Federal State Budgetary Educational Institution of Higher Education «Prof. V.F. Voino-Yasenetsky Krasnoyarsk State Medical University» of the Ministry of Healthcare of the Russian Federation department of Operative Surgery and Topographic Anatomy; head Doctor of Medical Sciences, Associate Professor of Russkikh A.N.

Surgical anatomy of the chest

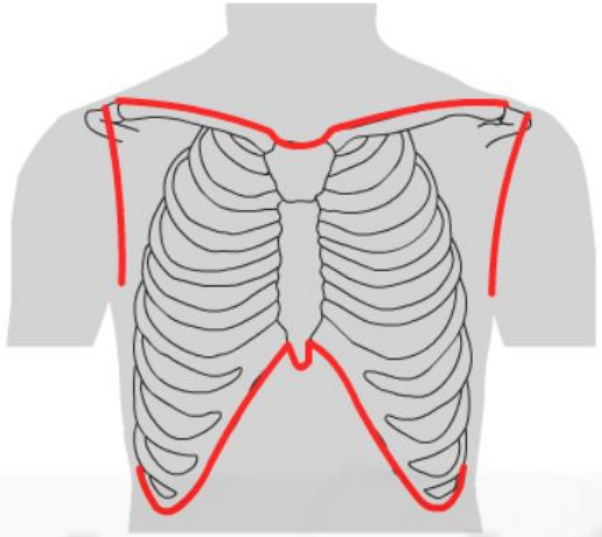
LECTURE PLAN:

1. The boundaries of the chest.
2. Layered structure of the chest wall, topography of the intercostal space.
3. Surgical anatomy of the breast.
4. Incisions on the breast with mastitis. Mastectomy.
5. Surgical anatomy of the pleura, lungs.
6. Operative access to the organs of the thoracic cavity.
7. Puncture, drainage of the pleural cavity.

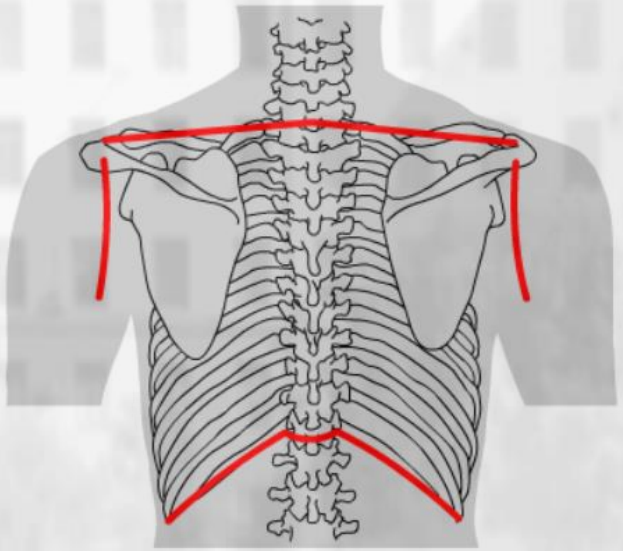
PURPOSE:

To give a topographic and anatomical justification of the basic principles of surgical interventions on the chest wall.

CHEST BOUNDARIES



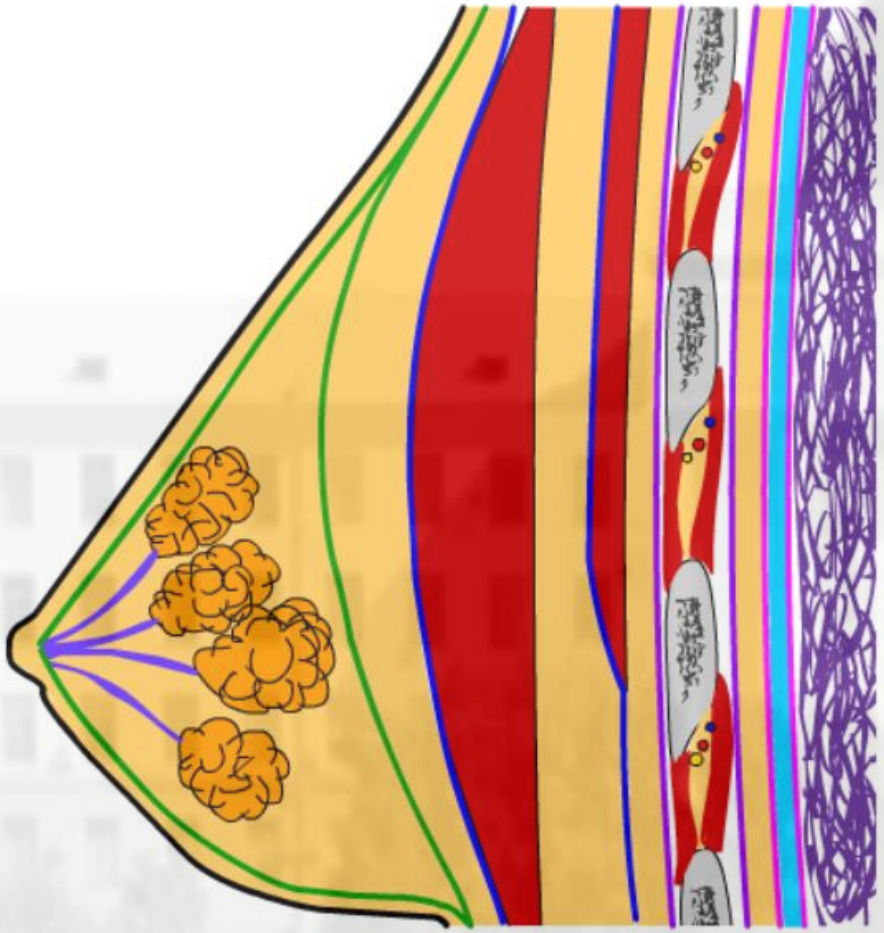
At the top is a line running along the upper edge of the handle of the sternum, the upper edge of the collarbones to their junction with the acromions.
From here, a line is drawn to the spinous process of the VII cervical vertebra.



Below is a line running from the xiphoid process of the sternum along the edge of the costal arch, along the anterior ends of the last two ribs and further along the XII rib to the spinous process of the XII thoracic vertebra.

Laterally - a line corresponding to the deleted-thoracic furrow in front and the medial edge of the deltoid muscle behind.

LAYERED STRUCTURE OF THE CHEST WALL



1. Skin
2. Subcutaneous fat
3. Superficial fascia (surface leaf)
4. Mammary gland
5. Superficial fascia (deep leaf)
6. retro-mammary cellular space
7. Own fascia (surface leaf)
8. Large pectoral muscles
9. Surface sub-sectoral cellular space
10. Own fascia (deep leaf)
11. Small pectoral muscle
12. Deep subsectoral cellular space
13. Own breast fascia
14. Ribs, intercostal muscles, intercostal SNP
15. intra-thoracic fascia
16. Prepleural fiber
17. Parietal pleura
18. Pleural cavity
19. Visceral pleura
20. Lung

TOPOGRAPHY OF THE INTERCOSTAL SPACE

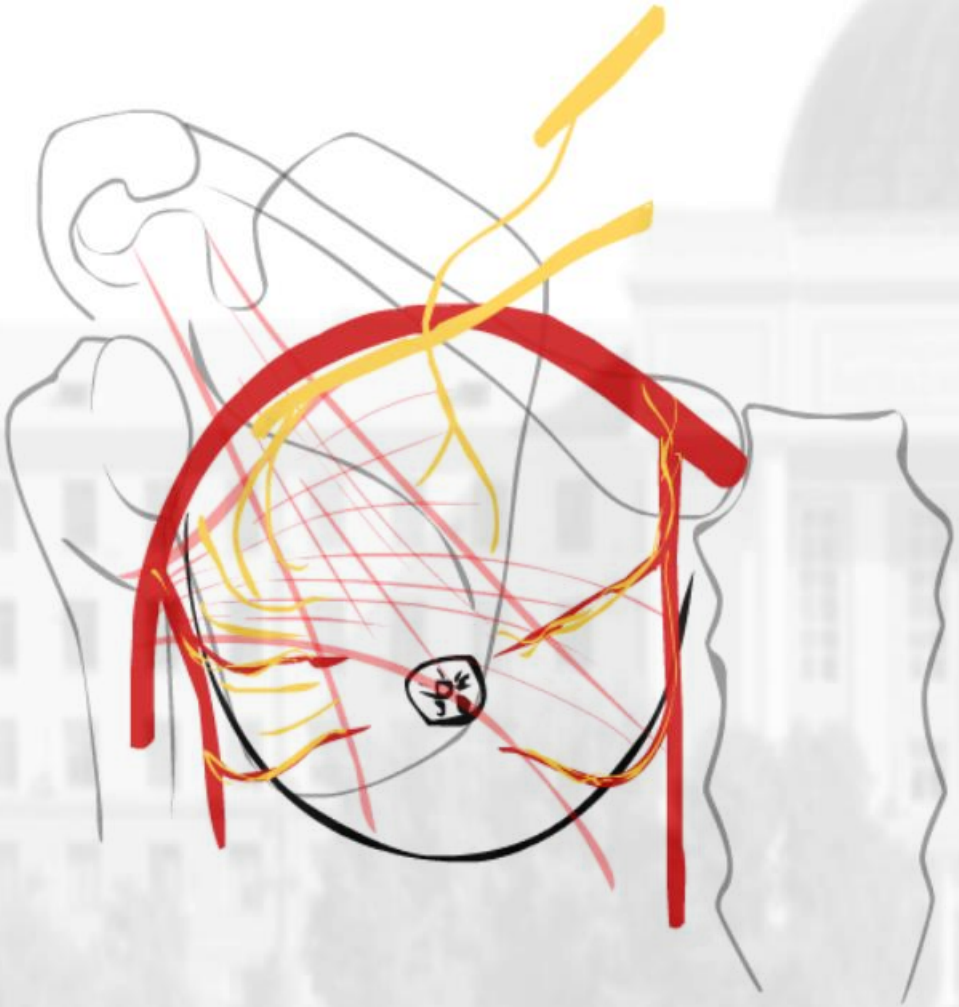
Intercostal gap is limited:

FROM ABOVE - the costal furrow;
OUTSIDE - the external intercostal muscle;
INSIDE - the internal intercostal muscle;

