MINISTRY OF HEALTH OF UKRAINE
KHARKIV NATIONAL MEDICAL UNIVERSITY

Preparation to MLE «STEP 2" in disciplines «Pulmonology" and "Occupational diseases", based on materials of MLE "STEP 2" 2017–2018

Methodical instructions for students of 6th course of medical faculty

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Preparation to MLE «STEP 2" in disciplines «Pulmonology" and "Occupational diseases", based on materials of MLE "STEP 2" 2017–2018: methodical instructions for students of 6th course of medical faculty / authors V.A. Kapustnik, I.F. Kostuk, O.O. Kalmykov, B.O. Shelest, O.L. Arkhipkina, A.Ya. Melenevich, V.M. Tverezovskyi, – Kharkiv: KhNMU, 2019. – 28 p.

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INTRODUCTION

Licensed integrated examination “STEP” is complex tool for standardized diagnostics of level of professional competence, which is a part of State examination of students, who study in specialty “Medicine” and doctors, who pass primary specialization, in Universities, independently on their conformity.

“STEP 2” is the exam of professionally-oriented disciplines, which in their content meet educational-professional program of training of specialists. “STEP 2” is a part of State attestation of students and is being passed on last course. Future doctors study complete course of medical and biological subjects, part of which is an occupational pathology.

Nowadays, diseases of respiratory organs take fourth place in structure of human pathology, which determines temporary or total loss of working capacity. The most prevalent are chronic obstructive lung diseases, bronchial asthma and pneumonias, which lead to such complications, as lung failure, pleurisy and suppuration processes in lungs; acute lung failure, pneumothorax and lung bleeding.

Besides, some influences have occupational factors, which are accompanied with increased dust content. However, despite scientific progress, there are still intoxications with occupational poisons (Carbon monoxide, Nitrogen etc.), chronic intoxications with led, mercury, benzene, etc., influence of electromagnetic radiation and vibration. These factors actualize studying of those medical courses.

Thus, these methodical materials are directed on support of answers in “Pulmonology” and “Occupational diseases” for examination of professionally-oriented subjects of “STEP 2” for 2017–2018 for students, which study “Medicine”.

EXAMPLES OF TASKS WITH EXPLANATION

PULMONOLOGY, 2017

Task 1. (24). A 40-year-old patient has acute onset of disease caused by overexposure to cold. Temperature has increased up to 39ºC. Foul-smelling sputum is expectorated during coughing. Various moist crackles can be auscultated above the third segment on the right. Blood test: leukocytes – 15,0·109/l, stab neutrophils – 12%, ESR- 52 mm/hour. On X-ray: In the third segment on the right, there is a focus of shadow3cmindiameter, low density, with fuzzy smooth margins and a clearing in its center. What disease is most likely in the given case?

A. Pneumonia complicated by an abscess
B. Infiltrative tuberculosis
C. Peripheral pulmonary cancer
D. Cystic echinococcosis
E. Pulmonary cyst

Correct answer: *A. Pneumonia complicated by an abscess*

Explanation:

Chest radiography (postero-anterior and lateral views) has been shown to be a critical component in diagnosing pneumonia CXR findings of a new infiltrate. Chest radiography may reveal a lobar consolidation, which is common in typical pneumonia. Although there is no gold standard for the diagnosis of community acquired pneumonia (CAP), a new infiltrate on chest radiograph in the setting of acute respiratory complaints (e.g., cough and dyspnea) is considered highly suggestive of CAP. At least 2 of the four need to be present. The four symptoms are fever (Temperature greater than 38°C), cough (with or without sputum,), dyspnea, chest pain. Physical examination may reveal dullness to percussion of the chest, crackles or rales on auscultation, bronchial breath sounds, tactile fremitus,. A white blood cell count greater than 10,400 per mm3 (10.40 × 109 per L;) and a C-reactive protein level of 5.0 mg per dL (47.62 nmol per L) or greater are modestly helpful when positive, but it is important to note that normal values do not rule out pneumonia.

Differential diagnosis includes excavating tuberculosis and mycosis, but seldom can been seen radiological sign of gas-liquid level. Pulmonary cystic lesions, such as intrapulmonary located bronchial cysts, sequestration or secondary infected emphysematous bullae can be difficult to differentiate, but localization of lesion and clinical signs can indicate the appropriate diagnosis. Localized pleural empyema can be distinguished by using CT scan or ultrasound.

Excavating bronchial carcinomas such as squamocellular or microcellular carcinoma are usually presented with thicker and irregular wall comparing to infectious lung abscess. Absence of febricity, purulent sputum and leukocytosis can indicate the carcinoma and not the infective disease. Radiological sign of air-fluid level can be seen and in hydatid cyst of lung.

Source: Davidson's essentials of Medicine, 2nd edition by J. Alastair Innes. Elsevier 2016. P. 289-293

Task 2. (31). On the 4th day after recovery from a cold a patient was hospitalized with complaints of solitary spittings of mucoid sputum. On the 2nd day there was a single discharge of about 250 ml of purulent blood-streaked sputum. Objectively: the patient's condition is moderately severe. Respiratory rate 28-30/min., Ps- 96/min., BP- 110/70 mm Hg. Respiration over the left lung is vesicular, over the right lung — weakened. There are various moist crackles over the lower lobe and amphoric breath sounds near the angle of scapula. What is the most likely diagnosis?

A. Acute pulmonary abscess
B. Exudative pleuritis
C. Acute focal pneumonia
D. Pleural empyema
E. Pyopneumothorax

Correct answer: *A. Acute pulmonary abscess*
Explanation:
"On the 2nd day there was a single discharge of about 250 ml of purulent blood-streaked sputum" and «amphoric breath sounds near the angle of scapula." are pathognomonic data for Acute pulmonary abscess.

The disease begins acutely: chills, fever, chest pain. After pus breaks through into the bronchus, a large amount of purulent sputum is secreted, sometimes with blood and an unpleasant odor. Above the lung lesion zone, weakened breathing is first heard, after an abscess breakthrough, bronchial breathing and moist rales are heard. Within 1-3 months, a favorable outcome may occur: a thin-walled cyst in the lung or focal pulmonary fibrosis; unfavorable outcome — abscess becomes chronic.

At radiography of the lungs, a massive darkening is detected at the initial stage, after an abscess is breached, a cavity with a level of fluid in it. Bronchoscopy often shows inflammatory changes in the wall of the bronchus associated with an abscess. In the analysis of blood – leukocytosis, shift of the leukocyte formula to the left, an increase in ESR.

