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INTERNAL MEDICINE
CARDIOVASCULAR DISEASES

Collection of test tasks
for 6th year students of
specialty Medicine

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The multiple-choice questions from basic cardiovascular diseases are designed to test in preparation for the Step 2 exam. The collection of tests is compiled in accordance with the work program of the discipline “Internal Medicine”, specialty Medicine”.

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INTRODUCTION

The study of the discipline "Internal Medicine" by students involves the development of competencies such as identifying key clinical syndromes with the interpretation of additional diagnostic methods, determining optimal diagnostic and treatment approaches for internal organ diseases, and providing emergency medical care in critical conditions.

This collection presents materials from the academic discipline "Internal Medicine (Cardiology, Endocrinology)", Section 3, Content Section 1: "Patient management in the cardiology clinic." According to the curriculum, 60 hours (2 ECTS credits) are allocated for the study of this section, which corresponds to 67% of the approved syllabus for the discipline "Internal Medicine (Cardiology, Endocrinology)" for 6th-year students within the "Medicine" educational-professional program at the second (master's) level of higher education in Ukraine, within the field of study I "Healthcare and social security", and the specialty "Medicine", leading to the professional qualification of "Doctor".

The handbook contains test questions that allow students to assess and consolidate their knowledge regarding the optimal diagnostic and treatment strategies for the most common clinical scenarios in cardiology practice. The test collection "Fundamentals of Diagnosis, Treatment, and Prevention of Major Cardiovascular Diseases" is based on the existing STEP 2 test database, with creative adaptation and the addition of new authorial material. The tests are grouped according to the approved thematic plan of practical classes for this discipline.

After each thematic section, a list of recommended literature is provided for in-depth independent study of the selected topic. The test collection is compiled in accordance with the requirements of the "Internal Medicine" curriculum for the specialties "Medicine".

This publication will be useful for preparing for the final assessment and will facilitate a better understanding of theoretical knowledge among 6th-year students.

LIST OF ABBREVIATIONS

ACE inhibitor	Angiotensin converting enzyme inhibitors
ACS	Acute coronary syndrome
ARBs	Angiotensin receptor blockers
AV block	Atrioventricular block
BP	Blood pressure
CT	Computed tomography
CKD	Chronic kidney disease
CHF	Congestive heart failure
DBP	Diastolic blood pressure
ECG	Electrocardiogram
EF	Ejection fraction
HR	Heart rate
Hb A1C	Glycated hemoglobin
INR	International normalized ratio
IV	Intravenously
MRI -	Magnetic resonance imaging
NT-pro BNP	N-terminal propeptide of natriuretic hormone
LV	Left ventricle
LDL	Low density lipoprotein
RR	Respiratory rate
SpO2	Oxygen saturation
SBP	Systolic blood pressure
TSH	Thyroid stimulating hormone
T4	Thyroxine

Arterial hypertension

1. The normal level of systolic blood pressure in patients with hypertension under the age of 65 years according to the recommendations of the European Society of Cardiology is:

A. 120-149 mm Hg.

B. 120-129 mm Hg.

C. 130-139 mm Hg.

D. 130-149 mm Hg.

E. 120-139 mm Hg.

2. A 26-year patient. BP - 150-160/80-100 mm Hg, BMI - 36.8 kg/m2. Echocardiography: interventricular septum - 1.2 cm, posterior wall of the LV - 1.1 cm. Biochemical blood test: total cholesterol - 6.8 mmol/l, LDL - 3.5 mmol/l, fasting glucose - 6.4 mmol/l. Which group of antihypertensive drugs is optimal for initial therapy?

A. Renin-angiotensin-aldosterone system blockers

B. Calcium channel blockers

C. Imidazoline receptor agonists

D. Diuretics

E. Adrenoblockers

3. A 28-year-old patient has frequent attacks of sudden increase in blood pressure, accompanied by intense headache, nausea, palpitations, pallor, tremor of the fingers, and after the cessation of the attack - polyuria. Indicate the probable cause of hypertension:

A. Pheochromocytoma

B. Cushing's syndrome

C. Conn's syndrome

D. Thyrotoxicosis

E. Addison's disease

4. In pregnant women with arterial hypertension, the following drugs are recommended for long-term use:

A. Atenolol, azilsartan

B. Torasemide, indapamide

C. Lisinopril, amlodipine

D. Methyldopa, labetalol

E. Perindopril, indapamide

5. A 60-year-old woman complains of a dry cough. She has a history of type 2 diabetes mellitus, hypertension, and bronchial asthma. She takes metformin, lisinopril, atorvastatin orally, budesonide and salbutamol inhalation. Blood pressure 140/80 mm Hg, heart rate 72/min. Hemoglobin A1C 6.4%, creatinine 72 μmol/L. The family physician believes that the patient's cough is caused by one of the medications. Correct the patient's therapy.

A. Replace salbutamol with tiotropium bromide

B. Replace atorvastatin with simvastatin

C. Replace lisinopril with amlodipine

D. Replace lisinopril with valsartan

E. Replace lisinopril with bisoprolol

6. A 25-year-old patient in the third trimester of pregnancy was found to have an increase in blood pressure to 140-160/90-100 mm Hg. Which of the following drugs should be prescribed in this case?

A. Furosemide

B. Labetalol

C. Doxazosin

D. Valsartan

E. Enalapril

7. A 60-year-old woman visited primary physician with complaints of headache. She has no chronic diseases, smokes for about 5 years 1 pack a day. The doctor conducts a physical examination. At what level of blood pressure can the third degree of hypertension be diagnosed?

A. Blood pressure 140/100 mm Hg.

B. Blood pressure 130/100 mm Hg.

C. Blood pressure 190/100 mm Hg.

D. Blood pressure 150/90 mm Hg.

E. Blood pressure 160/90 mm Hg.

8. The SCORE system for assessing the risk of hypertension can be used in older adults:

A. 30 years and older

B. 35 years and older

C. From 45 years and older

D. From 40 years and older

E. From 50 years and older

9. A 32-year-old patient has been maintaining blood pressure of 180/100 - 230/140 mm Hg for 2 years. Treatment with nifedipine had a partial hypotensive effect. At examination the blood pressure is 230/140 mm Hg. A systolic murmur is heard on both sides of the navel. In the urine: protein - 0.33 g/l, erythrocytes - 2-4 in p/z. Which disease is most likely?

A. Renal artery stenosis

B. Chronic glomerulonephritis

C. Bilateral renal hypoplasia

D. Pheochromocytoma

E. Coarctation of the aorta

10. Normal systolic blood pressure in patients with hypertension aged 65 years and older according to the recommendations of the European Society of Cardiology is:

A. 130-139 mm Hg.

B. 120-129 mm Hg.

C. 130-149 mm Hg.

D. 120-139 mm Hg.

E. 120-149 mm Hg.

11. A 58-year-old patient treated for hypertension. Daily blood pressure remains at the level of 160/90 mm Hg. The use of which antihypertensive therapy regimen allows to suspect resistant hypertension? Choose the best answer.

A. Calcium channel blockers and diuretics

B. ACE inhibitors or ARBs

C. ACE inhibitors and calcium channel blockers

D. Calcium channel blockers, ACE inhibitors or ARBs, and diuretics

E. ACE inhibitors or ARBs and beta-blockers

12. What level of blood pressure corresponds to the second degree of hypertension?

A. 140/100 mm Hg.

B. 130/90 mm Hg.

C. 140/90 mm Hg.

D. 150/95 mm Hg.

E. 135/90 mm Hg.

13. What indicators are needed to calculate cardiovascular risk in patients with hypertension according to the SCORE system?

A. Level of blood pressure, total cholesterol

B. Gender, age, smoking status, blood pressure, LDL cholesterol

C. Gender, age, smoking status

D. Sex, age, smoking status, blood pressure level

E. Sex, age, smoking status, blood pressure, total cholesterol

14. A 52-year-old woman visited a doctor as an annual checkup. Her medical history is unremarkable. BP 150/90 mm Hg, heart rate 80 beats/min, RR 14/min. Her blood pressure was normal 3 months ago. Which test is the first priority for determining the management of this patient?

A. Determination of TSH and free T4 levels

B. Repeat the blood pressure measurement at her next visit

C. Measure her creatinine level

D. Monitor blood pressure daily

E. Record an ECG

15. A 58-year-old man with diabetes complains of blood pressure instability. He takes lisinopril and metformin. BP 160/90 mm Hg, heart rate 80/min, RR 16/min. The doctor added another antihypertensive drug. A month later, the patient complained of swelling legs. Which of the following drugs was most likely prescribed for this patient?

A. Metoprolol

B. Verapamil

C. Chlorthalidone

D. Nifedipine

E. Spironolactone

16. A 59-year-old woman complains of headache, vomiting, and chest pain. Symptoms appeared 2 hours ago. The patient has a history of type 2 diabetes and hypertension for 4 years. Temperature 37.2°C, blood pressure 200/110 mm Hg, heart rate 120/min, respiratory rate 19/min, SpO2 98%. Ophthalmoscopy - signs of optic disc edema. Urinalysis - macrohematuria and proteinuria. Which drug is the best to start treatment of this patient?

A. Labetalol

B. Hydralazine

C. Lisinopril

D. Nitroprusside

E. Propranolol

17. A 19-year-old patient during a routine examination was found to have elevated blood pressure (180/110 mm Hg). There are no complaints. Physical examination revealed better development of the muscles of the upper half of the body. He has a heaving apex beat. Borders of the heart are extended to the left. The heart sounds are loud. A systolic murmur is heard in the interventricular space, over the aorta, neck vessels. There is accentuation of the second sound above the aorta. What is the most likely cause of high blood pressure in this case?

A. Coarctation of the aorta

B. Ventricular septal defect

C. Essential hypertension

D. Aortic regurgitation

E. Aortic stenosis

18. A 68-year-old woman with hypertension is taking enalapril, amlodipine, and spironolactone. What are the most likely abnormalities in the blood that require regular monitoring during this therapy?

A. Anemia

B. Thrombocytopenia

C. Hypernatremia

D. Hyperkalemia

E. Hypercalcemia

19. A 62-year-old man is hospitalized with a severe headache that began about an hour ago. He has a history of hypertension for 10 years. Blood pressure 180/120 mm Hg, heart rate 95/min, temperature 37.2°C, respiratory rate 20/min. The patient has blurred

vision, left-sided hemiparesis. After stabilization of the patient's condition, which test is the most optimal for diagnosis?

A. Head CT scan with contrast

B. Head CT scan without contrast

C. Echocardiography

D. ECG

E. Carotid doppler ultrasound

20. A 50-year-old patient who has been suffering from hypertension for more than 10 years suddenly developed a sudden increase in blood pressure to 200/110 mm Hg due to stress. The condition was accompanied by body tremors, headache, tachycardia, generalized agitation, feeling of heat and dry mouth. Which drug is the most appropriate?

A. Beta-blockers

B. Calcium channel blockers

C. Diuretics

D. ACE inhibitors

E. Angiotensin receptor blockers

21. A 62-year-old man consulted a urologist with complaints of frequent urination at night (5-6 times), feeling of incomplete bladder emptying, lower abdominal pain, slowing of urination rate. A history of stage 2 hypertension (maximum blood pressure 160/100 mm Hg). The prostate gland is palpably enlarged to the second degree. Determine the drug for long-term therapy of combined pathology in the patient:

A. Amlodipine

B. Enalapril

C. Indapamide

D. Tamsulosin

E. Betaxolol

22. A patient with arterial hypertension and chronic kidney disease has a blood potassium level of 6.2 mmol/L. Which of the following drugs is safe as a hypotensive agent?

A. Losartan

B. Spironolactone

C. Amlodipine

D. Eplerenone

E. Lisinopril

23. A 49-year-old woman with hypertensive crisis complains of palpitations, throbbing headache. Heart rate - 100/min, blood pressure - 190/100 mm Hg (hyperkinetic type of hemodynamics). Which drug should be preferred?

A. Beta-blocker

B. ACE inhibitor

C. Diuretic

D. Alpha blocker

E. Calcium antagonist

24. A 48-year-old patient with complaints of compressive occipital headache. Physical examination: BP - 190/100 mm Hg, heart rate - 92 beats/min. Daily blood pressure monitoring: average daily SBP - 162 mm Hg, DBP - 99 mm Hg. Urine test: albuminuria - 20 mg/day. Carotid doppler ultrasound did not revealed the atherosclerotic plaques. Fundoscopy: Salus I-II symptom. Echocardiography: Left ventricular mass index - 123 g/m², EF - 55%, LV end-diastolic dimension - 5.5 cm, interventricular septal thickness - 1.67, posterior wall thickness - 1.60 cm. Establish the diagnosis:

A. Stage 2 Hypertension

B. Hypertrophic cardiomyopathy

C. Renoparenchymal hypertension

D. Stage 3 Hypertension

E. Stage 1 Hypertension

25. In which of the following conditions is the use of nicardipine for the treatment of hypertensive crisis contraindicated?

A. Renal failure

B. Hepatic failure

C. Second-degree AV block

D. Tachyarrhythmia

E. Pregnancy

26. Which clinical condition requires outpatient management of patient with arterial hypertension?

A. Pulmonary edema

B. Nosebleeds

C. Acute coronary syndrome

D. Hypertensive encephalopathy

E. First stage hypertension

27. Which antihypertensive drugs are the first-line therapy for acute aortic dissection?

A. Nitroprusside and esmolol

B. Nitroprusside and furosemide

C. Nitroglycerin and verapamil

D. Phentolamine and labetalol

E. Torasemide and nitroglycerin

28. Choose a drug for the treatment of hypertensive crisis in a pregnant woman.

A. Atenolol

B. Enalapril

C. Verapamil

D. Torasemide

E. Methyldopa

29. For emergency care in hypertensive crisis it is recommended to use:

A. Potassium-sparing diuretics

B. Loop diuretics

C. Thiazide diuretics

D. Osmotic diuretics

E. Thiazide-like diuretics

30. A 50-year-old patient has been suffering from hypertension for 12 years. For 2 days he has been noticing a deterioration in his condition: headache, nausea, dizziness, facial swelling, shortness of breath with minor exertion, which he attributes to excessive consumption of salty foods and interruption of the prescribed antihypertensive therapy. Blood pressure 180/120 mm Hg, heart rate 88/min, respiratory rate 26/min. Bilateral crackles at the bases of lungs. Inpatient care should begin with:

A. Furosemide intravenously

B. Enalapril intravenously

C. Isosorbide dinitrate infusion

D. Metoprolol intravenously

E. Verapamil intravenously

31. A 66-year-old man has been suffering from hypertension for 15 years. He takes hypotensive drugs occasionally. He feels severe headache, dull chest pain without radiation. Blood pressure 200/110 mm Hg. ECG - left axis deviation, Sokolow-Lyon criterion - 40 mm, no signs of ischemia. Examination including neurological status and fundoscopy are normal. What is your preliminary diagnosis?

A. Myocardial infarction

B. Transient ischemic attack

C. Hypertensive emergency

D. Hypertensive urgency

E. Acute hypertensive encephalopathy

32. A 50-year-old woman with an asthma attack. Her pulmonary exam is significant for diffuse expiratory wheezes with prolonged expiratory phase. She took her salbutamol 10 times. Respiratory rate - 32/min, blood pressure 170/110 mm Hg, heart rate 130/min. What emergency hypotensive therapy is the best in this case?

A. Verapamil intravenously

B. Metoprolol intravenously

C. Enalapril intravenously

D. Furosemide intravenously

E. Labetalol intravenously

33. The target level of systolic blood pressure in patients with hypertension under the age of 65 years according to the recommendations of the European Society of Cardiology is:

A. 130-139 mm Hg.

B. 120-139 mm Hg.

C. 120-149 mm Hg.

D. 120-129 mm Hg.

E. 130-149 mm Hg.

34. A 48-year-old patient with hypertension complaints of dry cough. Two weeks ago, in addition to amlodipine, he was prescribed lisinopril. What can be the reason for such symptoms?

A. Lymphocytic infiltration of the lung

B. Pulmonary hyperinflation

C. Accumulation of histamine in the lung

D. Accumulation of bradykinin in the lung

E. Bronchial eosinophilic infiltration

35. The target level of systolic blood pressure in patients with hypertension and CKD according to the recommendations of the European Society of Cardiology is:

A. 120-139 mm Hg.

B. 120-129 mm Hg.

C. 120-149 mm Hg.

D. 130-149 mm Hg.

E. 130-139 mm Hg.

36. A 40-year-old patient complains of headache, dizziness, muscle weakness, and episodic leg cramps. He has history of hypertension for 10 years. Examination reveals BP - 180/100 mm Hg. Serum potassium level - 1.8 mmol/l, sodium level - 148 mmol/l. Urine test: relative density - 1008; protein, glucose is absent, leukocytes - 3-4 per m/f, erythrocytes - 1-2 per m/f. Which drugs should be chosen for the treatment of hypertension?

A. Calcium channel blockers

B. Mineralocorticoid receptor antagonist

C. Beta-blockers

D. ACE inhibitors

E. Thiazide diuretics

37. A 49-year-old patient after stress feels a sudden, stabbing pain, palpitations. He has a history of hypertension for 2 years. The patient is anxious, face hyperemia, legs tremor, moist skin. Heart rate 110/min, blood pressure 180/100 mm Hg. Which drug should be prescribed to improve the patient's condition?

A. Metoprolol

B. Nifedipine

C. Furosemide

D. Magnesium sulfate

E. Clonidine

38. A 60-year-old patient was admitted to the hospital with hypertensive emergency and acute heart failure. Which drug is the best for his initial treatment?

A. Sodium nitroprusside

B. Nifedipine

C. Propranolol

D. Labetalol

E. Captopril

39. A 54-year-old woman came to the primary physician for her annual physical exams. Her father died at age 50 from myocardial infarction. On examination: BMI - 26 kg/m2, temperature - 36.8°C, heart rate - 81/min, respiratory rate - 16/min, blood pressure 160/100 mm Hg on both arms. Fundoscopy - narrowing of retinal vessels. Laboratory values are within normal ranges. Choose the appropriate medication to reduce the risk of cardiovascular death in this patient.

A. Atorvastatin

B. Ramipril

C. Torasemide

D. Aspirin

E. Bisoprolol

40. A 24-year-old man has a high blood pressure about 160-170/100 mm Hg for a year. He takes amlodipine, enalapril, and chlorthalidone, but his blood pressure remains high. Renal ultrasound: partial visualization of the renal arteries on the left. What is the preliminary diagnosis?

A. Hypothalamic syndrome

B. Pheochromocytoma

C. Primary arterial hypertension

D. Adrenogenital syndrome

E. Renovascular hypertension

41. Which drugs should be avoided in management of patients with hypertension and diabetes?

A. Propranolol

B. Doxazosin

C. Indapamide

D. Spironolactone

E. Hydrochlorothiazide

42. A 60-year-old woman is hospitalized with complaints of compressive occipital headache, nausea, vomiting, dizziness. Heart rate 98/min, respiratory rate 16/min, SpO2 96%. Her blood pressure is 230/130 mmHg with otherwise normal vital signs and no other significant findings. What is your diagnosis?

A. Ischemic stroke

B. Hemorrhagic stroke

C. Transient ischemic attack

D. Hypertensive urgency

E. Subarachnoid hemorrhage

43. A 49-year-old patient complaints of compressive occipital headache, flying “flies” in eyes, tinnitus, and nausea. She has felt it for 2 days. She has a history of mild hypertension. She had a stressful situation the day before. She is stable, blood pressure - 175/100 mm Hg, heart rate - 90 per minute. What is your diagnosis?

A. Hypertensive urgency

B. Hemorrhagic stroke

C. Transient ischemic attack

D. Subarachnoid hemorrhage

E. Thyrotoxic crisis

44. Which of the following statements is true about the technique of blood pressure measurement?

A. All of the above

B. The patient's blood pressure should be measured in the supine position

C. Blood pressure should be measured three times with an interval of 2 minutes
D. During the patient's first visit, blood pressure should be measured on both arms, and subsequently, blood pressure should be measured on the arm with higher values
E. The patient should avoid caffeine intake, exercise, and smoking for 10 minutes before the blood pressure measurement

45. Among the causes of mortality in Ukraine, accidents, poisoning and injuries, malignant neoplasms, circulatory, endocrine, respiratory diseases, etc. predominate. Which class of diseases is most likely to take the first rank?
A. Endocrine diseases
B. Diseases of the respiratory system
C. Malignant neoplasms
D. Diseases of the circulatory system
E. Accidents, poisoning and injuries

46. Centrally acting antihypertensive drugs have advantages in the treatment of hypertension in patients
A. with coronary heart disease
B. with diabetes mellitus
C. pregnant women
D. after a stroke
E. elderly people

47. Which concomitant disease is an indication for adding beta-blockers to the antihypertensive regimen in a patient with hypertension?
A. Postinfarction cardiosclerosis
B. Diabetes mellitus
C. Gout
D. Ischemic stroke
E. Benign prostatic hyperplasia

48. Which risk category includes patients with hypertension and cardiovascular disease (acute coronary syndrome, stable angina, coronary revascularization, stroke, transient ischemic attack, peripheral arterial disease)?

