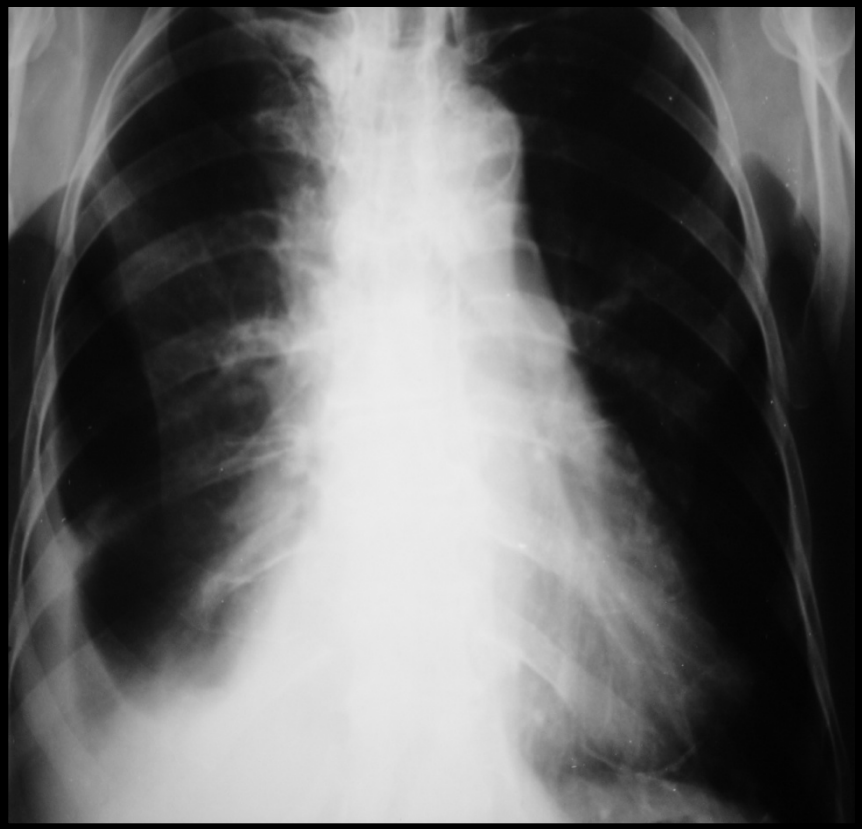


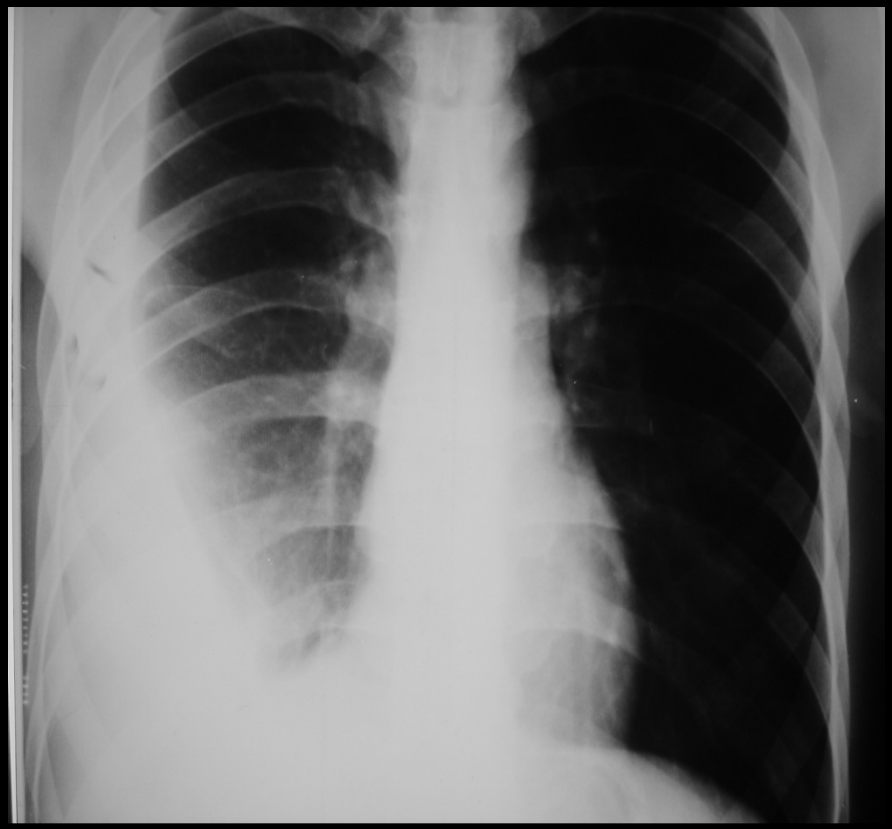
- Parcijalni



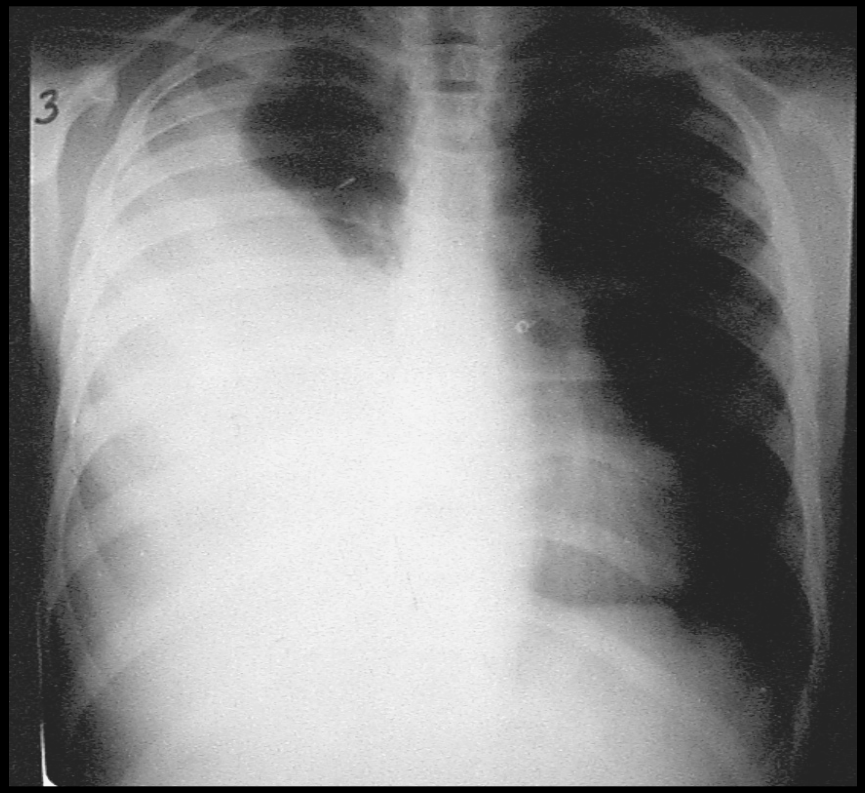