Before opening into the draining bronchus, lung abscess is manifested by fever with sweat, chills, malaise, dry cough, and sometimes chest pains of an

indefinite nature. After a cavity is breached, a cough appears in the bronchus, accompanied by a discharge of purulent sputum with an unpleasant odor, sometimes mixed with blood. Before abscess emptying, dullness of percussion sound and weakening of breathing in the affected area can be determined. After the formation of a cavity above it, voiced large-bubble rales, bronchial respiration with an amphoric shade are heard. With percussion, you can detect a sound with a tympanic hue. Prior to cavity formation, the diagnosis of a lung abscess is difficult. Pulmonary suppuration should be suspected with prolonged pneumonia with prolonged fever and persistent leukocytosis. With the breakthrough of an abscess in the bronchus, radiologically, a cavity is detected radiographically in the former site of darkening.

This purulent-destructive limited process in the lungs. It is characterized by the formation of one or several cavities with purulent contents in the lung parenchyma, surrounded by granulation tissue, a zone of perifocal inflammatory infiltration; proceeds with severe intoxication and fever.

Source: Davidson's essentials of Medicine, 2nd edition by J. Alastair Innes. Elsevier 2016. P. 289-293

Task 3. (52). A 23-year-oldman had taken 1g of aspirin to treat acute respiratory infection. After that he developed an asthmatic fit with labored expiration that was arrested by introduction of aminophylline. The patient has no medical history of allergies. The patient has undergone two surgeries for nasal polyposis in the past. What is the most likely diagnosis?

A. Aspirin-induced asthma.
B. Atopic bronchial asthma
C. Infectious allergic bronchial asthma
D. Exercise-induced asthma
E. Symptomatic bronchospasm

Correct answer: *A. Aspirin-induced asthma.*

Explanation:

Scientific evidence has proven that aspirin can cause asthma attacks. And if there are indications of its reception, then with a greater probability, we can say that it is aspirin-induced asthma. There are no other causes for asthma marked in the task: no exercise. Exercise-induced bronchospasm is an obstruction of transient airflow that usually occurs five to 15 minutes after physical exertion, Diagnosis is based on the results of a detailed history, including assessment of asthma triggers, symptoms suggestive of exercise-induced bronchoconstriction, and a normal forced expiratory volume at one second at rest. There are no evidences for infections and allergy.

Source: Davidson's essentials of Medicine, 2nd edition by J. Alastair Innes. Elsevier 2016. P. 277-280

Task 4. (150). A 52-year-old patient suffers from marked dyspnea during physical exertion, non-productive cough. The patient's condition has been persisting for 8 months. The patient has been a smoker for 30 years. In the lungs there are cellophane-type crackles auscultated on both sides. Respiration rate is 26/min., oxygen saturation of blood is 92%. On spirometry: moderate restrictive-type disturbance of external respiration. What is the most likely diagnosis?

A. Idiopathic fibrosing alveolitis
B. Chronic obstructive pulmonary disease (COPD)
C. Chronic bronchitis
D. Community-acquired pneumonia
E. Sarcoidosis

Correct answer: *A. Idiopathic fibrosing alveolitis*
Explanation:

If a patient suffering from chronic obstructive pulmonary disease (prolonged smoking, persistent dyspnea and unproductive cough) and in addition it is heard the cellophane type crackling and there are restrictive disorders of external respiration, this is in favor of idiopathic fibrosing alveolitis.

The disease is most common in patients over the age of 50 years. There is a predominance of the disease in men. The main complaints of patients are shortness of breath and unproductive cough. Sometimes there is a productive cough (up to 20%), even the production of purulent sputum, especially in patients with severe forms of IFA. Fever is not typical for IFA. Hemoptysis is also not characteristic of ELISA, and the appearance of this trait in an IFA patient should guide the doctor to look for a lung tumor, which in IFA patients occurs 4–12 times more often than in general population, even after taking into account the history of smoking. Other symptoms can be general weakness, arthralgia, myalgia, changes in the nail phalanges in the form of "drumsticks" (up to 70%).

On this case it essential clue for IFA is a patricular characteristic auscultatory phenomenon which is compared to "cellophane crackling" or a zipper lock ("Velcro").

Compared with crepitus in other diseases (pneumonia, bronchiectasis, congestive processes in the lungs), crepitus in IFA is more gentle (fine crackles): less loud and higher in frequency, heard at the height of inhalation, in the end-inspiratory period

Most often, wheezing is heard in the posterior basal areas, although as the disease progresses, crepitus may be heard over the entire surface of the lungs and throughout the inspiratory phase. In the early stages of the disease, basal crepitus may weaken or even completely disappear when the patient is tilted forward. Dry rales can be heard in 5–10% of patients and usually appear with concomitant bronchitis. Up to 50% of all patients have tachypnea.

As the disease progresses, signs of respiratory failure and pulmonary heart disease appear: diffuse ash-gray cyanosis, increased II tone above the pulmonary artery, tachycardia, swelling of the neck veins, peripheral edema. A decrease in the body weight of patients, up to the development of cachexia, is a characteristic feature of the terminal phase IFA.

On the radiograph – the strengthening and deformation of the pulmonary pattern, reticulation due to the proliferation of connective tissue around the pulmonary lobules (picture of the “honeycomb lung”). There is a symptom of "Frosted Lung" (gentle homogeneous darkening of the lung fields), often in the lower regions of the lungs and subpleural. More sensitive diagnostic methods are scanning with gallium-67 and bronchoalveolar lavage (bronchoscopy with bronchial lavage and subsequent examination of the washing liquid).

Source: Davidson’s essentials of Medicine, 2nd edition by J. Alastair Innes. Elsevier 2016. P. 304-309.

Task 5. (185). A 57-year-old patient complains of dyspnea at rest. The patient presents with orthopnea, acrocyanosis, bulging cervical veins. On percussion: dull sound over the lower lungs segments; on auscultation: no respiratory murmurs. Heart rate is 92/min. Right-sided cardiac dilatation is observed. The liver is enlarged by 7 cm. Shins are swollen. Pleural effusion is suspected. What indicator would confirm the presence of transudate in this case?

A. Total protein content in the pleural fluid below 25 g/l
B. Presence of atypical cells
C. Total protein content in the pleural fluid above30 g/l
D. Specific gravityexceeding1015
E. Positive Rivalta’s test

Correct answer: *A. Total protein content in the pleural fluid below 25 g/l*

Explanation:

The presence of transudate in the pleural effusion is indicated by the protein indicator in the pleural fluid below 25 g/l, also the presence of orthopnea, acrocyanosis, bulging cervical veins, right-sided dilatation of the heart, enlarged liver, swelling of the legs indicate the presence of heart failure

in a patient with transudate in the pleural cavity. Answers C. Total protein content in the pleural fluid above30 g/l D. Specific gravity exceeding 1015 E. Positive Rivalta's test are evidences of exudate atypical cells can not be the differential marker between transudate and exudates.