A. Moderate

B. Low

C. Very high

D. High

E. Medium

49. A 60-year-old woman after taking enalapril and isosorbide dinitrate abruptly got out of bed and fainted. Objectively: pale, moist skin. Pulse - 100/min, weak. Blood pressure - 70/40 mm Hg. ECG: sinus rhythm, regular, left ventricular hypertrophy. There are no changes in the central nervous system. What is the most likely cause of the patient's deterioration?

A. Stokes-Adams syndrome

B. Anaphylactic shock

C. Orthostatic hypotension

D. Cardiogenic shock

E. Acute bleeding

50. A 50-year-old patient complains of intense headache, dizziness, flashing “flies” before the eyes, a feeling of heat and trembling throughout the body. Blood pressure - 190/110 mm Hg, pulse - 82 beats/min, second tone accent over the aorta. Urinalysis: protein - 0.033 g/l, erythrocytes - 4-8 in the field of view. What pathological condition has developed in the patient?

A. Epileptiform seizure

B. Adisonian crisis

C. Hypertensive urgency

D. Thyrotoxic crisis

E. Hypertensive emergency

51. Choose a class of drugs (“gold standard”) to reduce the level of hypertension in a patient with diabetic nephropathy

A. ACE inhibitors, angiotensin receptor antagonists

B. β-blockers

C. Selective imidazoline receptor agonists

D. Thiazide diuretics

E. Calcium channel blockers

52. A 54-year-old woman suffering from type 2 diabetes mellitus for 2 years consulted a family doctor with complaints of headache and dizziness. After the examination, the diagnosis was made: Hypertension, 2 degree, stage II, high-risk group. Which option of antihypertensive therapy is the most optimal for this patient?

A. Perindopril and valsartan

B. Perindopril and amlodipine

C. Perindopril and atenolol

D. Perindopril and furosemide

E. Bisoprolol and indapamide

53. A 48-year-old woman presents to his primary care physician for a routine examination. Physical examination revealed an increase in blood pressure to 165/90 mm Hg. The rest of the physical examination was unremarkable. The patient states that 2 months ago her blood pressure was within normal limits. Which test should be prescribed to the patient to make the diagnosis?

A. Thyroid function assessment

B. Echocardiography

C. Serum creatinine assessment

D. Glycosylated hemoglobin assessment

E. Daily monitoring of blood pressure

54. A 69-year-old woman with hypertension came to you for a routine examination. She constantly takes enalapril, amlodipine and spironolactone. What blood disorders are most likely to occur with this therapy?

A. Hypercalcemia

B. Hyperkalemia

C. Hypernatremia

D Thrombocytopenia

E. Anemia

55. A 59-year-old woman complains of severe headache, vomiting, discomfort behind the sternum. Symptoms appeared 2 hours ago. The patient has a history of type 2 diabetes mellitus and hypertension for 4 years. Temperature 37.2°C, blood pressure 200/110 mm Hg, heart rate 120/min, respiratory rate 19/min, SpO2 98%. Fundoscopy - signs of optic disc edema. Urinalysis - macrohematuria and proteinuria. Which drug is the best to start treatment of this patient?

A. Labetalol

B. Hydralazine

C. Lisinopril

D. Nitroprusside

E. Propranolol

56. A 70-year-old patient is admitted to the hospital with pulmonary edema. BP 200/100 mm Hg, heart rate 102/min. Which drug is most appropriate to prescribe to the patient?

A. Nifedipine

B. Propranolol

C. Labetalol

D. Clopheline

E. Furosemide

57. What clinical symptoms may indicate damage of the nervous system in patient with malignant hypertension?

A. Paresis

B. Generalized weakness

C. Headache

D. Cramps

E. Shortness of breath

58. The drug of choice for the treatment of pregnant woman with malignant hypertension is:

A. Verapamil

B. Propranolol

C. Hydralazine

D. Phentolamine

E. Furosemide

59. A patient with hypertension and renal failure has hyperkalemia. Which antihypertensive drugs will be safe for the patient?

A. Aldosterone antagonists

B. Angiotensin receptor blockers

C. Calcium channel blockers

D. ACE inhibitors

E. Direct renin inhibitors

60. Which antihypertensive drugs are included in the second line of therapy for patients with hypertension according to the recommendations of the European Society of Cardiology?

A. ACE inhibitors

B. Angiotensin receptor blockers

C. Thiazides

D. Mineralocorticoid receptor antagonists

E. Calcium channel blockers

Standard answers

1. B	11. D	21. D	31. D	41. E	51. A
2. A	12. A	22. C	32. A	42. D	52. B
3. A	13. E	23. A	33. D	43. A	53. E
4. D	14. D	24. A	34. D	44. D	54. B
5. D	15. D	25. B	35. E	45. D	55. A
6. B	16. A	26. B	36. B	46. C	56. E
7. C	17. A	27. A	37. A	47. A	57. E
8. D	18. D	28. E	38. A	48. C	58. C
9. A	19. B	29. B	39. B	49. C	59. C
10. A	20. A	30. A	40. E	50. C	60. D

Recommended reading list

1. 2024 ESC Guidelines for the management of elevated blood pressure and hypertension. Eur Heart J. 2024 Oct 7;45(38):3912-4018. doi: 10.1093/eurheartj/ehae178. Erratum in: Eur Heart J. 2025 Feb 11: ehaf031. doi: 10.1093/eurheartj/ehaf031.

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Cardiac arrythmias

1. A 50-year-old patient with rheumatic mitral heart disease complains of sudden palpitations and chest discomfort after physical exercise. Physical examination: BP - 125/85 mm Hg, heart rate - 120 beats/min, pulse - 92 beats/min, irregular rhythm. ECG - the P wave is absent, QRS 0.08, RR intervals = 0.98-0.60 s. What pathological condition did the patient have?

A. Supraventricular extrasystole

B. Ventricular extrasystole

C. Paroxysmal ventricular tachycardia

D. Paroxysmal supraventricular tachycardia

E. Paroxysmal atrial fibrillation

2. A 47-year-old woman with dilated cardiomyopathy suddenly felt unwell at night. On examination: the skin is pale, acrocyanosis. Blood pressure - 85/60 mm Hg, heart rate - 170 beats per minute. QRS complexes are deformed, QRS = 0.18 s. What is the likely cause of the patient's deterioration?

A. Atrial fibrillation

B. Ventricular paroxysmal tachycardia

C. Ventricular extrasystoles

D. Paroxysmal atrial flutter

E. Supraventricular paroxysmal tachycardia

3. A 70-year-old man complains of shortness of breath, cough, swelling legs, chest pain at walking up to 150-200 meters. Last year he had a myocardial infarction. Also he has a persistent atrial fibrillation. He regularly takes the recommended therapy. ECG: trigeminy, trough-shaped ST shift down from the isoline. These symptoms can be caused by:

A. An overdose of nitrates

B. Overdose of digitalis drugs

C. Overdose of beta-blockers

D. Insufficient dose of diuretics

E. Overdose of ACE inhibitors

4. Absolute contraindication for the beta-blockers prescription is:

A. Acute myocardial infarction

B. Hypertrophic cardiomyopathy

C. Pulmonary edema

D. First-degree atrioventricular block

E. Pregnancy

5. A 38-year-old patient complains of palpitations, sweating. The palpitations started suddenly. Such attacks have been observed for the last 3 years, repeated every 2-3 months, provoked by excitement. These attacks end in several minutes with polyuria. Physical exam: skin is moist, tremor of fingers. The thyroid gland is not enlarged. Pulse and heart rate are not countable (more than 180 per minute). ECG: heart rate - 220 per minute, before every QRS complex a deformed tooth P is recorded, QRS = 0.08 s, ventricular complexes are not changed. What kind of heart rhythm disorder did the patient have?

A. Paroxysmal supraventricular tachycardia

B. Atrial fibrillation

C. Ventricular flutter

D. Atrial flutter

E. Paroxysmal ventricular tachycardia

6. A 70-year-old man with atrial fibrillation presents to his primary care physician for a rash. He reports that he recently switched antiarrhythmic medications as instructed by his cardiologist. He reports having discoloration of his skin and a burning sensation after sun exposure. On physical exam, there are blue and gray discolorations of his skin. An eye exam also reveals yellow-brown granules in the cornea. Which medication could lead to worsening in this patient?

A. Propafenone

B. Amiodarone

C. Bisoprolol

D. Digoxin

E. Sotalol

7. Choose the optimal drug for patient with permanent atrial fibrillation and heart failure with reduced ejection fraction.

A. Digoxin

B. Propafenone

C. Etacizine

D. Amiodarone

E. Sotalol

8. The side effects of nifedipine include:

A. AV block

B. Constipation

C. Reduction of ejection fraction of left ventricle

D. Bronchospasm

E. Sinus tachycardia

9. A 54-year-old man has a headache, dizziness, and blurred vision. According to his wife, in the morning after sleep he could not speak and felt sharp weakness in the right limbs. He had a history of myocardial infarction and permanent atrial fibrillation. Objectively: consciousness was preserved, the skin was pale, blood pressure was 130/90 mm Hg. Neurological status - motor aphasia, central paresis of VII and XII pairs of cranial nerves on the right side; right-sided central hemiparesis and hemihyperesthesia. What is the cause of the patient's deterioration?

A. Brain tumour

B. Subarachnoid haemorrhage

C. Arrhythmogenic shock

D. Cardioembolic stroke

E. Transient ischaemic attack

10. A 65-year-old woman is admitted to the hospital with acute myocardial infarction. In preparation for angioplasty, she developed an attack of ventricular tachycardia. Which of the following drugs will you use to correct arrhythmia in this case?

A. Flecainide

B. Amiodarone

C. Digoxin

D. Sotalol

E. Verapamil

11. A 54-year-old man complaints of shortness of breath, palpitations, swelling legs. He has been ill for 4 years, the symptoms increased gradually. The left heart border is shifted by 1 cm, heart sounds are deaf, arrhythmic. The liver protrudes from under the edge of the rib arch by 3 cm. The legs are swollen. ECG: atrial fibrillation, heart rate - 120 per minute, changes in the repolarisation phase. Echocardiography: EF 36%. Choose a drug from the proposed to control the heart rate.

A. Verapamil

B. Propranolol

C. Digoxin

D. Ivabradine

E. Diltiazem

12. A 67-year-old patient with acute myocardial infarction suddenly lost consciousness. ECG: Heart rate - 46 beats per minute, QRS = 0.09 s, QT = 0.47 s, ectopic rhythm, P-waves are not differentiated, f-waves are present in II, V1, ventricles contract independently of AV connection. What caused the deterioration of the patient's condition?

A. Sick sinus syndrome

B. CLC syndrome

C. Frederick's syndrome

D. Dresler's syndrome

E. WPW syndrome

13. A 50-year-old man was admitted to the intensive care unit with an attack of dyspnoea and palpitations. BP - 110/70 mm Hg, heart rate - 125 beats/min, pulse - irregular. The ECG shows atrial fibrillation. The patient was administered digoxin intravenously, the heart rate decreased to 85 beats/min and remains irregular. Which mechanism best explains the effect of digoxin in the patient?

A. Blockade of beta-receptors

B. Blockade of calcium channels

C. Positive inotropic effect

D. Increased activity of the vagus nerve

E. Blockade of Na+K+ATPase of cardiomyocytes

14. The patient complains of intensive chest pain, palpitations, shortness of breath. These symptoms appeared acutely, two hours ago. On examination, the patient is adynamic, lethargic. The skin is pale, moist, cold, and the extremities are ‘marble’. Pulse on the peripheral arteries is not determined. Blood pressure - 80/60 mm Hg, heart rate - 200/min, heart sounds are deaf. The ECG shows ventricular paroxysmal tachycardia. What is the most likely complication the patient has developed?

A. Obstructive shock

B. Acute left ventricular failure

C. Myocardial infarction

D. Arrhythmogenic shock

E. Pulmonary embolism

15. Which statements are true about electromechanical dissociation?

A. Absence of electrical activity on the ECG

B. Positive effect when administering amiodarone intravenously

C. The prognosis is better than with ventricular fibrillation

D. Positive effect of electroimpulse therapy

E. The presence of electrical activity on the ECG in the absence of mechanical activity of the heart

16. A 60-year-old man was admitted with arrhythmic shock. Blood pressure - 80/40 mm Hg, bradycardia, syncope. He became ill suddenly after significant effort. ECG: atrial rate is 100 beats/min, ventricular rate is 50 beats/min, part of P waves is superimposed on T, and there is no QRS complex behind them. What is the cardiac rhythm disturbance in the patient?

A. WPW syndrome

B. Atrial fibrillation

C. Ventricular fibrillation

D. Supraventricular extrasystoles

E. Second degree AV block

17. In the treatment of patients with sick sinus syndrome, severe bradycardia is used:

A. Verapamil

B. Bisoprolol

C. Quinidine

D. Pacemaker implantation

E. Digoxin

18. The patient is 26 years old. Over the past 5 months, he has had three attacks of severe palpitations that began and ended suddenly, lasting from 5 to 10 minutes. The attacks were accompanied by general weakness, sweating, and frequent urination. ECG in heart attack: irregular rhythm, heart rate - 100 per minute, P waves absent, f waves recorded. Objectively: the heart boundaries are not changed, the tones are clear, the

rhythm is regular, heart rate is 80 per minute, blood pressure is 125/75 mm Hg. ECG: sinus rhythm, HR 80 per minute, PQ = 0.09 s, delta wave is present. Your preliminary diagnosis:

A. Laun-Ganong-Levine syndrome, paroxysmal atrial fibrillation

B. Romano-Ward syndrome, paroxysmal atrial fibrillation

C. Mitral valve stenosis, paroxysmal atrial fibrillation

D. Wolf-Parkinson-White syndrome, paroxysmal atrial fibrillation

E. Jervell-Lange-Nielsen syndrome, paroxysmal atrial fibrillation

19. The main ECG difference between Second degree (2:1) AV block and sinus bradycardia is:

A. A prolonged PQ interval

B. P wave that is not followed by a QRS complex

D. Wide QRS complexes

E. Most often these states are indistinguishable

20. Name the ECG signs of first-degree AV block:

A. A PQ-interval progressively gets longer until a QRS is dropped

B. A PQ interval of greater than 0.20 seconds, the ventricular rhythm is correct

C. PQ duration is constant, periodic loss of the next QRS complexes

D. PQ duration is constant, progressive reduction of R-R intervals

E. A PQ interval of greater than 0.20 seconds, periodic loss of QRS complexes

21. A 72-year-old patient complains of palpitations, shortness of breath on effort. Objectively: heart rhythm is irregular, heart rate - 96/min, heart sounds are weakened, systolic murmur over the aorta, RR - 16/min. ECG: absence of P waves in all leads, different R-R intervals, f waves in V1. What cardiac arrhythmia should be considered?

A. Atrial extrasystole

B. Atrioventricular block

C. Ventricular extrasystole

D. Atrial fibrillation

E. Incomplete right bundle branch block

22. Frederick's syndrome is:

A. Bradyarrhythmic form of atrial fibrillation

B. Atrial flutter with incomplete atrioventricular block

C. Combination of paroxysmal atrial tachycardia with incomplete atrioventricular block

D. The combination of atrial fibrillation with complete atrioventricular block

E. The combination of paroxysmal atrial tachycardia with complete atrioventricular block

23. An absolute indication for permanent pacemaker implantation is:

A. Third degree atrioventricular block with Adams-Stokes syndrome

B. Paroxysmal ventricular tachycardia

C. Ventricular extrasystoles

D. Second degree AV block, type I.

E. Third degree atrioventricular block in acute myocardial infarction

24. An 80-year-old patient with third degree AV block and persistent atrial fibrillation has syncopal episodes. The patient has a demand persistent pacemaker. Objectively: the heart rate is correct, 42 beats per minute. What can cause the development of such conditions?

A. Ventricular conduction disturbance

B. Failing to pace

C. Paroxysmal supraventricular tachycardia

D. Paroxysmal ventricular tachycardia

E. Ischemic stroke

25. A 67-year-old man was admitted with recurrent syncopal episodes. Physical examination: heart sounds are deaf, marked bradycardia is noted. Pulse - 36 beats per minute, rhythmic. Blood pressure - 150/70 mm Hg. ECG: the ventricular rate is 36 per minute, none of the supraventricular impulses conducted to the ventricles. The most likely cause of syncope:

A. Complete AV block

B. Sinoatrial block

C. Sinus arrhythmia

D. Sinus bradycardia

E. Atrial fibrillation

26. What is characteristic of second-degree atrioventricular block, Mobitz I?

A. PQ duration is constant, progressive reduction of R-R intervals

B. PQ duration is constant, periodic loss of ventricular QRS complexes

C. A PQ interval of greater than 0.20 seconds, periodic loss of QRS complexes

D. A PQ interval of greater than 0.20 seconds, the ventricular rhythm is correct

E. A PQ-interval gradually gets longer until a QRS is dropped

27. What arrhythmia can lead to bradycardia?

A. Third degree atrioventricular block

B. Second degree AV block.

C. None of the above

D. Any of the reasons

E. Second degree sinoatrial blockade.

28. A 60-year-old woman is hospitalised with periodic syncope accompanied by convulsions. The patient's condition is severe, acrocyanosis, swollen legs. Pulse - 26 per minute, blood pressure - 85/60 mm Hg. Heart rate is regular, over the apex of the heart - I tone is weakened, accent of II tone in the second intercostal space to the left of the sternum. ECG: atrial and ventricular complexes are independently of each other,

the rate of ventricular complexes is 36 per minute. There are signs of myocardial injury. What is best treatment tactic?

A. Isadrine IV

B. Atropin IV

C. Temporary pacemaker

D. Dopamine IV

E. Epinephrine IV

29. A 78-year-old patient is hospitalised with acute inferior myocardial infarction. The heart rhythm is regular, heart rate - 35 per minute, blood pressure - 80/70 mm Hg. Suddenly the patient lost consciousness. Cyanosis of the face, neck are noted, clonic convulsions are appeared. What happened to the patient?

A. Cardiogenic shock

B. Epileptic seizure

C. Adams-Stokes syndrome

D. Pulmonary embolism

E. Acute cerebrovascular accident

30. A 34-year-old woman after rapidly changing her position from horizontal to vertical suddenly paled, fell down, her skin became moist, her limbs are cold, her pupils are dilated. The pulse is rapid and thready, blood pressure is 50/25 mm Hg. What condition has likely developed in the patient?

A. Ventricular fibrillation

B. Coma

C. Shock

D. Adams-Stokes syndrome

E. Collapse

31. A 32-year-old patient complained of palpitation, dizziness, shortness of breath during exertion. He denies chronic diseases and bad habits. Objective examination: Ps

- 74/min, rhythmic. BP - 130/80 mm Hg. There is systolic murmur in the aortic valve post. ECG: frequent ventricular extrasystoles, signs of left ventricular hypertrophy, ST segemet depression in I, V5, V6 leads. Echocardiography: interventricular septal thickness is 2 sm, the heart chambers are not dilated, the left ventricular outflow tract gradient is elevated (32 mm Hg). What is the most likely cause of the patient's cardiac rhythm disturbance?

A. Arterial hypertension

B. Aortic stenosis

C. Hypertrophic cardiomyopathy

D. Arrhythmogenic cardiomyopathy

E. Dilated cardiomyopathy

32. A 78-year-old patient with sick sinus syndrome complains of weakness, episodic syncope. BP 100/70 mm Hg, heart rate 43/min. What treatment tactics will you choose?

A. Verapamil

B. Atropine

C. Digoxin

D. Propafenone

E. Pacemaker implantation

33. A 64-year-old patient with stable angina suddenly feels palpitations. Objectively: heart sounds are deaf, arrhythmic, systolic murmur at the apex. Heart rate - 94/min. Blood pressure - 130/85 mm Hg. ECG: group, polytopic ventricular extrasystoles, episodic allorhythmia. Which life-threatening condition can be predicted?

A. Ventricular fibrillation

B. Paroxysm of atrial fibrillation

C. Complete atrioventricular block

D. Adams-Stokes syndrome

E. Sinoatrial block

34. A 62-year-old man with atrial fibrillation and congestive heart failure is constantly taking the recommended therapy. He complains of loss of appetite, nausea, dizziness. ECG: Heart rate 52/min, ventricular bigeminy. PQ 0.24 - 0.26 seconds. What medication can cause this adverse effect?

A. Digoxin

B. Bisoprolol

C. Lisinopril

D. Spironolactone

E. Furosemide

35. A 64-year-old man is being treated for coronary heart disease, permanent atrial fibrillation and heart failure. He takes warfarin to prevent thrombosis. Which method of monitoring the effectiveness and safety of anticoagulant therapy would be most appropriate?