In the intercostal fissure, neurovascular bundles pass from top to bottom:

intercostal vein
intercostal artery
intercostal nerve

MAMMARY GLAND



BLOOD SUPPLY

It is carried out mainly by branches of two arteries:

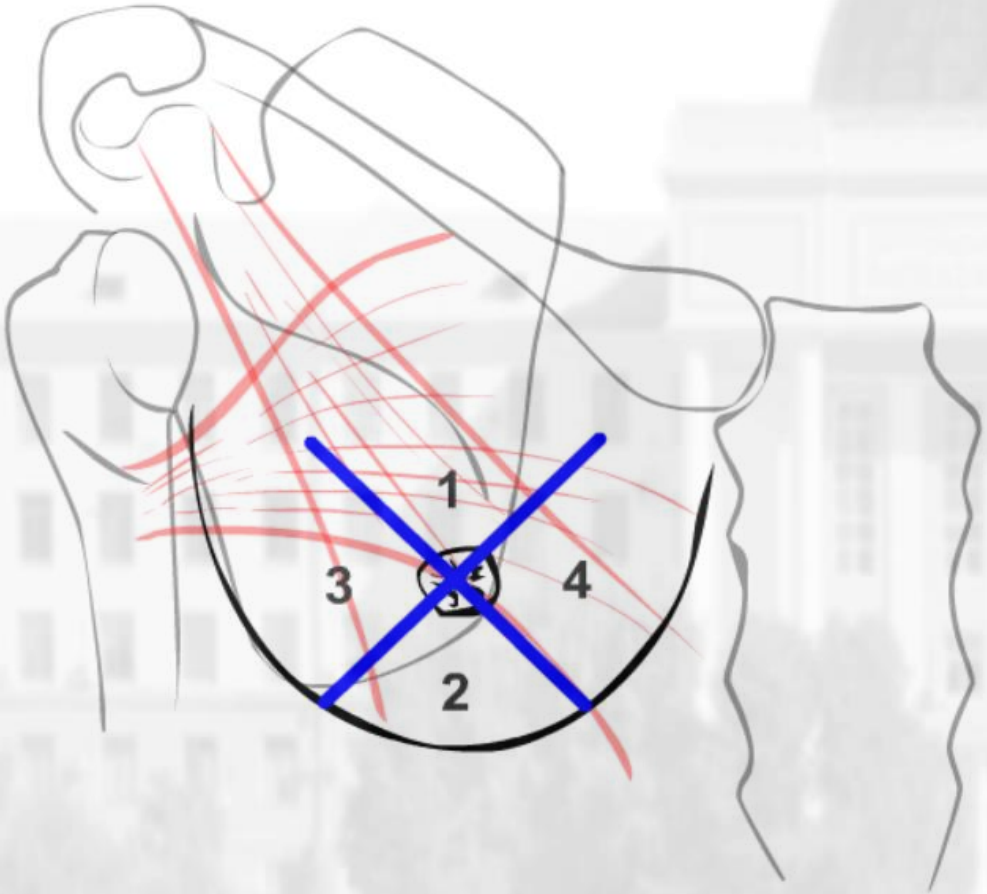
1. A. Thoracica interns.
2. A. Thoracica laterals.

Venous outflow through the
Vessels of the same name.

INNERVATION

1. Frame II-V nn. Intercostals.
2. Branches nn. pectorales medialis et lateralis
From the brachial plexus
3. Nn. Supraclaviculares from the cervix
Plexus.
4. Along with the vessels, sympathetic nerves also
penetrate into the gland.

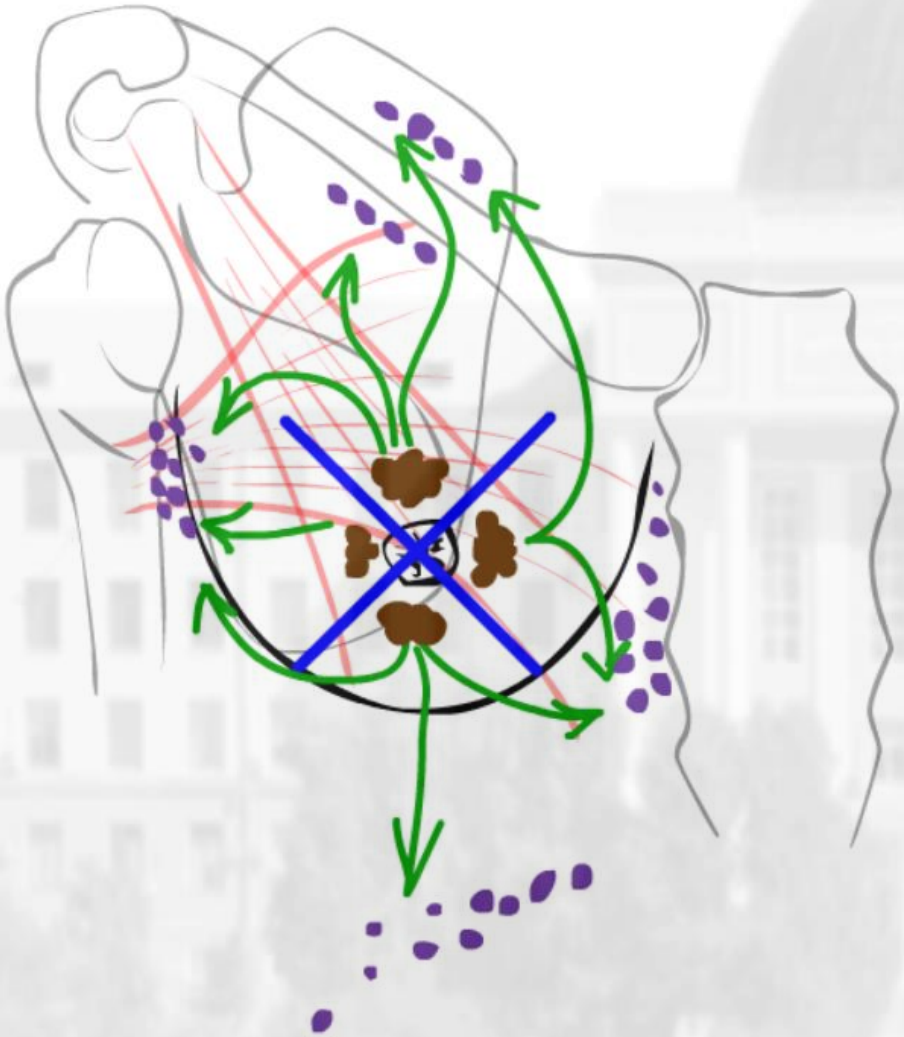
MAMMARY GLAND



Due to the peculiarities of lymph outflow, the mammary gland is conditionally divided into four quadrants:

1. Upper
2. Lower
3. Lateral
4. Medial

MAMMARY GLAND



Depending on the location of breast cancer, the following groups of lymph nodes are primarily affected:

1. Upper quadrant:

-Axillary;

-Subclavian;

-Supraclavicular;

2. Lower quadrant:

-Axillary;

-Parasternal;

-Lymph nodes of the abdominal cavity;

3. Lateral quadrants:

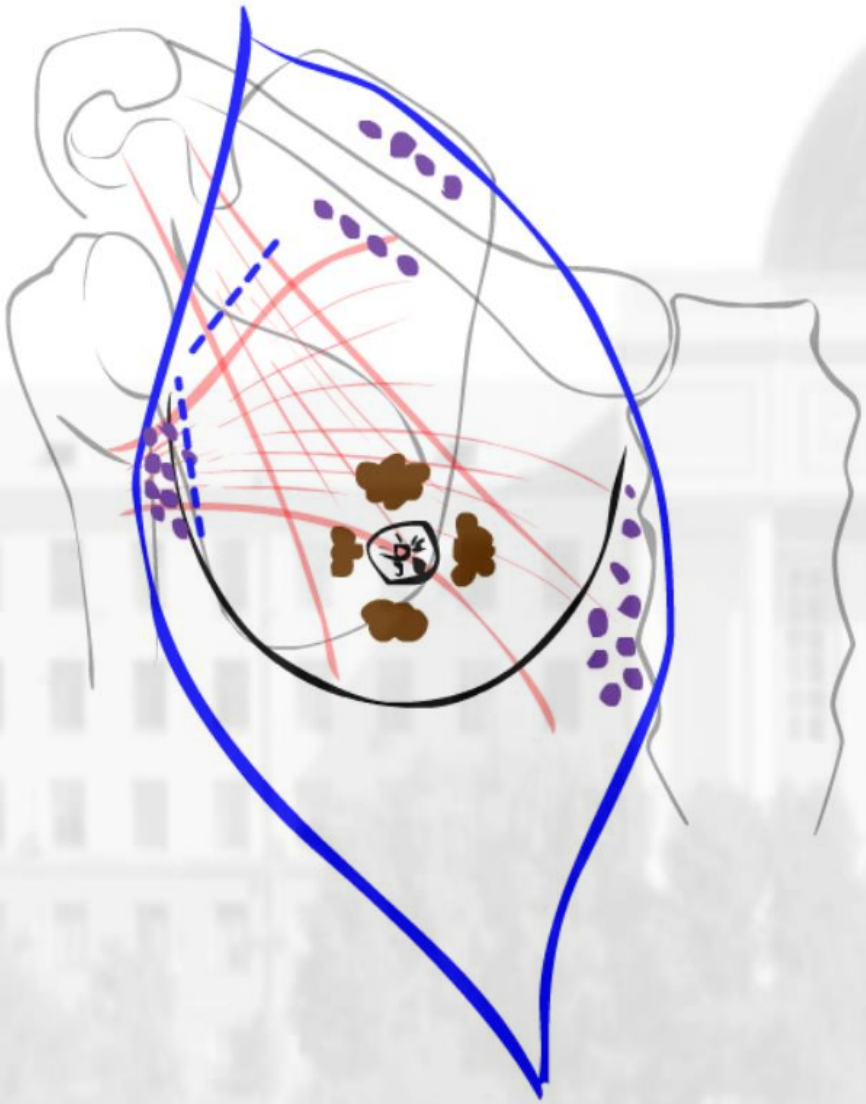
-Axillary;

4. Medial quadrant:

-Parasternal;

