

FEDERAL STATE BUDGETARY EDUCATIONAL INSTITUTION OF HIGHER EDUCATION
"KAZAN STATE MEDICAL UNIVERSITY" OF THE MINISTRY OF HEALTH OF THE
RUSSIAN FEDERATION

Department of Primary Care and General Practice

Model Clinical Vignette #1
In the discipline "Primary care"

A 32-year-old man consulted a primary care physician with *complaints of*:

- severe, pressing, retrosternal chest pains, which lasted for about 2 hours from midnight; ibuprofen had no effect;
- pressing and constricting retrosternal chest pain and shortness of breath on the way to the clinic, which resolved at rest; because of frequent stops, the patient had to make, the road to the clinic took half an hour instead of 10 minutes.

Medical history: over the past two years, he notes an increase in blood pressure up to 180/100 mm Hg, for which he consulted a doctor but did not take the recommended drugs. Random measurements of BP reveal BP in the range of 140–150/80–90 mm Hg. At the same time, the work-up revealed an increase in total cholesterol level up to 7.4 mmol/L and LDL 4.0 mmol/L; pharmacological treatment for this was not prescribed – he was following a diet. For four years, he has been suffering from type 2 diabetes mellitus, is being followed-up by an endocrinologist, and takes metformin 500 mg two times a day. During therapy, fasting glycemia is 6.0–7.0 mmol/L; glycated hemoglobin is 6.7%.

Anamnesis vitae: he grew and developed normally. Works as a salesman in a men's clothing store. **Past diseases:** myocarditis in childhood; chronic gastritis, exacerbations in spring/autumn no more than once a year; appendectomy at age 18. **Family history:** father died of myocardial infarction at 52 years old; mother is suffering type 2 diabetes. **Allergies:** there is no history of allergic reactions. **Psychosocial history:** smokes from the age of 15 (20–30 cigarettes a day).

Physical exam: general condition is serious. The patient looks well-nourished and has a height of 1.89 m, weight of 112 kg, BMI of 31.35 kg/m², and body temperature of 36.6°C. The skin and visible mucous membranes are normal in color; peripheral lymph nodes are not enlarged, and there is no edema. On comparative percussion of the lungs – resonant note; on auscultation – vesicular breathing, small bubbling wet rales in a small amount in the lower parts of both lungs (below the angle of the scapula), respiratory rate – 22 per minute. Heart sounds are muffled and rhythmic, and the heart rate is 50 per minute. BP 120/70 mm Hg. The abdomen is soft and non-tender. The liver does not protrude from the costal margin.

EKG is shown below:



Answer the following questions:

1. What is the diagnosis?
2. What justifies the diagnosis?
3. Provide a plan of differential diagnosis with at least three diseases having similar presentation.
4. What is/are the indication(s) for hospitalization in this patient?
5. Which test or tests would you order next? When would you schedule them?
6. Which non-pharmacological approaches would you recommend?
7. Which medications (with doses, forms of administration, and frequency) would you prescribe? What are the side effects that you would monitor?
8. What goals would you set for primary/secondary prevention, and how would you achieve them?
9. What should be done during follow up and long term monitoring?

MODEL ANSWER VIGNETTE #1

1. Anteroseptal STEMI. Concomitant diagnosis: Arterial hypertension Grade III, stage 3. DM type 2 (target HbA1 <7%). CVD risk is very high (4).

2. Justification/criteria for the diagnosis are:

- prolonged (2 hours) attack of chest pain on the night before treatment;
- first-onset angina of high functional class when walking up to polyclinics;
- increased cardiac troponin T;
- acute MI on EKG (ST-segment elevation by more than 1 mm in leads V1-V4);
- the wall involved is in accordance with the EKG leads, in which the ST segment is elevated.

The patient's comorbidities include grade III hypertension, stage 3, risk 4; type 2 diabetes mellitus, target HbA1 < 7%.