A. Platelet count

B. International normalized ratio

C. Prothrombin time

D. Fibrinogen level

E. Coagulation time

36. A 59-year-old patient with acute myocardial infarction has severe general weakness and a feeling of 'fading' in the heart. ECG: sinus rhythm, heart rate - 76/min. Periodically, there are widespread ventricular complexes lasting 0.22 seconds, irregular in shape, after which complete compensatory pauses are detected. What complication has occurred in this patient?

A. Atrial extrasystoles

B. Complete left bundle branch block

C. Atrioventricular extrasystoles

D. Ventricular extrasystoles

E. Complete right bundle branch block

37. A 20-year-old man was admitted to the clinic with complaints of palpitations, interruptions, chest pain and shortness of breath. These symptoms occurred after physical exertion and ended in syncopal states. After examination, the patient was diagnosed with hypertrophic obstructive cardiomyopathy. Which of the following antiarrhythmic drugs is contraindicated in the treatment of this pathology?

A. Verapamil

B. Flecainide

C. Digoxin

D. Bisoprolol

E. Amiodarone

38. A 27-year-old woman complained of palpitations and discomfort in the chest. Symptoms appeared suddenly 2 hours ago. Blood pressure 110/70 mm Hg, pulse 220/min. ECG: rhythm is correct, heart rate is -230/min, P wave is superimposed on T wave, QRS duration is 0.08. Choose the first drug for emergency treatment.

A. Lidocaine IV

B. Digoxin IV

C. Metoprolol injection

D. Adenosine injection

E. Verapamil IV

39. A 35-year-old patient with chronic glomerulonephritis has been on dialysis for the last 3 years has developed heart failure, weakness, dyspnoea. BP 80/50 mm Hg, heart rate 43/min. ECG: I degree atrioventricular block, high peak T-waves. What is the most likely cause of these changes?

A. Hypokalemia

B. Hypocalcaemia

C. Hyperkalemia

D. Hypernatremia

E. Hyperhydration

40. A 68-year-old patient with atrial fibrillation has been taking 5 mg of warfarin daily for 6 months. The doctor wants to increase the daily dose of it. What level of the International normalized ratio (INR) indicates a sufficient hypocoagulant effect of the drug?

A. 2,0-3,0

B. 1,0-1,5

C. 1,0-2,0

D. 0,8-1,2

E. 1,2-1,5

41. A 60-year-old woman complains of palpitations, chest discomfort. He has stable angina for 5 years, takes aspirin, bisoprolol. Objectively: heart sounds are arrhythmic, systolic murmur at the apex. Heart rate - 94/min. Blood pressure - 130/85 mm Hg. ECG: group, polytopic ventricular extrasystoles, episodes of allorhythmia. The patient should be treated with a high risk of developing which complication?

A. Ventricular fibrillation

B. Atrial fibrillation

C. Complete atrioventricular block

D. Sick sinus syndrome

E. Torsades de pointes

42. A 45-year-old man complains of shortness of breath, weakness, palpitations. He had an acute viral infection one month ago. Objectively: respiratory rate - 22/min, heart rate - 100/min. BP - 125/70 mm Hg. Heart sounds are arrhythmic, systolic murmur at the apex. ECG: ventricular extrasystoles, trigeminy. Echocardiography: moderate LV dilatation, myocardial contractility is preserved, EF - 50%. What is the most likely cause of the patient's rhythm disturbance?

A. Acute myocarditis

B. Hypertrophic cardiomyopathy
C. Acute pericarditis
D. Acute coronary syndrome
E. Dilated cardiomyopathy

43. A 40-year-old woman complains of sweating, weakness and palpitations. Physical examination reveals a non-painful symmetrically enlarged thyroid gland and an irregular heart rate. Blood pressure 150/90 mm Hg, heart rate 102/min. Thyroid function tests revealed high free T4 and low TSH level. The ECG shows an irregular rhythm. Which cardiac rhythm disorder is most likely to develop?
A. Atrial flutter
B. Atrial fibrillation
C. Paroxysmal supraventricular tachycardia
D. Ventricular tachycardia
E. Ventricular extrasystoles

44. A 65-year-old woman was admitted to the intensive care unit with shortness of breath, retrosternal chest pain and palpitations. Objectively: severe condition, BP 80/60 mm Hg, heart rate 155/min, respiratory rate 30/min, SpO2 - 78%. Diffuse moist rales in lungs are heard bilaterally. ECG - atrial fibrillation. What is the best treatment strategy for this patient?
A. Adenosine
B. Amiodarone
C. Electrical cardioversion
D. Diltiazem
E. Metoprolol

45. A 54-year-old man with persistent atrial fibrillation had myocardial infarction 6 months ago. He has a history of hypertension and type 2 diabetes. Warfarin was recommended for the prevention of thromboembolic complications. The patient is

satisfied with taking the drug once a day, but is annoyed by the need to frequently visit the laboratory to determine the INR. Which anticoagulant to replace warfarin would you suggest to the patient?

A. Rivaroxaban

B. Apixaban

C. Dabigatran

D. Acenocoumarol

E. Enoxaparin

46. A 77-year-old patient complains of weakness, dizziness, short-term episodes of fainting. Physical examination: heart rate - 36 beats/min, rhythm is regular, blood pressure - 140/80 mm Hg. ECG: atrial and ventricular complexes follow independently of each other, atrial rate – 82/min. Prescribe the treatment.

A. Amiodarone orally

B. Radiofrequency ablation

C. Coronary artery bypass grafting

D. Pacemaker implantation

E. Digoxin orally

47. A 77-year-old patient with acute myocardial infarction during thrombolytic therapy suddenly lost consciousness. Physical examination: pale skin, no pulse on the carotid arteries, agonal breathing, blood pressure is not determined. Which instrumental method will be the most informative in resuscitation?

A. Echocardiography

B. Chest CT scan

C. Electrocardiography

D. Chest X-ray

E. Pulse oximetry

48. A 65-year-old man with obliterating atherosclerosis developed dry gangrene of the left lower leg. The patient complains of weakness, palpitations. BP 110/70 mm Hg, heart rate 96/min. Blood test revealed high potassium and lactate level, arterial blood pH 7.27. Which ECG changes are most likely in this patient?

A. Peak high T-waves.

B. QT prolongation

C. ST depression.

D. T wave inversion

E. U waves

49. A 73-year-old woman complains of moderate palpitations and shortness of breath at walking. She has a history of deep vein thrombosis and hypertension. She takes warfarin, lisinopril, and atorvastatin. Blood pressure 140/80 mm Hg, heart rate 114 beats/min, respiratory rate 18/min. Cardiac activity is arrhythmic. Vesicular breathing over the lungs. There is no peripheral edema. ECG: atrial fibrillation, signs of LV hypertrophy. Chest CT scan is unremarkable. INR 2.5. How to optimize treatment in this patient?

A. Prescribe amiodarone

B. Switch from warfarin to rivaroxaban

C. Prescribe diltiazem

D. Prescribe digoxin

E. Prescribe aspirin

50. A 62-year-old man came to the cardiologist for a routine examination. He has no complaints. He has type 2 diabetes mellitus, arterial hypertension and atrial fibrillation. He takes metformin, lisinopril, warfarin and metoprolol. BP 120/80 mm Hg, HR 102 bpm, irregular heart rhythm, RR 18/min. INR 2.5. HbA1c is 6.2%. Should anything be changed in the treatment of this patient?

A. Increase the metoprolol dose

B. Refer for radiofrequency ablation

C. Switch from warfarin to dabigatran

D. Prescribe digoxin

E. Nothing

Standard answers

1. E	11. C	21. D	31. C	41. A
2. B	12. C	22. D	32. E	42. A
3. B	13. D	23. A	33. A	43. B
4. C	14. D	24. B	34. A	44. C
5. A	15. E	25. A	35. B	45. B
6. B	16. E	26. E	36. D	46. D
7. A	17. D	27. D	37. C	47. C
8. E	18. D	28. C	38. D	48. A
9. D	19. B	29. C	39. C	49. C
10. B	20. B	30. E	40. A	50. E

Recommended reading list

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6. Brugada J, Katritsis DG, Arbelo E, et al. ESC Guidelines for the management of patients with supraventricular tachycardiaThe Task Force for the management of patients with supraventricular tachycardia of the European Society of Cardiology (ESC). Eur Heart J 2020; 41:655.

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Syncope

1. A 20-year-old student, who crossed the threshold of the operating room for the first time, suddenly felt weak, dizzy, yawning and nausea, sweating, and numbness in the limbs. His pulse is small, slow, and weak. Blood pressure is low. The pupils are dilated, responsive to light. What should be done to provide emergency care?

A. Administer cardiac glycosides

B. Administer pentamine

C. Using smelling salts

D. Administer calcium gluconate

E. Put him a sitting position

2. A 57-year-old patient suddenly lost consciousness after intravenous administration of strophanthine. Physical examination: pale skin, acrocyanosis, no pulse on the carotid and femoral arteries, agonal breathing, blood pressure is not determined, heart sounds are not heard. Which diagnostic method will be the most informative for resuscitation?

A. Echocardiography

B. Chest CT scan

C. Electrocardiography

D. Heart MRI

E. Pulse oximetry

3. A 50-year-old patient was admitted to the hospital with shock. BP - 80/40 mm Hg, heart rate 50/min. He became ill suddenly after physical exertion. ECG: atrial rate 100 beats/min, ventricular rate 50 beats/min, some of the P waves are superimposed on T, and there is no QRS complex behind them. What caused the syncope?

A. WPW syndrome

B. Atrial fibrillation

C. Ventricular fibrillation

D. Supraventricular extrasystoles

E. Second degree AV block

4. A 76-year-old patient with pacemaker (regimen “on demand”) has short-term syncope. Objectively: the heart rate is correct, 42 beats per minute. What can be the cause of such conditions?

A. Violation of intraventricular conduction

B. Failing to pace

C. Paroxysmal supraventricular tachycardia

D. Paroxysmal ventricular tachycardia

E. Cerebral atherosclerosis

5. An 80-year-old female patient complains of weakness, dizziness, and occasional syncopal episodes for 3 months. Physical examination: heart sounds are deaf. Pulse - 36 beats per minute, rhythmic. Blood pressure - 160/80 mm Hg. ECG: ventricular rate 46 per minute, atrial and ventricular complexes are independent of each other. What is the most likely cause of the patient's syncope?

A. Sinoatrial block

B. Sinus bradycardia

C. Complete AV block

D. Atrial fibrillation

E. Sinus arrhythmia

6. A 66-year-old man was admitted to the clinic with periodic syncope and convulsions. The patient's condition is severe, acrocyanosis, swelling legs. Pulse - 26 per minute, blood pressure - 85/60 mm Hg. Cardiac rhythm is regular, the accent of the second tone in the second intercostal space on the left of the sternum. ECG: there is no relationship between P waves and QRS complexes; ventricular rate is 36 per minute. ECG signs of myocardial ischemia. What is your treatment option?

A. Isadrine

B. Amiodarone

C. Pacing

D. Dobutamine

E. Adrenaline

7. The woman is 70 years old. BP - 90/70 mm Hg, heart rate 40/min. She suddenly lost consciousness. Physical exam: diffuse cyanosis, clonic convulsions, convergence of the eyeballs. What is the likely cause of syncope?

A. Cardiogenic shock

B. Epileptic seizure

C. Adams-Stokes syndrome

D. Pulmonary embolism

E. Acute cerebrovascular accident

8. A 79-year-old patient was admitted with frequent syncope. On examination: heart sounds are deaf, severe bradycardia. The pulse is 37 beats per minute, rhythmic. Blood pressure - 165/70 mm Hg. ECG: atrial and ventricular complexes are independent of each other. The most likely cause of syncope:

A. Sinus arrhythmia

B. Sinus bradycardia

C. Sinoatrial block

D. Complete AV block

E. Atrial fibrillation

9. A 67-year-old patient has a combined mitral and aortic heart disease and has recently been experiencing dizziness, with three episodes of fainting (several seconds). Physical examination: no edema, heart rate - 40 beats/min, rhythm is regular, systolic murmur at the apex of the heart, aorta. Blood pressure - 160/70 mm Hg. ECG: atrial and ventricular complexes are independently of each other, atrial rate – 82/min, ventricular rate is 40 per minute. Your medical tactics:

A. Conservative treatment in a neurological clinic

B. Outpatient treatment with ACE inhibitors

C. Coronary artery bypass grafting

D. Pacemaker implantation

E. Conservative treatment in a cardiology clinic

10. A 70-year-old woman fainted after suddenly getting out of bed. She has a history of hypertension and stable angina for 20 years. She takes enalapril, isosorbide dinitrate, amlodipine. Objectively: the skin is pale, moist. Pulse - 100/min, weak. Blood pressure - 70/40 mm Hg. ECG: sinus rhythm, regular, signs of left ventricular hypertrophy. There are no changes in the central nervous system. What is the most likely cause of the syncope?

A. Adams-Stokes syndrome

B. Anaphylactic shock

C. Orthostatic hypotension

D. Cardiogenic shock

E. Acute bleeding

11. A 42-year-old man with spastic paraparesis was prescribed the muscle relaxant tizanidine with gradually dose increase. The patient immediately took the daily dose, after which he felt general weakness, dizziness, decreased strength in the legs and briefly lost consciousness. Physical examination: blood pressure - 75/55 mm Hg, pulse - 69/min, body temperature - 36.6°C, general muscle hypotension. What pathological condition did the patient have?

A. Syncope

B. Orthostatic hypotension

C. Adams-Stokes syndrome

D. Transient ischemic attack

E. Panic attack

12. A 64-year-old man is hospitalised with acute coronary syndrome. In 5 days, he felt severe chest pain and lost consciousness. Pulse is not palpable; heart sounds are absent. ECG: sinus rhythm, QS and ST segment elevation in V1-V4. Cardiopulmonary resuscitation was failed. A pericardial effusion was found at echocardiography. What complication is most likely to develop in the patient?

A. Cardiogenic shock
B. Acute mitral insufficiency
C. Left ventricular rupture
D. Pericarditis epistenocardica
E. Pulmonary embolism

13. A 17-year-old boy suddenly lost consciousness during a physical education lesson. Cardiopulmonary resuscitation was successful. Family history revealed that his father and grandfather had been treated by a cardiologist and died at a young age. Cardiac auscultation revealed a systolic murmur in the second intercostal space on the right. An echocardiography revealed the interventricular septal thickness is greater 19 mm. What disease can be suspected in this patient?

A. Aortic stenosis
B. Dilated cardiomyopathy
C. Acute pericarditis
D. Mitral stenosis
E. Hypertrophic cardiomyopathy

14. A 70-year-old patient complains of weakness, dizziness, short-term syncope, chest pain. Heart tones are rhythmic, I tone is enhanced. The heart rate is 40/min, blood pressure -160/90 mm Hg. What is the most likely cause of hemodynamic disorders?

A. Third degree AV block
B. First degree AV block
C. Bradysystolic form of atrial fibrillation
D. Sinus bradycardia

E. Complete left bundle branch block

15. A 22-year-old medical student during her stay in the operating room felt weak, dizzy, mild nausea, lost consciousness and fell. This state lasted for 2 minutes. Objectively: eyes closed, pale skin, diffuse hyperhidrosis, weak pulse, blood pressure - 90/60 mm Hg, shallow breathing, slow reaction to light, tendon reflexes are preserved, no seizures. What is the most likely diagnosis?

A. Syncope
B. Neurotic disorder
C. Acute coronary syndrome
D. Transient ischemic attack
E. Epileptic seizure

16. A 68-year-old patient came to a cardiologist for a routine examination. For 3 years he has had a permanent atrial fibrillation. During the examination, he suddenly fainted. ECG: heart rate - 46 beats per minute, QRS = 0.09 s, QT = 0.47 s, ectopic rhythm, P-waves are not differentiated, f-waves are present in II, V1, ventricles contract independently of AV-connection. What was the cause of the patient's syncope?

A. Sick sinus syndrome
B. Ventricular fibrillation
C. Frederick's syndrome
D. Paroxysmal supraventricular tachycardia
E. WPW syndrome

17. A 38-year-old woman with coronavirus infection (COVID-19) was admitted to the intensive care unit in an unconscious state. According to her relatives, the patient has hypothyroidism and has stopped taking her medication for the last 6 months. On examination, the patient was unconscious, tendon reflexes were reduced, body temperature was 35.50C, respiratory rate was 10/min, shallow. BP 70/50 mm Hg, heart

rate 42 beats/min. ECG: sinus rhythm, low voltage of QRS complexes and P and T waves. Echocardiography: hydropericardium. What is the most likely diagnosis?

A. Acute cerebrovascular accident

B. Acute coronary syndrome

C. Hypothyroid coma

D. Chronic adrenal insufficiency.

E. Acute pericarditis

18. A 64-year-old man with diabetes is brought to the emergency department by ambulance for loss of consciousness. His wife states that, he had a 3-day history of vomiting, severe diarrhea from food poisoning. Due to the refusal to eat, he stopped antidiabetic medications. Objectively: the patient is unconscious. His mucous membranes are dry. Respiration superficial, rapid. Pulse is 116/min. Blood pressure - 80/50 mm Hg. Serum sodium level- 160 mmol/l. Serum glucose level -45 mmol/l. Urinalysis showed only trace ketones. What is the preferred solution for fluid resuscitation?

A. 0.45% sodium chloride

C. 10% glucose solution

C. 5% glucose

D. 0.9% sodium chloride

E. 4% sodium bicarbonate solution

19. A 55-year-old man presents to the emergency department after his wife saw him collapse onto the ground. When he stood up from bed, his wife saw him briefly stop walking, turn pale, and fall to the ground. After 10 seconds, he regained consciousness and said he felt lightheaded and his vision became blurry prior to passing out. Medical history is significant for hypertension. He is taking hydrochlorothiazide and lisinopril. Physical examination is unremarkable. A 12-lead electrocardiogram does not demonstrate any cardiac arrhythmias or structural changes. What is your next step in examination of this patient?

A. Orthostatic vital sign (tilt test)

B. Serum electrolytes

C. Brain MRI

D. Coronary angiography

E. Echocardiography

20. An 18-year-old girl has diabetes mellitus type 1. For 2 days she has reporting abdominal pain, nausea, and vomiting. Her concerned family has brought her to the hospital because she has been getting confused. Objectively: she is unconscious, her skin and mucous membranes are dry. The body temperature - 36.6, HR - 100 beats/min, blood pressure - 90/50 mm Hg. Serum glucose is 33 mmol/l. What is the preliminary diagnosis?

A. Hyperosmolar hyperglycemic state

B. Diabetic lactic acidosis

C. Syncope

D. Septic shock

E. Diabetic ketoacidosis

21. A 48-year-old patient is brought to the emergency department by ambulance for loss of consciousness. She has a history of Addison's disease for 20 years. The patient is pale, cold, pulse is weak. Heart rate 120/min, blood pressure - 60/30 mm Hg. What is the likely cause of loss of consciousness in the patient?

A. Acute adrenal insufficiency

B. Syncope

C. Adams-Stokes syndrome

D. Acute myocardial infarction

E. Hypoglycemic state

22. A 29-year-old female is brought to the emergency room for palpitations, sweating, anxiety, and loss of consciousness. She is post-operative day 1 from subtotal

thyroidectomy for Graves' disease. Body temperature - 39.8 °C, respiratory rate - 38/min, heart rate - 135/min, BP - 190/50 mm Hg. ECG - atrial fibrillation. What complication has developed in the patient?

A. Thyroid storm

B. Hypoparathyroidism

C. Septic shock

D. Graves' disease relapse

E. Hypertensive emergency

23. A 64-year-old man with complaints of shortness of breath and retrosternal pain. He is post-operative day 4 from a laparoscopic cholecystectomy. His neck and face are cyanotic. Blood pressure -90/60 mm Hg, heart rate - 110/min, central venous pressure -330 mm Hg. ECG – right bundle branch block.

A. Pulmonary embolism

B. Acute bleeding

C. Dissection of the aorta

D. Acute myocardial infarction

E. Hypovolemic shock

24. A 47-year-old woman with acute myocardial infarction has experienced intensive chest pain and palpitations. She lost consciousness in 2 minutes. ECG: heart rate - 170 per minute. QRS complexes 0.18 s. What is the likely cause of the syncope?

A. Atrial fibrillation

B. Ventricular paroxysmal tachycardia

C. Ventricular extrasystoles

D. Paroxysmal atrial flutter

E. Supraventricular paroxysmal tachycardia

25. A 20-year-old woman with type 1 diabetes suddenly fainted. Her husband states, that she recently had pneumonia. At 2 days before admission she had thirst, nausea,

and vomiting. The patient ate almost nothing, reduced the daily dose of insulin. On physical examination, she is somnolent. Her skin and mucous membranes are dry. Heart rate - 100/min, blood pressure - 80/50 mm Hg. Serum glucose 23 mmol/l. What is the cause of the patient's deterioration?