Source: Davidson's essentials of Medicine, 2nd edition by J. Alastair Innes. Elsevier 2016. P. 484

Task 6. (188). During routine medical examination a 35-year-old woman presents with enlarged cervical and mediastinal lymph nodes. Her overall health is satisfactory. ESR is 30 mm/hour. Cervical node biopsy was performed. In the specimen there are granulomas composed of epithelial and giant cells, no caseous necrosis detected. What is the most likely diagnosis?

A. Sarcoidosis
B. Lymphogranulomatosis
C. Infectious mononucleosis
D. Nonspecific lymphadenitis
E. Lymph node tuberculosis

Correct answer: *A. Sarcoidosis*

Explanation:

An increase in mediastinal lymph nodes with a satisfactory general condition and an increase in ESR, as well as the presence of granulomas with giant and epithelial cells during biopsy in the cervical node, are in favor of sarcoidosis.

Sarcoidosis (Bénier-Beck-Shauman disease) is an inflammatory disease that can affect many organs and systems (particularly the lungs), characterized by the formation of granulomas in the affected tissues (this is one of the diagnostic signs of the disease that can be detected by microscopic examination; limited areas of inflammation having the form of a dense nodule of various sizes). Most often affects the lymph nodes, lungs, liver, spleen, less often — skin, bones, eye organ, etc. Sarcoidosis does not apply to infectious diseases and is not transmitted to others. The disease develops more often in young and middle age, somewhat more often in women. Sarcoidosis can be asymptomatic for a long time and can be detected by chance (for example, with X-ray or chest x-ray during a routine examination).

Detection of giant Reed-Berezovsky-Sternberg cells and their mononuclear precursors, Hodgkin cells, in biopsy specimens is an mandatory criterion for the diagnosis of lymphogranulomatosis. Infectious mononucleosis is an acute viral disease, which is characterized by fever, lesions of the pharynx, lymph nodes, liver, spleen, and peculiar changes in the blood structure of the body.

Source: Davidson's essentials of Medicine, 2nd edition by J. Alastair Innes. Elsevier 2016. P. 306-307

Task 7. (197). A 19-year-old young man complains of cough with expectoration of purulent sputum in amount of 100 ml per day, hemoptysis, dyspnea, increased body temperature up to 37,8oC, general weakness, weight loss. The patient's condition lasts for 4 years. Exacerbations occur 2-3 times a year. The patient presents with malnutrition, pale skin, cyanosis of the lips, drumstick (clubbed) fingers. Tympanic percussion sound in the lungs, weakened respiration, various numerous moist crackles in the lower pulmonary segments on the left can be observed. In blood: erythrocytes – 3,2·1012/l, leukocytes — 8,4 109/l, ESR- 56 mm/hour. OnX-ray: lung fields are emphysematous, the left pulmonary root is deformed and dilated. What is the most likely diagnosis?

A. Multiple bronchiectasis of the left lung
B. Chronic left-sided pneumonia
C. Chronic abscess of the left lung
D. Left-sided pulmonary cystic dysplasia
E. Suppuration of the cyst in the left lung

Correct answer: *A. Multiple bronchiectasis of the left lung*

Explanation:

The presence of cough with expectoration of purulent sputum in an amount of up to 100 ml per day with hemoptysis and a long inflammatory process in the bronchi (about 4 years) and an increase in ESR up to 56 mm/hour give rise to the fact that multiple bronchiectasis in the left lung can be suspected. Usual signs of multiple bronchiectasis of the left lung:

- Cough with purulent sputum, which occurs with characteristic regularity in the morning on waking and in the evening on going to sleep
- Hemoptysis
- Chest pain on breathing (rarely)

Examination:

- Barrel chest (especially in atelectatic bronchiectasis)
- Nails in the form of "watch glass"
- Fingers deformation in the form of "drumsticks"
- Auscultation — stable localization of moist rales
- Symptoms of respiratory failure
- Symptoms of pulmonary heart.

Bronchiectasis is an expansion of the lumen of the bronchus in the form of a cylinder or a bag. Can be congenital and acquired.

Pathogenesis: when coughing increases the pressure inside the bronchi, which leads to bulging of the wall of the bronchus. Macro anatomy – bronchiectasis can be in the form of a cylinder or a bag; dilatation of bronchioles – bronchiolectasis. In case of multiple bronchiectasis and bronchiolarectasis, the lungs are similar to the honeycomb in the incision. Micro anatomy – mucous membrane of bronchiectasis is often represented by stratified squamous epithelium (with metaplasia), sclerosis in the wall, purulent exudate in the cavity. In the surrounding tissue – pneumosclerosis, foci of inflammation.

Source: Davidson's essentials of Medicine, 2nd edition by J. Alastair Innes. Elsevier 2016. P. 285-287

OCCUPATIONAL DISEASES, 2017

Task 1. During the periodic medical examination an assembly fitter (works on soldering details) didn't report any health problems. Closer examination revealed signs of asthenic vegetative syndrome. Blood included red blood cells with basophilic aggregations and a somewhat higher number of reticulocytes, urine had a high concentration of delta-aminolevulinic acid. The complex of symptoms indicates the initial stage of chronic intoxication with:

A. Lead
B. Manganese
C. Mercury
D. Tin
E. Ethanol

Correct answer: *A. Lead*

Explanation:

Firstly, pay attention to the fact that the person worked with the soldering. Then, increased level of reticulocytes and erythrocytes with basophilic stippling. At last, the hallmark evidence of chronic lead intoxication is increased urinary excretion of delta-aminolevulinic acid.

Source: The textbook "Occupational diseases" Kyiv AUS Medicine Publishing 2016. Edited by V.A. Kapustnik, I.F. Kostuk. P. 200-207

Task 2. A 37-year-old worker during a fire ended up in the area of high CO concentration. He was delivered to a hospital in unconscious state. Objectively: the skin of his face and hands is crimson. Respiration rate is 20/min. ECG: alterations specific for hypoxic myocardium. Hourly diuresis is 40 ml. Blood test: erythrocytes — 4,5 · 1012/l, Hb- 136 g/l, color index —

0,89, ESR- 3 mm/hour, carboxyhemoglobin – 5%. What criterion allows determining the severity of the patient's condition?

