GUIDELINES
Individual work of students
During preparation for Practical classes

<table>
<thead>
<tr>
<th>Educational discipline</th>
<th>Surgical stomatology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module № 2</td>
<td>Inflammatory diseases in maxillofacial region.</td>
</tr>
<tr>
<td>Content module № 4</td>
<td>Nonodontogenous inflammatory diseases in maxillofacial region</td>
</tr>
<tr>
<td>Course</td>
<td>3</td>
</tr>
<tr>
<td>Faculty</td>
<td>Stomatological</td>
</tr>
</tbody>
</table>

Poltava 2018
1. Actuality of the topic:
Not looking at achievements of modern medicine in diagnostics and treatment of inflammatory diseases of maxillofacial region, their complication is enough widespread phenomena. To most terrible of them, till now insufficiently investigated, it is possible to signs a sepsis and a mediastinitis. Disharmony of gravity of a state in relation to local manifestations, variability of a clinical presentation of the above mentioned complications is frameed with difficulties for a well-timed establishment of the diagnosis and planning of the adequate scheme of treatment that results in long disability, physical inability and even to lethal cases. Therefore the precise knowledge of methods of diagnostics and principles of therapy of sepsis and mediastinitis is extremely important both in theoretical, and in the social - practical plan.

2. The objectives of the studies.
To know an etiology and features of a pathogenesis of sepsis, mediastinitis, a diversification of forms and clinical manifestations, methods of diagnostics, differential diagnostics and treatment.
To be able to survey the patient, to make a diagnose sepsis and mediastinitis, to carry out differential diagnostics, to develop the adequate scheme of an intensive care, to render an acute care.

3. Basic knowledge, skills, skills necessary for study topics (interdisciplinary integration).

<table>
<thead>
<tr>
<th>Name of previous courses</th>
<th>These skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatomy</td>
<td>Anatomy of a mediastinum.</td>
</tr>
<tr>
<td>Topographical anatomy</td>
<td>Topographical anatomy of a mediastinum.</td>
</tr>
<tr>
<td>General surgery</td>
<td>Features of clinical course surgical sepsis.</td>
</tr>
<tr>
<td>Physiopathology</td>
<td>Stages of a sepsis and one of his specific complications - a set of symptoms disseminated intravascular coagulation of a blood.</td>
</tr>
<tr>
<td>Pharmacology</td>
<td>Pharmacokinetics and a pharmacodynamics of preparations, which are applied to therapy of complications of inflammatory processes maxillofacial region.</td>
</tr>
</tbody>
</table>

4. Tasks for independent work in preparation for the classes.
4.1. A list of key terms, parameters, characteristics that must learn the student in preparation for the lesson:

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sepsis</td>
<td>('sèpsis/; from Gr. σῆψις: the state of putrefaction and decay) is a potentially deadly medical condition characterized by a whole-</td>
</tr>
</tbody>
</table>
body inflammatory state (called a systemic inflammatory response syndrome or SIRS) that is triggered by an infection.

<table>
<thead>
<tr>
<th>Mediastinitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>is inflammation of the tissues in the mid-chest, or mediastinum. It can be either acute or chronic.</td>
</tr>
</tbody>
</table>

4.2. **Theoretical questions to lesson:**
1. To define as concept a sepsis.
2. To define as concept a mediastinitis.
3. Etiology and a pathogenesis of a sepsis.
4. Classification of a mediastinitis and a sepsis.
5. Signs of anterior mediastinitis.
7. A clinical presentation of different phases of a sepsis.

4.3. **Practical works (tasks) are performed in class:**
- To carry out observation of the patient with a sepsis and a mediastinitis;
- To carry out with technique of a mediastinotomy;
- To make a treatment planning of patients with a sepsis and a mediastinitis.

5. **Theme contents:**

**The sepsis** is the morbid condition caused to constant or periodic entering in a blood of microorganisms from the locus of a purulent inflammation which is characterized by disharmony of gravity of the general infringements to his local manifestations and often occurrence of the locuses of a purulent inflammation in different members and tissues.

