

# *Sepsis*



*Sepsis* - a serious infectious and allergic disease caused by generalization of infection

- **Features :**

- Polyetiology (except viruses);
- not contagious;
- nonspecific clinical manifestations;
- predominance of hyperergic reactions, absence of immunity;
- nonspecific morphological manifestations.

## *Pathogenesis* of sepsis and its complications

- **1) endogenous mediators;**
- **2) disorder of the peripheral microcirculation;**
- **3) inhibition of myocardial function;**
- **4) reduction of transport and demand of oxygen in tissues.**

- *Sepsis* - severe sepsis with hypotension - septic shock (characterized by refractory to volume load) - syndrome of multiple organ dysfunction or failure, which includes:
  - **1) respiratory distress syndrome of adult;**
  - **2) acute renal failure;**
  - **3) acute liver failure;**
  - **4) DIC;**
  - **5) CNS-disorder**

# *Classification of sepsis*

1. According to etiology: staphylococcal, streptococcal, pneumococcal, gonococcal, anaerobic, mixed etc.
2. According to the source : ulcerative, postoperative, therapeutic, criptogenic.
3. According to localization of primary focus : gynecological, urological, otogenic, odontogenic etc.
4. According to duration: fulminant, acute, subacute, recidivous, chronic.
5. According to clinical features: septicemia, septicopyemia.
6. According to time of development: early (develops up to 14 days after injury), late (occurs in 2 weeks after injury).

# *Morphology of sepsis*

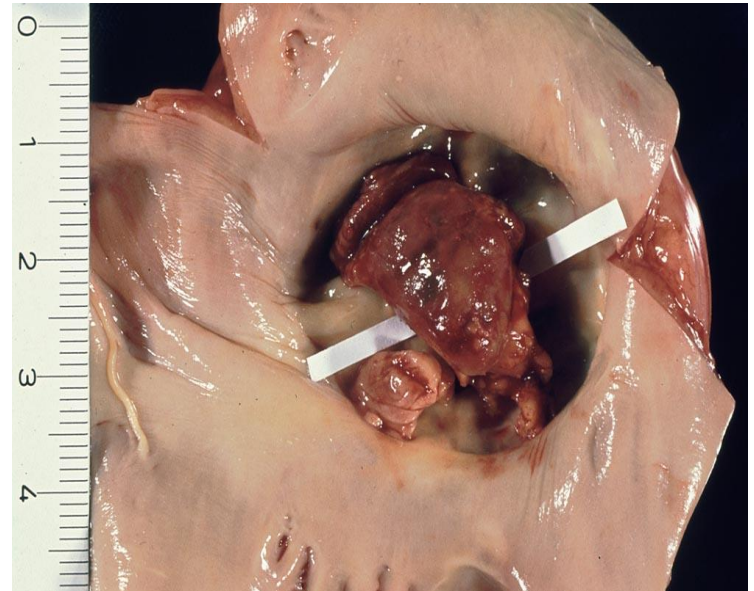
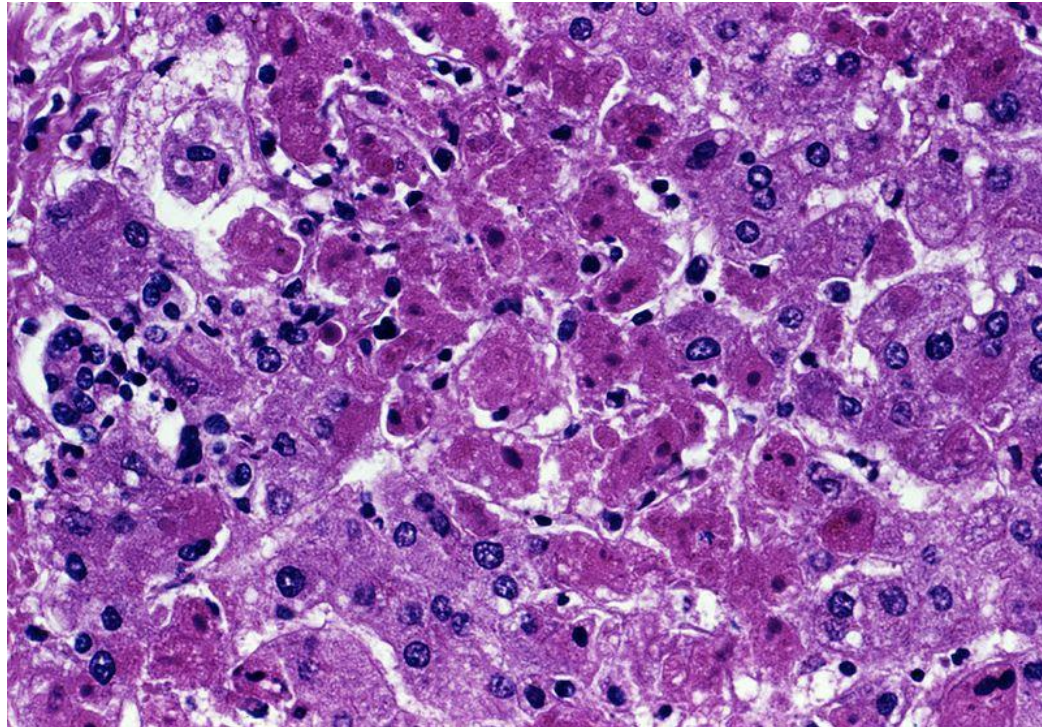
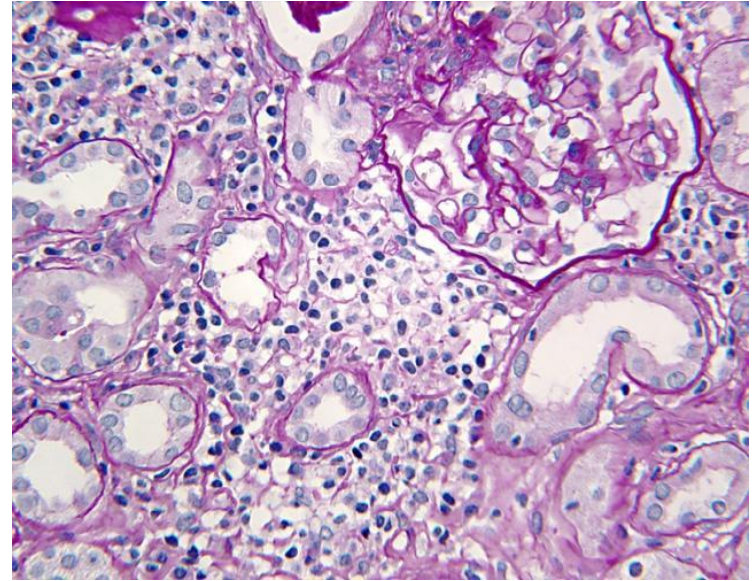
- ***Focal:***
  - septic focus;
  - lymphangitis;
  - Lymphotrombosis;
  - lymphadenitis;
  - phlebitis;
  - thrombophlebitis;
  - Bacterial-thrombotic embolism.