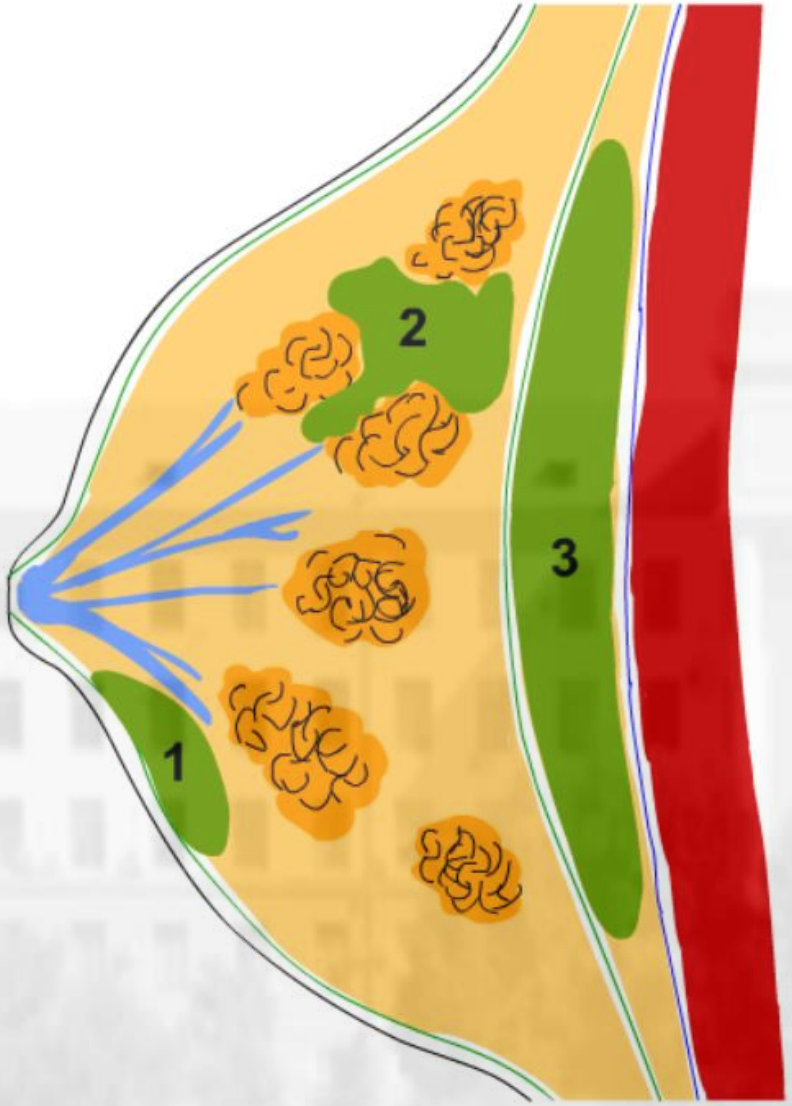
-Supraclavicular

MAMMARY GLAND



Radical mastectomy is the removal of the breast after cancer.
The purpose of this operation is to remove the breast in a single block together with the pectoral muscles, lymph nodes, and fatty tissue of the axillary, subclavian, and subclavian areas.

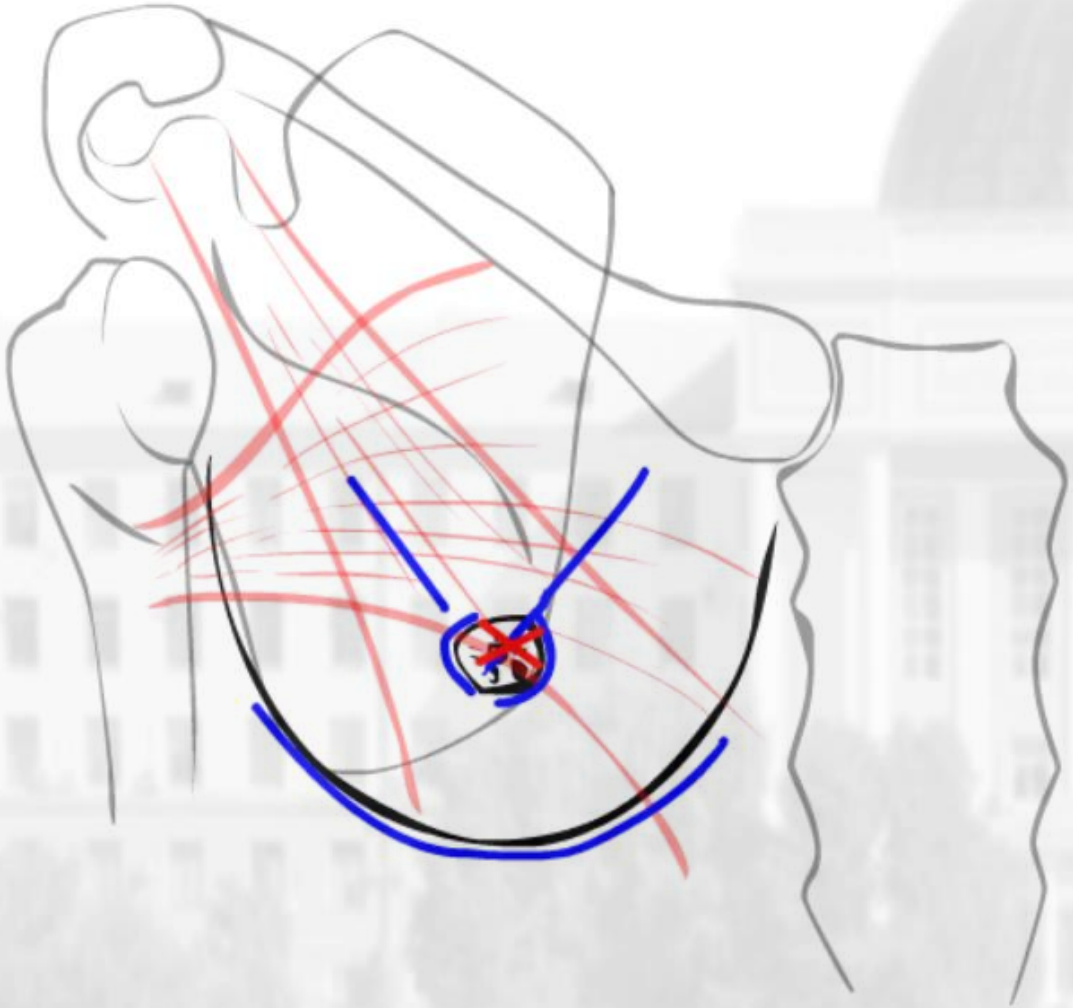
MAMMARY GLAND



TYPES OF PURULENT PROCESSES OF THE BREAST

1. INTRAMAMMARY MASTITIS
2. INTRAMAMMARY MASTITIS
3. RETROMAMMARY PHLEGMON

MAMMARY GLAND



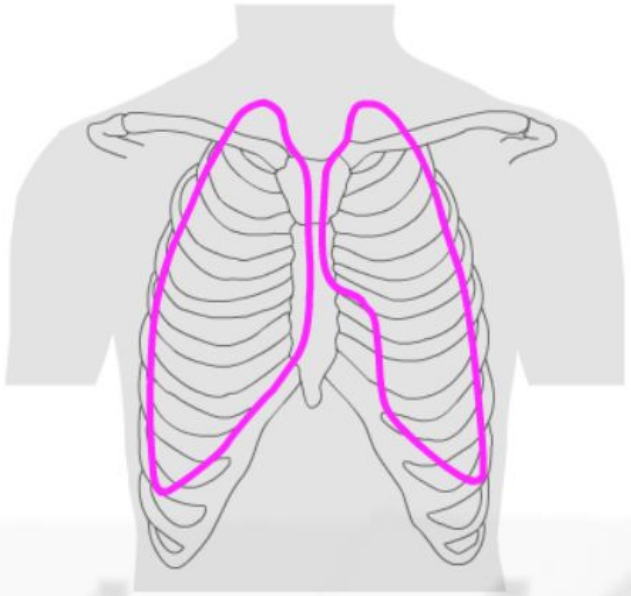
INCISIONS OF THE MAMMARY GLAND IN MASTITIS.

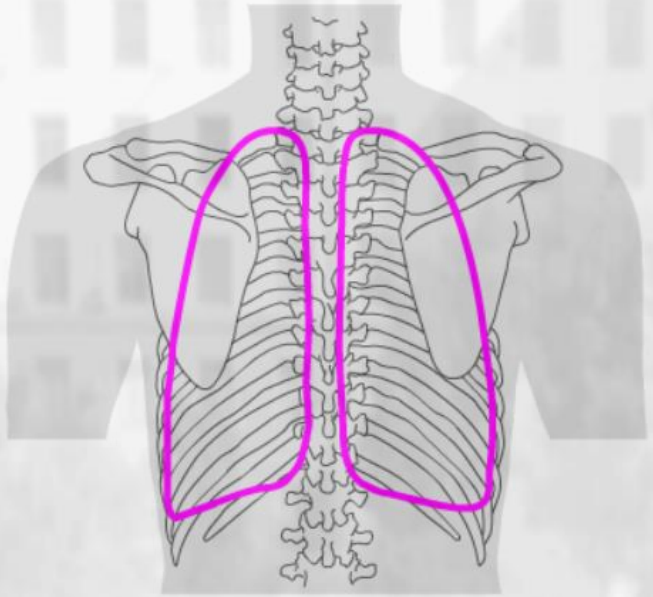
With retromammary mastitis:
- Paraareolar incision.

2. With intramammary mastitis:
-Radial incision from the edge of the areola.

When cutting the breast, the areola of the nipple should not be dissected. Damage to the areola leads to:
a) Deformation of the nipple, difficulty breastfeeding the baby;
b) Violation of the milk ducts, difficulty in outflow of secretions, lactostasis, infection, repeated mastitis.