A. Hyperosmolar hyperglycemic state

B. Septic shock

C. Diabetic ketoacidosis

D. An addisonian crisis

E. Hypovolemic shock

26. A 50-year-old male was found unconscious in the field and brought to the emergency department. The patient was intubated in transit and given a 2 liter bolus of normal saline. On arrival, the patient's blood pressure is 80/60 mmHg and temperature is 37.5C. Jugular veins are flat and capillary refill time is 4 seconds. Cardiac index – low. Pulmonary capillary wedge pressure – low. Systemic vascular resistance - high. Which of the following is the most likely diagnosis?

A. Septic shock

B. Cardiogenic shock

C. Anaphylactic shock

D. Neurogenic shock

E. Hypovolemic shock

27. Syncope is a sudden short-term loss of consciousness with loss of postural tone. Most syncope episodes are the result of the following condition:

A. Seizures

B. Cerebral ischemia

C. Cerebral hypoxia

D. Neuroglycopenia

E. Myocardial ischemia

28. Which of the following drugs can cause bradyarrhythmia and syncope?

A. Phenothiazines

B. Cardiac glycosides

C. Calcium channel blockers

D. Tricyclic antidepressants

E. ACE inhibitors

29. A 27-year-old patient is brought to the emergency department with a syncope. Should we perform an ECG immediately?

A. If syncope occurred during exertion

B. If the probable cause of syncope is arrhythmia

C. If the syncope occurred when supine

D. ECG is performed in every patient with syncope

E. If syncope occurred after psycho-emotional stress

30. A 67-year-old man complains of recurrent syncopal episodes lasting 3-5 minutes. He states that this has happened to him several times, especially when he stands up suddenly, walks fast or turns his head sharply. He notes numbness, dizziness, and sometimes even speech problems just before losing consciousness. After the syncope episode, the patient is a little embarrassed, but usually returns to baseline within a minute. There is a history of type 2 diabetes mellitus and hypertension. BP 160/90 mm Hg, HR 90/min, RR 14/min, SpO2 97%. Neurological status is unremarkable. After getting up from the chair and walking, the patient feels numbness and tingling, severe weakness and blurred vision. What is the most likely cause of the patient's syncope?

A. Vertebral artery stenosis

B. Cardiac rhythm disorders

C. Myocardial ischemia

D. Hypertensive encephalopathy

E. Cerebral atherosclerosis

Standard answers

1. C	7. C	13. E	19. A	25. C
2. C	8. D	14. A	20. E	26. E
3. E	9. D	15. A	21. A	27. B
4. B	10. C	16. C	22. A	28. C
5. C	11. A	17. C	23. A	29. B
6. C	12. C	18. A	24. B	30. A

Recommended reading list

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3. Harrison's Principles of Internal Medicine, 21e Eds. Jameson J.L., Kasper D.L., Fauci A.S., et al. McGraw-Hill Education, 2022, https://accessmedicine.mhmedical.com/content.aspx?bookid=3095&sectionid=259856983.

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Chest pain

1. A 56-year-old woman with stable angina, FC III. She regularly takes bisoprolol, amlodipine. She complains of chest pain at walking up to 150-200 m. Coronary angiography: 85% stenosis of the common trunk of the left coronary artery. Which of the following is the best therapy for this patient?

A. Add valsartan

B. Add verapamil

C. Add ivabradine

D. Perform coronary angioplasty

E. Add trimetazidine

2. A 54-year-old man has arterial hypertension, stable angina and gastroesophageal reflux disease. Recently, he has been experiencing frequent episodes of heartburn after meals. Which of the following drugs could have caused the patient's gastroenterological pathology to worsen?

A. Isosorbide dinitrate

B. Metoprolol

C. Enalapril maleate

D. Trimetazidine

E. Hydrochlorothiazide

3. A 70-year-old patient is admitted with chest pain and shortness of breath, which occurred suddenly after physical exertion. The ECG showed ST-segment elevation in the II, III, and aVF leads. Elevated CK-MB is found in the serum. What is the most likely diagnosis?

A. Stable angina

B. Acute anterior myocardial infarction

C. Acute pericarditis

D. Aortic dissection

E. Acute inferior myocardial infarction

4. A 45-year-old patient complains of left side chest pain at rest, shortness of breath. Objectively: respiratory rate - 25/min, cyanosis. There is tympanic sound over the left lung, no breath sounds, and decreased vocal tremor. What is the most likely diagnosis?

A. Pleural effusion

B. Spontaneous pneumothorax

C. Community-acquired pneumonia

D. Aortic dissection

E. Pulmonary atelectasis

5. A 37-year-old man is brought to the emergency department with intensive retrosternal pain. The pain started 2 days ago. It gets worse when he lies down. The patient is jogging regularly (up to 15 kilometres per week). A week ago he had an upper respiratory tract infection. His temperature - 37.6 ºC, blood pressure - 120/80 mm Hg, HR – 92/min, respiratory rate – 18/min. Pulmonary auscultation reveals a pericardial friction murmur. ECG: ST elevation up to 3 mm in all leads. Chest X-ray: no pathological changes. Which of the following is the most appropriate next step in management?

A. Serum NT-pro BNP level

B. Serum high-sensitivity troponin I

C. Chest CT scan

D. Echocardiography

E. Evaluation of Coxsackie B virus antibodies

6. The patient with acute myocardial infarction has episodes of atrial fibrillation for 5 days, and fever up to 38-38.4^{0}C. Blood pressure 90/60 mm Hg, HR – 102/min. ECG shows complete right bundle branch block, QS complexes with ST elevation in V1-V4 leads. Echocardiography: pericardial effusion. What complication of myocardial infarction did the patient occur?

A. Dressler's syndrome
B. Cardiogenic shock
C. Thrombotic endocarditis
D. Heart left ventricle aneurysm
E. Pulmonary embolism

7. A 59-year-old man complains of retrosternal pain behind the sternum lasting from 5 to 20 minutes during effort and at rest. Her pain gets worse 2 days ago. Physical examination reveals normal lung sounds, a regular rhythm with a hyperdynamic apical impulse. Blood pressure - 160/100 mm Hg, heart rate - 80/min. ECG: negative T wave in V2-V5. What is the most likely diagnosis?
A. Acute myocarditis
B. Non-ST elevation acute coronary syndrome without
C. Intercostal neuralgia
D. Vasospastic angina
E. Stable angina, II functional class

8. What test is used to diagnose and confirm stable angina?
A. Daily blood pressure monitoring
B. Reovasography
C. Treadmill test (stress test)
D. ECG
E. Plethysmography

9. A 56-year-old patient complains of chest pain at walking up to 100-150 m. He has it several times a day, it lasts up to 10 minutes, and relieved by nitroglycerin. Blood pressure - 140/80 mm, HR 78/min. The rest of the physical examination ss unremarkable. ECG – signs of left ventricle hypertrophy. What is the most likely diagnosis?
A. Stable angina, class III

B. Stable angina, class I

C. Stable angina, class IV

D. Stable angina, class II

E. Unstable angina

10. A 70-year-old man complains of attacks of chest pain, radiating to the left arm. This pain occurs at rest, always at the same time, at night. Which of the following tests should be ordered next?

A. Daily ECG monitoring

B. Cardiac CT scan

C. Echocardiography

D. Coronary angiography

E. Stress test

11. A 60-year-old patient was diagnosed coronary artery disease and heart failure, class II. Which of the following criteria is the most significant to confirm systolic heart failure?

A. Blood pressure 100/70 mm Hg

B. Heart rate 100/min

C. Left ventricle ejection fraction less than 40%.

D. Negative T-waves in leads V1-V4

E. Dilatation of the left ventricle

12. What ECG changes are typical for a patient with vasospastic angina at heart attack?

A. QRS complex prolongation

B. ST depression

C. ST elevation

D. Prolonged PQ interval

E. Shortened PQ interval

13. A 52-year-old patient complaints of chest pain on effort radiating to the left arm, lasting up to 15 minutes. The pain is relieved with nitroglycerin. During the past 2 days his pain is increasing in frequency and severity. The patient took nitroglycerin 6-8 times per day. HR - 76 beats/min, blood pressure - 160/96 mm Hg. The patient deterioration can be explained by:

A. Nitroglycerin overdose

B. Atherosclerotic plaque rupture

C. Development of nitrate tolerance

D. Increased stroke volume

E. Left ventricular volume overload

14. A 77-year-old man complains of chest pain radiating into the left arm and jaw. The pain lasts 3-5 minutes and is relieved with nitroglycerin. The pain occurs at walking up to 200 m, and when he climbs 1 flight of stairs. He also feels retrosternal pain under emotional stress and walking in the cold or wind. What is the functional class of stable angina pectoris?

A. V class

B. II class

C. IV class

D. I class

E. III class

15. Name the main clinical sign of stable angina.

A. Chest pain during exercise

B. Chest pain at night

C. Chest pain and cardiac arrhythmia

D. Chest pain at rest only

E. Chest pain and low blood pressure

16. A 60-year-old man complains of epigastric pain, nausea, and vomiting without blood. On physical exam, heart sounds are soft, heart rate 100/minute, extrasystoles. Blood pressure - 100/70 mm Hg. The abdomen is non-painful on palpation. The liver is not enlarged. Peritoneal symptoms are negative. ECG: ST elevation in II, III, aVF leads. What is the most likely diagnosis?

A. Acute pericarditis

B. Acute pancreatitis

C. Aortic dissection

D. Acute myocardial infarction

E. Peptic ulcer

17. A 60-year-old patient complains of chest pain at walking for a distance of about 500 metres, and when he climbing stairs two flights and more. Which of the following tests should be ordered next to confirm stable angina?

A. Measurement of cardiac-specific biomarkers

B. Echocardiography

C. Stress test

D. 6-minute walk test

E. Transesophageal pacing

18. A 54-year-old patient has arterial hypertension, coronary heart disease: stable angina, class II. Concomitant diseases: gastroesophageal reflux disease, erosive esophagitis. Adverse effects of what drug can lead to getting worse esophagitis in the patient?

A. Enalapril

B. Metoprolol

C. Isosorbide dinitrate

D. Omeprazole

E. Hydrochlorothiazide

19. Which ECG changes are convincingly indicative of coronary artery disease during the treadmill test?

A. Prolonged PQ interval

B. Complete right bundle branch block

C. Reverse of the negative T waves

D. Atrial extrasystoles

E. ST depression more than 2 mm

20. A 62-old male with stable angina, class II. During the last week he notes frequent chest pain, exercise intolerance, and he used nitroglycerin 3-4 times per day. Which of the following is the most likely diagnosis?

A. Stable angina, functional class III

B. Microvascular angina

C. Progressive angina

D. Acute myocardial infarction

E. Vasospastic angina

21. A 57-year-old patient complains of shortness of breath and squeeze chest pain. It occurs mainly at night and lasts up to 15 minutes. Heart rate - 58/min, blood pressure - 140/90 mm Hg. Heart sounds are rhythmic. No changes were detected on the ECG at rest and during bicycle ergometry. Daily monitoring of the ECG revealed temporary ST elevation at night, and sinus bradycardia. Which of the following is the best therapy for this patient?

A. Beta-blockers

B. Nitrates

C. Cardioprotective drugs

D. ACE inhibitors

E. Calcium channel blockers

22. A patient complains of acute chest pain radiating to the back, shortness of breath, dizziness. She has a history of hypertension. On physical exam, she is pale. HR 104/minute, blood pressure - 90/50 mm Hg. Cardiac exam reveals a systolic murmur best heard at the right sternal border in II intercostal space. The rest of the physical examination is unremarkable. ECG – signs of left ventricular overload. What disease can be suspected?

A. Acute left ventricular failure

B. Acute myocardial infarction

C. Acute pericarditis

D. Aortic dissection

E. Pulmonary embolism

23. The 49 years-old female complains of frequent chest pain attacks that occurs mostly at night. Nifedipine relieved her pain. The ECG shows transient ST elevation during the pain attack. What is the most likely diagnosis?

A. Progressive angina

B. Acute myocardial infarction

C. New onset angina pectoris

D. Vasospastic angina

E. Acute pericarditis

24. A 28-year-old patient complains of chest pain on physical exertion, shortness of breath, palpitations. Cardiac exam reveals systolic murmur best heard at the left sternal border in III-V intercostal space. ECG showed signs of left ventricular overload. Echocardiography: interventricular septum thickening and hypokinesis, low volume of left ventricle, systolic doming of the aortic valve. What is the most likely diagnosis?

A. Dilated cardiomyopathy

B. Infective endocarditis

C. Ventricular septal defect

D. Aortic stenosis

E. Hypertrophic cardiomyopathy

25. What statement is true regarding painless myocardial ischemia?

A. Does not occur in patients without myocardial infarction and/or angina pectoris

B. Does not require therapy before the onset of angina

C. Detected by 48-hour ECG monitoring

D. Less dangerous than painful myocardial ischemia

E. It is treated only with nitrates

26. What is the target level for low-density lipoprotein in extremely high-risk patients?

A. <1.4 mmol/l

B. <3 mmol/l

C. <1.8 mmol/l

D. <2.5 mmol/l

E. <2 mmol/l

27. Thrombolytic therapy is indicated for patients with non-ST-elevation acute coronary syndrome:

A. Should not be used

B. Within the 6 hours after onset of disease

C. Intensive recurrent chest pain

D. Coronary thrombus detected by coronary angiography

E. Every patient within the 12 hours after onset of disease

28. A 45-year-old female patient suddenly felt chest tightness, shortness of breath, and dizziness. These symptoms remain when she is taking 4 tablets of nitroglycerin. The skin is pale and moist. Blood pressure - 80/60 mm Hg, HR 109/min. ECG: ST-segment elevation up to 3 mm in V4-V6 leads. Establish a preliminary diagnosis.

A. Unstable angina

B. ST elevation acute coronary syndrome

C. Vasospastic angina

D. Hypoglycemic state

E. Non-ST-elevation acute coronary syndrome

29. A 75-year-old woman complains of palpitations, weakness, chest pain radiating to the left shoulder and aggravated by breath, fever. Physical examination: body temperature 38.5^0C, BP - 105/50 mm Hg, Ps -120/min. Auscultation revealed biphasic murmur in the area of "absolute" cardiac dullness. ECG: concordant ST-segment elevation in V4-V6 leads. What is the most likely diagnosis?

A. Acute pericarditis

B. Pulmonary infarction

C. Myocardial infarction

D. Community-acquired pneumonia

E. Dressler's syndrome

30. A 42-year-old obese patient suddenly felt chest pain behind, shortness of breath. 2 days later he noted hemoptysis. Physical examination: orthopnea, severe diffuse cyanosis, swollen cervical veins. Respiratory rate - 42 per 1 min, heart rate - 120 per 1 min. Blood pressure - 90/60 mm Hg. The liver protrudes from under the edge of the rib arch by 4 cm. Swelling in the lower extremities, superficial varicose veins. ECG: P-pulmonale, right axis deviation, deep S wave in I lead, Q wave in III lead, ST elevation in III, R, V1. The clinical situation is regarded as:

A. Paroxysmal atrial fibrillation

B. Myocardial infarction

C. Community-acquired pneumonia

D. Pulmonary embolism

E. Pneumothorax

31. A 57-year-old man complaints of compressive chest pain at physical activity during last year. Pulse - 68 beats per minute, rhythmic. BP 150/80 mm hg. The rest of the

physical examination is unremarkable. ECG without pathological changes. Your preliminary diagnosis:

A. Prinzmetal angina

B. Acute myocardial infarction

C. Stable angina

D. Dilated cardiomyopathy

E. Unstable angina

32. Which of the following methods is the most appropriate for diagnosis in a patient with a low probability of coronary heart disease?

A. Echocardiography

B. Exercise test

C. Myocardial scintigraphy

D. ECG at rest

E. Coronary angiography

33. A 56-year-old patient complaints of burning chest pain radiating to the left shoulder, left arm, which lasts 35 minutes. Nitroglycerin didn`t give relief. Physical examination: pale skin, sweating, hypotension, tachycardia - 110 per minute. Cardiac auscultation revealed S4 heart sound. ECG: ST elevation in III, aVF leads. What is the most probable diagnosis?

A. Gastroesophageal reflux disease

B. Unstable angina

C. Anterior myocardial infarction

D. Inferior myocardial infarction

E. Aortic dissection

34. A 49-year-old man suffers from a compressive chest pain, which occurs when he walking up to 500-600 m. He has hypertension for the last 7 years. Heart rate 74/min,

blood pressure 120/80 mm Hg. Exercise stress testing (75 W) revealed ST depression in V4-V6 leads. What is the most likely diagnosis?

A. Angina pectoris, I functional class

B. Angina pectoris, II functional class

C. Angina pectoris, III functional class

D. Angina pectoris, IV functional class

E. Unstable angina

35. What conditions are necessary for the formation of atherosclerotic plaque in the vessels?

A. Platelet thrombus formation

B. Artery wall damage

C. Genetic predisposition

D. Hyperlipidemia

E. All of the above

36. A 78-year-old patient with ST-elevation acute coronary syndrome was admitted to the reperfusion center for urgent revascularisation. At the prehospital stage, he received a loading dose of aspirin. Which of the following antiplatelet agents is a priority in the dual antiplatelet therapy for this clinical case?

A. Dipyridamole

B. Prasugrel

C. Cangrelor

D. Clopidogrel

E. Ticagrelor

37. A 67-year-old man suddenly felt acute chest pain, shortness of breath. The patient is agitated, the skin and mucous membranes are pale, cyanotic. Varicose veins of the lower extremities. Pulse - 140 per minute, blood pressure - 90/70 mm Hg. Physical exam is notable for a decreased breath sounds over the right lower lobe, muffled heart

sounds, intensification of the second sound of the pulmonary artery. Your preliminary diagnosis is:

A. Exudative pleurisy

B. Pulmonary embolism

C. Right-sided pneumonia

D. Dressler's syndrome

E. Myocardial infarction

38. A 68-year-old man complaints of chest pain that occur suddenly, usually in the early morning. Sublingual nitroglycerin has no effect. The ECG recorded during the pain showed transient ST-segment elevation in the V1-V4 leads. Cardiac markers of myocardial necrosis are within normal limits. What is the most likely diagnosis?

A. Acute anterior myocardial infarction

B. Acute inferior myocardial infarction

C. New-onset angina

D. Vasospastic angina

E. Progressive angina

39. Carrying oxygen therapy for patients with acute coronary syndrome is required if oxygen saturation less:

A. 85%

B. Every patient needs oxygen therapy

C. 80%

D. 90%

E. Only with symptoms of pulmonary edema

40. A 63-year-old man had a myocardial infarction 5 years ago. He is being treated with rosuvastatin at a dose of 40 mg/day in combination with ezetimibe 10 mg/day due to a long-standing high LDL cholesterol level (8.9 mmol/l). What should be prescribed to this patient?

A. Fenofibrate

B. Omega-3 eicosopentaenoic acid and docosahexaenoic acid

C. Cholesterol

D. Nicotinic acid

E. Subtilisin-kexin type 9 proconvertase inhibitor

41. Which of the following symptoms is pathognomonic for stable angina?

A. Negative T wave in V2-V6 leads

B. Ventricular extrasystole after exercise

C. Compressive chest pain and ST segment depression during exercise

D. Q wave in III and aVF leads

E. Stabbing chest pain during exercise

42. Which antianginal drugs have been shown to have an effect on the survival rate of patients with coronary artery disease?

A. Amiodarone

B. Calcium channel blockers

C. Sidonimines (molsidomine)

D. β-blockers

E. Nitrates

43. A 60-year-old patient complains of chest pain at walking up to 500 metres, when he climbing stairs to 2 floors. Which of the following examinations is appropriate to confirm the diagnosis of stable angina?

A. ECG

B. Cardiac markers of myocardial necrosis

C. 6-minute walk test

D. Echocardioscopy

E. Treadmill test

44. A 50-year-old patient states the chest pain become more frequent over the past 2 weeks. It occurs at rest, lasts up to 10 minutes. Also, he notes shortness of breath and sweating. Previously, he felt pain at walking up to 200 m only. What is the most likely diagnosis?

A. Acute myocardial infarction

B. Stable angina, IV functional class

C. Stable angina, III functional class

D. Variant angina

E. Progressive angina

45. Patient 46 years old complaints of retrosternal pain on effort for the first time in his life. ECG: 2 mm ST depression in the II, III, and aVF leads. Markers of myocardial necrosis are within normal limits. What is the most likely diagnosis?

A. New-onset angina

B. Vasospastic angina

C. Aortic dissection

D. Acute inferior myocardial infarction

E. Progressive angina

46. A 62-year-old patient has recently noticed the appearance of compressive chest pain during emotional stress and being in the cold. Physical exam is notable for a muffled, rhythmic heart sounds, systolic murmur at the apex. Pulse - 68 beats/min, rhythmic. BP 140/90 mm hg. ECG is normal. What is your diagnosis?