## *General features of Sepsis:*

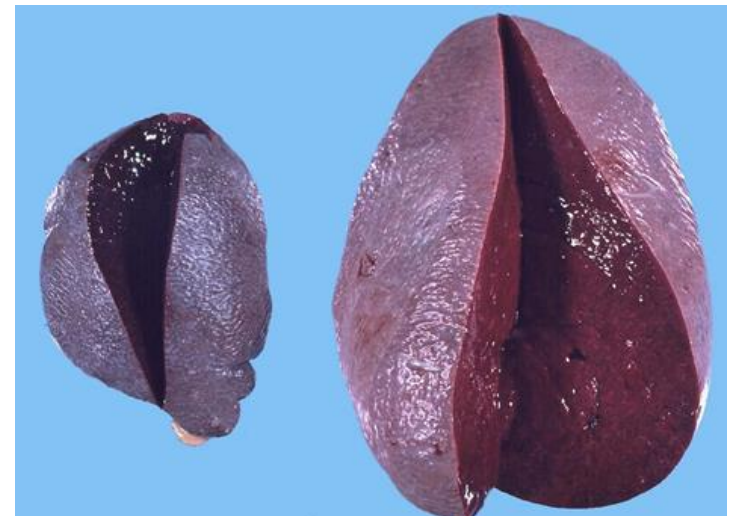
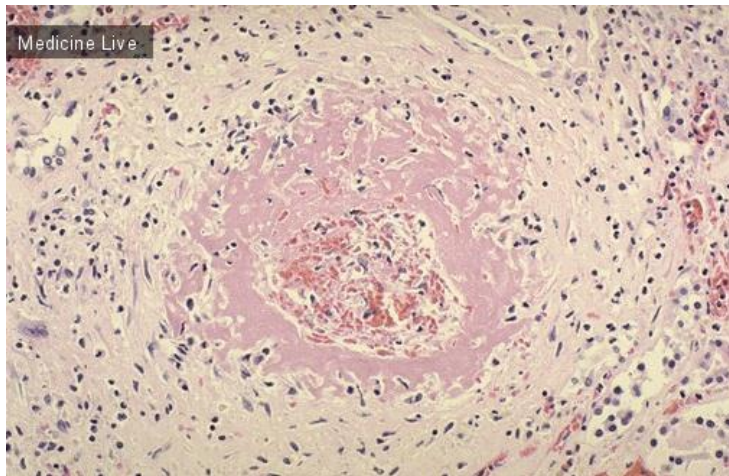
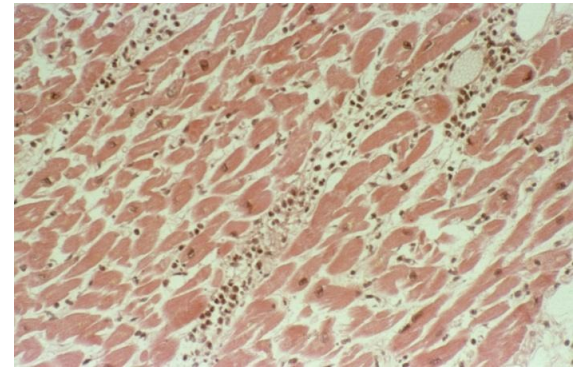
- **Dystrophic**
- **Inflammatory**
- **Hyperplastic**





# *Septicemia*

- form of sepsis, which is characterized by a **pronounced toxemia** (high temperature, blackout), increased reactivity (**hyperergia**), *no septic metastases* and **rapid flow**.