Pleuralni izliv

nakupljane tečnosti u pleuralnom prostoru različite etiologije



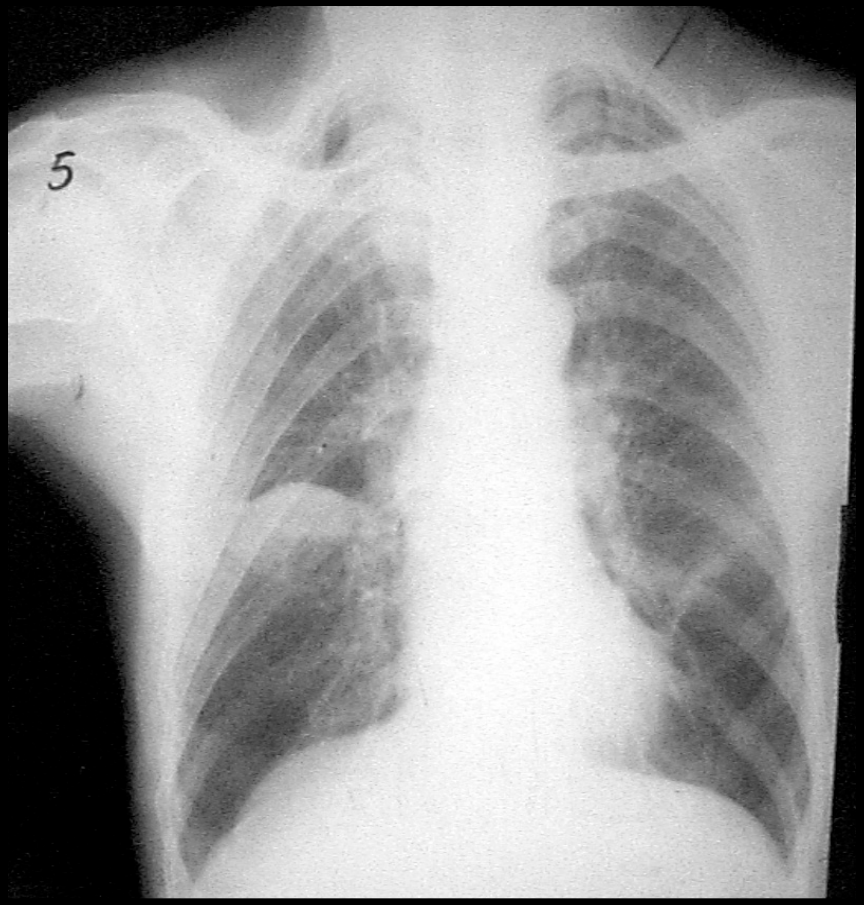


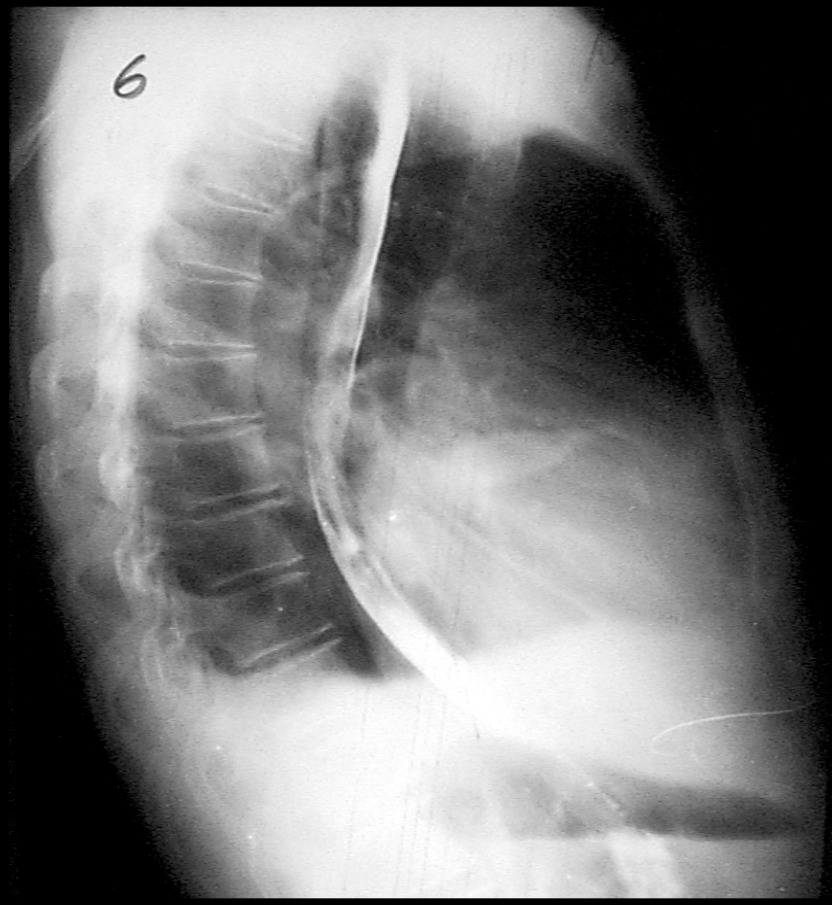