A. Carboxyhemoglobin concentration
B. Respiratorydisorders
C. ECG results
D. Extent of trophic disorders
E. Development of chronicrenal failure

Correct answer: *A. Carboxyhemoglobin concentration*
Explanation:

The present patient has acute poisoning of CO. The toxic properties of carbon monoxide make it a strong poison affecting the blood. High affinity of carbon monoxide for ferrous iron of hemoglobin, which is almost 300 times greater than the affinity of hemoglobin for oxygen, triggers its toxic effect on the body. Carbon monoxide forms carboxyhemoglobin displacing oxygen from its compounds with hemoglobin. Furthermore, part of hemoglobin becomes inactive, causing disruption of oxygen transportation to tissues and resulting in hypoxia. The amount of formed carboxyhemoglobin is proportional to partial pressure of carbon monoxide and inversely proportional to the pressure of oxygen in the inhaled air. Severity is largely determined by the percentage of carboxyhemoglobin content in the blood and state of consciousness.

Source: The textbook "Occupational diseases" Kyiv AUS Medicine Publishing 2016. Edited by V.A. Kapustnik, I.F. Kostuk. P. 200-207

Task 3. A man works in casting of nonferrous metals and alloys for 12 years. In the air of working area there was registered high content of heavy metals, carbon monoxide, and nitrogen. During periodic health examination the patient presents with asthenovegetative syndrome, sharp pains in the stomach, constipations, pain in the hepatic area. In urine: aminolevulinic acid and coproporphyrin are detected. In blood: reticulocytosis, low hemoglobin level. Such intoxication is caused by:

A. Lead and lead salts
B. Tin
C. Carbon monoxide
D. Nitric oxide
E. Zinc

Correct answer: *A. Lead and lead salts*
Explanation:

The presence of asthenovegetative syndrome, sharp pains in the stomach, constipations, pain in the hepatic area are common for lead

intoxication. Changes in the digestive tract: the cramping abdominal pain, persistent constipation are referred to so-called lead colic. Blood changes presented by reticulocytosis, low hemoglobin level also typical of lead intoxication. In addition, at last, the increased level of aminolevulinic acid and coproporphyrin in urine is proof for lead intoxication.

Source: The textbook "Occupational diseases" Kyiv AUS Medicine Publishing 2016. Edited by V.A. Kapustnik, I.F. Kostuk. P. 200-207

Task 4. During assessment of work conditions at the mercury thermometer manufacture, content of mercury vapors in the air of working area is revealed to exceed maximum concentration limit. Specify the main way of mercury penetration into the body:

A. Respiratory organs
B. Intact skin
C. Damaged skin
D. Gastrointestinal tract
E. Mucous tunics

Correct answer: *A. Respiratory organs*

Explanation:

Metallic mercury is present in the air as vapor. Mercury can enter the body through the respiratory system (in the form of vapor and aerosol) through the GI tract or the skin. As it was found as mercury vapors, so the way of penetration is respiratory organs.

Source: The textbook "Occupational diseases" Kyiv AUS Medicine Publishing 2016. Edited by V.A. Kapustnik, I.F. Kostuk. P. 275-279.

Task 5. During health assessment of car drivers and police officers on point duty, the physicians detected carboxyhemoglobinin the blood of the patients, weakened reflex responses, disturbed activity of a number of enzymes. Revealed professional health disorders are most likely to be associated with the effect of:

A. Carbonmonoxide
B. Sulfurous anhydride
C. Mental stress
D. Aromatichydrocarbons
E. Nitric oxide

Correct answer: *A. Carbonmonoxide*

Explanation. Carbon monoxide forms carboxyhemoglobin by displacing oxygen from its compounds with hemoglobin. Furthermore, part of

hemoglobin becomes inactive, causing disruption of oxygen transportation to tissues and resulting in hypoxia. The main pathological processes observed in the acute carbon monoxide poisoning include changes in the peripheral blood. Thus, the blood assay in patients with the mild intoxication reveals eruthrocytosis, hyperhemoglobinemia, sometimes neutrophilia, increased blood viscosity and slow ESR. Carboxyhemoglobin in the blood is determined at the peak of intoxication.

Source: The textbook "Occupational diseases" Kyiv AUS Medicine Publishing 2016. Edited by V.A. Kapustnik, I.F. Kostuk. P. 194-200.

Task 6. A 47-year-old man is employed at the weaving workshop, has 15-year-long record of service at this factory; his work conditions are associated with high-frequency and high-intensity noise. During periodical examination he was diagnosed with occupational deafness. What are the grounds for making such a diagnosis?

A. Audiometry data and hygienic assessment of working environment
B. Record of service at this factory
C. Noise characteristic at this factory
D. Central nervous system examination results
E. Inner ear examination results

Correct answer: *A. Audiometry data and hygienic assessment of working environment*

Explanation:

Diagnosis of occupational deafness is established on the basis of occupational history, sanitary and hygienical characteristic of working conditions, considerations of the patients' complaints, medical history and past history, instrumental examination of the acoustic and vestibular apparatus, the cardiovascular and nervous systems. Pay attention that the essential methods of examination of people working under conditions of influence of noise are: tonal (4-8 thousand Hz) and speech audiometry as well as tests for auditory detection of 50% and 100% of speech. In some cases of working capacity examination, objective audiometry is necessary to be carried out.

Source: The textbook "Occupational diseases" Kyiv AUS Medicine Publishing 2016. Edited by V.A. Kapustnik, I.F. Kostuk. P. 112-122.

Task 7. Survey radiograph of a 52-year-old worker of an agglomeration plant (28-yearlong record of service, the concentration of metal dust is 22-37 mg/m3) shows mildly pronounced interstitial fibrosis with diffused contrasting well-defined small nodular shadows. The patient has no complaints. Pulmonary function is not compromised. What is the provisional diagnosis?

A. Siderosis
B. Silicosis
C. Anthraco-silicatosis
D. Silicatosis
E. Anthracosis

Correct answer: *A. Siderosis*
Explanation:

Siderosis is metalloconiosis caused by inhalation of metal and iron dust. His work place indicates on possibility of metalloconiosis (siderosis is a type of metalloconiosis). The rest of answers are referred to pneumoconiosis. The clinical presentation of siderosis is quite poor (The patient has no complaints). The respiratory function remains unchanged — that is typical for siderosis. In addition, only X-ray shows the interstitial fibrosis and disseminated finely nodular opacities with distinct borders, which are the regions of accumulation of metal dust. Thus, diagnosis of siderosis is based on X-ray examination findings with paying attention to the dust composition present in industry, where the patient works.

Source: The textbook "Occupational diseases" Kyiv AUS Medicine Publishing 2016. Edited by V.A. Kapustnik, I.F. Kostuk. P. 63-64.

Task 8. A 37-year-old man working as a typesetter in a print shop complains of rapid fatigability, paroxysmal attacks of stomachache, weak drooping hands. Examination of neurological status revealed hypotrophy of the forearm muscles. Carporadial reflexes are sharply weakened. Sensitivity is not disturbed. Gums present with dark blue border. What neurological pathology is it?