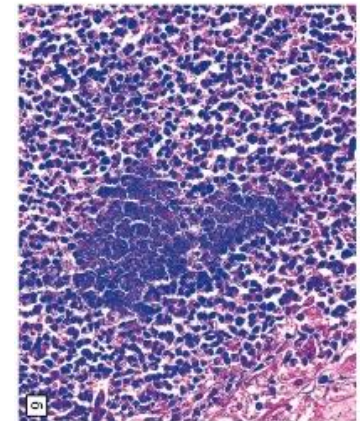
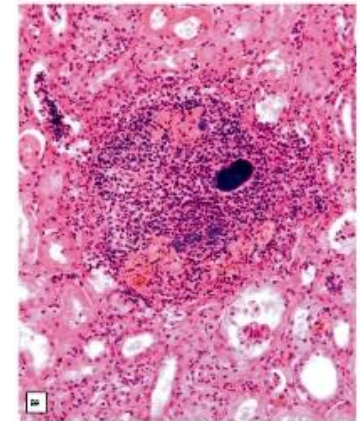
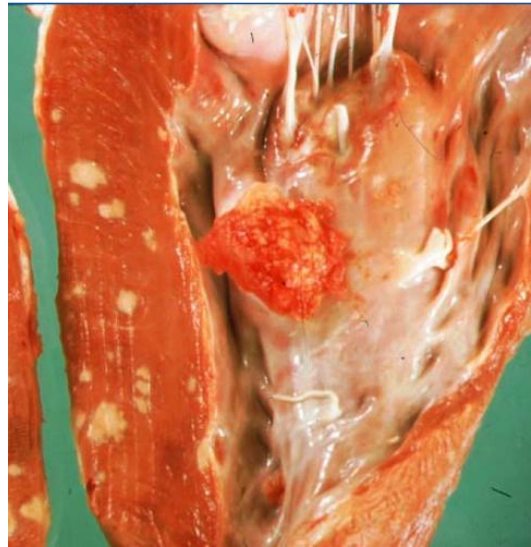
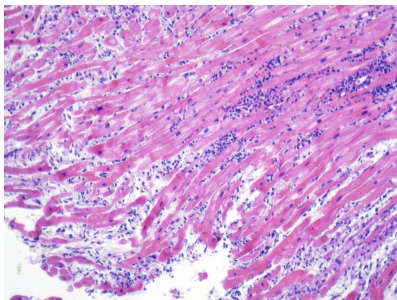
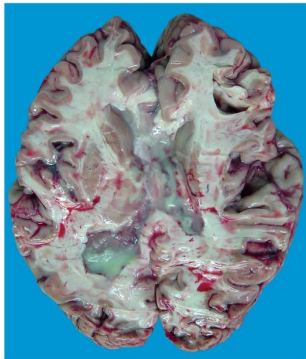


## *Morphology of septicemia*

- **septic focus** is usually **absent** or weakly expressed,
- skin and sclera often **icteric** (hemolytic jaundice),
- **hemorrhagic syndrome** as a petechial rash on the skin, bleeding into serous and mucous membranes and internal organs were found.
- hyperplasia of lymphoid and hematopoietic tissues, **increased spleen and lymph nodes**. In the spleen and lymph nodes are not only the proliferation of lymphoid and reticular cells, but also the accumulation of mature and immature hematopoietic cells.
- bone marrow hyperplasia. There are also foci of **extramedullary hematopoiesis**.
- interstitial inflammation of internal organs.

# *Septicopyemia*

- form of sepsis, characterized by suppurative processes in the gate of a bacterial infection and embolism ("metastasis of pus") with the formation of abscesses in many organs and tissues.



## *Morphology of septicopyemia:*

- septic focus, usually located at the gate of infection with **purulent lymphangitis and lymphadenitis**.
- First metastatic abscesses appears in the lungs.
- Then, in the organs of the systemic circulation, liver (**liver abscess**), kidneys (**suppurative nephritis**), subcutaneous tissue, bone marrow (**suppurative osteomyelitis**), in the synovium (**purulent arthritis**), heart valves (**acute septic polypous ulcerative endocarditis**).
- Lymph nodes are not sharply increased, **septic spleen**.



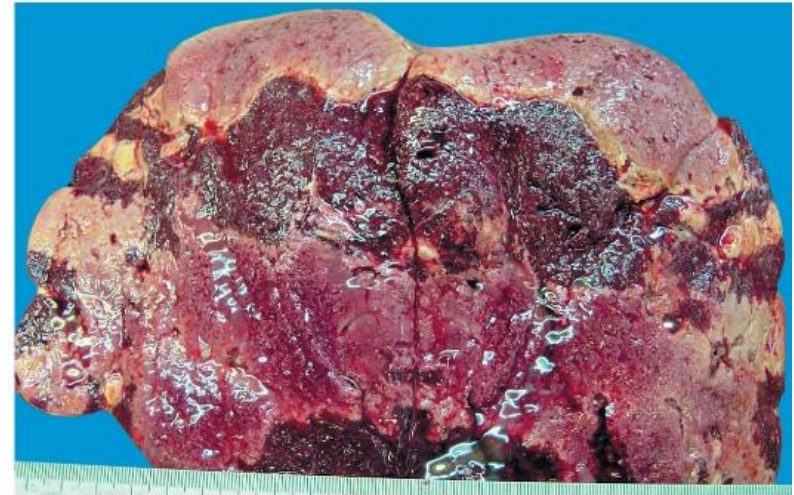
# *Septic (bacterial) endocarditis*

- special form of sepsis, which is characterized by **septic valvular heart disease**.
- Since the septic focus is on the heart valves, hyperergic damage exposed primarily cardiovascular system that determines the originality of clinical and pathological manifestations of the disease.
- Currently, the most common pathogens of bacterial endocarditis became *Staphylococcus aureus* and *Streptococcus*.

## *Classification*

- According to duration there are acute – 2 weeks, subacute and chronic septic endocarditis- years.
- According to presents of primary disease:
  - 1) occurring on the modified valves— secondary septic endocarditis;
  - 2) occurring on intact valves — primary septic endocarditis (Chernogubov’s disease).