3. With retromammary phlegmon:
-Semicircular incision along the transitional fold of the breast.





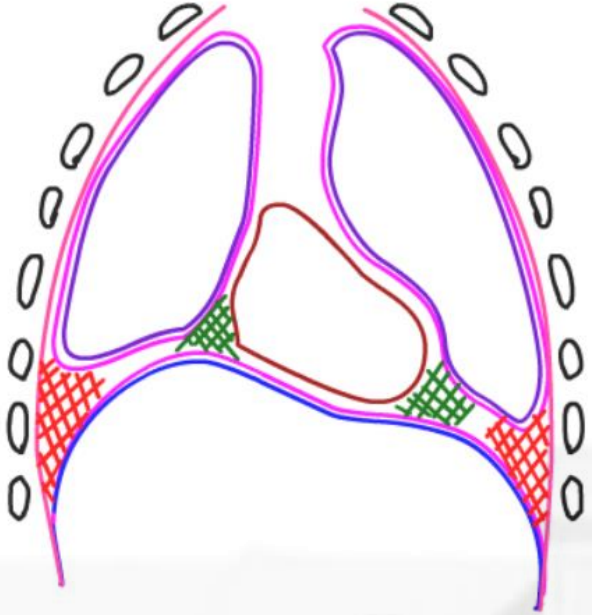
PLEURAL CAVITIES

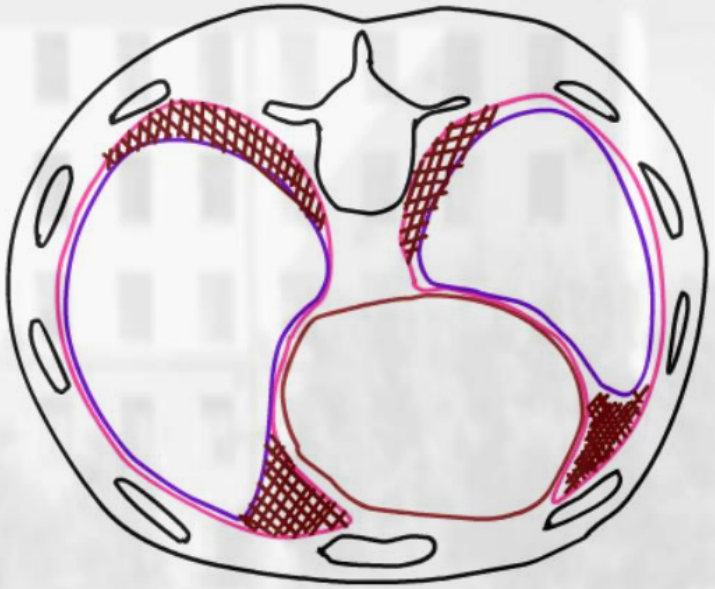
THE BOUNDARIES OF THE RIGHT PLEURA.

Anterior - goes from top to bottom behind the sternum, reaching the median line and even going beyond it to the left. At level VI, the intercostal space passes into the lower boundary.
The lower one turns downwards and outwards from the cartilage of the VI ribs and crosses the VII ribs along the mid-clavicular line, the X rib along the middle axillary, the XI rib along the scapular, and the XII ribs along the paravertebral line.
Posterior - enters the anterior surface of the spine, sometimes reaching the median line.

BORDERS OF THE LEFT PLEURA.

Anterior - descending from top to bottom behind the sternum, reaches the cartilage of the IV ribs, deviates to the left. At level VI, the intercostal space passes into the lower boundary.
The lower one is symmetrical to the lower border of the right pleura. Back - corresponds to the joints between the ribs and Vertebrae.





PLEURAL SINUSES

1. Costal-diaphragmatic. It is formed between the costal and diaphragmatic parts of the pleura. The deepest sinus. It is used to puncture of the pleural cavity.

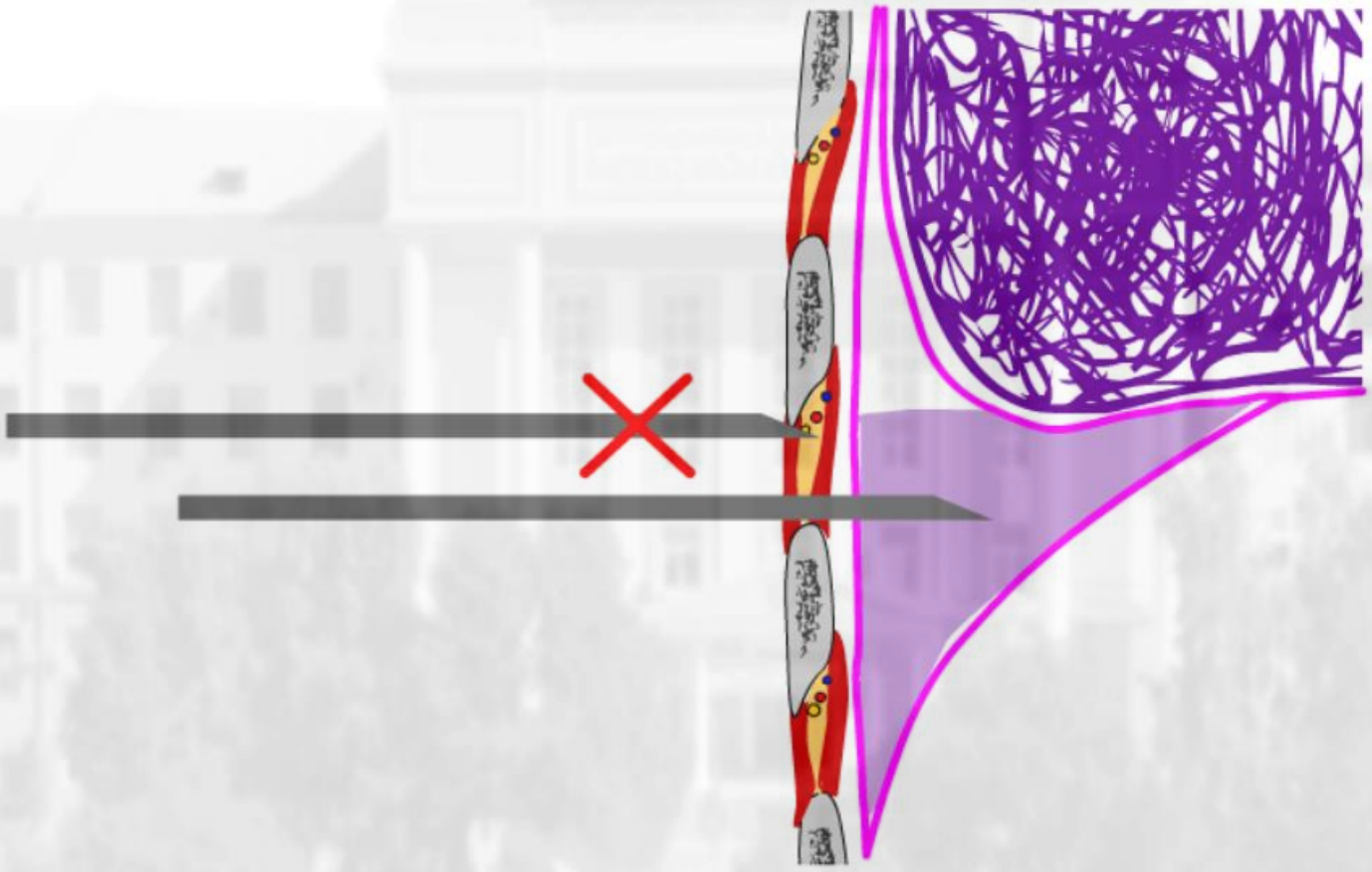
2. Diaphragmatic-mediastinal. It is formed during the transition of the mediastinal part of the pleura to the diaphragmatic.

3. Rib-mediastinal. It is located between the costal part of the pleura and the mediastinal.

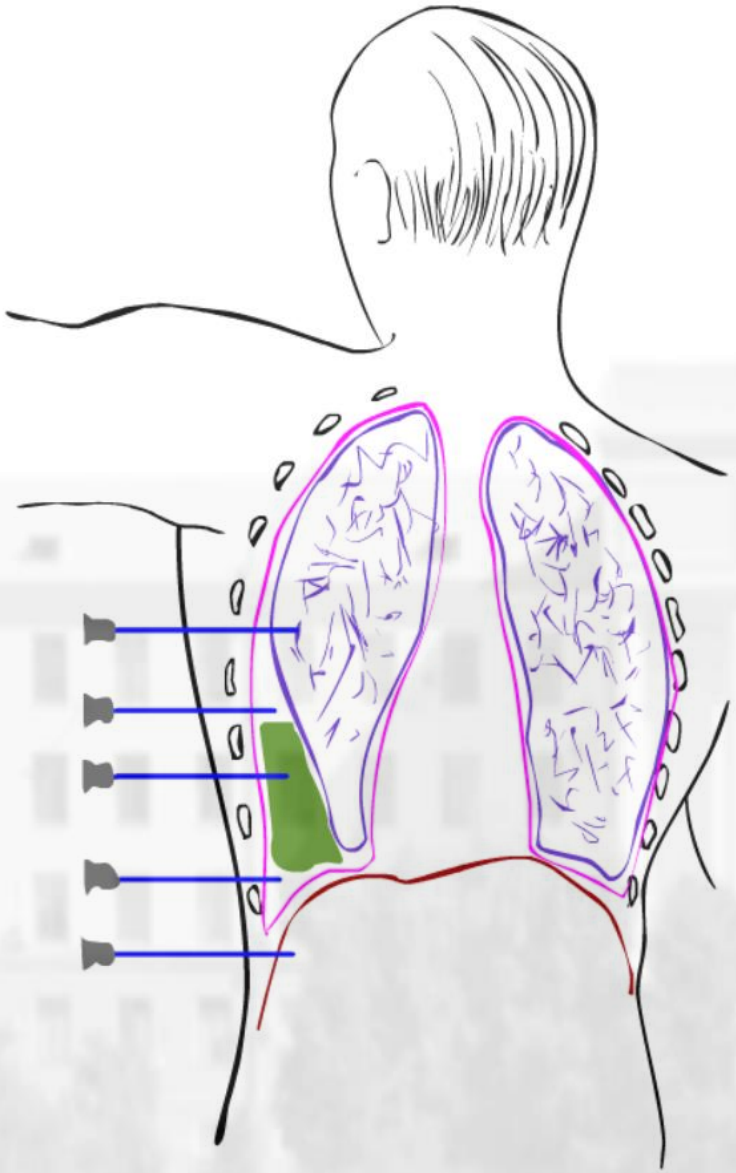
PUNCTURE OF THE PLEURAL CAVITY

It is performed to clarify the diagnosis, as well as to remove liquid contents from the pleural cavity.

Indications. Exudative and purulent pleurisy, hemothorax.The puncture of the pleura is performed in the center of percussion bluntness, more often in the VII-VIII intercostal space along the posterior axillary or scapular line. The needle is injected directly over the upper edge of the rib, because there is a risk of damage to the intercostal nerve.