- The diagnosis of hypertension is made based on its history, medical records (the patient consulted a doctor about this), as well as complaints of an increase in BP up to 180/100 mm Hg at home.
- Grade III is based on the BP levels of up to 180/100 mm Hg.
- Stage 3 is diagnosed based on target organ damage, especially the cardiovascular system (this patient had an MI at the time of visiting a doctor).
- The risk of cardiovascular complications (4, very high) based on the degree of increase in blood pressure, presence of ≥ 3 risk factors (male sex, smoking, diabetes mellitus, a positive family history of CVD – the father died of myocardial infarction before the age of 55) and target organ damage – (MI).
- Diabetes mellitus is established based on anamnesis and medical records; the target HbA1 value is based on the patient's age (young) and the presence of a severe complication of diabetes mellitus – myocardial infarction.

3. Differential diagnosis:

- a) chest pain of coronary origin: angina pectoris, myocardial infarction, acute coronary syndrome;
- b) non-coronary chest pain: CVD not associated with the pathology of the coronary vessels: dissecting aortic aneurysm, PE, pericarditis, myocarditis, cardiomyopathies, paroxysmal tachycardias, neurocirculatory dystonia, etc.;
- c) pain in respiratory diseases: pleurisy, pneumonia, pneumothorax, etc.;
- d) pain in diseases of the musculoskeletal frame of the chest: myositis, Titze's syndrome, osteochondrosis with radicular syndrome;
- e) pain in diseases of the abdominal organs: hernia of the POD, cholecystitis, pancreatitis, gastric ulcer, etc.

Angina	Pericarditis	Costochondritis
<ul style="list-style-type: none"> - Substernal "pressure" radiating to the neck, jaw, arm; - pain is sharp, pleuritic, positional, or reproduced; - associated with exertion; - ↓ with NTG or rest; - ± EKG Δs: ST Depression, T-wave Inversion. 	<ul style="list-style-type: none"> - Sharp chest pain that radiates trapezius, fever, weakness; - ↑ with respiration; - ↓ with sitting forward; - ± pericardial friction rub; - ± history of infection; - EKG: (diffuse ST Elevation & PR ↓, opposite in a VR ± Pericardial effusion. 	<ul style="list-style-type: none"> - Localized sharp pain; - ↑ with movement; - reproduced by palpation or crowing rooster maneuver.

4. Since this patient has STEMI, this patient requires immediate hospitalization in a tertiary care facility with PCI and ICU/CCU. Record an EKG STAT, give NTG sublingually, and Aspirin 325 mg. Call an advanced-care ambulance and transport the patient on a stretcher to the hospital.

EKG conclusion: regular sinus rhythm, normal electrical axis. PQ = 180 ms, QRS = 84 ms, ST-segment elevation in leads V1-V5. Given that the patient has ST-segment elevation MI and the duration of symptoms is less than 12 hours, reperfusion therapy is recommended (Class 1A), preferably primary percutaneous coronary intervention (Class 1C). This type of medical care is provided in specialized vascular centers operating across the country.