75 - 80% it develops on the aortic valves

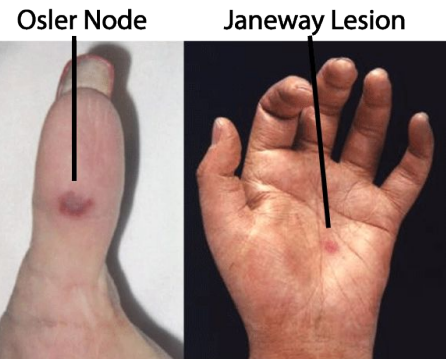


# *Peripheral signs of bacterial endocarditis*

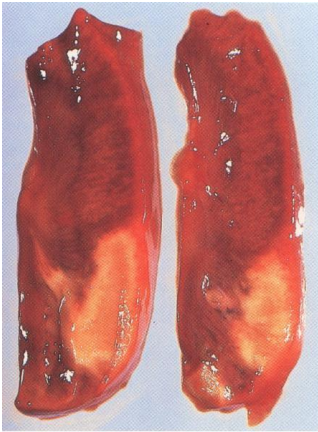
- 1) petechial hemorrhages on the conjunctiva of the eye at the inner corner of the lower eyelid (**spots Lukin-Liebman**);
- 2) nodules on the palms of the hands (**Osler nodes**);
- 3) thickening of the distal nail phalanxes ("**Drumsticks**");
- 4) foci of necrosis in the subcutaneous adipose tissue;
- 5) hemorrhages in the skin and subcutaneous tissue (**Janeway spots**);
- 6) **jaundice**.



Petechial haemorrhages in the conjunctiva from septic emboli in bacterial endocarditis. Note also the linear haemorrhage at the junction between the conjunctiva and the sclerotic. This is another feature of the peripheral embolisation.





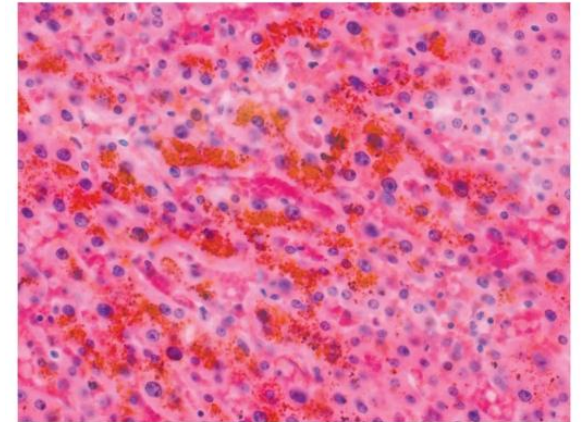
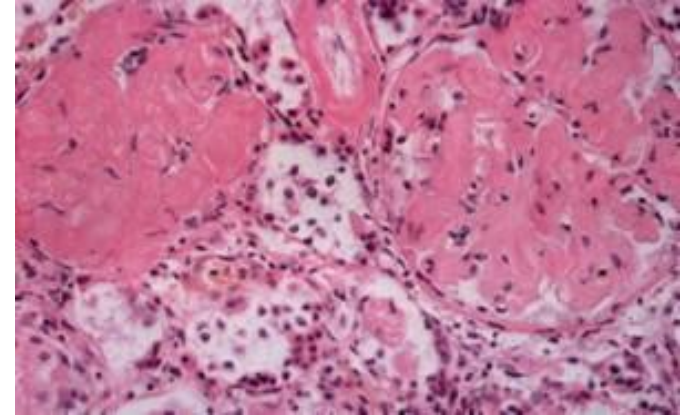


○ Recent renal infarct from a septic embolus in bacterial endocarditis. M/56.



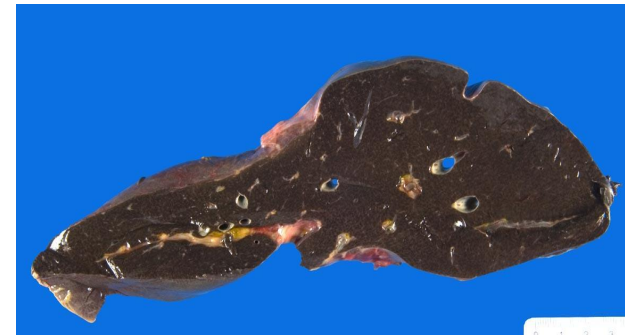
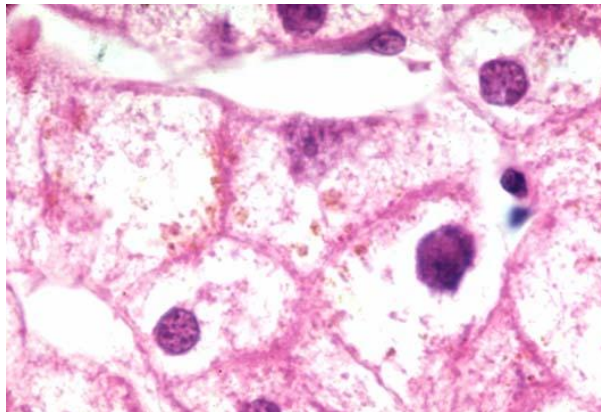
# *Chroniosepsis*

- Characterized by **long-term non-healing septic focus** and extensive suppuration.
- Such septic foci found in carious teeth, tonsils, but often they are extensive suppuration occurring after injury.
- Pus and tissue breakdown products are absorbed, leading to intoxication, increasing exhaustion and development of **amyloidosis**.