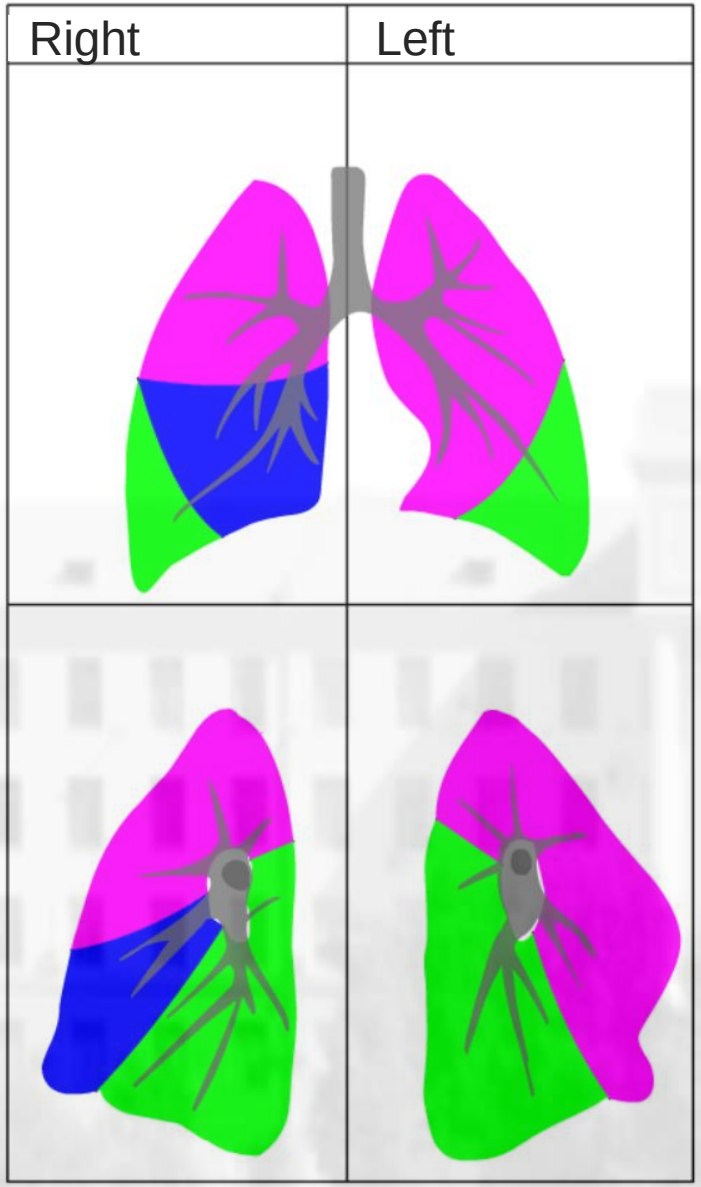
PUNCTURE OF THE PLEURAL CAVITY



Needle hit options:

1. Needle in lung tissue
2. A needle in a gas bubble
3. Needle in the exudate
4. Needle in fibrin deposits
5. Needle into the abdominal cavity

Lungs

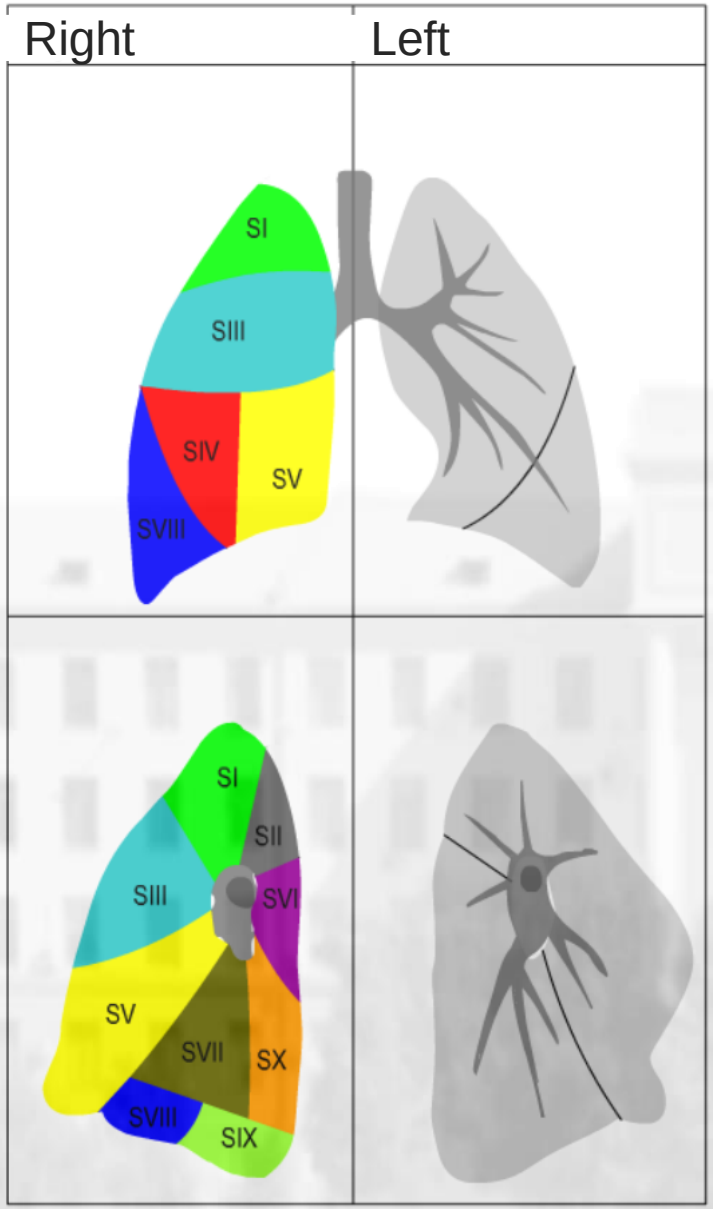


They have a shared structure.

There are three lobes in the right lung:
Upper,
Middle,
And lower.

There are two lobes of the left lung:
The upper
And lower.

Lungs



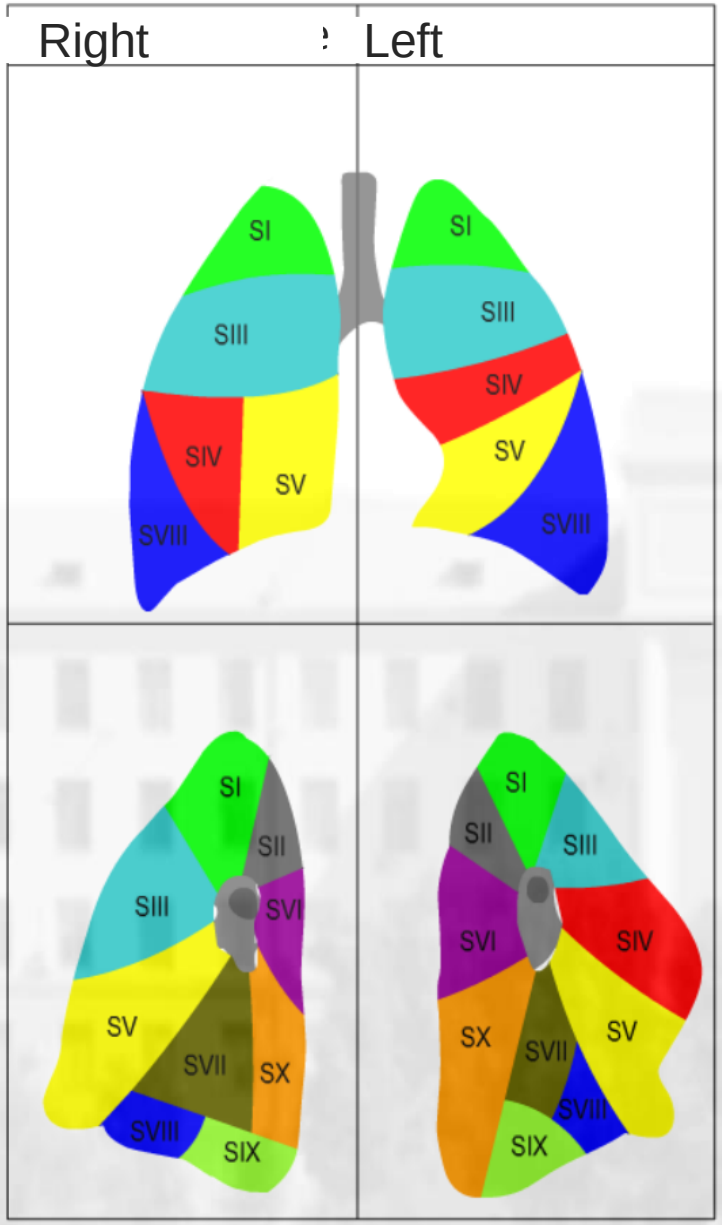
Segments of the right lung.

Upper lobe:
SI - apical;
SII - posterior;
S III - front.

Middle lobe:
SIV - lateral;
SV is medial.

Lower lobe:
SVI - apical;
SVII - medial basal;
XVIII - anterior basal;
SIX - lateral basal;
SX - posterior basal

Lungs

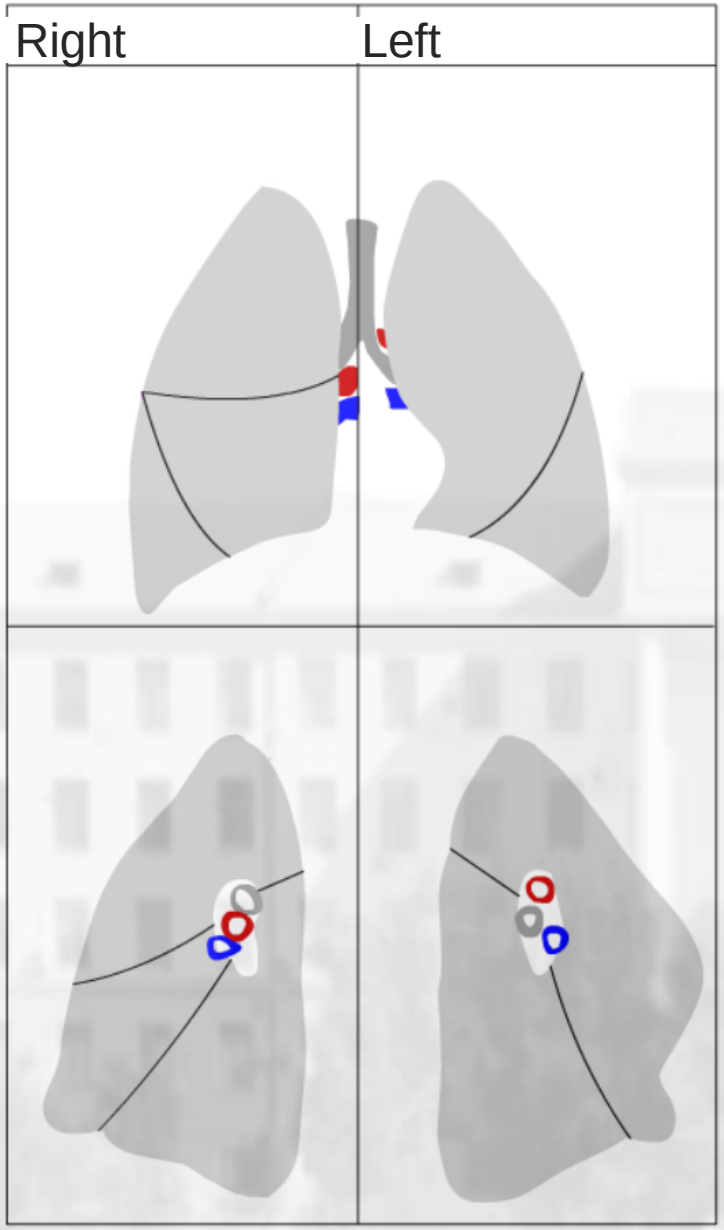


Segments of the left lung.