A. Lead polyneuropathy
B. Guillain-Barre syndrome (postinfectious polyneuritis)
C. Shingles
D. Ulnar neuropathy
E. Brachialplexitis

Correct answer: *A. Lead polyneuropathy*
Explanation:

First, pay attention that the patient is involved in typing industry that can be associated with the lead intoxication. Then, it is described typical clinical symptoms of the chronic lead intoxication: the so-called antebrachial paralysis is a typical form of polyneuritis developing under the impact of lead. The syndrome is primarily characterized by the impairment of extensor of hands and fingers. The process begins with an impairment of common digital extensor

with subsequent paresis of the remaining extensors of the fingers and hands. Pre-eminent disorder of the radial nerve causes a forced position of the hand, which drops in semipronation at a right angle. In the severe forms of the chronic lead intoxication the patients often complain of the so-called lead colic, manifested by the cramping paroxysmal abdominal pain. Moreover, quite hallmark for lead intoxication is the presence of lead margin on the gums.

Source: The textbook "Occupational diseases" Kyiv AUS Medicine Publishing 2016. Edited by V.A. Kapustnik, I.F. Kostuk. P. 200-207.

PULMONOLOGY, 2018

Task 1. A 40-year-old patient has acute onset of disease caused by overexposure to cold. Temperature has increased up to 39ºC. Foul-smelling sputum is expectorated during coughing. Various moist crackles can be auscultated above the 3rd segment on the right. Blood test: leukocytes — $15{,}0\times10^9$/l, stab neutrophils — 12%, ESR — 52 mm/hour. On X-ray: in the 3rd segment on the right there is a focus of shadow 3 cm in diameter, low density, with fuzzy smooth margins and a clearing in its center. What disease is most likely in the given case?

A. Pneumonia complicated by an abscess
B. Infiltrative tuberculosis
C. Peripheral pulmonary cancer
D. Cystic echinococcosis
E. Pulmonary cyst

Correct answer: *A. Pneumonia complicated by an abscess.*

Explanation:

Chest radiography (posteroanterior and lateral views) has been shown to be a critical component in diagnosing pneumonia CXR findings of a new infiltrate. Chest radiography may reveal a lobar consolidation, which is common in typical pneumonia. Although there is no gold standard for the diagnosis of community acquired pneumonia (CAP), a new infiltrate on chest radiograph in the setting of acute respiratory complaints (e.g., cough and dyspnea) is considered highly suggestive of CAP. At least 2 of the four need to be present. The four symptoms are fever (Temperature greater than 38°C), cough (with or without sputum,), dyspnea, and chest pain. Physical examination may reveal dullness to percussion of the chest, crackles or rales on auscultation, bronchial breath sounds, tactile fremitus,. A white blood cell count greater than 10,4/mm3 (10.40×10^9/L;) and a C-reactive protein level of 5.0 mg/dL (47.62 nmol/L) or greater are modestly helpful when positive, but it is important to note that normal values do not rule out pneumonia

Differential diagnosis includes excavating tuberculosis and mycosis, but seldom can been seen radiological sign of gas-liquid level. Pulmonary cystic lesions, such as intrapulmonary located bronchial cysts, sequestration or secondary infected emphysematous bullae can be difficult to differentiate, but localization of lesion and clinical signs can indicate the appropriate diagnosis. Localized pleural empyema can be distinguished by using CT scan or ultrasound.

Source: Davidson's essentials of Medicine, 2nd edition by J. Alastair Innes. Elsevier 2016. P. 289-293.

Task 2. During physical exertion a man suddenly developed acute chest pain on the right and dyspnea. Objectively he assumes forced halfsitting position in the bed, presents with diffuse cyanosis, resting tachypnea of 38/min., the right side of the thorax is enlarged and does not participate in the respiratory process; percussion on the right reveals tympanic resonance and absence of respiration. What is the most likely diagnosis in this case?

A. Spontaneous pneumothorax
B. Hemothorax
C. Lobar pneumonia
D. Pulmonary embolism
E. Acute pleurisy

Correct answer: *A. Spontaneous pneumothorax.*

Explanation:

Pneumothorax is the presence of air in the pleural space, which can either occur spontaneously, or result from iatrogenic injury or trauma to the lung or chest wall. Primary spontaneous pneumothorax occurs in patients with no history of lung disease. Smoking, tall stature and the presence of apical subpleural blebs are known risk factors. Secondary pneumothorax affects patients with pre-existing lung disease, especially COPD, bullous emphysema and asthma. It is most common in older patients and is associated with the highest mortality rates. There is sudden-onset unilateral pleuritic chest pain or breathlessness (those with underlying chest disease may have severe breathlessness).

Source: Davidson's essentials of Medicine, 2nd edition by J. Alastair Innes. Elsevier 2016. P. 289-293.

Task 3. A 19-year-old student was urgently hospitalized due to marked dyspnea and chest pain on the left. Her body temperature is 38.8oC. She has been presenting with these signs for 3 days. Respiratory rate is 42/min.,

shallow. Percussion sound is dull to the left from the center of the scapula, no respiration can be auscultated. The left heart border is displaced outwards by 3 cm. Embryocardia and heart rate of 110/min are observed. Palpation of the right subcostal area is painful. What urgent measures should be taken in this case?

A. Urgent thoracocentesis
B. Prescription of penicillin antibiotics
C. Administration of furosemide
D. Administration of cardiac glycosides
E. Referral into thoracic surgery unit

Correct answer: *A. Urgent thoracocentesis*
Explanation:

The clinical signs of exudative pleurisy is described: "marked dyspnea and chest pain on the left. Examination: percussion sound is dull to the left from the center of the scapula, no respiration can be auscultated. The left heart border is displaced outwards by 3 cm".

The accumulation of fluid within the pleural space is termed pleural effusion. Accumulations of frank pus (empyema) or blood (haemothorax) represent separate conditions. Pleural fluid accumulates due either to increased hydrostatic pressure or decreased osmotic pressure ("transudative effusion", as seen in cardiac, liver or renal failure), or to increased microvascular permeability caused by disease of the pleural surface itself, or injury in the adjacent lung ('exudative effusion'). Symptoms and signs of pleurisy often precede the development of an effusion, especially in patients with underlying pneumonia, pulmonary infarction or connective tissue disease. However, the onset may be insidious. Breathlessness is often the only symptom related to the effusion and its severity depends on the size and rate of accumulation. Therapeutic aspiration may be required to palliate breathlessness, but removing >1.5 L in one episode is inadvisable, as this can cause re-expansion pulmonary oedema. An effusion should never be drained to dryness before establishing a diagnosis, as further biopsy may be precluded until further fluid accumulates. In young patients presenting with a moderate or large spontaneous primary pneumothorax, an attempt at percutaneous needle aspiration of air should be made in the first instance, with a 60–80% chance of avoiding the need for a chest drain.