Sepsis - polyetiological and nonspecific disease, which is characterized by stereotype of manifestations (irrespective of a kind of the agent), their different depth and an expressiveness, and also oppression of barrier functions of different systems. His agent can be any microorganism, but more often - a staphylococcus, colon bacillus (colibacillus, Escherichia coli), blue pus bacillus (Pseudomonas aeruginosa), Proteus, anaerobes, less often - a streptococcus, pneumococcus and other microorganisms.

In V.I. Struchkova's opinion, the pathogenesis of a sepsis is defined by such factors: microbiologic - a kind, virulence, a state of a circulation in the locus; amount and in of action of microorganisms; entrance infection atriums, character and in volume of decayed tissues, a resistance of an organism.

In dependence on various combinations of the listed factors the sepsis can be the acutissimus (fulminant), caused diffusion pathogenic microorganisms and described by the extremely serious and fast clinical course; acute - with development of the expressed clinical presentation of illness within several days and absence of
remissions, subacute - manifestation of metastatic abscesses showing mainly and less expressed common infringements, chronic - slowly streaming process with long, about several months and even years, the periods of remissions between formation of the locuses of an inflammation in various organs and tissues.

**COLUMNS OF LOGIC FRAME OF THE THEME:**

**Classification of a sepsis**

<table>
<thead>
<tr>
<th>On localization of the initial locus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odontogenic</td>
</tr>
</tbody>
</table>

**For phylum of clinical course**

| Fulminant | Acute | Subacute | Chronic |

**On a degree of gravity**

| Mild | Average | Serious |

**On phases of clinical course**

| Pyoresorptive fever | Initial phase (toxemia) | Hematosepsis (a bacteriemia without purulent metastasises) | Septicopyemia (a constant bacteriemia with purulent metastasises) |

**Complications of a sepsis**

| Septic shock | wound dystrophy | disseminated intravascular clotting, DIC | regional thrombophlebites | Bleedings of a various genesis |

**Classification of a mediastinitis**

<table>
<thead>
<tr>
<th>On localization of process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anterior</td>
</tr>
</tbody>
</table>

**On clinical course**

| Acute | Chronic |
| Serous | Purulent |

**Phases of a mediastinitis**

| Reactive | Toxic | Terminal |
The septic process educing in maxillofacial region, section on:
- odontogenic - the initial locus of a purulent inflammation is in a periodontium;
- stomatogenic - the locus of a purulent inflammation is posed in tissues mucous, environmental an oral cavity;
- wound - the cause of development are contaminated wounds;
- tonsillogenic - the abscess is posed in region of tonsils or peripharyngeal tissues space;
- rhinogenic - the source is posed in a nasal sinus;
- othogenic - the locus of a purulent inflammation is on the average an ear.

The variety of forms and clinical manifestations of a sepsis frame appreciable difficulties for his ordering. Classify a sepsis on phases: an initial phase of a sepsis (toxemia), a hematosepsis (a bacteriemia without purulent metastasises) and a septicopyemia (a constant bacteriemia with purulent metastasises). Till now one of most complicated questions in treatment of the general manifestations inflammatory processes still have a question on competency of the term "purulently - absorption fever". In opinion M.I. Cusine and co-authors (1979), purulently - absorption fever should be related to the initial form of manifestation of a sepsis they name its "presepsis". V.G. Bochorishvilly and co-authors (1981) distinguished some variants of a so-called presepsis: a lingering subfebrile condition with constant or rather fast transition in high (it is frequent hectic) a fever; "causeless" one-day (is more often continuing 2-3 hour) rises of a body temperature with a fever and the subsequent down-pour then. These phenomena can proceed 3-4 weeks, and then the interval between rises of temperature decreases also a fever accepts hectic, remittent or constant character. During rather long time (from 1 till 3 months) rise of temperature alternates with its recession.