pleuritis - likvidotoraks



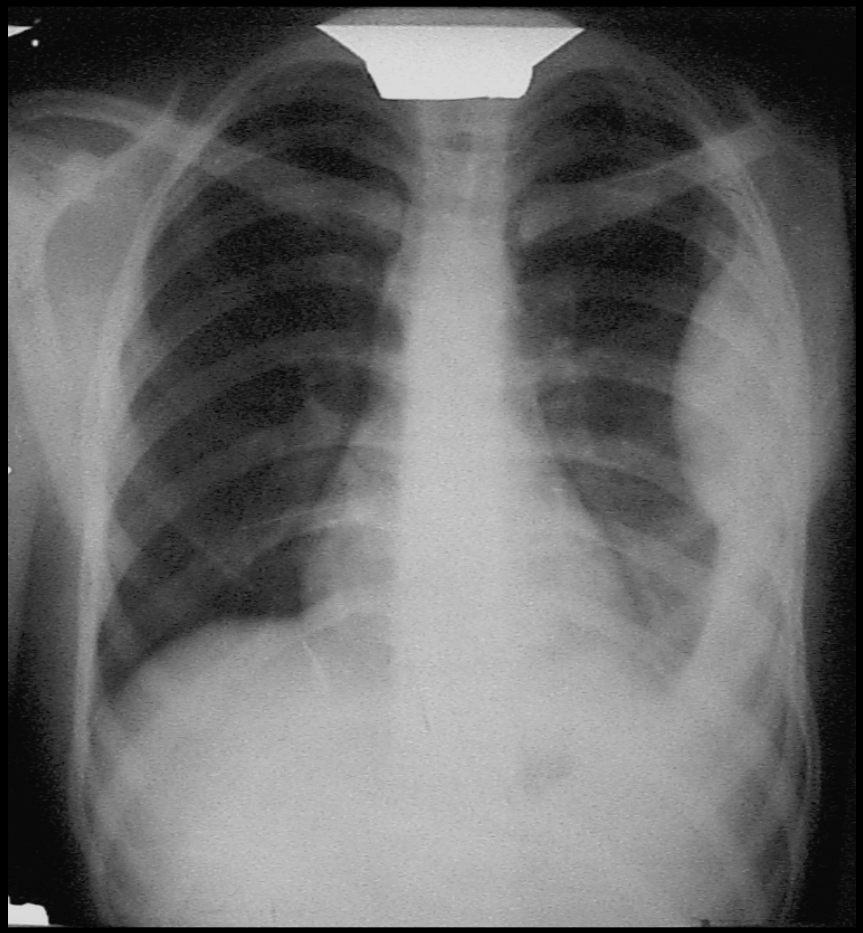


Interlobarni pleuritis

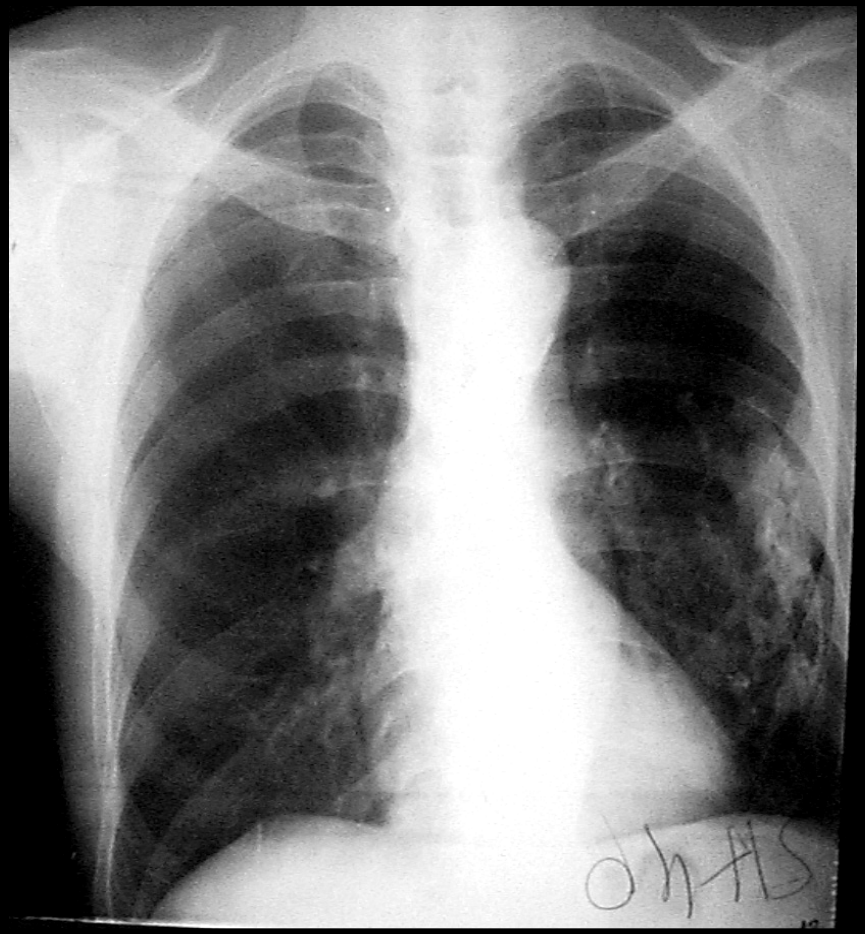