Source: Davidson's essentials of Medicine, 2nd edition by J. Alastair Innes. Elsevier 2016. P. 289-293.

Task 4. On the 4th day after recovery from a cold a patient was hospitalized with complaints of solitary spittings of mucoid sputum. On the 2nd day, there was a single discharge of about 250 ml of purulent blood-streaked

sputum. Objectively: the patient's condition is moderately severe. Respiratory rate — 28- 30/min., Ps- 96/min., BP- 110/70 mm Hg. Respiration over the left lung is vesicular, over the right lung — weakened. There are various moist crackles over the lower lobe and amphoric breath sounds near the angle of scapula. What is the most likely diagnosis?

A. Acute pulmonary abscess
B. Exudative pleuritis
C. Acute focal pneumonia
D. Pleural empyema
E. Pyopneumothorax

Correct answer: *A. Acute pulmonary abscess*
Explanation:

Symptoms explanation shows, that "On the 2nd day there was a single discharge of about 250 ml of purulent blood-streaked sputum" and« amphoric breath sounds near the angle of scapula", which are pathognomonic signs for acute pulmonary abscess.

Clinical course. The disease begins acutely: chills, fever, chest pain. After pus breaks through into the bronchus, a large amount of purulent sputum is secreted, sometimes with blood and an unpleasant odor. Above the lung lesion zone, weakened breathing is first heard, after an abscess breakthrough, bronchial breathing and moist rales are heard. Within 1-3 months, a favorable outcome may occur: a thin-walled cyst in the lung or focal pulmonary fibrosis; unfavorable outcome — abscess becomes chronic.

At radiography of the lungs, a massive darkening is detected at the initial stage, after an abscess is breached, a cavity with a level of fluid in it. Bronchoscopy often shows inflammatory changes in the wall of the bronchus associated with an abscess. In the analysis of blood — leukocytosis, shift of the leukocyte formula to the left, an increase in ESR.

Before opening into the draining bronchus, lung abscess is manifested by fever with sweat, chills, malaise, dry cough, and sometimes chest pains of an indefinite nature. After a cavity is breached, a cough appears in the bronchus, accompanied by a discharge of purulent sputum with an unpleasant odor, sometimes mixed with blood. Before abscess emptying, dullness of percussion sound and weakening of breathing in the affected area can be determined. After the formation of a cavity above it, voiced large-bubble rales, bronchial respiration with an amphoric shade are heard. With percussion, you can detect a sound with a tympanic hue. Prior to cavity formation, the diagnosis of a lung abscess is difficult. Pulmonary suppuration should be suspected with prolonged pneumonia with prolonged fever and persistent leukocytosis. With the

breakthrough of an abscess in the bronchus, radiologically, a cavity is detected radiographically in the former site of darkening.

This purulent-destructive limited process in the lungs. It is characterized by the formation of one or several cavities with purulent contents in the lung parenchyma, surrounded by granulation tissue, a zone of perifocal inflammatory infiltration; proceeds with severe intoxication and fever.

Source: Davidson's essentials of Medicine, 2nd edition by J. Alastair Innes. Elsevier 2016. P. 289-293

Task 5. A 19-year-old young man complains of cough with expectoration of purulent sputum in amount of 100 ml/day, hemoptysis, dyspnea, increased body temperature up to 37.8oC, general weakness, weight loss. The patient's condition has been persisting for 4 years. Exacerbations occur 2–3 times/year. The patient presents with malnutrition, pale skin, cyanosis of the lips, drumstick (clubbed) fingers. Tympanic percussion sound in the lungs, weakened respiration, various numerous moist crackles in the lower pulmonary segments on the left can be observed. In blood: erythrocytes — $3{,}2\times10^{12}$/L, leukocytes — $8{,}4\times10^{9}$/L, ESR – 56 mm/hour. On X-ray: lung fields are emphysematous; the left pulmonary root is deformed and dilated. What is the most likely diagnosis?

A. Multiple bronchiectasis of the left lung
B. Chronic left-sided pneumonia
C. Chronic abscess of the left lung
D. Left-sided pulmonary cystic dysplasia
E. Suppuration of the cyst in the left lung

Correct answer: *A. Multiple bronchiectasis of the left lung*

Explanation:

Bronchiectasis means abnormal dilatation of the bronchi due to chronic airway inflammation and infection. It is usually acquired, but may result from an underlying genetic or congenital defect of airway defenses.

Clinical features:

- Chronic cough productive of purulent sputum;
- Pleuritic pain;
- Haemoptysis;
- Halitosis.

Acute exacerbations may cause fever and increase these symptoms. Examination reveals coarse crackles caused by sputum in bronchiectatic spaces. Diminished breath sounds may indicate lobar collapse. Bronchial breathing due to scarring may be heard in advanced disease.

The presence of cough with expectoration of purulent sputum in an amount of up to 100 ml/day with hemoptysis and a long inflammatory process in the bronchi (about 4 years) and an increase in ESR up to 56 mm/hour give rise to the fact that multiple bronchiectasis in the left lung can be suspected.

Usual signs of multiple bronchiectasis of the left lung:

- Cough with purulent sputum, which occurs with characteristic regularity in the morning on waking and in the evening on going to sleep;
- Hemoptysis;
- Chest pain on breathing (rarely);

Examination:

- Barrel chest (especially in atelectatic bronchiectasis);
- Nails in the form of "watch glass"
- Fingers deformation in the form of "drumsticks"

Auscultation: stable localization of moist rales • Symptoms of respiratory failure

- Symptoms of pulmonary heart.

Bronchiectasis is an expansion of the lumen of the bronchus in the form of a cylinder or a bag. Can be congenital and acquired.

Pathogenesis: when coughing increases the pressure inside the bronchi, which leads to bulging of the wall of the bronchus. Macro anatomy — bronchiectasis can be in the form of a cylinder or a bag; dilatation of bronchioles — bronchiolectasis. In case of multiple bronchiectasis and bronchiolarectasis, the lungs are similar to the honeycomb in the incision. Micro anatomy — mucous membrane of bronchiectasis is often represented by stratified squamous epithelium (with metaplasia), sclerosis in the wall, purulent exudate in the cavity. In the surrounding tissue — pneumosclerosis, foci of inflammation.

Source: Davidson’s essentials of Medicine, 2nd edition by J. Alastair Innes. Elsevier 2016. P. 285-287

OCCUPATIONAL DISEASES, 2018

Task 1. A 39-year-old man, a battery attendant, suddenly developed weakness, loss of appetite, nonlocalized colicky abdominal pains, and nausea. Objectively his skin is gray; there is pink-gray stripe on his gums; the stomach is soft and sharply painful. Blood test detected erythrocytes with basophilic stippling and anemia. The patient has a history of peptic ulcer disease of the stomach. There is tendency to constipation. What is the most likely provisional diagnosis?