Upper lobe:
SI+II - apical-posterior;
S III - front;
SIV - upper tongue;
SV - lower tongue.

Lower lobe:
SVI - apical;
SVII - medial basal;
XVIII - anterior basal;
SIX - lateral basal;
SX - posterior basal

Lungs



The gate of the lung is a funnel-shaped depression on the mediastinal surface
Of the lung, in which the elements enclosed in the duplication of the visceral pleura and forming the root of the lung pass: the main bronchus, pulmonary veins, pulmonary artery, fatty tissue, blood and lymphatic vessels, nerve
Fibers.

Syntopy of the main elements of the lung root:

Right lung:
Top-down: bronchus-artery-vein
Front-back: vein-artery-bronchus

Left lung:
Top-down: artery-bronchus-vein
Front-back: vein-artery-bronchus

Thoracic surgery was developed much later than abdominal surgery.

1857. Rosier resected several ribs for the first time to a patient with chronic plural empyema.

1861. Pean resected the lobe of the lung by applying annealing of the lung tissue with a thermal scooter.

In 1883 N.F. Korobkin performed a pneumotomy for a chronic lung abscess.

In our country, lobectomy was first performed by P.I. Dyakonov in 1898.
McEwen in 1897, and then Kymmel in 1910, performed lung removal for a cancerous tumor. However, these observations did not trigger the development of pulmonary surgery, because the lack of means to combat shock and open pneumothorax made such operations very dangerous for patients.

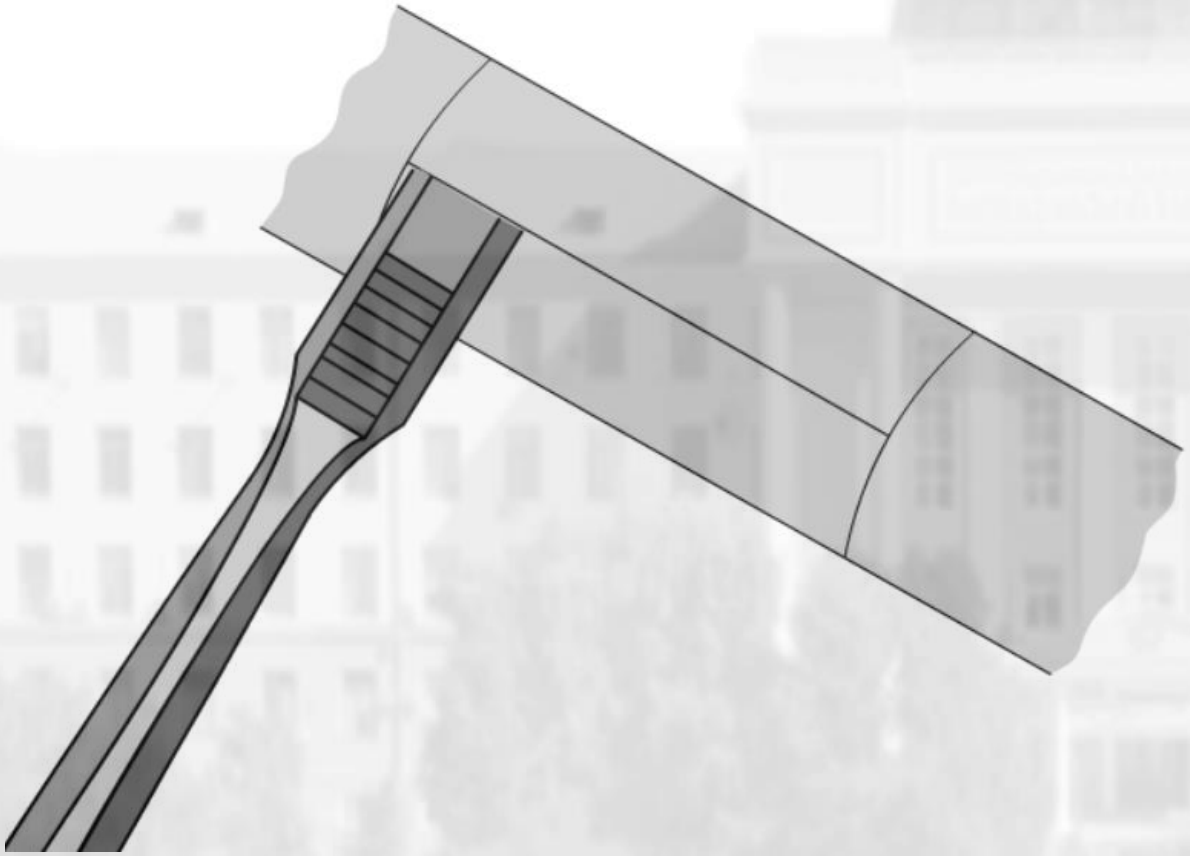
By 1923. Lilienthal and Graham performed about 100 lung operations for cancer. But the mortality rate was high (over 50%).

S.I. Spasokukotsky (1924), A.N. Bakulev (1933), B.E. Linberg (1935) successfully performed lobectomy, and this marked the beginning of the development of thoracic surgery in the USSR.

A great contribution to the development of methods of operations on the organs of the thoracic cavity was made by A.N. Bakulev, B.E. Linberg, P.A. Kupriyanov, F.G. Uglov, B.K. Osipov, V.I. Kazansky, B.V. Petrovsky, V.I. Struchkov, L.K. Bogush, A.V., Vishnevsky, etc.

SUBCOSTAL RIB RESECTION

Indications. Rib resection is used for operative access to the pleura and organs of the thoracic cavity, and is also performed as an independent operation when the ribs are affected by a tumor or osteomyelitis.



After incision of soft tissues over
The removed rib with a scalpel, an H-shaped incision of the periosteum is made.

The periosteum is separated with a Farabef rasp
First to the level of the upper and then the lower edge of the rib.

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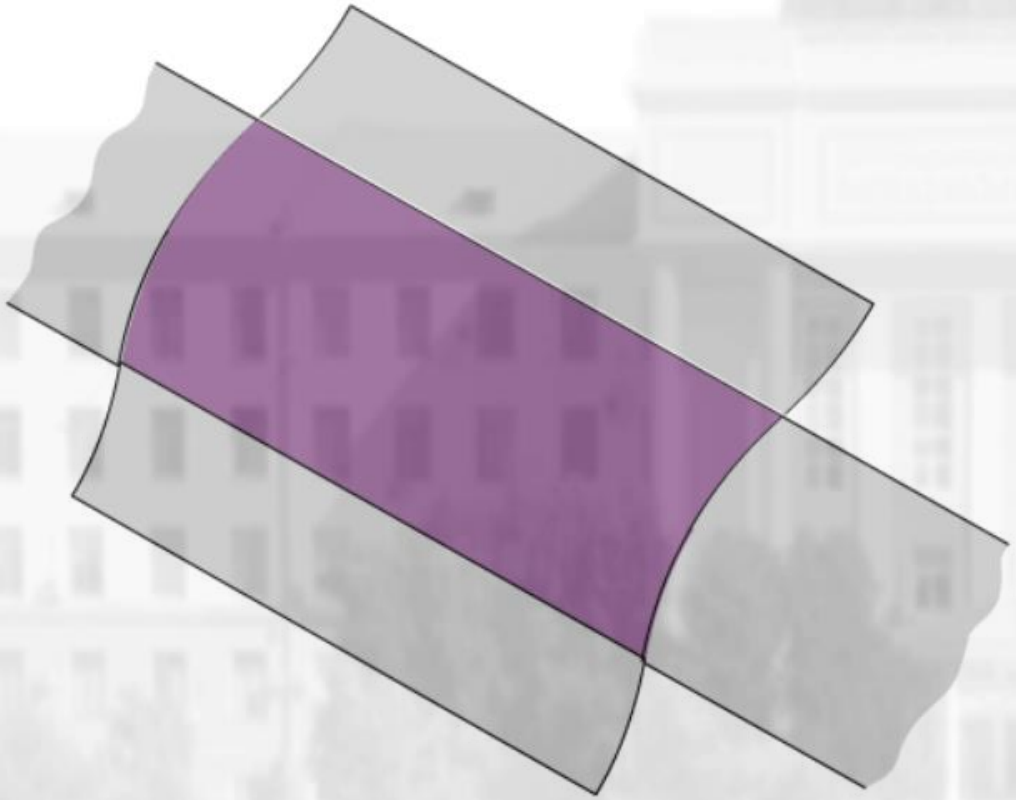