## *Morphology of chroniosepsis:*

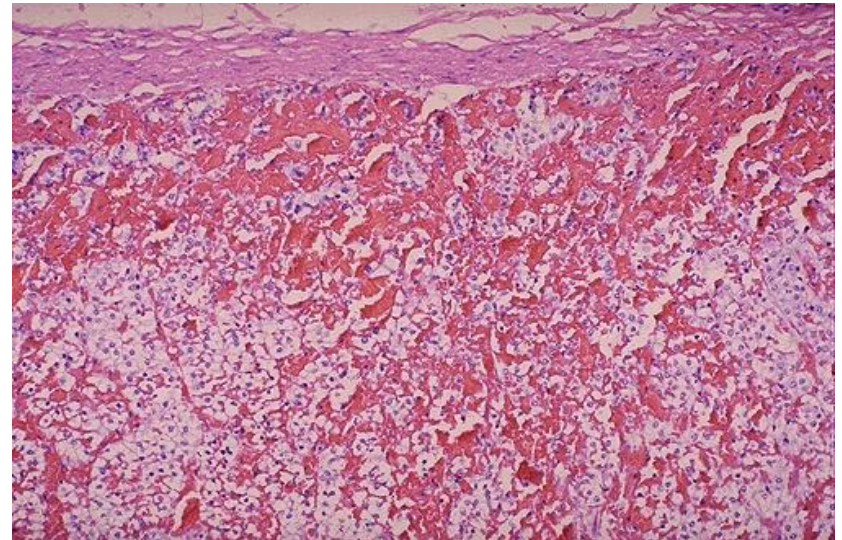
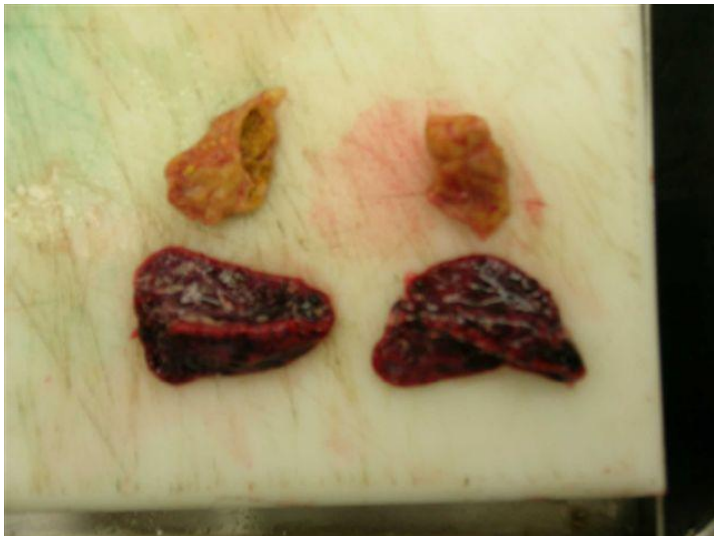
- Changes in the organs and tissues in chronic sepsis are mainly atrophic.
- Expressed exhaustion, dehydration.
- Spleen decreased in size.
- In the liver, myocardium, striated muscle **brown atrophy** is detected.





# *Septic shock*

- In septic shock, circulating bacterial endotoxin (lipopolysaccharide) binds to CD14 receptors of macrophages, which leads to a massive release of cytokines, especially TNF.
- Therefore increased vascular permeability and intravascular blood coagulation.
- DIC.
- Septic shock characterized by: necrosis of the anterior pituitary gland, necrosis and hemorrhage of adrenal glands (Waterhouse-Friderichsen syndrome), renal cortical necrosis

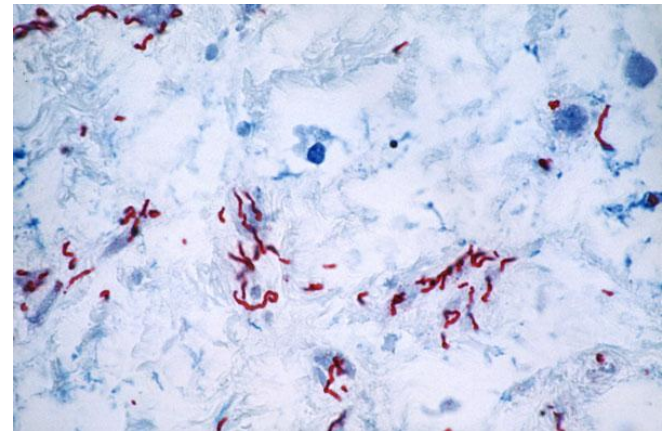
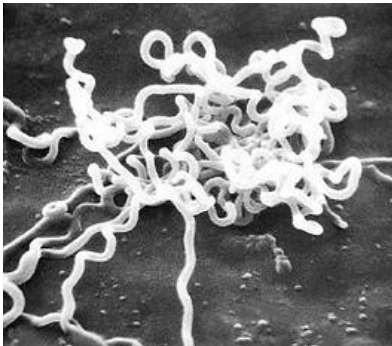


# *Syphilis*



# *Syphilis*

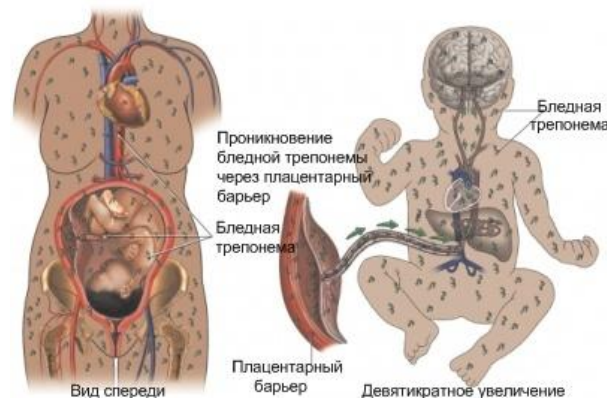
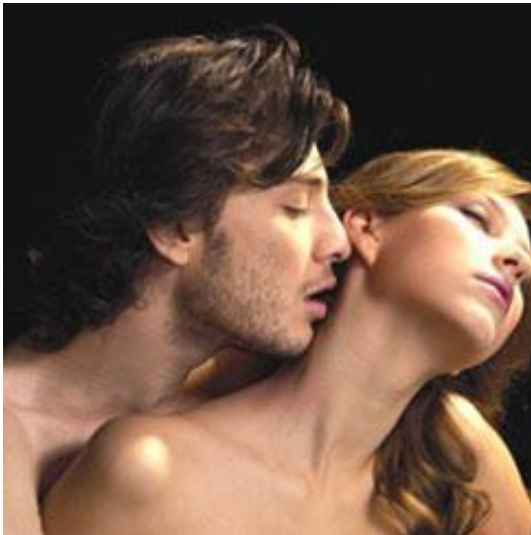
- is a chronic systemic sexually transmitted infection caused by the *Treponema pallidum*.