A. Acute myocardial infarction

B. Aortic stenosis

C. Dilated cardiomyopathy

D. Vasospastic angina

E. Stable angina

47. A 47-year-old patient had stable angina for 5 years. He noted increased intensity and frequency of chest pain at physical activity during last week. Stress ECG showed ST depression in the II, III, aVF leads. Markers of myocardial necrosis are within normal limits. What is the most likely diagnosis?

A. New-onset angina

B. Acute inferior myocardial infarction

C. Acute anterior myocardial infarction

D. Progressive angina

E. Vasospastic angina

48. A 48-year-old man complains of chest pain with radiation to the left arm, which have become more frequent over the past week. It occurs as at exercises, and as at rest, lasts up to 10-15 minutes. He increased daily dose of nitroglycerin tablets. The patient had acute myocardial infarction two years ago. Blood pressure - 120/80 mm Hg, pulse - 72 beats/min, rhythmic. ECG: signs of myocardial scar. What is the diagnosis?

A. Progressive angina

B. Post-infarction cardiosclerosis

C. Acute ST-elevation myocardial infarction

D. Stable angina

E. Acute non-ST-elevation myocardial infarction

49. A 54-year-old patient complains of chest pain. He has been experiencing similar pain attacks for 5 years. Recently, the pain become more frequent and occur after minimal physical activity, and sometimes at night. Which of the following represents the best next step in management?

A. ECG

B. Biochemical blood test

C. Chest X-ray

D. Coronary angiography

E. Echocardiography

50. A 56-year-old patient had stable angina, II functional class. Today he felt intensive chest pain at rest, which disappeared after taking 6 nitroglycerin tablets only. Blood pressure - 120/80 mm Hg, heart rate - 104/min. ECG: single ventricular extrasystoles, ST depression in I, aVL, and T-waves inversion in V2-V4 leads. What is the most likely diagnosis?

A. Vasospastic angina

B. Early post-infarction angina

C. Acute non-ST-elevation acute coronary syndrome

D. Stable angina, III functional class

E. Acute ST-elevation myocardial infarction

51. Daily monitoring of the ECG makes it possible to establish the presence of the patient:

A. Systolic myocardial dysfunction

B. Cardiac aneurysm

C. Metabolic syndrome X

D. Silent myocardial ischemia

E. Diastolic myocardial dysfunction

52. A patient with varicose veins of the lower extremities suddenly felt chest pain on the right, hemoptysis, shortness of breath, dizziness. Objectively: cyanosis of the neck, face, pulse – 116/min, arrhythmic, blood pressure - 100/70 mm Hg, RR 26 per minute, SpO2 80%. Heart sounds are muffled. Pulmonary exams are notable for crackles on the right. ECG: pathological Q wave in the III lead, right bundle branch block. Which drug should be prescribed?

A. Streptokinase

B. Warfarin

C. Fondaparinux

D. Nitroprusside sodium

E. Furosemide

53. A 55-year-old female suddenly felt intense, compressive chest pain radiating to the left shoulder blade and lower jaw. The pain was accompanied by shortness of breath, palpitations, and fear of death. Physical exam: she is cold, sweat, agitated. Heart rate – 120/min, blood pressure - 110/70 mm Hg. ECG - sinus rhythm, left axis deviation, ST elevation in V4-V6 leads. What is the most likely diagnosis?

A. Acute myocarditis

B. Unstable angina

C. Acute non-ST-elevation myocardial infarction

D. Acute pericarditis

E. Acute ST-elevation myocardial infarction

54. A 59-year-old male with abdominal pain was brought to the emergency department. His pain started about an hour ago. The patient is lethargic, adynamic. The skin is pale, cold extremities, weak pulse. Heart rate - 120/min, blood pressure - 70/40 mm Hg. ECG: ST elevation in I, aVL, V1-V6 leads. What is the most likely diagnosis?

A. Acute pancreatitis

B. Arrhythmogenic shock

C. Cardiogenic shock

D. Perforated peptic ulcer

E. Acute pericarditis

55. A 67-year-old female complaints of acute chest pain radiating to the left arm. It lasted about half an hour. She took 3 tablets of nitroglycerin and didn't get better so she came to the emergency department. What disease should be suspected?

A. Cardiac asthma

B. Pulmonary edema

C. Myocardial infarction

D. Stable angina

E. Bronchial asthma

56. A 76-year-old man was dining at home when he suddenly felt acute onset, crushing chest pain. He had a history of hypertension for 20 years and obliterative atherosclerosis of the lower extremities for 10 years. Ambulance arrived in 20 minutes. Patients died in 30 minutes. What is the most likely cause of this patient's death?

A. Complete AV blockade

B. Ventricular fibrillation

C. Atrial fibrillation

D. Pulmonary embolism

E. Cardiac tamponade

57. Which of the following is a significant risk factor for acute coronary syndrome?

A. Unstable atherosclerotic plaque which narrow the artery lumen by > 50%.

B. The blood pressure 160/90 mm Hg.

C. Serum glucose level 16 mmol/l

D. Stable atherosclerotic plaque which narrow the artery lumen by > 80%.

E. Serum glucose level 2.8 mmol/l

58. A 62-year-old man complains of chest pain and dyspnea at rest. He had acute anterior ST elevation myocardial infarction 5 weeks ago. He takes all recommended medications. The ECG shows an abnormal Q wave and ST elevation in V1-V4 leads. The troponin I level is high. What is the cause of the patient's deterioration?

A. Dressler's syndrome

B. Recurrent myocardial infarction

C. Exudative pericarditis

D. Pulmonary embolism

E. Pulmonary edema

59. A 64-year-old woman complains of chest pain on the left side. Her pain increases when she breath or cough. Body temperature - 39.5°C, HR 97/min, BP 150/90 mm hg. Pulmonary exams are notable for decreased breath sounds over the left lower lobe

breath sounds. Short sound is heard during inspiration and expiration. What disease should be considered?

A. Left-sided dry pleurisy

B. Exudative pleurisy

C. Acute myocarditis

D. Left-sided pneumothorax

E. Community-acquired pneumonia

60. What side effects can occur in patients with acute myocardial infarction after administration of morphine intravenously?

A. Tachycardia

B. Low blood pressure

C. Decreased myocardial contractility

D. Respiratory depression

E. Increased left ventricular preload

61. A 72-year-old man was admitted to the cardiology department with complaints of chest pain. The condition is severe, cold sweat, arrhythmic pulse, blood pressure - 110/70 mm Hg. ECG: QS, ST elevation in V1-V3 leads. What is the most likely diagnosis?

A. Acute non-ST-elevation myocardial infarction

B. Acute ST-elevation anterior myocardial infarction

C. Myocardial infarction of the right ventricle

D. Acute ST-elevation lateral myocardial infarction

E. Acute ST-elevation inferior myocardial infarction

62. Which of the following is true regarding treatment of acute coronary syndrome (ACS)?

A. Beta-blockers in ACS are prescribed only to patients with arrhythmic complications

B. Dual antiplatelet therapy with clopidogrel and aspirin is often used in patients with prior ischemic stroke

C. Diagnostic angiography with intent to perform revascularization is indicated in patients with non-ST elevation ACS who have refractory angina

D. Eptifibatide should be administered 12 hours or more before coronary angiography

E. Nitrate infusion is indicated in patients with complete occlusion of the infarct-dependent artery

63. A 63-year-old woman is hospitalised with an acute myocardial infarction. BP - 90/60 mm Hg, pulse 118/min, rhythmic. Which of the following drugs is contraindicated?

A. Isosorbide dinitrate

B. Heparin

C. Morphine

D. Fentanyl

E. Dopamine

64. A 58-old male complains of chest pain. The chest pain started this morning, and since then, his condition has been worsening. ECG: pathological Q wave and ST elevation in I, II, aVL, V1-V6 leads. What are the reasons for the ECG changes?

A. Left bundle branch block

B. Acute non-ST-elevation myocardial infarction

C. Acute ST-elevation myocardial infarction

D. Dilated cardiopathy

E. Acute pericarditis

65. A 75-year-old man is hospitalised with acute chest pain radiating to the left arm. The pain started about an hour ago. The patient took 4 nitroglycerin tablets and didn't get better. He noted it helped him previously. Physical examination: pulse - 110 beats/min, blood pressure - 90/60 mm Hg, respiratory rate - 21 per minute. Pulmonary

exam is notable for a bibasilar decreased breath sounds. ECG: pathological Q wave and ST elevation in II, III and aVF leads. The serum troponin I is elevated. What is the most likely diagnosis?

A. Acute ST-elevation anterior myocardial infarction

B. Pulmonary embolism

C. Acute ST-elevation inferior myocardial infarction

D. Progressive angina

E. Acute myocarditis

66. During the past fourth days a 62-year-old male has felt on chest pain, which lasted more than an hour. Today he has decided to go to the hospital. Blood pressure -120/75 mm Hg, heart rate – 82/minute. ECG: sinus rhythm, left bundle branch block (not previously recorded). Which of the following tests should be ordered to confirm myocardial necrosis?

A. Troponin I

B. Lactate dehydrogenase

C. Myoglobin

D. Aspartate aminotransferase

E. Creatine kinase MB

68. A 68-year-old patient complains of intense chest pain and shortness of breath. He had after myocardial infarction 3 weeks ago. Objectively: the patient's condition is severe, face cyanosis, swelling and pulsation of the jugular veins. The pulse is rhythmic, weak, 140/min, blood pressure - 70/20 mm Hg. RR 27/min, SpO2 82%. Pulmonary exam is notable for a bibasilar decreased breath sounds. Echocardiography performed showing 1.5 sm circumferential echo-free space. Which of the following is the best therapy for this patient?

A. Pleural puncture

B. Norepinephrine infusion

C. Intra-aortic balloon counterpulsation

D. Pericardiocentesis

E. Dobutamine infusion

69. A 52-year-old female patient complains of intense pressure in her chest and weakness. On exam, there is jugular venous distension, acrocyanosis, ascites, leg swelling. HR 100/min, BP 100/60 mm Hg. Heart sounds are muffled, no cardiac murmurs. Chest X-ray: small heart, calcium deposits in the pericardium. What is the most likely diagnosis?

A. Constrictive pericarditis

B. Exudative pericarditis

C. Acute myocarditis

D. Mitral stenosis

E. Cardiac amyloidosis

70. A 70-year-old man suddenly felt shortness of breath and chest pain. He had cholecystectomy 5 days ago. Physical exam is notable for a central cyanosis. Blood pressure -90/60 mm Hg, heart rate - 110/min, central venous pressure -33 mm H2O. ECG - right axis deviation, right bundle branch block. What is the cause of the patient's deterioration?

A. Pulmonary embolism

B. Acute bleeding

C. Aortic dissection

D. Acute myocardial infarction

E. Hypovolemic shock

Standard answers

1. D	11. C	21. E	31. C	41. C	51. D	61. B
2. A	12. C	22. D	32. B	42. D	52. A	62. C
3. E	13. B	23. D	33. D	43. E	53. E	63. A
4. B	14. E	24. E	34. C	44. E	54. C	64. E
5. D	15. A	25. C	35. E	45. A	55. C	65. C

6. A	16. D	26. A	36. E	46. E	56. B	66. A
7. B	17. C	27. A	37. B	47. D	57. A	67. D
8. C	18. C	28. B	38. D	48. A	58. B	68. D
9. A	19. E	29. A	39. D	49. D	59. A	69. A
10. A	20. C	30. D	40. E	50. C	60. D	70. A

Recommended reading list

1. 2025 ACC/AHA/ACEP/NAEMSP/SCAI Guideline for the Management of Patients With Acute Coronary Syndromes: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. Circulation. 2025 Feb 27. doi: 10.1161/CIR.0000000000001309.
2. 2024 ESC Guidelines for the management of chronic coronary syndromes. Eur Heart J. 2024 Sep 29;45(36):3415-3537. doi: 10.1093/eurheartj/ehae177. Erratum in: Eur Heart J. 2025 Feb 21:ehaf079. doi: 10.1093/eurheartj/ehaf079.
3. 2023 ESC Guidelines for the management of acute coronary syndromes. Eur Heart J. 2023 Oct 12;44(38):3720-3826. doi: 10.1093/eurheartj/ehad191. Erratum in: Eur Heart J. 2024 Apr 1;45(13):1145. doi: 10.1093/eurheartj/ehad870.
4. 2021 ESC Guidelines on cardiovascular disease prevention in clinical practice. Eur Heart J. 2021 Sep 7;42(34):3227-3337. doi: 10.1093/eurheartj/ehab484. Erratum in: Eur Heart J. 2022 Nov 7;43(42):4468. doi: 10.1093/eurheartj/ehac458.
5. ACG Clinical Guideline for the Diagnosis and Management of Gastroesophageal Reflux Disease. Katz PO, Dunbar KB, Schnoll-Sussman FH [et al]. Am J Gastroenterol. 2022 Jan 1;117(1):27-56. doi: 10.14309/ajg.0000000000001538.
6. Correction to: 2021 AHA/ACC/ASE/CHEST/SAEM/SCCT/SCMR Guideline for the Evaluation and Diagnosis of Chest Pain: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. Circulation. 2023 Dec 12;148(24):e281. doi: 10.1161/CIR.0000000000001198. Epub 2023 Dec 11. Erratum for: Circulation. 2021 Nov 30;144(22):e368-e454. doi: 10.1161/CIR.0000000000001029.

Dyspnea

1. A 65-year-old woman complains of shortness of breath at walking up to 50-100 m and during sleep. She has a history of hypertension for 10 years and takes antihypertensive drugs. She underwent chemotherapy for breast cancer one year ago. Echocardiography showed significant dilatation of the left ventricle. Which of the following drugs could lead to a patient's deterioration?

A. Aspirin

B. Lizinopril

C. Citarabine

D. Doxorubicin

E. Hydrochlorothiazide

2. A 59-year-old woman complains of shortness of breath at walking. She had acute myocardial infarction 2 months ago. Physical exam is notable for a pathological precardiac pulsation in the IV intercostal space on the left of the sternum. The ECG showed a ST elevation ('frozen' ECG) and a negative T wave in the precordial leads. Chest X-ray: change in the configuration of the cardiac shadow due to a saccular protrusion on the left. Which diagnosis is most likely?

A. Mitral valve insufficiency

B. Mitral stenosis

C. Recurrent myocardial infarction

D. Aortic stenosis

E. Postinfarction cardiac aneurysm

3. A 69-year-old woman complaints of chest pain, shortness of breath, headache, productive cough. Body temperature - 37.4^0C, blood pressure - 130/80 mm Hg, pulse - 80 beats/min, respiratory rate - 20/min, SpO2 - 96%. Chest X-ray: homogeneous intense opacification in the right lower lobe, with an upper oblique contour. What another physical exam finding might you expect?

A. Wheezes

B. Bronchial breathing

C. Crepitation

D. Crackles

E. Absent breath sounds

4. A 48-year-old man with community acquired pneumonia complains of left-sided chest pain, especially when he breath. Also, he notes escalation in breathlessness. Objectively: body temperature - 38.3^0C, heart rate - 98 per minute, blood pressure - 120/80 mm Hg, respiratory rate - 24/min. On exam, there is jugular venous distension, decreased breath sounds on the left side, with moist rales. The heart tones are muffled. Hepatomegaly, leg swelling. ECG: ST elevation in I, III, avL, avF, and V1-V4 leads. What is the cause of the patient's deterioration?

A. Acute cor pulmonale

B. Pericardial effusion

C. Spontaneous pneumothorax

D. Acute myocarditis

E. Exudative pleurisy

5. A 47-year-old woman has suffered nightly crises of shortness of breath and wheezing. She has a history of knee injury and has been taking diclofenac for a week. Physical exam revealed signs of rhinitis, nasal polyps. Blood pressure - 130/80 mm Hg, heart rate - 84 beats/min, respiratory rate - 19/min. Physical examination reveals vesicular breath and no murmurs could be auscultated. Which of the following is the most likely cause of the patient's dyspnea?

A. Mitral stenosis

B. Acute pericarditis

C. Bronchial asthma

D. Pulmonary embolism

E. Cardiac asthma

6. A 45-year-old patient is hospitalised with femoral shaft fracture. Blood pressure - 110/70 mm Hg, pulse - 114 beats/min, respiratory rate - 26 per minute. After skeletal traction the patient suddenly felt shortness of breath. Physical exam is notable for a central cyanosis. Lung percussion - normal sound. Blood pressure - 60/40 mm Hg, heart rate - 156 beats per minute. ECG: right heart deviation. What is the most likely cause of the patient's deterioration?

A. Disorders of the central nervous system

B. Painful shock

C. Myocardial infarction

D. Pneumothorax

E. Pulmonary embolism

7. A 60-year-old man complaints of intense shortness of breath, cough with frothy pink sputum. Body temperature - 36.4^0C, blood pressure - 160/80 mm Hg, pulse - 100 beats/min, respiratory rate - 29/min, SpO2 - 80%. Bibasilar crackles are heard on pulmonary auscultation. What is the most likely cause of the patient's deterioration?

A. Collection of fluid in the alveoli and interstitial lung tissue

B. Accumulation of fluid in the pleural cavity

C. Destruction of interalveolar septa

D Pulmonary artery occlusion

E. Airway mucus hypersecretion

8. A 72-year-old patient has complaints of cough with a large amount of sputum, shortness of breath, faintness. He has a history of chronic obstructive pulmonary disease for about 20 years. HR - 120 per minute, BP 130/80 mm Hg, RR 28/min. Heart sounds are muffled, accent of the second tone over the pulmonary artery. Chest examination showed bilateral fine basal rails, wheezes. Which ECG changes are the most typical for this patient?

A. Left ventricle hypertrophy

B. Right ventricle hypertrophy

C. Left atrium hypertrophy

D. Left bundle branch block

E. First degree AV block.

9. Name the ECG sign of right atrial hypertrophy:

A. High peak P wave in V5 - V6 leads

B. Double P-wave in I, II, aVL leads

C. Negative P-wave in II and III leads

D. Negative P-wave in aVR

E. High peak P wave in II, III, aVF leads

10. A 65-year-old patient complains of shortness of breath with difficulty in inhaling, right hypochondrium heaviness, swelling in the legs, feet. Wheezes are heard on pulmonary auscultation. Heart auscultation - accent of the second tone over the pulmonary artery. What ECG changes should be expected?

A. Left atrium hypertrophy

B. Atrial fibrillation

C. Left axis deviation

D. Extrasystoles

E. Right ventricle hypertrophy

11. A 65-year-old man complains of inspiratory dyspnea. He has coronary artery disease for 15 years. BP 150/90 mm Hg, heart rate - 52/min. Heart sounds are muffled, accent of the second tone over the pulmonary artery. Fine bibasilar rales are heard on pulmonary auscultation. ECG: pathological Q wave in III, aVF leads. Echocardiography: left ventricular dilatation, left ventricular ejection fraction - 35%. What is the mechanism of hemodynamic disorders in the patient?

A. Systolic-diastolic dysfunction

B. Metabolic dysfunction

C. Diastolic dysfunction

D. Systolic dysfunction

E. Violation of peripheral resistance

12. A 26-year-old man complains of shortness of breath and palpitations when he climbing stairs and walking fast. These symptoms have become progressively more severe during the last month. He had upper respiratory tract infection two months ago. Physical examination is unremarkable. ECG: negative T-waves in V2-V4 leads. What is the preliminary diagnosis?

A. Acute pericarditis

B. Acute myocarditis

C. Acute myocardial infarction

D. Septic endocarditis

E. Hypertrophic cardiomyopathy

13. The patient suddenly felt a shortness of breath that appeared after exercise. He has superficial thrombophlebitis of the lower extremities. Physical examination: acrocyanosis, respiratory rate - 38 per minute, heart rate - 106 per minute, blood pressure - 90/60 mm Hg. Physical exam is notable for a decreased breath sounds over the right lower lobe. Which diagnostic method should be used first?

A. Chest X-ray

B. Bronchoscopy

C. Echocardiography

D. Electrocardiography

E. Spirography

14. A 27-year-old woman complains of shortness of breath, chest pain, palpitations, cough. The heart sounds are arrhythmic, 1 tone at the apex is a clapping sound. Chest X-ray: the pulmonary pattern is enhanced due to venous congestion, the lung roots are dilated, structureless, the median shadow is enlarged, the pulmonary artery arch is

protruding along the left contour. In the first oblique position, the retrocardiac space is narrowed by the enlarged left atrium, which shifts the esophagus backwards along the small radius arc. In the second oblique position, an enlargement of the right ventricular arch is detected. The aorta is unchanged. What is the most likely conclusion?