Purulently - absorption the fever is a general set of symptoms which is closely linked to local suppurative process and is caused by an adsorption of toxic products from the locus of a purulent inflammation. It is characteristic for all pyoinflammatory diseases of maxillofacial region and can be observed within 7 day after dissecting a suppurative focus. Sowings of a blood at patients with purulently - absorption fever are usually sterile. With the first has suggested to define I.V. Davydovsky's given set of symptoms (1944). In development purulently - absorption fevers the basic role are played with an adsorption of products of albuminous disintegration and bacteria. Resorption descends in the lymphogenous and hematogenous way. Long clinical course of this fever can result in weakening the general and specific immune responsiveness of an organism. Simultaneously with an adsorption of toxic products there is a big loss to pus of proteins, enzymes and other materials. At typical extraction tooth with periodontitis, on data E. Sabo (1977), in a circulating blood is possible to find bacteria in 70 % of patients. This bacteriemia in some hours stops. However in some cases the bacteriemia and a toxemia can be prolonged 3-4 days.
The big difficulties at carrying out of differential diagnostics between a sepsis and purulently - absorption fever in early terms of their development are marked by many authors. In case after elimination of a suppurative focus and carrying out of adequate anti-inflammatory medicamental therapy the general manifestations the short-term bacteriemia it is necessary to think is not eliminated and observed, that the patient had initial phase of a sepsis. Despite of awake influence on a suppurative focus, the general state of the patient worsens, the body temperature raises up to 39-40°C (with the big fluctuations within day), there is a fever, a strong headache, a tachycardia, tachypnea, a sleeplessness. If from a blood the pathogenic microflora it specifies development of a hematosepsis is sowed. At this stage of development of a sepsis it is not possible to reveal the purulent metastatic locuses. When on a background of clinical manifestations of a hematosepsis there are purulent metastatic locuses in various members and tissues it specifies development of the following stage of a sepsis - septicopyemias.

The clinical presentation at a sepsis sharply worsens. The patient has exaltation or depression, a icteritiousness of cutaneous, a reddening of cheeks, an eye there are nitidous, labiums - dry and bright, furred tongue becomes frequent and gradually its filling decreases it impose. At the extremely serious forms the hemorrhagic set of symptoms is observed: a hemorrhage on places of injections and the easiest traumas, hemorrhages in fauces, nasal bleedings, a vomiting with an admixing of a scarlet blood or as a coffee grounds, a bloody diarrhea, micro- and a macrohematuria (T.V. Zhernakova, 1981). Changes both red, and white uniform elements of a blood are characteristic. The sepsis is accompanied by quickly increasing anemia which is taped clinically (paleness of integuments and a soft palate, icteritiousness scleras, etc.), and in analysis’s of a blood (decrease of number of erythrocytes and haemoglobin contents). The anemia results from oppression of an erythrogenesis. The most typical changes of white uniform elements of a blood at a sepsis are the expressed leukocytosis with neutrophilic alteration to the left (sharp "rejuvenasence" of leucocytes), appearance of toxic stippling of leucocytes. Erythrocyte sedimentation rate (ESR) than 50 mm / h are enlarged more. Studying of activity coagulate fibrinolytic properties of a blood at patients with a sepsis has allowed L.P. Malchikovoj and G.A. Kraskovskoj (1982) to reveal radical changes in system blood coagulation. At this morbid condition authors mark augmentation human globulin fractions of blood. In their opinion, it can influence rising of proteolytic activity of a blood for it is known, that the protein shadowing proteolytic enzymes from action of inhibitors, is basically in an alpha-2-globulin fractions.

The hardest complication of a sepsis is the septic shock. It arises owing to influence on an organism of the patient of bacterial toxins and insufficient maintenance of tissues of an organism with Oxygen is expressed in radical changes of functions of all of its systems from which on the foreground infringement of a circulation acts, the respirations. For last decade frequency of cases of a septic shock has increased in 2-3 times.
Releaser of development of a septic shock is the expressed bacteriemia with the subsequent abjection in a blood of a significant amount of bacterial endotoxins. At this state the fragmentation of red bloody cells that is surveyed as investigation of disseminated intravascular coagulation (M.I. Cusin and co-avt., 1983). By authors it is revealed, that originating of a poikilocytosis at a sepsis is caused by a bacterial intoxication. As a result of immediate or mediated actions of bacterial toxins on erythrocytic membranes variate physical and chemical properties of a lipide biolayer of these uniform elements.