Inkapsulirani pleuritis

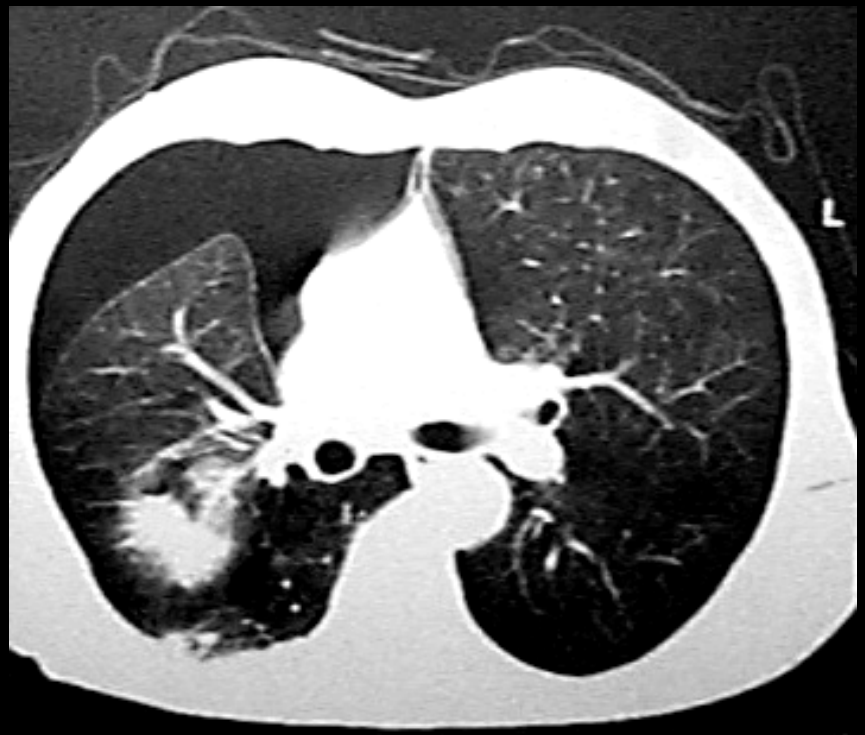


Pleuralne athezije

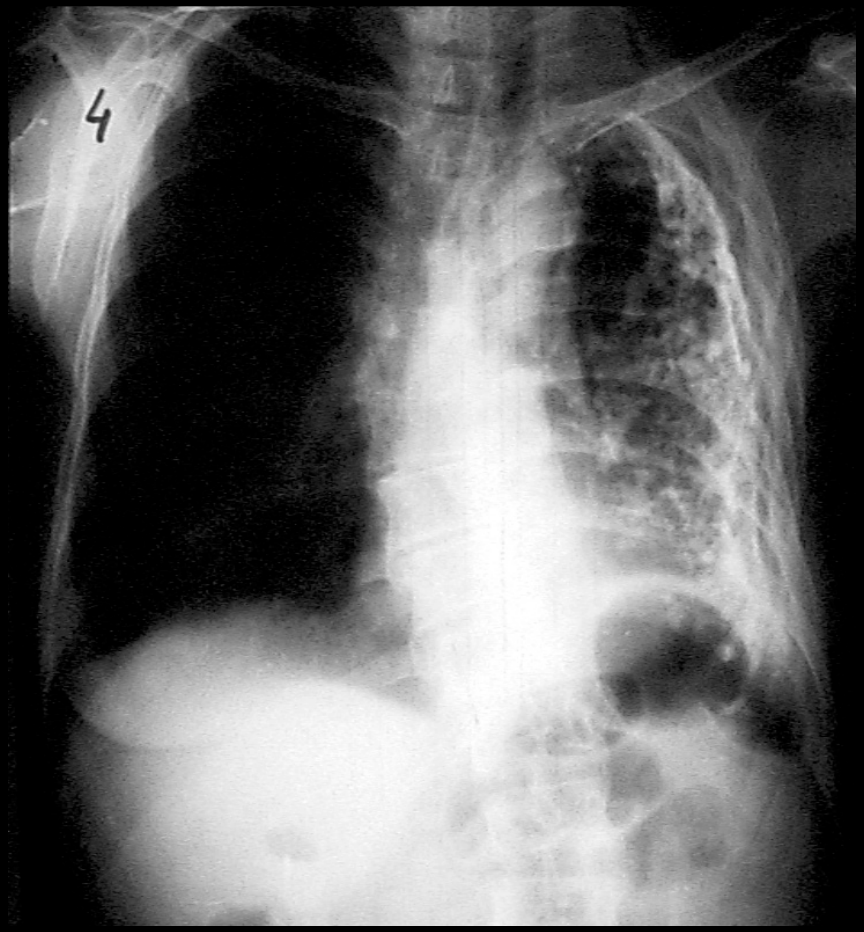