A. Tetralogy of Fallot

B. Aortic regurgitation

C. Aortic aneurysm

D. Cardiomyopathy

E. Mitral stenosis

15. A 75-year-old man complains of shortness of breath at walking up to 100 m, swelling legs, general weakness. He has a history of arterial hypertension for 15 years. He had a myocardial infarction a year ago. He takes aspirin, lisinopril, bisoprolol, rosuvastatin, furosemide. Objectively: acrocyanosis. Respiratory rate - 24/min, heart rate 86/min, blood pressure 120/80 mm Hg. Physical examination reveals bilateral pulmonary rales; heart sounds are weakened. The liver protrudes from under the edge of the rib arch by 6 cm. Swelling in the legs, feet. Echocardiography: left ventricular dilatation, ejection fraction 30%. Which drug should be added to the treatment of this patient?

A. Eplerenone

B. Digoxin

C. Hydrochlorothiazide

D. Valsartan

E. Ivabradine

16. A 30-year-old man complains of palpitations, shortness of breath at walking. He denies chronic diseases and bad habits. Heart rate-76/min, rhythmic pulse. Blood pressure - 120/80 mm Hg. Auscultation revealed systolic murmur above aorta, the first heart sound was normal.

ECG: left ventricle hypertrophy, negative T waves in I, avL, V5, V6 leads. Echocardiography: interventricular septum 2 cm. What is the most likely diagnosis?

A. Hypertrophic cardiomyopathy

B. Aortic stenosis

C. Arterial hypertension

D. Myocardial infarction

E. Coarctation of the aorta

17. A 32-year-old woman complains of weakness, lethargy, chest tightness, shortness of breath. She has been ill for 2 days. Body temperature 37.6 °C. Blood pressure 90/60 mm Hg, heart rate 102/min. The pulse is weak, slowing during inspiration. On exam, there is jugular venous distension, acrocyanosis. ECG: low voltage. Chest X-ray - huge spherical heart shadow. What is the preliminary diagnosis?

A. Exudative pericarditis

B. Acute myocarditis

C. Pulmonary embolism

D. Aortic dissection

E. Acute coronary syndrome

18. A 73-year-old female patient is hospitalised with a strangulated femoral hernia. The patient has varicose veins of the left lower extremity, obesity. What is the most likely complication that may occur in the postoperative period?

A. Pulmonary embolism

B. Sepsis

C. Acute respiratory distress syndrome

D. Myocardial infarction

E. Hospital-acquired pneumonia

19. A 65-year-old man complains of shortness of breath on exertion. Physical examination: BP180/100 mm Hg, HR - 94/min, respiratory rate - 29/min. Pulmonary exams are notable for bibasilar crackles. Choose a drug for initial therapy.

A. Isosorbide dinitrate

B. Morphine

C. Furosemide

D. Nifedipine

E. Labetalol

20. A 50-year-old woman is hospitalised with complaints of intense dry cough, dyspnea at rest. She has a history of bronchial asthma. At home, she took 12 inhalations of salbutamol. Her exam is notable for decreased lung sounds bilaterally with wheezes. Respiratory rate 32/min, blood pressure is 140/90 mm Hg, heart rate is 106/min, SpO2 87%. Which of the following emergency care drugs is the best for this patient?

A. Albuterol

B. Ceftriaxone

C. Prednisolone

D. Budesonide

E. Ipratropium bromide

21. A 67-year-old man complains of palpitations, dyspnea at rest. These symptoms started two hours ago. The patient is lethargic. The skin is pale, moist, cold; limbs - mottled skin. There is absent radial pulse bilaterally. Blood pressure - 80/60 mm Hg, heart rate - 200/min, heart sounds are muffled. The ECG shows ventricular paroxysmal tachycardia. What is the cause of the patient's deterioration?

A. Aortic dissection

B. Pulmonary edema

C. Myocardial infarction

D. Arrhythmogenic shock

E. Pulmonary embolism

22. A 70-year-old man is hospitalised with chest pain and shortness of breath, which occurred suddenly after physical exertion. ECG - ST segment elevation in II, III, aVF leads. High level of troponin I. Which diagnosis is the most likely?

A. Pulmonary embolism

B. Acute anterior myocardial infarction

C. Acute pericarditis

D. Aortic dissection

E. Acute inferior myocardial infarction

23. A 40-year-old woman suddenly felt severe chest pain, shortness of breath. RR - 30/min, HR 108/min, BP 100/70 mm Hg, SpO2 80%. Chest wall deformity and expiratory muscles activity found in the patient. Pulmonary exam is notable for tympanic sound over the left lung, absent breath sounds, and decreased vocal tremor. What is the most likely diagnosis?

A. Exudative pleurisy

B. Spontaneous pneumothorax

C. Community-acquired pneumonia

D. Pulmonary embolism

E. Acute coronary syndrome

24. A 70-year-old man with acute anterior myocardial infarction complaints of chest pain, shortness of breath at rest. His exam is notable for acrocyanosis, jugular venous distension, decreased lung sounds bilaterally, weak pulse. HR 140/min, blood pressure - 70/20 mm Hg. Echocardiography performed showing 1.5 cm circumferential echo-free space. What is the cause of the patient's deterioration?

A. Ventricular septal rupture

B. Pulmonary edema

C. Acute heart aneurysm

D. Cardiac tamponade

E. Pericarditis epistenocardica

25. A 25-year-old man complains of shortness of breath during exercise, pain in the left hypochondrium, fever. Objectively: the condition is severe, the skin is like ‘coffee with milk’, single haemorrhages on the hands. Temperature 38.9^0C, pulse - 104/min, rhythmic, blood pressure - 100/60 mm Hg. Auscultation revealed systolic murmur above aorta. The liver protrudes from under the edge of the rib arch by 3 cm. Mild splenomegaly. Complete blood count: Hb - 96 g/l, leucocytes - 3.2x10^9 /l, ESR - 58 mm/h. What is your preliminary diagnosis?

A. Acute coronary syndrome

B. Mitral stenosis

C. Infectious endocarditis

D. Acute pericarditis

E. Acute myocarditis

26. A 74-year-old woman complains of shortness of breath on effort, peripheral edema, periodic tinnitus, fatigue. She has hypertension for about 20 years. The skin and mucous membranes are pale, acrocyanosis. Respiratory rate - 25 per minute, heart rate - 80 per minute, blood pressure - 190/100 mm Hg. Physical examination reveals normal lung sounds, a regular cardiac rhythm with a hyperdynamic second tone over the aorta. The liver protrudes from under the edge of the rib arch by 2 cm. There is ankle swelling. ECG: left ventricular hypertrophy. Determine the stage and class of congestive heart failure.

A. CHF II A, FC III

B. CHF II A, Killip II

C. CHF I, FC I

D. CHF III, FC IV

E. CHF II B, FC IV

27. A 67-year-old man complains of shortness of breath at minimal physical activity. BP 150/90 mm Hg, heart rate - 92/min. The heart sounds are muffled. Pulmonary examination reveals bilateral rales. ECG: pathological Q wave in III, aVF leads. Echocardiography: left ventricular dilatation, LVEF - 35%. What is the basis of the patient's hemodynamic disorders?

A. Metabolic dysfunction

B. Systolic dysfunction

C. Systolic-diastolic dysfunction

D. Decreased peripheral resistance

E. Diastolic dysfunction

28. A 34-year-old man complains of shortness of breath at night. His father died at the age of 40 from heart failure. He denies bad habits and chronic diseases. Pulse - 109 per minute. Blood pressure - 100/60 mm Hg. Cardiac and pulmonary exams are notable for bibasilar crackles and a systolic apical murmur. Echocardiography: significant dilatation of all heart chambers, LVEF - 28%. What is the most likely diagnosis?

A. Dilated cardiomyopathy

B. Constrictive pericarditis

C. Ischemic cardiomyopathy

D. Acute myocarditis

E. Hypertrophic cardiomyopathy

29. A 50-year-old woman is hospitalised with of shortness of breath, cough with pink frothy sputum. She has arterial hypertension for 5 years. She does not regularly take antihypertensive drugs. Objectively: acrocyanosis, RR 36/min. BP - 240/120 mm Hg, HR - 120 per minute. Physical exams are notable for bibasilar crackles, muffled cardiac tones. What is the cause of the patient's deterioration?

A. Acute coronary syndrome

B. Acute left ventricular failure

C. Pulmonary embolism

D. Acute right ventricular failure

E. Cardiogenic shock

30. A 68-year-old man presents to the emergency department for worsening shortness of breath over the course of 2 weeks. He noticed that his feet are swelling and that he feels short of breath when climbing the stairs. Medical history is significant for a myocardial infarction approximately 3 months ago. Physical examination is notable for bibasilar crackles, jugular venous distension, and bilateral lower extremity edema. A chest radiograph is obtained, which demonstrates bilateral pleural effusion, cephalization, and Kerley lines. Which of the following is the most likely cause of patient's dyspnea?

A. Pulmonary embolism

B. Dressler's syndrome

C. Exudative pleurisy

D. Interstitial pulmonary edema

E. Interstitial pneumonia

31. A 48-year-old patient complaints of shortness of breath at physical activity, palpitations, leg swelling, heaviness in the right hypochondrium. Echocardiography: left ventricle dilatation, LVEF - 37%, interventricular septum - 0.6 cm in diastole and 0.68 - in systole, severe mitral regurgitation, pulmonary artery pressure - 47 mm Hg, pericardial leaflet separation 1.2 cm. What is the likely diagnosis of the patient?

A. Hypertrophic cardiomyopathy

B. Restrictive cardiomyopathy

C. Cardiac amyloidosis

D. Fabry disease

E. Dilated cardiomyopathy

32. A 25-year-old man (injecting drug addict) complains of shortness of breath, fever up to 38,8^{0}C for the last 2 months. On exam, there is jugular venous distension,

hepatomegaly. Cardiac exam reveals a holosystolic murmur heard best at the lower sternal border, becoming louder with inspiration. What is the preliminary diagnosis?

A. Pulmonary valve insufficiency

B. Aortic valve insufficiency

C. Tricuspid valve insufficiency

D. Exudative pericarditis

E. Mitral valve insufficiency

33. A 42-year-old man complains of shortness of breath during exercise, compressive retrosternal pain, palpitations. Recently, there have been attacks of paroxysmal nocturnal dyspnea. Cardiac exam reveals a holosystolic murmur best heard at the left sternal border in III-V intercostal space. Echocardiography: severe asymmetrical left ventricular hypertrophy, non-dilated left ventricle, LVEF - 65%. What is the reason for the patient's complaints?

A. Left ventricular systolic dysfunction

B. Left ventricular outflow tract obstruction

C. Pulmonary arterial hypertension

D. Left atrial insufficiency

E. Right ventricular systolic dysfunction

34. A 44-year-old man complains of shortness of breath, cough and chest pain. Bending forward alleviate the pain. BP - 110/70 mm Hg, heart rate - 86 beats/min. Cardiac auscultation reveals pericardial friction rub best heard at the left II-III intercostal space. What is the preliminary diagnosis?

A. Acute pericarditis

B. Acute myocarditis

C. Acute coronary syndrome

D. Constrictive pericarditis

E. Libman-Sachs endocarditis

35. A 68-year-old woman was hospitalised with shortness of breath, headache, dizziness, chest pain. For a month she has been experiencing periodic syncope. Cardiac exam is notable for muffled heart sounds and a systolic murmur that radiates to the carotids. HR 76/min. BP - 100/60 mm Hg. What is the preliminary diagnosis?

A. Mitral valve insufficiency

B. Acute pericarditis

C. Aortic stenosis

D. Hypertrophic cardiomyopathy

E. Aortic valve insufficiency

36. A 72-year-old patient complains of paroxysmal nocturnal dyspnea, throbbing headache, dizziness. Objectively: pale skin, carotid pulsation, pulse - 98 per minute, rhythmic, high, fast, blood pressure - 100/50 mm Hg. A diastolic decrescendo murmur heard best at the right upper sternal in the second intercostal space. What is the most likely diagnosis?

A. Mitral stenosis

B. Atrial septal defect

C. Aortic insufficiency

D. Aortic stenosis

E. Hypertrophic cardiomyopathy

37. A 37-year-old man complaints of palpitations, dizziness, shortness of breath during physical activity. He denies chronic diseases. Heart rate - 74/min, rhythmic. Blood pressure - 130/80 mm Hg. Auscultation reveals systolic murmur above aorta, the first heart sound ss normal. ECG: left ventricular hypertrophy. Echocardiography: non-dilated heart chambers, interventricular septal thickness 2 cm. What is the most likely diagnosis?

A. Aortic stenosis

B. Myocardial infarction

C. Arterial hypertension

D. Hypertrophic cardiomyopathy with left ventricular outflow tract obstruction
E. Coarctation of the aorta

38. A 56-year-old female patient complains of swollen hands and legs, shortness of breath, memory impairment, constipation. Objectively: dry skin, facial edema, temperature 35.8^0C. Heart sounds are muffled, rhythmic. HR 52 beats/min, BP 90/60 mm Hg. The thyroid gland is not palpable. TSH level is 12.4 mIU/l (normal values are 0.5 to 5.0 mIU/L). Which drug would you prescribe to the patient?
A. Digoxin
B. Methimazole
C. Levothyroxine
D. Furosemide
E. Bisoprolol

39. A 63-year-old man complains of chest pain behind the sternum and shortness of breath when he climbing the stairs. He has type 2 diabetes mellitus and hypertension for 10 years. The doctor suspects coronary artery disease. ECG shows left ventricle hypertrophy. Which of the following represents the best next step in management?
A. Troponin test
B. Myocardial scintigraphy
C. 6-minute walk test
D. Stress echocardiography
E. Treadmill test (stress test)

40. A 60-year-old patient complains of chest pain, shortness of breath, palpitations. Heart rate - 100 beats/min, blood pressure - 110/70 mm Hg. Systolic murmur heard at the apex. ECG: ST elevation in V3-V6 leads. High troponin I level. What is the most likely diagnosis?
A. Acute myocarditis
B. Unstable angina

C. Non-ST-elevation myocardial infarction

D. Acute pericarditis

E. ST-elevation myocardial infarction

41. A 70-year-old woman suddenly felt shortness of breath at night, that worse in the supine position. Objectively: pale skin, sweating, blood pressure - 210/140 mm Hg, heart rate - 120/min. Bibasilar crackles are heard on pulmonary auscultation. What drug should be prescribed for the treatment?

A. Intravenous furosemide and nitroglycerin

B. Intravenous enalapril and furosemide

C. Intravenous digoxin and nitroglycerin

D. Intravenous labetalol and furosemide

E. Intravenous nitroglycerin and captopril per os

42. A 52-year-old man was admitted to the emergency department with complaints of shortness of breath and palpitations. He was hospitalized with urinary tract infection for a month ago. Blood pressure was 100/60 mm Hg, HR - 128/min, RR - 28/min. SpO2 - 89%. Serum creatinine - 96 μmol/l, troponin I -1.0 ng/ml (normal values<0.1 ng/ml). The chest X-ray shows a mild right pleural effusion and subsegmental atelectasis. ECG: sinus tachycardia, right bundle branch block and T-wave inversion in III and avF leads. What diagnostic test is the best to confirm the diagnosis?

A. Echocardiography

B. Chest CT scan

C. Myocardial scintigraphy

D. Lower extremity ultrasound

E. Heart catheterisation

43. A 22-year-old woman complains of shortness of breath on slight physical exertion, swelling legs, weakness. There is a history of frequent respiratory tract infections. Heart rate - 78/min, blood pressure - 130/80 mm Hg, acrocyanosis, swelling in the legs

and feet. Heart sounds were rhythmic, a systolic murmur best heard at the left sternal border. Hepatomegaly. Which of the following represents the best next step in management?

A. Cardiac catheterisation
B. Echocardiography
C. Electrocardiogram
D. Coronary angiography
E. Myocardial biopsy

44. A 72-year-old man complains of shortness of breath, cough, swelling legs, and abdominal distension. He has chronic obstructive pulmonary disease for 20 years. Heart rate - 92/min, blood pressure - 120/70 mm Hg, respiratory rate - 24/min. The skin is cyanotic, swelling in the legs, ascites. Chest exam reveals limited expansion, hyperresonance on percussion, marked expiratory wheezing, and a prolonged expiratory phase. Heart sounds are muffled with a regular rhythm. What is the mechanism of cardiac changes in this patient?

A. Respiratory reflex
B. Bainbridge reflex
C. Cardiovascular reflex
D. Secondary pulmonary hypertension
E. Kitaev's reflex

45. A 23-year-old woman complains of palpitations, shortness of breath, chest tightness that began a few hours ago. Heart rate 152/min, blood pressure 100/60 mm Hg. ECG: sinus rhythm, the P wave is superimposed on the T wave, the QRS complexes are 0.08 seconds. What is the cause of the patient's deterioration?

A. Paroxysmal supraventricular tachycardia
B. Ventricular tachycardia
C. Paroxysmal atrial fibrillation
+D. Paroxysmal atrial flutter

E. Paroxysmal antidromic supraventricular tachycardia

46. A 45-year-old man suddenly felt chest pain and shortness of breath. In 2 days, he noted hemoptysis. Objectively: orthopnea, diffuse cyanosis, swollen cervical veins. Respiratory rate 42 per/min, heart rate 120/min, blood pressure - 90/60 mm Hg, SpO2 84%. The liver protrudes from under the edge of the rib arch by 5 cm, swelling in the legs, dilated superficial veins in the lower extremities. ECG: P-pulmonale, tachycardia, S I and Q III, right bundle branch block. What is your preliminary diagnosis?

A. Atrial fibrillation

B. Myocardial infarction

C. Community-acquired pneumonia

D. Pulmonary embolism

E. Spontaneous pneumothorax

47. A 43-year-old man is hospitalised with shortness of breath, weakness, chest pain, palpitations. He had a respiratory tract infection 2 months ago. Respiratory rate 30/min, heart rate 100/min, blood pressure - 125/70 mm Hg, SpO2 93%. Heart sounds are arrhythmic (extrasystoles), weakening of the first tone, systolic apical murmur. ECG: ventricular trigeminy. Echocardiography: moderate LV dilatation, LVEF - 50%. What is the most likely diagnosis?

A. Acute myocarditis

B. Hypertrophic cardiomyopathy

C. Acute pericarditis

D. Acute coronary syndrome

E. Dilated cardiomyopathy

48. A 37-year-old woman complains of shortness of breath and palpitations, which have been increasing in frequency and have become progressively more severe during last month. She has been experiencing these symptoms within a week after COVID-19 vaccination. Respiratory rate 22/min, heart rate - 90/min, BP - 120/80 mm Hg, SpO2

90%. ECG: sinus tachycardia. Echocardiography: dilatated left ventricle, LVEF - 38%. Y suspects. Which of the following tests is the most informative to confirm the myocarditis?

A. Cardiac catheterisation
B. Chest CT scan
C. Myocardial scintigraphy
D. Coronary angiography
E. Myocardial biopsy

49. A 40-year-old patient complains of shortness of breath and chest pain at rest. He had flu 10 days ago. Physical examination is notable for acrocyanosis, jugular venous distension. Cardiac tones are muffled, rhythmic. Heart rate 104/min, RR 28/min, Blood pressure 90/70 mm Hg, SpO2 87%. ECG: low QRS voltage, concordant ST segment changes. A chest radiograph is obtained, which demonstrates cephalization, spherical cardiac silhouette. What is your preliminary diagnosis?

A. Exudative pericarditis
B. Acute myocarditis
C. Acute coronary syndrome
D. Dilated cardiomyopathy
E. Unstable angina

50. A 70-year-old woman suddenly felt shortness of breath, chest pain. HR 110/minute, blood pressure - 90/70 mm Hg. Physical examination is notable for acrocyanosis, varicose veins of the lower extremities, decreased breath sounds over the right lower lobe. What is your preliminary diagnosis?

A. Exudative pericarditis
B. Pulmonary embolism
C. Aortic dissection
D. Cardiogenic shock
E. Myocardial infarction

Standard answers

1. D	11. D	21. D	31. E	41. A
2. E	12. B	22. E	32. C	42. B
3. E	13. D	23. B	33. B	43. B
4. B	14. E	24. D	34. A	44. D
5. C	15. A	25. C	35. C	45. A
6. E	16. A	26. A	36. C	46. D
7. A	17. A	27. B	37. D	47. A
8. B	18. A	28. A	38. C	48. E
9. E	19. C	29. B	39. E	49. A
10. E	20. C	30. D	40. E	50. B

Recommended reading list

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Heart murmurs

1. A 35-year-old man complains of palpitations, chest pain, dizziness. He has been ill for about 10 years. The examination revealed pallor skin, de Musset sign, a diastolic murmur heard best at the right upper sternal in the second intercostal space. What other physical exam finding might you expect?

A. Excessive visible carotid arterial pulsation

B. Low blood pressure

C. Small weak pulse

D. Atrial fibrillation

E. Right ventricle hypertrophy

2. A 44-year-old woman complains of palpitations, weakness, chest pain, radiating to the left shoulder. The pain gets worse when she breath in. Temperature 38.5^0C, blood pressure - 105/50 mm Hg, heart rate -120/min. On exam, there is a biphasic murmur best heard at the left sternal border in III-IV intercostal space, decreased lung sounds bilaterally. ECG: concordant ST segment changes. What is the most likely diagnosis?