A. Saturnism (lead poisoning)
B. Acute appendicitis
C. Perforation of gastric ulcer
D. Acute cholecystitis
E. Chronic alcoholism

Correct answer: *A. Saturnism (lead poisoning)*
Explanation:
The presence of asthenovegetative syndrome (suddenly developed weakness, loss of appetite); nonlocalized colicky abdominal pains are common for lead intoxication. Changes in the digestive tract: the cramping abdominal pain, persistent constipation are referred to so-called lead colic. Blood changes presented by erythrocytes with basophilic stippling and anemia, which is also typical for lead intoxication.
Source: The textbook "Occupational diseases" Kyiv AUS Medicine Publishing 2016. Edited by V.A. Kapustnik, I.F. Kostuk. P. 200-207

Task 2. During the periodic medical examination an assembly fitter (works on soldering details) didn't report any health problems. Closer examination revealed signs of asthenic-vegetative syndrome. Blood included red blood cells with basophilic aggregations and a somewhat higher number of reticulocytes, urine had a high concentration of delta-aminolevulinic acid. The complex of symptoms indicates the initial stage of chronic intoxication with:

A. Lead
B. Manganese
C. Mercury
D. Tin
E. Ethanol

Correct answer: *A. Lead*
Explanation:

Firstly, pay attention to the fact that the person worked with the soldering. Then, increased level of reticulocytes and erythrocytes with basophilic stippling. At last, the hallmark evidence of chronic lead intoxication is increased urinary excretion of delta-aminolevulinic acid.

Source: The textbook "Occupational diseases" Kyiv AUS Medicine Publishing 2016. Edited by V.A. Kapustnik, I.F. Kostuk. P. 200-207

Task 3. A man works in casting of nonferrous metals and alloys for 12 years. In the air of working area there was registered high content of heavy metals, carbon monoxide, and nitrogen. During periodic health examination the patient presents with asthenovegetative syndrome, sharp pains in the stomach, constipations, pain in the hepatic area. In urine: aminolevulinic acid and coproporphyrin are detected. In blood: reticulocytosis, low hemoglobin level. Such intoxication is caused by:

A. Lead and lead salts
B. Tin
C. Carbon monoxide
D. Nitric oxide
E. Zinc

Correct answer: *A. Lead and lead salts*

Explanation:

The presence of asthenovegetative syndrome, sharp pains in the stomach, constipations, pain in the hepatic area are common for lead intoxication. Changes in the digestive tract: the cramping abdominal pain, persistent constipation are referred to so-called lead colic. Blood changes presented by reticulocytosis, low hemoglobin level also typical of lead intoxication. And, at last, the increased level of aminolevulinic acid and coproporphyrin in urine is proof for lead intoxication.

Source: The textbook "Occupational diseases" Kyiv AUS Medicine Publishing 2016. Edited by V.A. Kapustnik, I.F. Kostuk. P. 200-207

Task 4. During assessment of work conditions at the factory manufacturing mercury thermometers, the content of mercury vapors in the air of the working area is revealed to exceed the maximum concentration limit. Specify the main pathway of human body exposure to mercury:

A. Respiratory organs
B. Intact skin
C. Damaged skin
D. Gastrointestinal tract
E. Mucous tunics

Correct answer: *A. Respiratory organs*
Explanation:
Metallic mercury is present in the air as vapor. Mercury can enter the body through the respiratory system (in the form of vapor and aerosol) through the GI tract or the skin. According to task: the vapors have been found in the working area, with concentration, which exceed maximum limit. As it was found as mercury vapors, so the way of penetration is respiratory organs.
Source: The textbook "Occupational diseases" Kyiv AUS Medicine Publishing 2016. Edited by V.A. Kapustnik, I.F. Kostuk. P. 275-279.

Task 5. During health assessment of car drivers and police officers on point duty, the physicians detected carboxyhemoglobin in the blood of the patients, weakened reflex responses, disturbed activity of a number of enzymes. Revealed professional health disorders are most likely to be associated with the effect of:
A. Carbon monoxide
B. Sulfurous anhydride
C. Mental stress
D. Aromatic hydrocarbons
E. Nitric oxide

Correct answer: *A. Carboxyhemoglobin concentration*
Explanation:
The present patient has acute poisoning of CO. The toxic properties of carbon monoxide make it a strong poison affecting the blood. High affinity of carbon monoxide for ferrous iron of hemoglobin, which is almost 300 times greater than the affinity of hemoglobin for oxygen, triggers its toxic effect on the body. Carbon monoxide forms carboxyhemoglobin-displacing oxygen from its compounds with hemoglobin. Furthermore, part of hemoglobin becomes inactive, causing disruption of oxygen transportation to tissues and resulting in hypoxia. The amount of formed carboxyhemoglobin is proportional to partial pressure of carbon monoxide and inversely proportional to the pressure of oxygen in the inhaled air. Severity is largely determined by the percentage of carboxyhemoglobin content in the blood and state of consciousness.

Source: The textbook "Occupational diseases" Kyiv AUS Medicine Publishing 2016. Edited by V.A. Kapustnik, I.F. Kostuk. P. 212–218.

Task 6. 40-50 minutes after the completion of repair works conducted in a closed garage, with car engine running, the repair workers developed severe

headache in the temporal area, nausea, tinnitus, vertigo, etc. These symptoms are characteristic of acute poisoning with:

A. Carbon monoxide
B. Aldehydes
C. Organochlorides
D. Hydrogen sulfide
E. Fluoride

Correct answer: *A. Carboxyhemoglobin concentration*
Explanation:

The present patient has acute poisoning of CO. The toxic properties of carbon monoxide make it a strong poison affecting the blood. High affinity of carbon monoxide for ferrous iron of hemoglobin, which is almost 300 times greater than the affinity of hemoglobin for oxygen, triggers its toxic effect on the body. Carbon monoxide forms carboxyhemoglobin-displacing oxygen from its compounds with hemoglobin. Furthermore, part of hemoglobin becomes inactive, causing disruption of oxygen transportation to tissues and resulting in hypoxia. The amount of formed carboxyhemoglobin is proportional to partial pressure of carbon monoxide and inversely proportional to the pressure of oxygen in the inhaled air. Severity is largely determined by the percentage of carboxyhemoglobin content in the blood and state of consciousness.

Source: The textbook "Occupational diseases" Kyiv AUS Medicine Publishing 2016. Edited by V.A. Kapustnik, I.F. Kostuk. P. 212–218.