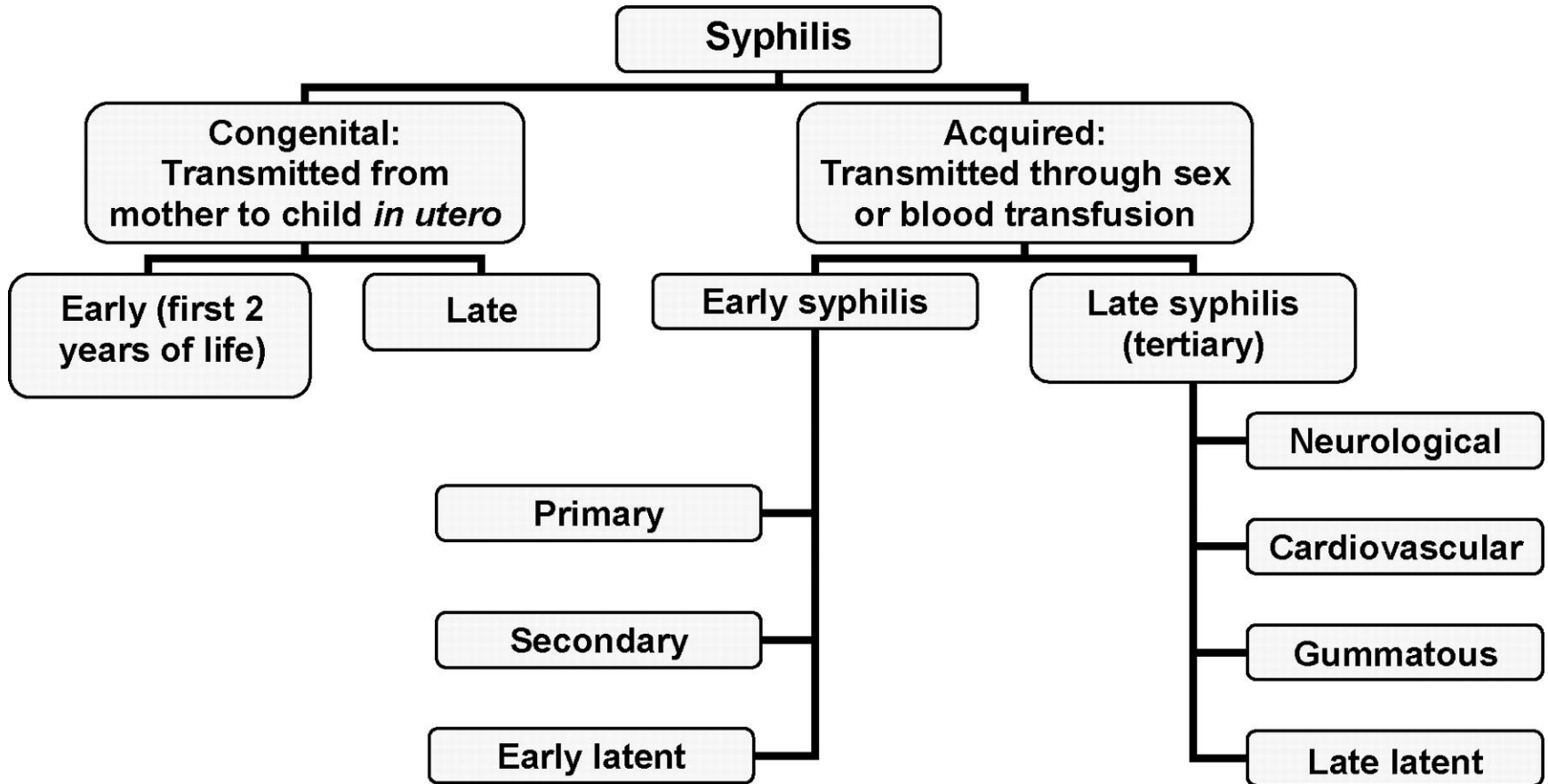


# *The main way of transmission of syphilis:*

- sexual
- domestic
- professional
- transplacental



# Classification of syphilis



## *Incubation period*

- between 3 weeks to 3 months after a person has been infected with syphilis.



# *Primary syphilis*

- skin lesion, called a **chancre**, appears at the point of contact
- This is classically (40% of the time) a single, firm, painless, non-itchy skin ulceration with a clean base and sharp borders between 0.3 and 3.0 cm in size.
- The most common location in women is the cervix (44%), the penis in heterosexual men (99%), and anally and rectally relatively commonly in men who have sex with men (34%)
- **Lymphangitis.**
- **Lymphadenitis**





## Types of chancre

- localization - genital, extragenital;
- by number - a single, multiple,
- size - small, giant;
- in outline - round, oval, semilunar, slit-shaped, herpetic;
- on the surface - erosive, ulcerative, crusty.
- hidden chancre. The men in the urethra, in the scaphoid fossa, symptoms reminiscent of subacute gonorrhoea.

# *Atypical chancre:*

- 1. Induratum edema** - when the consolidation under the erosion extends far beyond its borders, the usual localization - the lower lip, the prepuce, the labia majora.
- 2. Chancroid-felon (whitlow).** Lesion localized on the distal phalanx of the finger - it swells, becomes purple-red, soft tissue - infiltrated. Chancroid-felon has ulcers form with rough edges, the bed is covered with dirty-gray patina. The similarity with the felon enhance pain.
- 3. The chancre-amygdalitis.** Localized on the tonsils, it is swell, redden, condensed, fever, symptoms of intoxication appear. Increased lymph nodes.