Treatment is necessary complex, which will consist of the general (antibacterial and an immunotherapy, infusion-transfusion treatment) and a surgical intervention on the locus of an infection contamination - local treatment of suppurative focuses, a sanitation of site of entry, struggle against systemic infection, modification therapy.

**Mediastinitis** - an inflammation of a fat of a mediastinum.

Mediastinum - the space posed between leaf mediastinum of a pleura, a breast bone and a thoracic part of a column.

Mediastinum is conditional part on anterior, back, and also on top, average, inferior.

In a anterior mediastinum thymus, heart, a trachea, an ascending part and an aortic arch, precava, pulmonary arteries and nerves, phrenic veins and nerves are placed. In back - esophagus, a thoracic lymphatic duct, the inferior part of a vagus nerve, unpaired and hemiazygos the veins, a descending aorta.

Diffusion of pus at inflammatory processes of bottom of an oral cavity and a neck descends on deep fascial-fat to spaces of a neck through previsceral space and vascular fissures and is intercommunicate to an anterior mediastinum, and through retrovisceral space - with back.

The suspicion on a odontogenic mediastinitis arises in that case when despite of a sufficient incision and an adequate drainage of a suppurative focus, and also a conductive intensive care, the general state of the patient the body temperature rise, pulse - 130-150 in 1 minutes worsens, weak filling and a strain, and infringement on the part of psychical activity.

**Signs of a mediastinitis anterior:**
a) Sign Gerke - intensifying of a pain at retroversion heads;
b) Ivanov's sign - intensifying of a pain at moving a neurovascular fascicle of a neck up;
c) jugular sign Ravich-Shcherbo - a retraction of a part bulbar recesses at an inspiration;
d) sign Popovs - a constant tussiculation;
g) compression sign - a pain in region of a mediastinum at a percussion on heels the outstretched leg in a horizontal position;
i) sign Rutenberg-Revutsky - intensifying of a retrosternal pain, a short wind, a dysphagia at passive shifts of a trachea.

**Signs of a posterior mediastinitis:**
a) Sign Ridingers - a pain strengthens at attempt to swallow meal or during a deep inspiration;
b) Juxtaspinal sign Ravitch-Sherbo-Shtenbergs - a rigidity long muscles of a back which has reflex character;
c) The sign of a prelum unpaired and hemiazygos veins - is observed dilating intercostal veins, appearance of an exudate in a pleura and a pericardium.

Physical examination of the patient has insignificant informativity. The important diagnostic method of research is the roentgenography which is carried out in front-back, lateral and slanting projections. The X-ray examination allows to reveal changes of contours of a mediastinum, and also presence of convex shades of the spherical form in the top parts, more often on the one hand. Dilating a shade of a mediastinum and appearance of a horizontal level of fluid with air bubbles, or presence of free gas in a mediastinum is marked. For revealing dynamics of process the X-ray examination is necessary for repeating every 2-3 day.

Mediastinotomy - incision of a mediastinum for a surgical intervention on heart, an aorta, an esophagus, at purulent process of a mediastinum. Apply a median or lateral mediastinotomy by V.I. Rozumovsky (1899) in various paravariations more often.