5. It is necessary to take an EKG and EchoCG (to confirm acute coronary pathology, such as hypo-/a-kinetic regions). Check cardiac troponin T or I (biomarkers to determine the level of damage to cardiomyocytes in the blood and confirm the diagnosis).
In the hospital: doppler ultrasonography of the neck and lower extremities vessels to detect atherosclerotic lesions, daily EKG monitoring to detect ischemic changes and rhythm disturbances, TEE and TMT to identify exercise tolerance and the degree of ischemic changes.
6. Non-pharmacological approaches during the current visit: After the patient's condition has stabilized:
 - make the patient comfortable: lie down/sit;
 - placing the patient in a room with good ventilation;
 - make sure air entry to the patient is not blocked;
 - remove tight clothes, unbutton shirts.
7. Outpatient: antiplatelet therapy at the prehospital stage of treatment for this patient includes the intake of 250 mg of acetylsalicylic acid and 600 mg of clopidogrel.
In patients with STEMI with ST-segment elevation, the use of dual antiplatelet therapy is recommended for the early onset of myocardial reperfusion; at the first contact with the patient, it is recommended to use acetylsalicylic acid and clopidogrel in loading doses (250 and 600 mg, respectively).
Inpatient treatment: aspirin 125 mg in the morning or clopidogrel 200 mg 1 time in the morning, Isosorbide mononitrate 60 mg per day, Bisoprolol 5 mg per day, atorvastatin 20 mg at night, Nadroparin calcium 0.3 s.c. 1 time per day, Enalapril 6.25 mg at night, with an increase in dose titrated according to the blood pressure. When the patient's condition is stabilized, conduct coronary angiography and decide on the method of myocardial revascularization (angioplasty and stenting or coronary artery bypass grafting).
8. Prevention strategies include combating risk factors: constant intake of cholesterol-lowering drugs – secondary prevention of exacerbations – constant intake of beta-blockers, ACE inhibitors, and antiplatelet therapy:
 - ask the patient to be as lean as possible without being underweight;
 - physical activity 30 mins/day x 5 times/week;
 - saturated fats <10%, trans unsaturated fatty acids <1%;
 - salt <5 gm per day;
 - ≥ 200 gms vegetables (2–3 servings) per day;
 - ≥ 200 gms vegetables (2–3 servings) per day;
 - fish 1–2 times per week;
 - 30 gms unsalted nuts (15 gm walnuts, 7.5 gm almond, 7.5 gm hazelnut);
 - no alcohol or limit <2 drinks for men, <1 drink for women;
 - smoking cessation.
9. Outpatient follow-up: After discharge from the hospital, observation by a cardiologist until the general condition of the patient stabilizes two times a month. A year after the stabilization of the condition, patients can be supervised by the general physician (GP). Recommended frequency of clinical, laboratory, and instrumental examinations by the patient after MI:
 - annually: CBC, Biochemical blood tests (2 or more according to indications);
 - quarterly: lipid profile (achieve target LDL-C values);
 - annually/biennially: urinalysis (1–2 per year);

- EKG (4 or more): at least once (more frequently if indications), Holter EKG monitoring, stress test, EchoCG, CXR.

SAMPLE CASES WITH ANSWERS

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Department of Primary Care and General Practice

**Model Clinical Vignette #2
In the discipline "Primary care"**

A 28-year-old male presented to the primary care physician with the following complaints:

Chief complaints:

- Episodes of dyspnea accompanied by shortness of breath, dry paroxysmal cough, and a sensation of "chest tightness and wheezing," occurring 2-3 times daily per week
- Persistent nasal congestion, frequent sneezing, especially in the morning and upon exposure to household dust
- Sleep disturbances due to impaired nasal breathing

History of present illness: The patient has experienced year-round nasal congestion and morning sneezing, particularly when exposed to household dust, for 3 years. Over the past 5 weeks, he developed episodes of dyspnea accompanied by shortness of breath, dry paroxysmal cough, and wheezing. These symptoms are triggered by exposure to household dust, physical exertion, and inhalation of tobacco smoke. The patient associates the exacerbation with recent home renovations and possible exposure to cold. Episodes resolve spontaneously within 2-3 hours in fresh air. No prior medical evaluations.

Past medical history:

- Normal growth and development
- Atopic dermatitis in early childhood
- Frequent upper respiratory tract infections

Family history: Mother has bronchial asthma

Allergies: Denies food or drug allergies

Immunization history: Completed childhood vaccinations; no immunizations in the past 12 years

Social history:

- Smoker: 1 pack per day since age 16
- Denies alcohol consumption
- Occupation: Welder

Physical examination: General condition: Satisfactory. Vital signs: Temperature 36.6°C, Respiratory rate 20/min, Heart rate 80 bpm, Blood pressure 120/75 mmHg. Anthropometrics: Height 172 cm, Weight 74 kg, BMI 25 kg/m². HEENT: Impaired nasal breathing due to congestion; oropharynx unremarkable. Skin: No abnormalities noted. Lymph nodes: No peripheral lymphadenopathy. Respiratory: Chest symmetrical with equal bilateral expansion; percussion reveals normal lung resonance; auscultation reveals vesicular breathing with occasional dry rales on forced expiration. Peak expiratory flow: 80% of predicted. Cardiovascular: Regular rhythm, normal heart sounds. Abdomen: Soft, non-tender; liver at costal margin. Extremities: No edema

Laboratory investigations:

- Complete blood count: WBC: $5.9 \times 10^9/L$, RBC: $5.0 \times 10^{12}/L$, Platelets: $257 \times 10^9/L$, Hemoglobin: 142 g/L. Differential: Neutrophils (band) 1%, Neutrophils (segmented) 60%, Eosinophils 8%, Basophils 0%, Lymphocytes 22%, Monocytes 9%. ESR: 4 mm/h

Answer the following questions:

1. What is the diagnosis?
2. What justifies the diagnosis?
3. Provide a plan of differential diagnosis with at least three diseases having similar presentation.
4. What is/are the indication(s) for hospitalization in this patient?
5. Which test or tests would you order next? When would you schedule them?
6. Which non-pharmacological approaches would you recommend?
7. Which medications (with doses, forms of administration, and frequency) would you prescribe? What are the side effects that you would monitor?
8. What goals would you set for primary/secondary prevention and how would you achieve them?
9. What should be done during follow up and long term monitoring?

SAMPLE CASES WITH ANSWERS

MODEL ANSWER VIGNETTE #2

1. Allergic bronchial asthma, persistent, mild severity. Allergic rhinitis, perennial, persistent, moderate severity, exacerbation stage.
2. Justification:
 - **Allergic bronchial asthma** – diagnosis based on complaints (episodes of breathing difficulty, accompanied by shortness of breath, dry cough, wheezing, triggered by physical exertion, contact with house dust, strong odors, tobacco smoke), history data (family history of atopic diseases, manifestations of atopic dermatitis in early childhood, symptoms of allergic rhinitis), physical examination data (auscultation reveals dry wheezes in the lungs during forced expiration, PEFr – 80%), laboratory examination data (eosinophilia 8% in the complete blood count);
 - **persistent, mild severity** – частота дневных приступов чаще 1 раза в неделю, но реже 1 раза в день, ночные приступы отсутствуют, физическая активность не снижена, ПСВ 80%.
 - **Allergic rhinitis, perennial** – diagnosis based on complaints (persistent nasal congestion, multiple sneezing, especially in the morning and upon contact with dust for 3 years), history data (family history of atopic diseases, manifestations of atopic dermatitis in early childhood); physical examination data (impaired nasal breathing due to congestion), laboratory examination data (eosinophilia in the complete blood count).
 - **persistent, moderate severity** – symptoms (runny nose, sneezing, nasal congestion) present more than 4 days a week, more than 4 weeks, moderately expressed, disrupt sleep;
 - **exacerbation stage** – based on complaints (nasal congestion, multiple sneezing), which have worsened over the past 5 weeks, physical examination data (nasal congestion).
3. **Differential Diagnosis:**
 - a. **Chronic obstructive pulmonary disease:** justification for differential diagnosis is the similarity of symptoms (episodes of breathing difficulty, accompanied by shortness of breath, dry cough, wheezing, feeling of "chest tightness", smoking history, presence of dry wheezes during lung auscultation, reduced PEFr). Exclusion criteria for this disease are early onset (COPD is characteristic for age over 40 years), family history of atopic diseases (mother of the patient has bronchial asthma), coexisting atopic diseases in the patient (atopic dermatitis, allergic rhinitis), change in symptom severity within a few hours, reversibility of obstruction (from history – episodes resolve spontaneously within 2-3 hours), however, for objective assessment of obstruction reversibility, a bronchodilator test is necessary.
 - b. **Acute respiratory viral infection. Acute bronchitis:** justification for differential diagnosis is the similarity of symptoms (dry cough, "chest tightness", nasal congestion, sneezing, association with hypothermia, presence of dry wheezes during lung auscultation). Exclusion criteria for this disease are duration, perennial nature of rhinitis symptoms (ill for 3 years), association of condition worsening and onset of breathing difficulty episodes with apartment renovation (possibly due to contact with house dust allergen), family history of atopic diseases, presence of atopic dermatitis in early childhood, improvement of condition in fresh air, absence of catarrhal phenomena on physical examination, signs of allergic inflammation in the complete blood count (eosinophilia with normal leukocyte and ESR levels).
4. No indications for hospitalization.
5. Tests in ambulatory setting:
 - a. Pulmonary function testing: spirometry with bronchodilator test (recording bronchial obstruction by FEV₁, PEFr indicators and assessing its reversibility by FEV₁ increase $\geq 12\%$ and ≥ 200 ml after inhalation of 400 mcg salbutamol); home peak flowmetry.
 - b. Pulse oximetry (to exclude respiratory failure).
 - c. Complete blood count with differential (eosinophilia may indicate allergic inflammation).