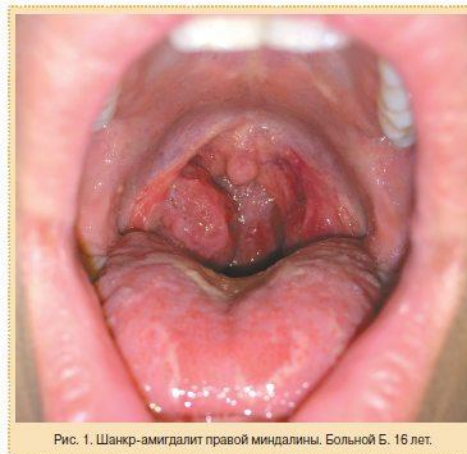
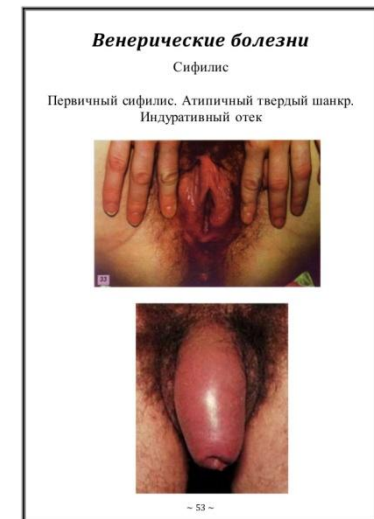


Рис. 1. Шанкр-амигдалит правой миндалины. Больной Б. 16 лет.



# *Secondary syphilis*

- occurs approximately four to ten weeks after the primary infection.
- symmetrical, reddish-pink, non-itchy rash on the trunk and extremities, including the palms and soles.
- The rash may become maculopapular or pustular. It may form flat, broad, whitish, wart-like lesions known as condyloma latum on mucous membranes. All of these lesions harbor bacteria and are infectious.
- Other symptoms may include fever, sore throat, malaise, weight loss, hair loss, and headache.
- Rare manifestations include liver inflammation, kidney disease, joint inflammation, periostitis, inflammation of the optic nerve, uveitis, and interstitial keratitis.



# *Tertiary syphilis*

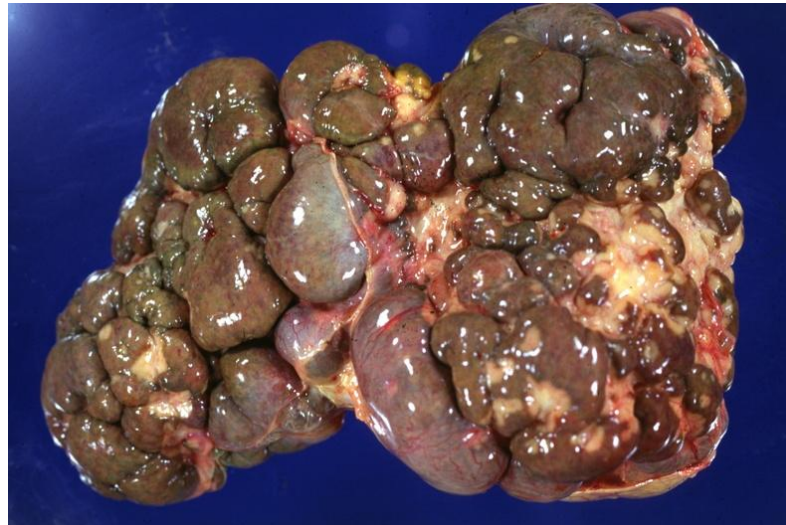
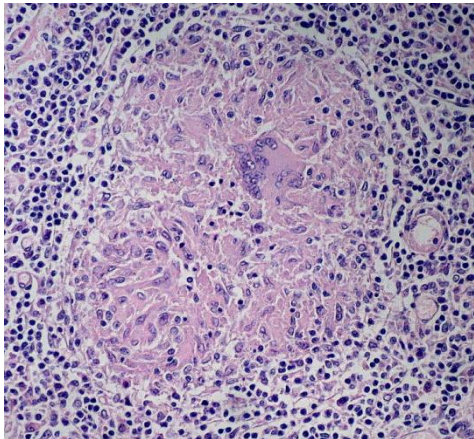
- may occur approximately 3 to 15 years after the initial infection, and may be divided into three different forms: gummatous syphilis (15%), late neurosyphilis (6.5%), and cardiovascular syphilis (10%)





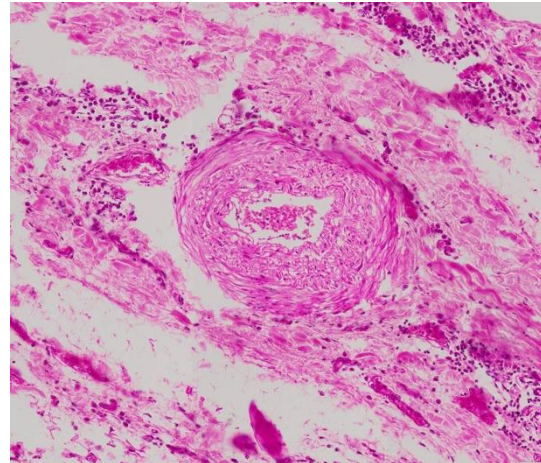
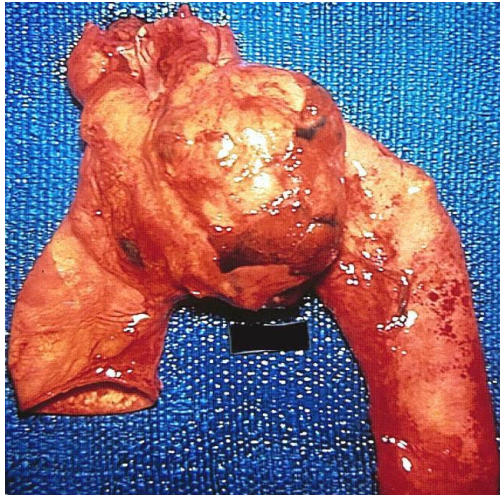
# *Gummatous syphilis*

- or late benign syphilis usually occurs 1 to 46 years after the initial infection, with an average of 15 years.
- This stage is characterized by the formation of chronic gummas, which are soft, tumor-like balls of inflammation which may vary considerably in size. They typically affect the skin, bone, and liver (“hepar lobatum”), but can occur anywhere.