A. Acute pericarditis

B. Acute myocarditis

C. Myocardial infarction

D. Mitral stenosis

E. Dressler's syndrome

3. A 44-year-old patient with rheumatic aortic stenosis has attacks of paroxysmal nocturnal dyspnea. Cardiac exam is notable for a new systolic apical murmur, systolic murmur above aorta, the first heart sound is muffled. A chest radiograph is performed, which demonstrates lateral and downward displacement of the cardiac apex. What is the reason for a new systolic murmur at the cardiac apex?

A. Concomitant mitral stenosis

B. Concomitant aortic regurgitation

C. Concomitant mitral regurgitation

D. Pulmonary embolism

E. Aortic stenosis progression

4. A 22-year-old female easily get tired. She states doctors revealed heart murmur heart murmur throughout her childhood. Pulse 87/min, rhythmic. Blood pressure - 95/60 mm Hg. The systolic murmur is best heard in at the left sternal border in II intercostal space. The chest radiograph shows dilatation of the pulmonary trunk. What is the most likely diagnosis?

A. Aortic stenosis

B. Pulmonary valve insufficiency

C. Mitral valve prolapse

D. Mitral stenosis

E. Pulmonary stenosis

5. A 29-year-old drug addicted man complains of shortness of breath, fever, leg swelling for the last month. On exam, there is jugular venous distension, hepatomegaly. Cardiac exam reveals a holosystolic murmur heard best at the lower sternal border, becoming louder with inspiration. What is the preliminary diagnosis?

A. Pulmonary valve insufficiency

B. Aortic valve insufficiency

C. Tricuspid valve insufficiency

D. Exudative pericarditis

E. Mitral valve insufficiency

6. A 26-year-old male complains of chest pain. She has been experiencing these symptoms within a week after acute respiratory infection. Body temperature 37.2^0C. Heart sounds are muffled, systolic apical murmur. ECG: first-degree AV block, low QRS voltage, negative T waves in V4-V6 leads. What is your preliminary diagnosis?

A. Acute myocarditis

B. Acute pericarditis

C. Vasospastic angina

D. Mitral valve insufficiency

E. Unstable angina

7. What is the most common presenting symptom for constrictive pericarditis?

A. Fever

B. Systolic heart murmur

C. Intense chest pain

D. Arterial hypertension

E. Beck's triad - muffled heart sounds, jugular venous distention, and hypotension

8. A 23-year-old patient complains of shortness of breath at physical activity, pain in the left hypochondrium, fever 38-39^0 C. Objectively: the condition is severe, the skin is like ‘coffee with milk’, single hemorrhages on the hands. Pulse - 96 per minute, rhythmic, blood pressure - 110/60 mm Hg. Cardiac exam reveals protodiastolic murmur best heard at the right sternal border in II intercostal space. The liver protrudes from under the edge of the rib arch by 4 cm. Mild splenomegaly. Complete blood count: red blood cells - 2.8x10^12/l, Hb - 96 g/l, leucocytes - 3.2x10^9 /l, ESR - 58 mm/h. What is your diagnosis?

A. Rheumatic fever

B. Acute pericarditis

C. Infective endocarditis

D. Hypertrophic cardiomyopathy

E. Acute myocarditis

9. 32-year-old patient complains of cardiac irregularities, dizziness, dyspnea at physical exertion. He has never suffered from such condition before. Objectively: Ps-74/min., rhythmic. BP- 130/80 mm Hg. Auscultation revealed systolic murmur above aorta, the first heart sound was normal. ECG showed hypertrophy of the left ventricle,

signs of repolarization disturbance in the I, V5 and V6 leads. Echocardiogram revealed that interventricular septum was 2 cm. What is the most probable diagnosis?

A. Aortic stenosis

B. Myocardial infarction

C. Arterial hypertension

D. Hypertrophic cardiomyopathy with left ventricular outflow tract obstruction

E. Coarctation of the aorta

10. A 39-year-old man complains of chest pain. Auscultation revealed biphasic murmur in the area of "absolute" cardiac dullness. It becomes louder when the patient leans forward. What is the preliminary diagnosis?

A. Mitral valve prolapse

B. Aortic stenosis

C. Coarctation of the aorta

D. Ventricular septal defect

E. Acute pericarditis

11. A 62-year-old patient was admitted with STEMI 2 days ago. Auscultation revealed protodiastolic gallop rhythm at the left sternal border in the IV-V intercostal space, intensification of the second sound of the pulmonary artery. ECG: QS complexes and ST elevation in V3-V6 (‘frozen’ ECG). What complication occurred in the patient?

A. Acute left ventricular aneurysm

B. Pericarditis epistenocardica

C. Thrombotic endocarditis

D. Dressler's syndrome

E. Rupture of mitral valve chordae

12. A 33-year-old patient has a history of rheumatic heart disease. The examination revealed pallor skin, excessive visible carotid arterial pulsation. Cardiac exam is

notable for a systolic murmur and protodiastolic murmur best heard at the right sternal border in the II intercostal space. What is the most likely diagnosis?

A. Combined mitral stenosis and aortic regurgitation

B. Combined aortic stenosis and mitral regurgitation

C. Combined mitral stenosis and mitral regurgitation

D. Combined aortic stenosis, aortic regurgitation and mitral regurgitation

E. Combined aortic stenosis and aortic regurgitation

13. A 52-year-old patient complains of shortness of breath on effort, attacks of paroxysmal nocturnal dyspnea, throbbing headache, dizziness. Physical examination is notable for pallor skin, visible carotid arterial pulsation. Pulse - 98 per minute, rhythmic, high, fast, blood pressure - 100/50 mm Hg. Cardiac auscultation reveals diastolic murmur at the right sternal border in the II intercostal space, the first heart sound is muffled at the apex. What is the most likely diagnosis?

A. Mitral stenosis

B. Atrial septal defect

C. Aortic valve insufficiency

D. Aortic stenosis

E. Coarctation of the aorta

14. A 47-year-old patient after tooth extraction has a fever 39.2^0C. On exam, there is pallor skin, conjunctival haemorrhages, weak, labile pulse. HR 100 beats/min, blood pressure 140/70 mm Hg. Cardiac auscultation reveals diastolic murmur above aorta. Echocardiography – thickening of the aortic valve leaflets with mobile vegetations, moderate aortic regurgitation. What is the most likely diagnosis?

A. Acute myocarditis

B. Congenital aortic regurgitation

C. Liebman-Sachs endocarditis

D. Bacterial endocarditis

E. Rheumatic endocarditis

15. A patient with atrial septal defect has a systolic murmur in the II-III intercostal space along the left parasternal line. Its occurrence is associated with:

A. Increased pulmonary blood flow

B. Right-to-left shunt

C. Left-to-right shunt

D. Increased mitral blood flow

E. Increased tricuspid blood flow

16. A 26-year-old patient has shortness of breath on effort, episodic chest pain. Heart rate 80 beats/min, pulse rhythmic, blood pressure 120/80 mm Hg. Cardiac exam reveals sustained apex beat, heart borders are shifted to the right and left. Auscultation reveals a holosystolic murmur in the IV left intercostal space with systolic tremor. ECG: signs of right ventricular hypertrophy. What is your preliminary diagnosis?

A. Coarctation of the aorta

B. Pulmonary stenosis

C. Ventricular septal defect

D. Mitral stenosis

E. Atrial septal defect

17. 20-year-old patient has in good health. Echocardiography revealed a ventricular septal defect with left-to-right shunt. What physical finding could you expect?

A. Intensification of the second sound of the pulmonary artery

B. A systolic murmur at the left sternal border

C. Subxiphoid (high epigastric) pulsation

D. Diffuse cyanosis

E. “Drumsticks” fingers

18. 66-year-old patient complains of shortness of breath. Echocardiography revealed left atrial enlargement, calcification of the mitral valve leaflets, doming of the anterior leaflet with restricted tip motion. What are the reasons for these changes?

A. Mitral valve insufficiency
B. Atrial septal defect
C. Mitral stenosis of the valve
D. Aortic regurgitation
E. Aortic stenosis

19. A 37-year-old female patient complains of cardiac irregularities, chest pain. Cardiac exam is notable for a systolic murmur at the right sternal border in the II intercostal space. Objectively: systolic murmur in the second intercostal space on the right. Echocardiography revealed hypertrophic cardiomyopathy. What drug should be prescribed for the treatment?
A. Nitrates
B. Loop diuretics
C. Calcium channel blockers
D. Cardiac glycosides
E. Beta-blockers

20. What pathological condition is not associated with left ventricular volume overload?
A. Patent ductus arteriosus
B. Atrial septal defect
C. Ventricular septal defect
D. Mitral regurgitation
E. Aortic regurgitation

21. A 72-old male complains of intense chest pain and shortness of breath. He was hospitalized with an anterior myocardial infarction 3 days ago. Cardiac auscultation reveals a new systolic murmur best heard at the left sternal border in the II-IV intercostal space. What is the cause of the patient's deterioration?
A. Pulmonary embolism

B. Aortic dissection

C. Ventricular septal rupture

D. Recurrent myocardial infarction

E. Dressler's syndrome

22. A 65-year-old patient complains of chest pain. Echocardiography revealed calcification of the aortic valve leaflets, high transaortic flow rate, left ventricle hypertrophy. What is diagnosis?

A. Coarctation of the aorta

B. Aortic regurgitation

C. Takayasu's arteritis

D. Marfan syndrome

E. Aortic stenosis

23. A 66-year-old patient was hospitalised with complaints of shortness of breath, headache, dizziness, chest pain during physical activity. Past medical history: frequent acute tonsillitis in childhood. Objectively: the left heart border is shifted to the left. Auscultation revealed systolic murmur above the aorta, that radiates to the the carotid arteries. The pulse is 76/min. BP - 100/60 mm Hg. What is the most likely diagnosis?

A. Insufficiency of the mitral valve

B. Coarctation of the aorta

C. Aortic stenosis

D. Hypertrophic cardiomyopathy

E. Insufficiency of the aortic valve

24. A 38-year-old patient has a dampened first tone and a systolic murmur at the apex, that radiates to the left axillary region, increased intensity of the second sound at pulmonic region. What pathological condition is characterised by these clinical symptoms?

A. Aortic regurgitation

B. Mitral stenosis

C. Tricuspid regurgitation

D. Mitral regurgitation

E. Aortic stenosis

25. A 38-year-old man complains of shortness of breath, cough and chest pain. Bending forward alleviate the pain. BP - 120/80 mm Hg, heart rate - 92 beats/min. Cardiac auscultation reveals pericardial friction rub best heard at the left II-III intercostal space. What is the preliminary diagnosis?

A. Acute pericarditis

B. Acute myocarditis

C. Acute coronary syndrome

D. Constrictive pericarditis

E. Libman-Sachs endocarditiss

26. A 63-year-old man presents for a routine clinic visit without any physical complaints. Physical examination revealed a systolic murmur at the second right intercostal space and at the Erb's point, that radiates to the carotids. What valvular heart disease can be suspected in the patient?

A. Aortic regurgitation

B. Tricuspid regurgitation

C. Mitral stenosis

D. Aortic stenosis

E. Mitral regurgitation

27. The secondary aortic regurgitation can be caused by:

A. Syphilitic aortitis

B. Aortic dissection

C. Rheumatic heart disease

D. All of the above

E. Infectious endocarditis

28. A 20-year-old man is bought to the emergency room after collapsing in a fitness club. The ambulance team recorded ventricular fibrillation that was successfully resuscitated. Cardiac auscultation revealed a systolic murmur in the second right intercostal space. Echocardiography showed the interventricular septal thickness is greater 2 cm. What disease can be suspected in this patient?

A. Aortic stenosis
B. Dilated cardiomyopathy
C. Acute pericarditis
D. Mitral stenosis
E. Hypertrophic cardiomyopathy

29. A 39-year-old man is hospitalised with shortness of breath, chest pain, palpitations. He had an acute viral infection 2 months ago. Objectively: respiratory rate - 30/min, heart rate - 96/min. BP - 130/70 mm Hg. Heart sounds are arrhythmic, systolic murmur at the apex. Echocardiography: moderate LV dilatation, moderate mitral insufficiency, myocardial contractility is preserved, LVEF - 50%. What is the most likely diagnosis?

A. Acute myocarditis
B. Hypertrophic cardiomyopathy
C. Rheumatic heart disease
D. Acute coronary syndrome
E. Dilated cardiomyopathy

30. A 70-year-old woman complains of shortness of breath, headache, dizziness, chest pain on effort. Physical exam is notable for a pale skin, ejection murmur in the second right intercostal space that radiates to the carotids. HR 78/min, BP - 105/70 mm Hg. What is the preliminary diagnosis?

A. Mitral regurgitation
B. Acute pericarditis

C. Aortic stenosis

D. Hypertrophic cardiomyopathy

E. Aortic regurgitation

31. A 50-year-old patient complaints of shortness of breath during physical activity, palpitations, swelling of the lower extremities, and right upper quadrant heaviness. Cardiac auscultation revealed muffled first sound and systolic murmur at the apex, that radiates to the left axillary region. Echocardiography showed significant left ventricular dilatation, LVEF - 36%, pulmonary hypertension. What is the preliminary diagnosis?

A. Hypertrophic cardiomyopathy

B. Aortic stenosis

C. Rheumatic heart disease

D. Fabry disease

E. Dilated cardiomyopathy

32. A 32-year-old man complains of shortness of breath at walking. He denies chronic diseases and bad habits. Heart rate 76/min, blood pressure - 130/80 mm Hg. Auscultation revealed systolic murmur above aorta, the first heart sound was normal. Echocardiography revealed that interventricular septum was 1.8 cm. What is the most likely diagnosis?

A. Hypertrophic cardiomyopathy

B. Aortic stenosis

C. Rheumatic heart disease

D. Aortic stenosis

E. Coarctation of the aorta

33. A 29-year-old female complains of shortness of breath, chest pain, palpitations, nonproductive cough. The heart sounds are arrhythmic, 1 tone at the apex is a clapping sound. Chest X-ray: the pulmonary pattern is enhanced due to venous congestion, the

lung roots are dilated, structureless, the median shadow is enlarged, the pulmonary artery arch is protruding along the left contour. In the first oblique position, the retrocardiac space is narrowed by the enlarged left atrium, which shifts the esophagus backwards along the small radius arc. In the second oblique position, an enlargement of the right ventricular arch is detected. The aorta is unchanged. What is the most likely conclusion?

A. Tetralogy of Fallot

B. Aortic regurgitation

C. Aortic aneurysm

D. Cardiomyopathy

E. Mitral stenosis

34. A 37-year-old man complains of shortness of breath at night. His father had heart disease and died at the age of 39. He denies bad habits and chronic diseases. Pulse 109/min, blood pressure 100/60 mm Hg. Cardiac and pulmonary exams are notable for bibasilar crackles and a systolic apical murmur. Echocardiography: significant dilatation of all heart chambers, LVEF - 28%. What is the most likely diagnosis?

A. Dilated cardiomyopathy

B. Constrictive pericarditis

C. Ischemic cardiomyopathy

D. Acute myocarditis

E. Hypertrophic cardiomyopathy

35. A 30-year-old patient complains of chest pain on physical exertion, shortness of breath, palpitations. Cardiac exam reveals holosystolic systolic murmur best heard at the left sternal border in III-V intercostal space. Echocardiography reveled interventricular septum thickening and hypokinesis, low volume of left ventricle, systolic doming of the aortic valve. What is the most likely diagnosis?

A. Dilated cardiomyopathy

B. Infective endocarditis

C. Ventricular septal defect

D. Aortic stenosis

E. Hypertrophic cardiomyopathy

36. A 44-year-old man complains of shortness of breath at walking, palpitations. Cardiac exam reveals a holosystolic murmur best heard at the left sternal border in III-V intercostal space. Echocardiography: severe asymmetrical left ventricular hypertrophy, non-dilated left ventricle, LVEF - 65%. What is the reason for the patient's complaints?

A. Left ventricular systolic dysfunction

B. Left ventricular outflow tract obstruction

C. Pulmonary arterial hypertension

D. Left atrial insufficiency

E. Right ventricular systolic dysfunction

37. A 20-year-old male presents for a routine clinic visit without any physical complaints. His blood pressure is 190/100 mm Hg. Physical examination shows underdeveloped legs compared with arms. The heart borders are shifted to the left. Physical examination reveals loud heart sounds. A midsystolic murmur heard at the second right intercostal space that radiates to the carotids; systolic murmur posteriorly over the thoracic spine; accentuation of the second tone above the aorta. What is the preliminary diagnosis?

A. Coarctation of the aorta

B. Ventricular septal defect

C. Marfan syndrome

D. Aortic regurgitation

E. Aortic stenosis

38. A 28-year-old man complains of chest pain that radiates to the back. BP 165/95 mm Hg, heart rate 111/min, respiratory rate 14/min. His exam is notable for pale skin,

weak pulse, De Musset's sign, hypermobile joints. The patient is tall and thin, with long arms and legs. What physical finding might you expect at cardiac auscultation?

A. A holosystolic murmur best heard at the left sternal border

B. Late systolic murmur at the apex

C. Mid-diastolic murmur with presystolic accentuation at the apex

D. Diastolic murmur at the second right intercostal space

E. Systolic murmur at the second right intercostal space

39. A 36-year-old man is admitted to the hospital with chest pain. His father died of sudden cardiac death at the age of 32. BP 90/50 mmHg, HR 116/min, RR 12/min. The patient is tall and thin, with long fingers and hypermobile joints. Cardiac auscultation reveals a diastolic murmur at the second right intercostal space and at the Erb's point. What is the cause of this patient's disease?

A. Coronary atherosclerosis

B. Hypertrophic cardiomyopathy

C. Spontaneous aortic rupture

D. Spontaneous mitral valve chordae ruptured

E. Aortic dissection

40. A patient with hypertension suddenly felt intense retrosternal pain that radiates to the back, shortness of breath. HR 104/minute, rhythmic, BP - 90/50 mm Hg. Physical exam is notable for a muffled heart sounds, diastolic murmur above the aorta. What disease can be suspected?

A. Acute left ventricular failure

B. Mediastinal mass

C. Acute pericarditis

D. Aortic dissection

E. Pulmonary embolism

41. A 18-year-old female presents with four days of malaise, painful joints, nodular swelling over her elbows, low-grade fever, and a rash on her chest and left shoulder. Two weeks ago, she complained of a sore throat that gradually improved but was not worked up. She was seen for a follow-up approximately one week later. At this visit her cardiac exam was notable for a late diastolic murmur heard best at the apex in the left lateral decubitus position with no radiation. Which of the following is the best step in the management of this patient?

A. Penicillin therapy

B. NSAIDS for symptomatic relief

C. Aortic valve replacement

D. Mitral valve repair

E. Reassurance that this is a benign murmur and send home

42. A 32-year-old male with a history of injection drug use has been feeling short of breath and fatigued for the past several weeks. He is having trouble climbing the stairs to his apartment and occasionally feels like his heart is racing out of control. His past medical history is most notable for a previous bout of infective endocarditis after which he was lost to follow-up. On exam, you note that his carotid pulse has rapid rise and fall. On cardiac auscultation you detect diastolic murmur at the 3rd intercostal space on the left. What is the most likely diagnosis?

A. Mitral regurgitation

B. Papillary muscle rupture

C. Mitral stenosis

D. Aortic stenosis

E. Aortic regurgitation

43. A 72-year-old female presents to the emergency department following a syncopal episode while walking down of stairs. The patient does not take any medications. Your work-up demonstrates that she has symptoms of angina and congestive heart failure. Temperature 36.8 ºC, BP 160/80 mmHg, HR 81/min, RR 20/min. Physical examination

is notable for a systolic murmur present at the right upper sternal border that radiate to the carotid arteries. Blood glucose is 7,6 mmol/L. Which of the following factor associated with the poor prognosis in this patient?

A. Syncope

B. Angina

C. Congestive heart failure

D. Arterial hypertension

E. Diabetes mellitus

44. A 37-year-old man with a history of IV drug use presents to the emergency room with complaints of fevers, chills, and malaise for one week. Vital signs are as follows: temperature 40.0^{o}C, HR 110 bpm, BP 110/70 mmHg, RR 16/min, SpO2 97%. Cardiac auscultation reveals an intensive systolic murmur that is loudest at the lower left sternal border. Initial management includes administration of which of the following regimens?

A. IV Vancomycin

B. IV Vancomycin, IV levofloxacin

C. IV Vancomycin, IV ceftriaxone

D. IV Vancomycin, IV gentamycin, rifampin per os

E. IV Vancomycin, IV ceftriaxone, IV fluconazole

45. A 73-year-old man presents to the emergency department with acute substernal “pressure” chest pain that began a few hours ago. He had acute myocardial infarction and revascularization 7 days ago. He complaints on dyspnea that worsens in the supine position. Bibasilar crackles are heard on pulmonary auscultation. Cardiac exam reveals a new holosystolic murmur best heard at the left sternal border in III-V intercostal space. ECG: ST depression in the anterior precordial leads. What is the most likely cause of this patient’s new symptoms?