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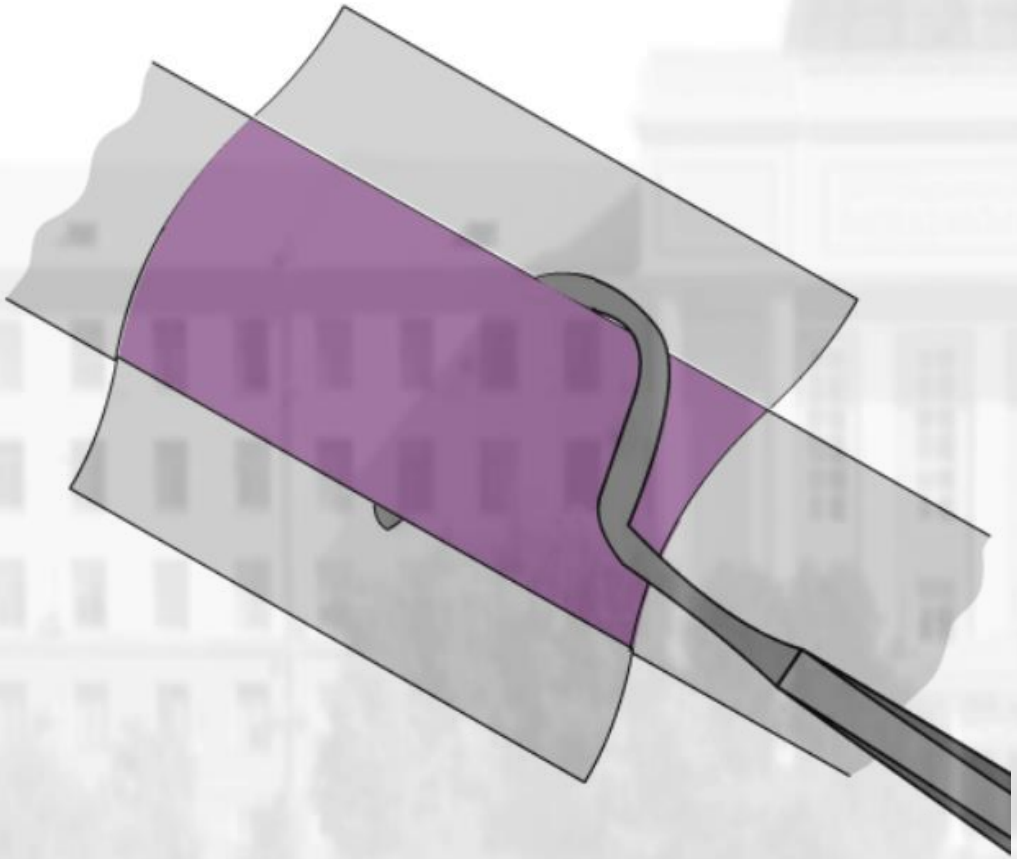

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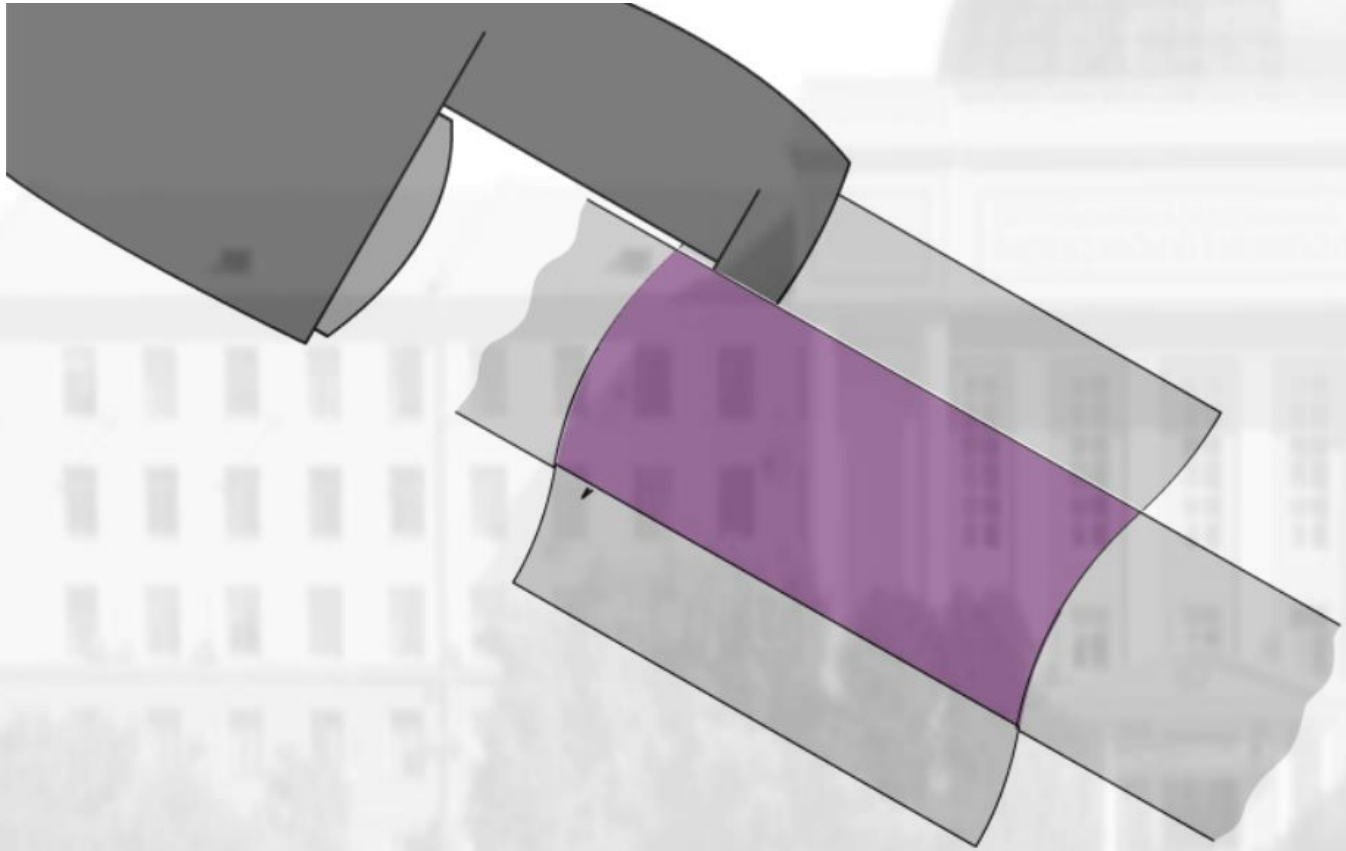

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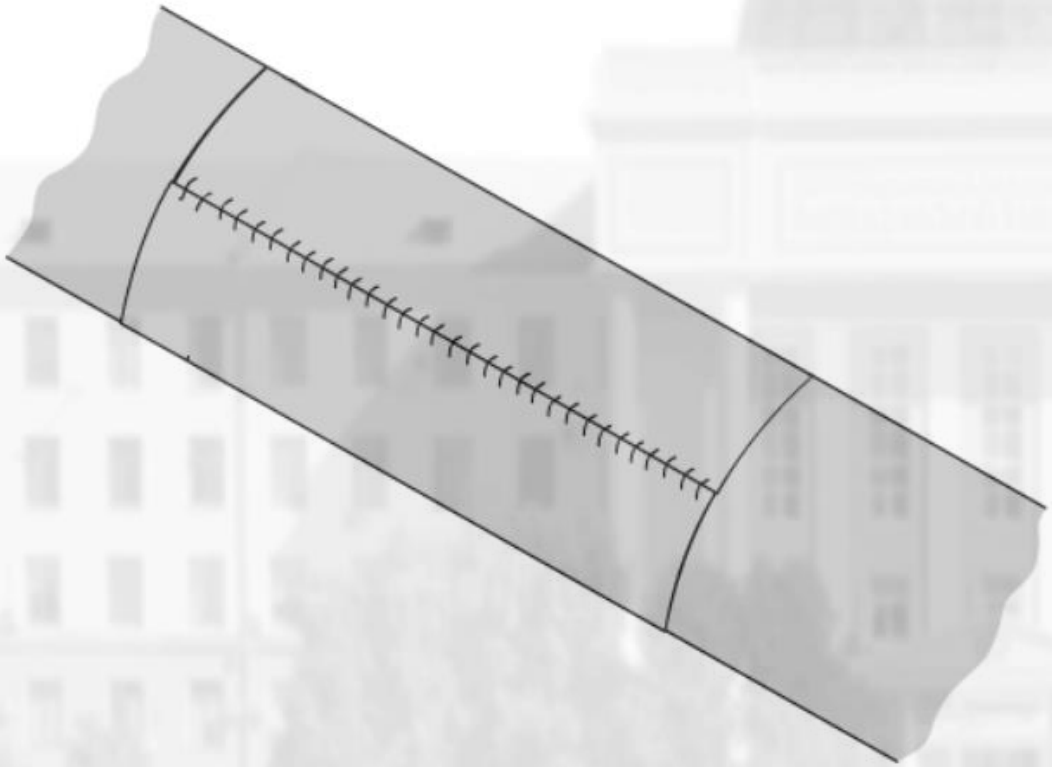

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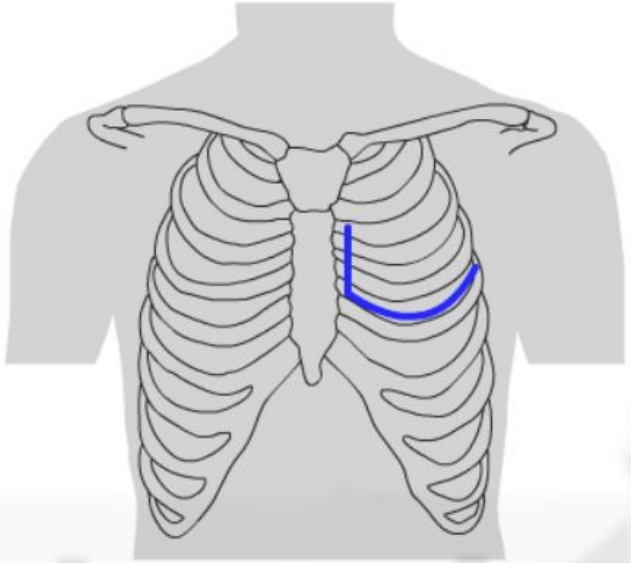
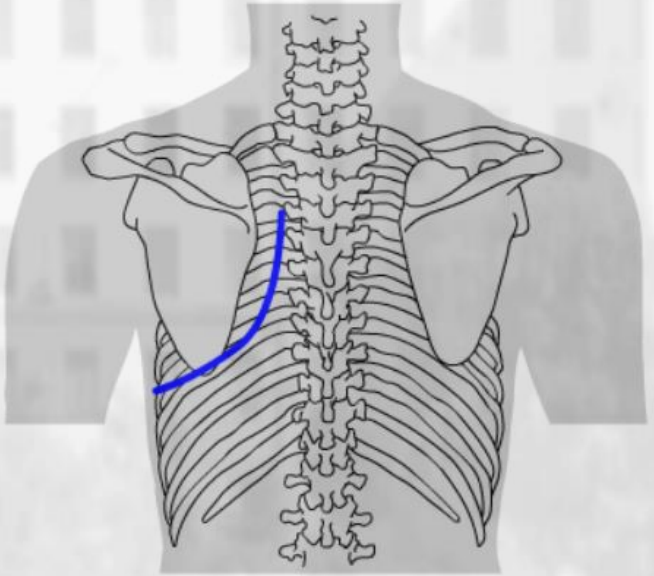
The rib is resected with rib cutters.