# *Cardiovascular syphilis*

- usually occurs 10–30 years after the initial infection. The most common complication is syphilitic aortitis (mesaortitis), which may result in aneurysm formation.
- Men 40-60 y.o.
- Ascending and aortic arch, inflammation of the vasa vasorum extend to the intima of the aorta - elastic fibers are destroyed - syphilitic aortic aneurysm forms, sometimes formed syphilitic aortic valve defect, coronary artery disease.



# *Neurosyphilis*

- Refers to an infection involving the CNS.
- It may occur **early**, being either **asymptomatic** or in the form of **syphilitic meningitis**, or late as **meningovascular syphilis**, **general paresis**, or **tabes dorsalis**, which is associated with poor balance and lightning pains in the lower extremities.
- Late neurosyphilis typically occurs 4 to 25 years after the initial infection.
- *Meningovascular* syphilis typically presents with **apathy** and **seizure**, and general paresis with dementia and tabes dorsalis.
- Also, there may be **Argyll Robertson pupils**, which are bilateral small pupils that constrict when the person focuses on near objects, but do not constrict when exposed to bright light.



# *Tabes dorsalis*

- Or **syphilitic myelopathy**, is a slow degeneration (demyelination) of the nerves primarily in the dorsal columns (posterior columns) of the spinal cord.
- Signs and symptoms may not appear for decades after the initial infection and include weakness, diminished reflexes, paresthesias (shooting and burning pains, pricking sensations, and formication), hypoesthesias (abnormally diminished cutaneous, especially tactile, sensory modalities), tabetic gait (locomotor ataxia), progressive degeneration of the joints, loss of coordination, episodes of intense pain and disturbed sensation (including glossodynia), personality changes, urinary incontinence, dementia, deafness, visual impairment, positive Romberg's test, and impaired response to light (Argyll Robertson pupil).
- The skeletal musculature is hypotonic due to destruction of the sensory limb of the spindle reflex. The deep tendon reflexes are also diminished or absent; for example, the "knee jerk" or patellar reflex may be lacking (Westphal's sign).
- A complication of tabes dorsalis can be transient neuralgic paroxysmal pain affecting the eyes and the ophthalmic areas, previously called "Pel's crises", now more commonly called "tabetic ocular crises," an attack is characterized by sudden, intense eye pain, tearing of the eyes and sensitivity to light.



# *General paresis*

- Degenerative changes are associated primarily with the frontal and temporal lobar cortex.
- Symptoms of the disease first appear from 10 to 30 years after infection. Incipient GPI is usually manifested by neurasthenic difficulties, such as fatigue, headaches, insomnia, dizziness, etc.
- As the disease progresses, mental deterioration and personality changes occurs. Typical symptoms include loss of social inhibitions, asocial behavior, gradual impairment of judgment, concentration and short-term memory, euphoria, mania, depression, or apathy.
- Subtle shivering, minor defects in speech and Argyll Robertson pupil may become noticeable.

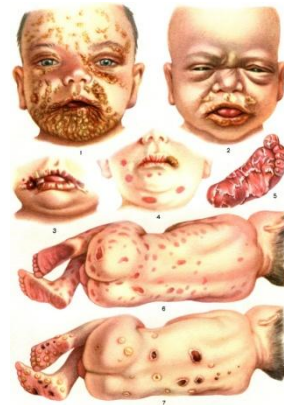
# *Congenital syphilis*

- is that which is transmitted during pregnancy or during birth. Two-thirds of syphilitic infants are born without symptoms.
- Common symptoms that develop over the first couple of years of life include enlargement of the liver and spleen (70%), rash (70%), fever (40%), neurosyphilis (20%), and lung inflammation (20%).
- If untreated, late congenital syphilis may occur in 40%, including saddle nose deformation, Higoumenakis sign, saber shin, or Clutton's joints among others.



# *Early congenital syphilis*

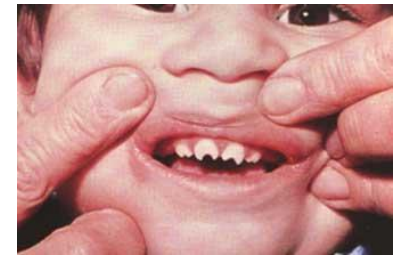
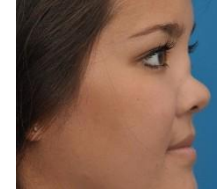
- Newborns may be asymptomatic and are only identified on routine prenatal screening. If not identified and treated, these newborns develop poor feeding and rhinorrhea.
- Early congenital syphilis occurs in children between 0 and 2 years old.
- Symptomatic newborns, if not stillborn, are born premature, with hepatosplenomegaly, skeletal abnormalities, pneumonia and a bullous skin disease known as pemphigus syphiliticus.



# Late congenital syphilis

Symptoms include:

- blunted upper incisor teeth known as *Hutchinson's teeth*
- inflammation of the cornea known as *interstitial keratitis*
- *deafness* from auditory nerve disease
- frontal bossing (prominence of the brow ridge)
- *saddle nose* (collapse of the bony part of nose)
- hard palate defect
- swollen knees
- *saber shins*
- short maxillae
- protruding mandible
- A frequently-found group of symptoms is **Hutchinson's triad**, which consists of Hutchinson's teeth (notched incisors), keratitis and deafness and occurs in 63% of cases.



***Thank you for your attention!***