Task 7. A 37-year-old worker during a fire ended up in the area of high CO concentration. He was delivered to a hospital in unconscious state. Objectively: the skin of his face and hands is crimson. Respiration rate is 20/min. ECG: alterations specific for hypoxic myocardium. Hourly diuresis is 40 ml. Blood test: erythrocytes — 4.5· 1012/L, Hb- 136 g/L, color index — 0.9, ESR- 3 mm/hour, carboxyhemoglobin — 5%. What criterion allows determining the severity of the patient's condition?

A. Carboxyhemoglobin concentration
B. Respiratory disorders
C. ECG results
D. Extent of trophic disorders
E. Development of chronic renal failure

Correct answer: *A. Carboxyhemoglobin concentration*
Explanation:

The present patient has acute poisoning of CO. The toxic properties of carbon monoxide make it a strong poison affecting the blood. High affinity of carbon monoxide for ferrous iron of hemoglobin, which is almost 300 times greater than the affinity of hemoglobin for oxygen, triggers its toxic effect on the body. Carbon monoxide forms carboxyhemoglobin-displacing oxygen from its compounds with hemoglobin. Furthermore, part of hemoglobin becomes inactive, causing disruption of oxygen transportation to tissues and resulting in hypoxia. The amount of formed carboxyhemoglobin is proportional to partial pressure of carbon monoxide and inversely proportional to the pressure of oxygen in the inhaled air. Severity is largely determined by the percentage of carboxyhemoglobin content in the blood and state of consciousness.

Source: The textbook "Occupational diseases" Kyiv AUS Medicine Publishing 2016. Edited by V.A. Kapustnik, I.F. Kostuk. P. 212–218.

Task 8. A 28-year-old man complains of skin rash and itching on the both of his hands. The condition persists for 1,5 years. The exacerbation of his condition he ascribes to the occupational contact with formaldehyde resins. Objectively: lesion foci are symmetrically localized on both hands. Against the background of erythema with blurred margins there are papulae, vesicles, erosions, crusts, and scales. What is the most likely pathology?

A. Occupational eczema
B. Idiopathic eczema
C. Allergic dermatitis
D. Simple contact dermatitis
E. Erythema multiforme

Correct answer: *A. Occupational eczema*
Explanation:

The occupational eczema occurs under the influence of industrial chemicals that have sensitizing properties. It is chronic condition, developing due to occupational activity. It is characterized by a tendency to spread, long course with frequent relapses and exacerbations even after removal of contact with an irritant.

According to task: skin rash appeared due to longitudinal (1,5 years) work in unfavorable working condition. Skin symptoms include lesion foci are symmetrically localized on both hands. Against the background of erythema with blurred margins there are papulae, vesicles, erosions, crusts, and scales.

Source: The textbook "Occupational diseases" Kyiv AUS Medicine Publishing 2016. Edited by V.A. Kapustnik, I.F. Kostuk. P. 409–410.

Task 9. Survey radiograph of a 52-year-old worker of an agglomeration plant (28-year-long record of service, the concentration of metal dust is 22-37 mg/m3) shows mildly pronounced interstitial fibrosis with diffused contrasting well-defined small nodular shadows. The patient has no complaints. Pulmonary function is not compromised. What is the provisional diagnosis?

A. Siderosis
B. Silicosis
C. Anthraco-silicatosis
D. Silicatosis
E. Anthracosis

Correct answer: *A. Siderosis*
Explanation:

Siderosis is metalloconiosis caused by inhalation of metal and iron dust. His work place indicates on possibility of metalloconiosis (siderosis is a type of metalloconiosis). The rest of answers refer to pneumoconiosis. The clinical presentation of siderosis is quite poor: the patient describe no complaints. The respiratory function remains unchanged – that is typical for siderosis. In addition, only X-ray shows the interstitial fibrosis and disseminated finely nodular opacities with distinct borders, which are the regions of accumulation of metal dust. Thus, diagnosis of siderosis is based on X-ray examination findings with paying attention to the dust composition present in industry, where the patient works.

Source: The textbook "Occupational diseases" Kyiv AUS Medicine Publishing 2016. Edited by V.A. Kapustnik, I.F. Kostuk. P. 63-64.

Task 10. A 38-year-old woman has been working as a milker for 15 years. She made an appointment with the doctor due to development of red rashes on her hands, predominantly in the interdigital space. The rashes are weeping, itching, and expanding on her skin. Examination of her hands shows her nail plates to be yellow and brittle. These presentations aggravate during work. Make the provisional diagnosis:

A. Occupational eczema
B. Scabies
C. Pemphigus
D. Pyoderma
E. Dermatophytosis

Correct answer: *A. Occupational eczema*
Explanation:

The occupational eczema occurs under the influence of industrial chemicals that have sensitizing properties. It is chronic condition, developing due to occupational activity. It is characterized by a tendency to spread, long course with frequent relapses and exacerbations even after removal of contact with an irritant.

According to task: skin rash appeared due to longitudinal (15 years) work in unfavorable working condition. Skin symptoms include red rashes on patient's hands, predominantly in the interdigital space. They are weeping, itching, and expanding on her skin. Examination of patient's hands shows nail plates to be yellow and brittle. These presentations aggravate during work

Source: The textbook "Occupational diseases" Kyiv AUS Medicine Publishing 2016. Edited by V.A. Kapustnik, I.F. Kostuk. P. 409–410.

Task 11. A 37-year-old man working as a typesetter in a print shop complains of rapid fatigability, paroxysmal attacks of stomachache, weak drooping hands. Examination of neurological status revealed hypotrophy of the forearm muscles. Carporadial reflexes are sharply weakened. Sensitivity is not disturbed. Gums present with dark blue border. What neurological pathology is it?

A. Lead polyneuropathy
B. Guillain-Barre syndrome (postinfectious polyneuritis)
C. Shingles
D. Ulnar neuropathy
E. Brachial plexitis

Correct answer: *A. Lead polyneuropathy*

Explanation: First, note, that patient's occupation is typesetter — typing industry is or can be associated with lead intoxication, due to its usage in dye. There are described typical symptoms of lead intoxication: antebrachial paralysis is a typical form of polyneuritis developing under the impact of lead. The process begins with an impairment of common digital extensor with subsequent paresis of the remaining extensors of the fingers and hands. Pre-eminent disorder of the radial nerve causes a forced position of the hand, which drops in semipronation at a right angle. In the severe forms of the chronic lead intoxication, the patients often complain of the so-called lead colic, manifested by the cramping paroxysmal abdominal pain. Moreover, quite hallmark for lead intoxication is the presence of lead margin on the gums.

Source: The textbook "Occupational diseases" Kyiv AUS Medicine Publishing 2016. Edited by V.A. Kapustnik, I.F. Kostuk. P. 200-207.

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