masivni Likvidopneumotoraks



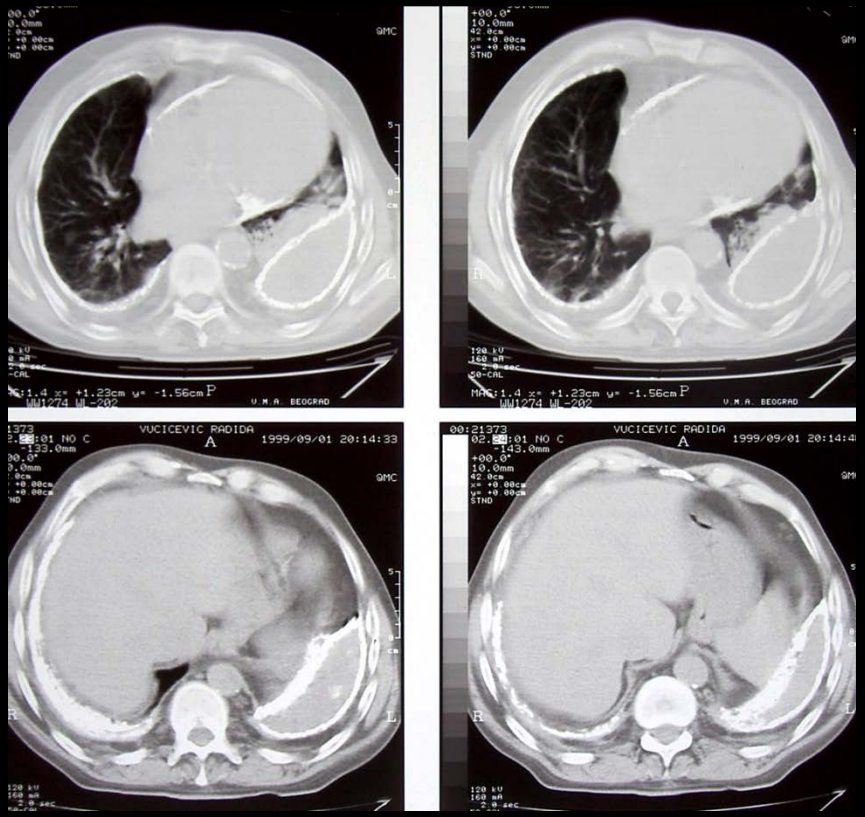


Fibrothorax



kalcifikovana pleura

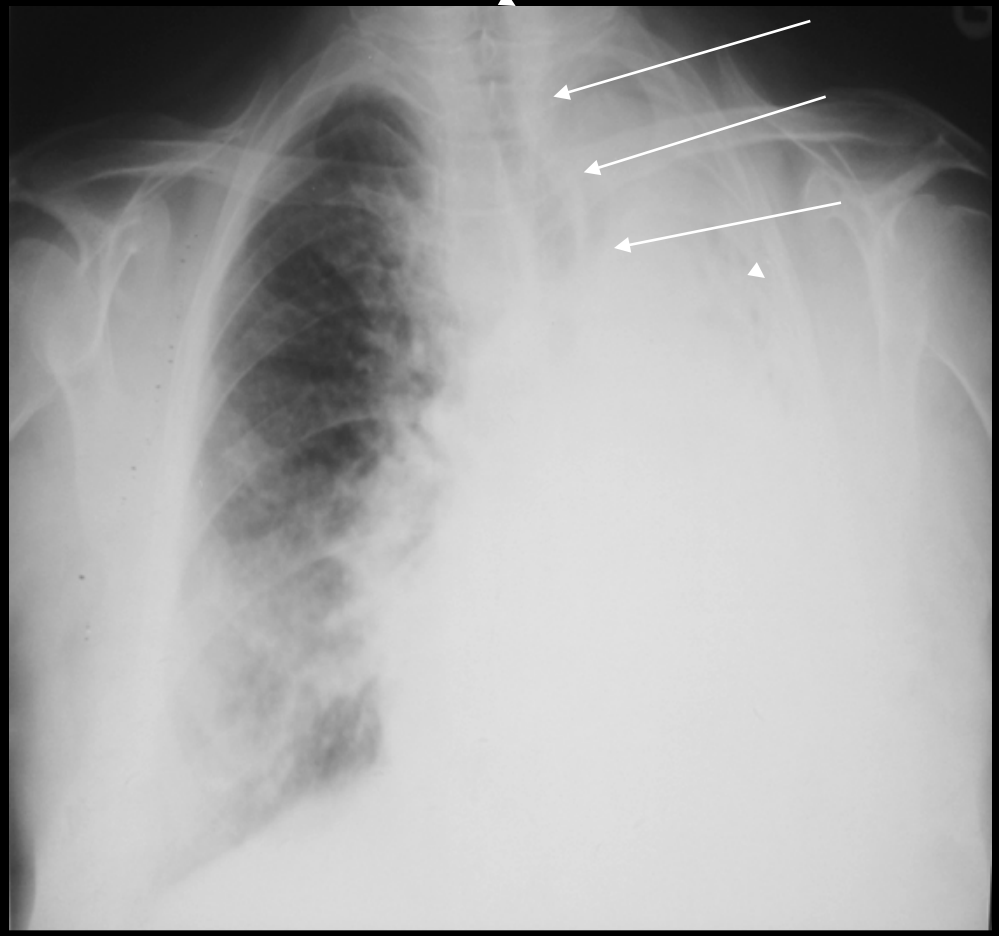