The integrity of the periosteum
Is restored by nodular sutures.

QUICK ACCESS TO THE LUNG

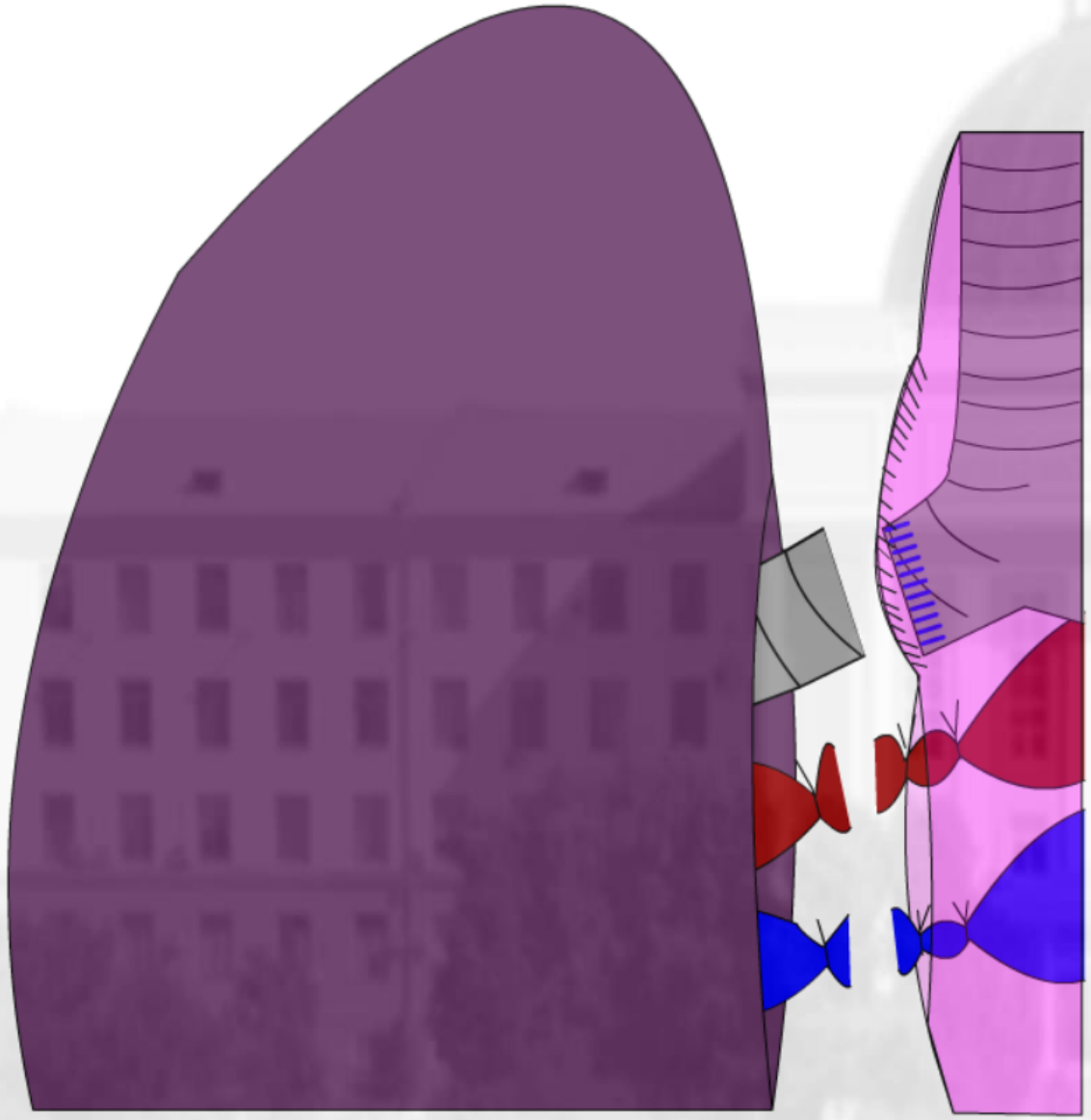


Anterolateral access. The patient lies on his healthy side or back. The incision begins at the level of the III ribs outwards from the parasternal line down to the level of the nipple. Then the incision continues along the upper edge of the V rib to the middle or posterior axillary line. Access to the lung is carried out in the IV or V intercostal spaces. If necessary, the IV and/or V rib is resected.



Rear-side access. The patient lies on his healthy side or stomach. The incision begins at the level of the spinous process the IV along the paravertebral line and continues to the angle of the scapula. Along the course of the VI rib, the incision continues to the anterior axillary line. The VI and/or VII ribs is resected.

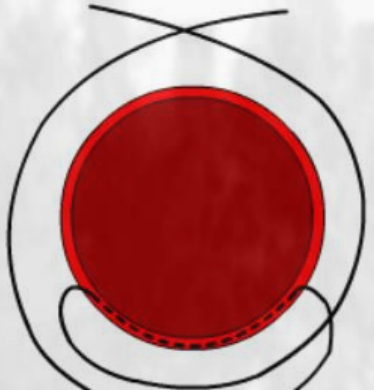
Principles of processing elements of the lung root during pulmonectomy



1. Bronchus:
- Sutured by the device UKB;

- The stump of the bronchus is covered by the mediastinal pleura (hand-wrapped suture).

2. Artery and vein:
- 2 ligatures (one stitched) for the central segment of the vessel, one ligature for The part to be removed.



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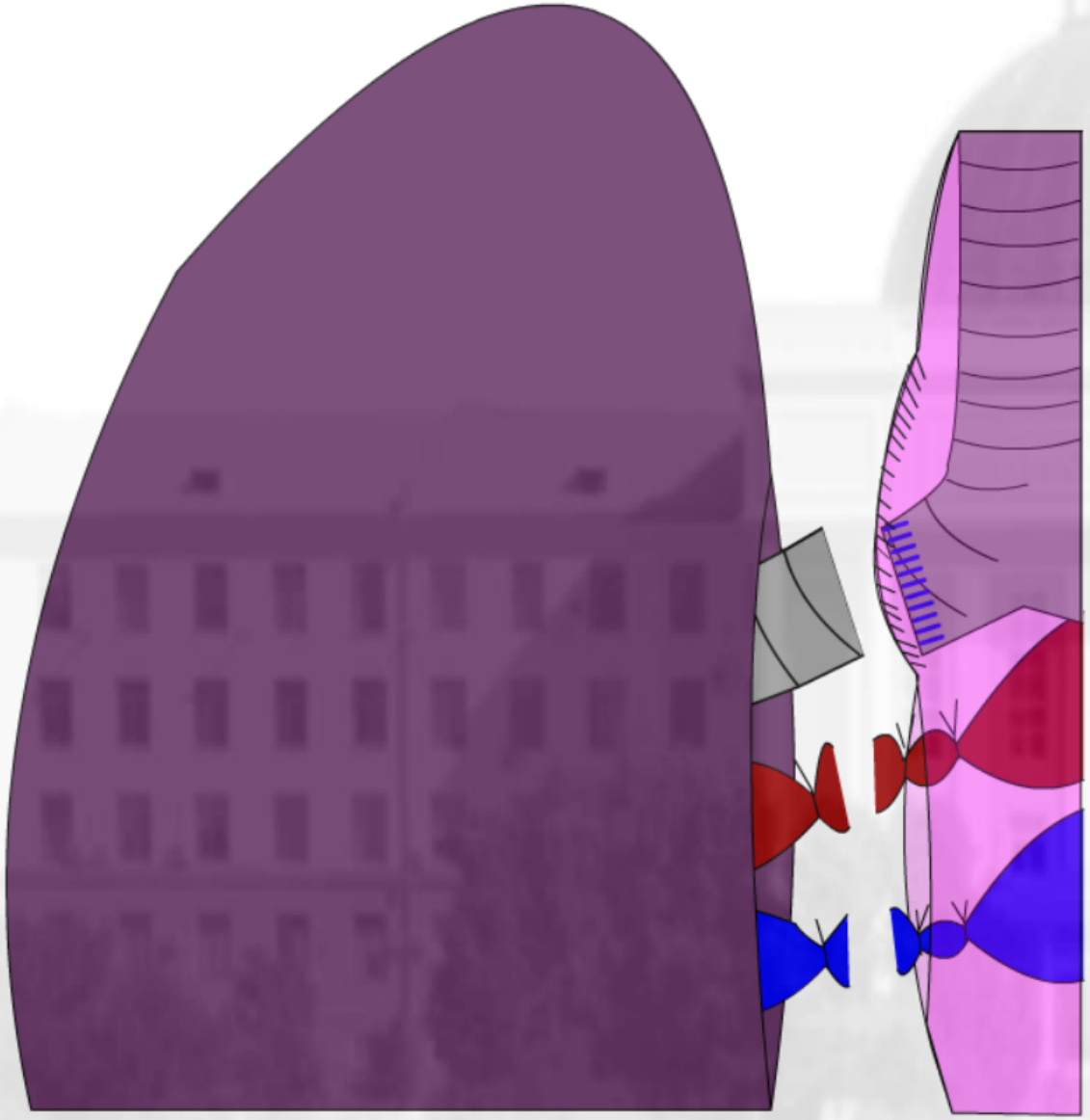

The sequence of processing elements of the root of the lung:

- Classical pulmonectomy:
1. Bronchus;
2. The artery;
3. Vein.

With lung cancer:
1. Vein;
2. The artery;
3. Bronchial.

With purulent diseases (abscesses):
1. Bronchus;
2. The artery;
3. Vein.

THANK YOU FOR YOUR ATTENTION!!!