6. Materials for self control:
A. Assignments for self control (tables, charts, drawings, graphs)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Recommendations</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>To seize procedure of examination of the patient.</td>
<td>To carry out in such sequence: 1. Interrogation of the patient (the complaint, an anamnesis of disease). 2. Survey of the patient, a palpation, a percussion, probing. 3. Additional methods of diagnostics (immunoassay of a blood, a cytologic method, serological tests).</td>
<td>To pay attention to an aggravation of symptoms of the patient, not beginning from carried out local treatment and the general, that is carried out. X-ray examination, remote infra-red thermodiagnostic, analysis of a blood on a microflora, etc.</td>
</tr>
<tr>
<td>To carry out observation of the patient.</td>
<td>During examination to reveal attributes of a sepsis, a mediastinitis.</td>
<td>To pay attention to correctness of filling of a case history.</td>
</tr>
<tr>
<td>To appoint treatment.</td>
<td>To appoint the general and local treatment.</td>
<td></td>
</tr>
</tbody>
</table>

B. Self-control tests:
PROBLEM №1.
The mediastinum shares on:
A. Anterior and posterior.
B. Top, average, inferior.
C. Anterior, inferior and posterior.
D. Anterior, posterior, top, average, inferior.
E. Medial, average, lateral.

PROBLEM №2.
Into an anterior mediastinum does not enter:
A. Heart.
B. An aortic arch.
C. An esophagus.
D. A trachea.
E. Diaphragms veins and nerves.

PROBLEM №3.
Into a posterior mediastinum does not enter:
A. An esophagus.
B. A thoracal lymphatic duct.
C. The inferior part of a vagus nerve.
D. A trachea.
E. A descending aorta.

PROBLEM №4.
Distinguish the following forms of mediastinites:
A. Serous.
B. Purulent.
C. Putrefactive.
D. Anaerobic.
E. Diffuse.

PROBLEM №5.
Signs Gerke, Ivanov, Ravich-Shcherbo characteristic for:
A. Phlegmons floor of the mouth.
B. Pneumonias.
C. Mediastinitis.
D. Sepsis.

PROBLEM №6.
The sepsis is:
A. A morbid condition caused by periodic entering in a blood of microorganisms from a suppurative focus which is characterized by disharmony of serious general infringements and local manifestations.
B. A morbid condition caused by periodic or constant entering in a blood of microorganisms from a suppurative focus which is characterized by disharmony of serious general infringements and local manifestations and often educations of suppurative focuses in different members and tissues.
C. Purulent disease of a skin.
D. A chronic intoxication of an organism.
E. A chronic infectious disease.

**PROBLEM № 7.**

Changes in a peripheric blood at the patient with a sepsis:
A. Lowering of quantity of erythrocytes.
B. Lowering of quantity of a haemoglobin.
C. Lowering of a color parameter.
D. Rising a color parameter.
E. A leukocytosis with sharp alteration to the left, appearance of juvenile forms, toxic stippling of leucocytes.

**C. Tasks for self-control:**
The patient of 55 years has arrived in clinic of maxillofacial surgery with the diagnosis: a phlegmon floor of mouth with diffusion of purulent process to pterygoid - mandibular and peripharyngeal spaces at the left. To the patient the phlegmon is opened, suppurative focuses are drained, extracted causal tooth. The appointed massive antibacterial therapy, however, during the next several hours the state of the patient has worsened. The temperature has got intermittent character. There was a loss of consciousness, attributes of respiratory failure, arterial pressure has decreased up to 80/50 mm of a hg, a tachycardia - 150 strokes in one minutes.

1. What development of complication can be suspected at the patient?
2. What additional methods of examination are necessary for carrying out for specification of the diagnosis?
3. What complications can arise at the patient?

**7. Bibliography.**

**Basic:**
2. Hupp JR, Williams TP, Vallerand WP: The 5 minute clinical consult for dental professionals PDA, Baltimore, 2002, Williams & Wilkins

**Additional:**

Methodical development is prepared by docent Rezvina Ye. Yu.
STANDARDS OF ANSWERS.

Tests:
1 - D, B; 2 - C; 3 - D; 4 - A, B, E; 5 - C, 6 - B; 7 - A, B, I.

Standards of answers to a problem:
1. A sepsis.
2. Clinical analysis of a blood, a bacteriological blood analysis.
3. A septic toxi-infectious shock, a set of symptoms of disseminated intravascular coagulation of a blood.