Polyserositis



kalcifikovana pleura i perikard

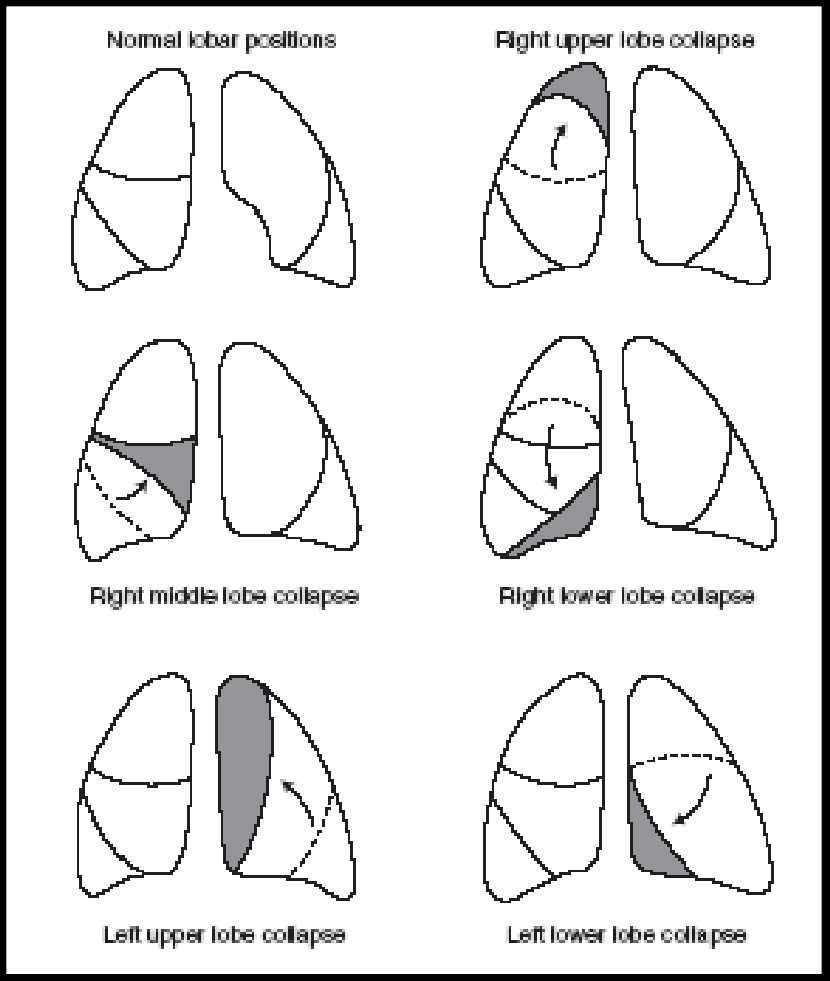
Atelektaza

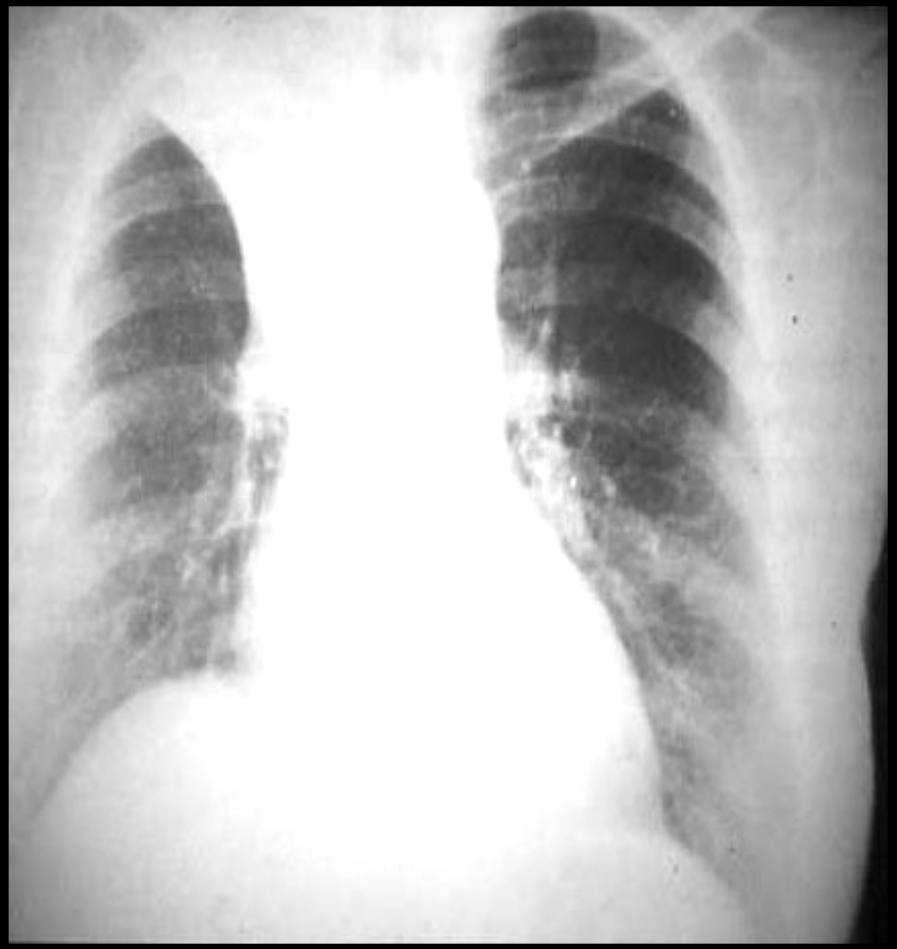
sy karakteriše nestanak vazduha iz određenog dela pluća



Tip:
- opstrukciona (resorptivna)
- adhezivna
- kompresiona
- pločasta (Fleischner-ova)