- d. Chest X-ray (to exclude alternative diagnosis).
 - e. ECG (to exclude alternative diagnosis).
 - f. Consultation with an allergist-immunologist (to identify sensitization and determine the feasibility of allergen-specific immunotherapy (ASIT)), otorhinolaryngologist (for differential diagnosis with other ENT pathology, identification of anatomical features).
6. Non-pharmacological management:
- a. Режим – general/standard (nothing specific).
 - b. Diet – main variant of standard diet (hypoallergenic diet not required as the patient has no confirmed food allergy).
 - c. Patient and family education (education goals: provide the patient with necessary information about the disease, differences between basic and emergency therapy drugs, indications for seeking medical help, teach asthma symptom control, correct use of inhalation devices, monitoring condition with peak flowmetry).
 - d. Elimination measures for specific (causative allergens) and non-specific triggers (avoidance of tobacco smoke, strong odors, pollutants, occupational hazards, etc.).
 - e. Smoking cessation (both active and passive).
 - f. Physical activity, physical rehabilitation – regular physical exercises, aerobic training, swimming, inspiratory muscle training with threshold load. If symptoms occur due to physical exertion, reduce their intensity, take "as needed" medications to relieve symptoms.
7. Pharmacological Management:
- a. Medication therapy for bronchial asthma:
 - i. basic therapy according to step 2 clinical guidelines for bronchial asthma:
 - ii. low doses of inhaled corticosteroids (budesonide (DPI) 200 mcg/dose, 1 dose twice daily), alternative therapy considering coexisting allergic rhinitis – leukotriene receptor antagonist montelukast 10 mg once daily orally. Follow-up visit (to assess effectiveness) 1 month after the first visit, then every 3 months with subsequent treatment adjustment.
 - iii. "As needed" therapy for symptom relief: SABA (salbutamol (MDI) 100 mcg/dose, 1-2 doses).
 - b. Medication therapy for allergic rhinitis according to step 3 clinical guidelines for allergic rhinitis:
 - i. intranasal corticosteroids: mometasone – nasal spray 50 mcg/dose, 2 doses in each nostril once daily for 1-1.5 months;
 - ii. antihistamines: levocetirizine 5 mg/day (or cetirizine 10 mg/day) for 1-1.5 months;
 - iii. decongestants: xylometazoline 0.1% solution – nasal spray, 1 dose in each nostril 2-3 times daily for severe nasal congestion, short course up to 3-5 days.
8. Prevention strategies:
- a. Influenza vaccination (annually), pneumococcal vaccination (since the patient has not been previously vaccinated against pneumococcal infection, it is recommended to first administer PCV13, followed by PPV23 after 2 months, then PPV23 every 5 years).
 - b. Preventive measures:
 - i. non-pharmacological – patient and family education, measures to eliminate or limit exposure to specific and non-specific triggers, control of inhalation technique, monitoring condition with peak flowmetry, smoking cessation, physical rehabilitation, influenza and pneumococcal vaccination;
 - ii. pharmacological – use of basic treatment drugs long-term and daily with effectiveness assessment and subsequent adjustment every 3 months, "as needed" emergency drugs (frequent use indicates lack of asthma symptom control), treatment of allergic rhinitis with intranasal corticosteroids, antihistamines, leukotriene receptor antagonists orally).

9. Long term monitoring and follow-up:
 - a. minimum frequency of follow-up visits (examinations, consultations) – 1-3 times a year
 - b. Parameters to follow-up during visits: achieving complete or partial control of bronchial asthma (assessment of control over the past 4 weeks in accordance with clinical guidelines for bronchial asthma, AST test, PFT (Target FEV1, PEF >80% predicted)
 - c. Lifelong monitoring and follow-up
 - d. Visit/consultations: Pulmonologist, Allergist-immunologist (as indicated).

SAMPLE CASES WITH ANSWERS