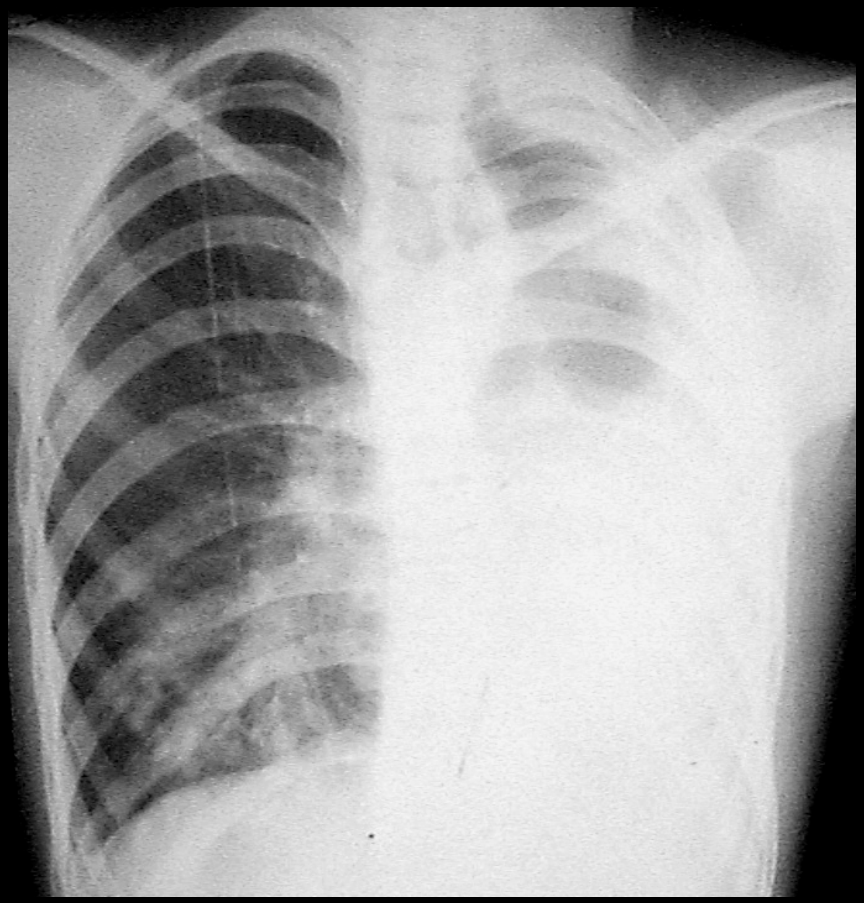
Rtg: "mlečno staklo" poštuje anatomske granice,
privlači incizure, sužen hemitorax,
medijastinum na bolesnu stranu,
elevirama hemidijafragma,
privlačenje hilusa, odsustvo vazdušnog bronhograma,
kompenzatorna hiperinflacija



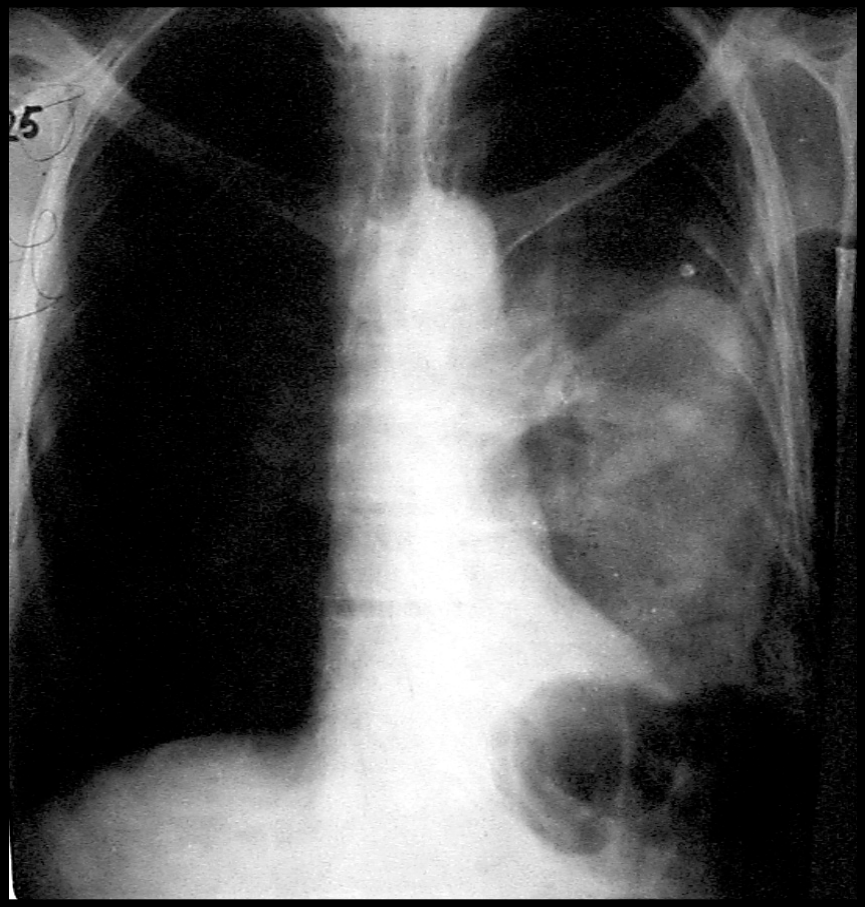


golden S znak - gornjeg režnja

Pneumectomia



Atelektaza





http:// www.med.pr.ac/katedra/interna-medicina.php