A. Aortic stenosis

B. Ventricular wall aneurysm

C. Restrictive pericarditis

D. Papillary muscle rupture

E. Dressler's syndrome

46. A 36-year-old man presents to the emergency room with chest pain and shortness of breath with exertion. He noted these symptoms during 2 years episodically. Temperature 36.6°C, BP 122/83 mm Hg, HR 80/min, RR 13/min, SpO2 98%. Cardiac auscultation reveals a systolic murmur heard right of the upper sternal border that radiates to the carotids. An ECG shows left ventricular hypertrophy. Troponin I < 0.01 ng/mL. Which of the following is the most likely diagnosis?

A. Bacterial endocarditis

B. Bicuspid aortic valve

C. Cardiac myxoma

D. Mitral insufficiency

E. Aortic stenosis

47. A 79-year-old man presents to the emergency room after a syncopal event. The patient has a history of hyperlipidemia for which he is taking atorvastatin. On physical examination, his vital signs are stable, but on cardiac auscultation, you detect a crescendo-decrescendo systolic murmur loudest on the right upper sternal border radiating to the neck. What another physical exam finding might you expect?

A. That the murmur would best be heard in the lateral left decubitus position

B. The character of the murmur would be machine-like

C. The murmur would also have a mid-systolic click loudest before second heart sound

D. The murmur would also have an opening snap

E. Palpation of the carotid pulse would be weak and late relative to the patient’s heart sounds

48. An 18-year-old male complains of headache and rapid leg fatigue with exercise. HR 77, BP in left arm 155/100, RR 14/min, SpO2 98%. On palpation, his left dorsalis pedis pulse is delayed as compared to her left radial pulse. His lower extremities feel slightly cool. Blood pressure obtained on the left lower extremity is 120/80. Which of the following is the most likely underlying pathology?

A. Peripheral arterial disease

B. Aortic regurgitation

C. Coarctation of the aorta

D. Marfan syndrome

E. Aortic stenosis

49. A 46-year-old man with a history of hepatitis C and current intravenous drug use presents with 5 days of fever, chills, headache, and severe back pain. On physical exam temperature 38.4ºC, BP 110/60 mmHg, HR 96/min, RR 18/min. He is thin and diaphoretic with pinpoint pupils, poor dentition, and track marks on his arms and legs. A high-pitched systolic murmur is heard, loudest in the left sternal border and with inspiration. Which of the following is the most appropriate method to confirm the diagnosis?

A. Blood cultures

B. ECG

C. Echocardiography

D. Chest CT scan

E. Troponin test

50. A 65-year-old male with a history of coronary artery disease and myocardial infarction status post coronary artery bypass graft (CABG) surgery presents to his cardiologist for a routine appointment. On physical exam, the cardiologist appreciates a holosystolic, high-pitched blowing murmur heard loudest at the apex and radiating towards the axilla. Which of the following is the best predictor of the severity of this patient's murmur?

A. Enhancement with hand grip maneuver

B. Enhancement with expiration

C. Presence of audible third sound

D. Enhancement with inspiration

E. Presence of audible fourth sound

Standard answers

1. A	11. A	21. C	31. E	41. A
2. A	12. E	22. E	32. A	42. E
3. C	13. C	23. C	33. E	43. C
4. E	14. D	24. D	34. A	44. C
5. C	15. C	25. A	35. E	45. D
6. A	16. C	26. D	36. B	46. B
7. B	17. B	27. D	37. A	47. E
8. C	18. C	28. E	38. D	48. C
9. D	19. E	29. A	39. E	49. C
10. E	20. B	30. C	40. D	50. C

Recommended reading list

1. 2024 ACC/AHA Clinical Performance and Quality Measures for Adults With Valvular and Structural Heart Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Performance Measures. Circ Cardiovasc Qual Outcomes. 2024 Apr;17(4): e000129. doi: 10.1161/HCQ.0000000000000129.

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3. 2024 European Society of Cardiology Guidelines on Peripheral Arterial and Aortic Diseases. Eur Cardiol. 2024 Nov 29;19:e24. doi: 10.15420/ecr.2024.45.
4. Cardiovascular outcomes and trends of Transcatheter vs. Surgical aortic valve replacement among octogenarians with heart failure: A Propensity Matched national cohort analysis. Sattar Y, Song D, Almas T [et al.]. Int J Cardiol Heart Vasc. 2022 Sep 15;42:101119. doi: 10.1016/j.ijcha.2022.101119.
5. Corrigendum to: 2021 ESC/EACTS Guidelines for the management of valvular heart disease: Developed by the Task Force for the management of valvular heart disease of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS). Eur Heart J. 2022 Jun 1;43(21):2022. doi: 10.1093/eurheartj/ehac051. Erratum for: Eur Heart J. 2022 Feb 12;43(7):561-632. doi: 10.1093/eurheartj/ehab395.
6. Harrison's Principles of Internal Medicine, 21e Eds. Jameson J.L., Kasper D.L., Fauci A.S., et al. McGraw-Hill Education, 2022, https://accessmedicine.mhmedical.com/content.aspx?bookid=3095&sectionid=259856983.
7. Pericardial Diseases: International Position Statement on New Concepts and Advances in Multimodality Cardiac Imaging. Klein AL, Wang TKM, Cremer PC [et al.]. JACC Cardiovasc Imaging. 2024 Aug;17(8):937-988. doi: 10.1016/j.jcmg.2024.04.010.

Heart failure

1. A 72-year-old patient with coronary artery disease takes spironolactone and furosemide which she takes regularly. Monitoring diuretic therapy involves:

A. Weighing the patient

B. Calculation of creatinine clearance

C. Calculation of circulating blood volume

D. Complete blood count

E. Urinalysis

2. A 62-year-old patient with chronic heart failure and atrial fibrillation takes warfarin, bisoprolol, digoxin, torasemide, enalapril. He complains of weakness, dizziness. Heart rate 40 bpm, blood pressure 105/70 mm Hg. The liver protrudes from under the edge of the rib arch by 2 cm, swelling of legs. ECG: ventricular bigeminy, ST depression ("scooped out"). Adverse reaction of which drug is the cause of the patient's deterioration?

A. Warfarin

B. Bisoprolol

C. Digoxin

D. Torasemide

E. Enalapril

3. Loop diuretics act mainly:

A. In the descending limb of Henle's loop

B. In the distal tubules

C. In the ascending limb of Henle's loop

D. In the proximal tubules

E. Along the entire length of the nephron

4. Adverse reactions of spironolactone include:

A. Hypomagnesemia

B. Hypokalemia

C. Hypercalcemia

D. Hyponatremia

E. Metabolic acidosis

5. A 60-year-old patient was hospitalized with asthma. He has hypertension for 10 years. He had a myocardial infarction 3 years ago. Blood pressure 250/120 mm Hg, HR 118/min, respiratory rate 33/min, SpO2 78%. Physical exam is notable for orthopnea, pale skin, cold sweat, acrocyanosis, bibasilar crackles. What is the most likely diagnosis?

A. Acute right ventricular failure

B. Pulmonary embolism

C. Acute myocardial infarction

D. Bronchial asthma attack

E. Acute left ventricular failure

6. A 68-year-old male was hospitalized with acute myocardial infarction and pulmonary edema. Which of the following findings is more likely to be seen in the patient?

A. Bradycardia

B. Increased left ventricular ejection fraction

C. Decreased end-diastolic pressure in the left ventricle

D. High partial pressure of carbon dioxide

E. Crackles above more than 50% of the lungs

7. A 72-year-old patient with acute ST elevation myocardial infarction and pulmonary edema. Blood pressure – 170/100 mm Hg, heart rate – 100 per minute, RR 32/min, SpO2 76%. Which of the following is the best therapy for this patient?

A. IV nitroglycerin, digoxin, morphine

B. IV nitroglycerin, bisoprolol, furosemide

C. IV nitroglycerin, bisoprolol, dobutamine

D. IV nitroglycerin, bisoprolol, morphine, furosemide, dobutamine

E. IV nitroglycerin, morphine, furosemide

8. A 50-year-old patient complains of palpitations and shortness of breath during physical exertion. Cardiac auscultation is notable for a systolic murmur heard best at the left upper sternal border. Echocardiography revealed severe asymmetrical left ventricular hypertrophy, non-dilated left ventricle, LVEF - 62%. What mechanism of the progression of chronic heart failure in the patient?

A. Pulmonary arterial hypertension

B. Right ventricular systolic dysfunction

C. Left ventricular diastolic dysfunction

D. Left ventricular systolic dysfunction

E. Left atrial failure

9. There are 4 stages of chronic heart failure according to the New York Heart Association (NYHA) classification. What symptoms are typical for the III functional class?

A. Leg swelling that occurs in the evening and disappears overnight

B. Shortness of breath in ordinary physical activity

C. Hepatomegaly and low urine output

D. All of the above

E. Cyanosis, pulmonary fine crackles

10. A 42-year-old male complains of dyspnea, palpitations. He has reported escalation in breathlessness when walking across the room, leading him to sleep in a recliner. Echocardiography revealed severe left ventricular hypertrophy, non-dilated left ventricle, LVEF - 60%. What mechanism of the progression of chronic heart failure in the patient?

A. Left ventricular systolic dysfunction

B. Left ventricular outflow tract obstruction

C. Pulmonary arterial hypertension

D. Left atrial insufficiency

E. Right ventricular systolic dysfunction

11. Which diuretics can very quickly lead to electrolyte abnormalities in the patients?

A. Indapamide

B. Furosemide

C. Amiloride

D. Eplerenone

E. Spironolactone

12. A 60-year-old patient was revealed generalized edema. The cardiologist suspected heart failure and prescribed a laboratory test to verify the diagnosis. Which of the following tests is most appropriate to confirm heart failure?

A. C-reactive peptide

B. Myoglobin

C. NT-pro BNP

D. Troponin I

E. MB-creatine phosphokinase

13. A 59-year-old man complains of chest pain, shortness of breath, and increased body temperature to 38° C. He has been treated for acute myocardial infarction for 10 days. HR – 86/min, BP 110/70 mm Hg. Heart auscultation revealed pericardial friction rub. Chest X-ray: no pathology. Complete blood count: leukocytosis, ESR – 35 mm/h. ECG: pathological Q wave in V1-V3, ST segment is back on the iso-line. What drugs would be the most appropriate to prescribe?

A. Glucocorticoids

B. Antibiotics

C. Thrombolytics

D. Nitrates

E. Anticoagulants

14. A 70-year-old man complains of shortness of breath at walking up to 100 m, swelling of the lower extremities, general weakness. He has a history of arterial hypertension for 15 years, myocardial infarction a year ago. His medications include taking aspirin, lisinopril, bisoprolol, rosuvastatin, furosemide which he takes regularly. RR – 24/min, HR 86/min, blood pressure 130/80 mm Hg, SpO2 87%. Cardiac and pulmonary exams are notable for bibasilar crackles, muffled heart sounds, swelling legs. The liver protrudes from under the edge of the rib arch by 6 cm., feet. Echocardiography: left ventricular dilatation, ejection fraction 30%. What drug should be added to the treatment of this patient?

A. Digoxin

B. Hypothiazide

C. Eplerenone

D. Ivabradine

E. Valsartan

15. A 48-year-old patient complaints of shortness of breath during physical exertion, palpitations, swelling of the lower extremities. Echocardiography: end-diastolic volume of left ventricle– 225 ml, LVEF – 37%, severe mitral regurgitation, systolic pulmonary pressure – 47 mm Hg, pericardial separation 3.2 cm. What is the patient's probable diagnosis?

A. Hypertrophic cardiomyopathy with left ventricular outflow tract obstruction

B. Hypertrophic cardiomyopathy without left ventricular outflow tract obstruction

C. Cardiac amyloidosis

D. Fabry disease

E. Dilated cardiomyopathy

16. A 52-year-old male complains of shortness of breath with minimal physical exertion, which worsens in a supine position, as well as swelling of the lower extremities. Two months ago, he had a myocardial infarction. Objective findings: moist rales in the lower lung fields on both sides, swelling of the lower extremities. Blood pressure – 150/90 mmHg, heart rate – 92 bpm, respiratory rate – 26 breaths/min. Chest X-ray – bilateral pleural effusion, Kerley lines. What is the cause of the patient's deterioration?

A. Pulmonary embolism

B. Dressler's syndrome

C. Exudative pleuritis

D. Interstitial pulmonary edema

E. Interstitial pneumonia

17. A 36-year-old female complains of dyspnea and cough with pink sputum after physical exertion. Medical history is significant for rheumatic mitral stenosis. Pulmonary auscultation reveals bilateral fine and medium moist rales over the lower lung fields. What is the leading mechanism of deterioration?

A. Increased hydrostatic blood pressure

B. Decreased oncotic blood pressure

C. Increased oncotic blood pressure

D. Increased aggregation of erythrocytes and platelets

E. Decreased lymphatic drainage

18. A 50-year-old woman suddenly felt a mixed-type dyspnea and cough with pink frothy sputum at night. Objective findings: severe condition, acrocyanosis, respiratory rate – 36 breaths/min. Pulmonary exam is notable for bibasilar crackles. Heart examination: Borders of the heart are extended to the left. Blood pressure – 240/120 mmHg, pulse – 120 bpm. What is the most likely diagnosis?

A. Myocardial infarction

B. Acute left ventricular failure

C. Pulmonary embolism

D. Acute right ventricular failure

E. Hypertensive encephalopathy

19. A 32-year-old patient has been complaining for 2 years of dyspnea at rest, nocturnal episodes of suffocation, leg swelling, and progressive abdominal enlargement. Objective findings: acrocyanosis, moist rales in the lower lung fields. Pulse – 90 bpm, irregular. Heart sounds are weakened, systolic murmur heard best at the over the apex. Blood pressure – 90/60 mmHg. Echocardiography: dilatation of all heart chambers, EF – 28%, normal heart valves, no thickening of the pericardial layers. What is the most likely diagnosis?

A. Dilated cardiomyopathy

B. Constrictive pericarditis

C. Bronchial asthma

D. Acute myocarditis

E. Hypertrophic cardiomyopathy

20. A 65-year-old man complains of inspiratory dyspnea. He has coronary artery disease for 15 years. BP 150/90 mm Hg, heart rate - 52/min. Heart sounds are muffled, accent of the second tone over the pulmonary artery. Fine bibasilar rales are heard on pulmonary auscultation. ECG: pathological Q wave in III, aVF leads. Echocardiography: left ventricular dilatation, left ventricular ejection fraction - 35%. What is the mechanism of hemodynamic disorders in the patient?

A. Metabolic dysfunction

B. Systolic dysfunction

C. Systolic-diastolic dysfunction

D. Peripheral resistance disorders

E. Diastolic dysfunction

21. A 72-year-old female complains of dyspnea with minimal physical exertion, peripheral edema, intermittent tinnitus, fatigue, and elevated blood pressure up to 190/110 mmHg. She has had hypertension for about 10 years. Physical findings: pale skin and mucous membranes, acrocyanosis. RR – 25/min, vesicular breathing over the lungs. Heart auscultation: weakened heart tones, accentuated second heart sound over the aorta. HR – 80 bpm, BP – 190/100 mmHg. The liver protrudes from under the edge of the rib arch by 2 cm. Lower limb edema. ECG: signs of left ventricular hypertrophy and systolic overload. Determine the stage of heart failure and NYHA class:

A. CHF II A, NYHA III

B. CHF II A, NYHA II

C. CHF I, NYHA I

D. CHF III, NYHA IV

E. CHF II B, NYHA IV

22. A 70-year-old male complains of inspiratory dyspnea, chest discomfort, and cough. He has had high blood pressure for 20 years and a history of myocardial infarction. The condition worsened an hour ago after physical exertion. Physical findings: orthopnea. BP – 200/110 mmHg, pulse – 110 bpm, rhythmic. Heart auscultation: weakened tones, accentuated second heart sound, systolic murmur over the aorta. Pulmonary auscultation: decreased breath sounds, moist rales over the lower lung fields. No peripheral edema. What is the cause of the patient's deterioration?

A. Mitral valve insufficiency

B. Aortic valve insufficiency

C. Acute heart failure

D. Aortic stenosis

E. Acute coronary syndrome

23. A 60-year-old male is brought to the emergency department by ambulance for loss of consciousness. Physical exam is notable for pale grey skin, acrocyanosis, cold sweat. Blood pressure - 90/60 mm Hg, heart rate - 50 bpm. Physical examination reveals

bilateral pulmonary rales, an S4 heart sound is present. Which of the following represents the best next step to confirm diagnosis?

A. Coronary angiography

B. Chest CT scan

C. Pulse oximetry

D. Electrocardiography

E. Echocardiography

24. A 72-year-old female complains of shortness of breath at walking up to 50-100 m and during sleep. She has a history of hypertension for 10 years and takes antihypertensive drugs. She underwent chemotherapy for breast cancer one year ago. Echocardiography showed significant dilatation of the left ventricle. Which of the following drugs could lead to a patient's deterioration?

A. Aspirin

B. Lizinopril

C. Citarabine

D. Doxorubicin

E. Hydrochlorothiazide

25. A 45-year-old patient is hospitalised for a closed fracture of the left hip. Blood pressure - 110/70 mm Hg, pulse - 114 bpm, RR – 26/min. After traction, the condition sharply deteriorated: cyanosis of the upper half of the torso and dyspnea appeared. Pulmonary exam reveals decreased breath sounds and normal percussion sound. Blood pressure - 60/40 mm Hg, heart rate - 156 bpm. ECG: right axis deviation. What is the most likely cause of heart failure?

A. Disorders of the central nervous system

B. Painful shock

C. Myocardial infarction

D. Pneumothorax

E. Pulmonary embolism

26. A 70-year-old woman is hospitalised with severe shortness of breath. She has a history of hypertension, type 2 diabetes mellitus, and post-infarction cardiosclerosis. Physical exam is notable for bilateral pulmonary rales and swelling of the lower extremities. Blood pressure 110/70 mm Hg, heart rate 100 bpm, respiratory rate 26/min, SpO2 80%. Ultrasound exam reveals bilateral pleural effusion and cardiomegaly. Which drug will you prescribe as an initial therapy?

A. Nitroglycerin

B. Spironolactone

C. Ramipril

D. Bisoprolol

E. Torasemide

27. A 56-year-old man complaints of dyspnea during physical activity for 5-6 months. In recent weeks, he has also been experiencing dyspnea at rest. He has a history of arterial hypertension and stable angina. He takes statins, metoprolol, lisinopril, and furosemide. Blood pressure 120/70 mm Hg, heart rate 92 bpm, respiratory rate 27/min, SpO2 92%. Cardiac auscultation reveals a holosystolic murmur at the apex, systolic tremor. What is the most likely cause of heart failure?

A. Aortic stenosis

B. Aortic regurgitation

C. Mitral stenosis

D. Mitral regurgitation

E. Cardiac aneurysm

28. A 54-year-old man complains of shortness of breath on exertion, fatigue and swelling of the legs. These symptoms have worsened over the past two weeks. In childhood he had rheumatic fever. Cardiac auscultation reveals presystolic murmur best heard at the apex, swelling of the legs. Echography shows thickening of the mitral valve leaflets. Which of the following represents the best next step in management?

A. Diuretic therapy

B. Penicillin therapy

C. Mitral valve replacement

D. Anti-inflammatory therapy

E. Beta-blockers therapy

29. Patient with heart failure was performed a 6-minute walk test. What is the minimal normal walking distance?

A. 300 m

B. 600 m

C. 1000 m

D. 1500 m

E. 400 m

30. You need to assess cardiac function in a patient with suspected heart failure. Which of the following is the best method?

A. Heart MRI

B. Heart CT scan

C. Coronary angiography

D. Transthoracic echocardiography

E. Transesophageal echocardiography

31. You suspect heart failure in a patient with dyspnea and ascites. Which of these tests will help you confirm the diagnosis?

A. Serum albumin level

B. Serum brain natriuretic peptide level

C. Serum D-dimer level

D. Serum troponin level

E. Prothrombin time

32. A 72-year-old man complains of shortness of breath and swelling of the lower extremities. BMI is 34 kg/m2. Cardiac auscultation revealed a systolic murmur that radiates to the carotids. Echocardiogram revealed normal left ventricular systolic function and aortic stenosis with an average pressure gradient of 40 mm Hg. Which of the following is the most appropriate next step in the patient's management?

A. Aortic valve replacement

B. Cardiac catheterisation

C. Transesophageal echocardiography

D. Medical management and request an echocardiography in 1 year

E. Treadmill stress test

33. What statement about beta-blocker therapy in patients with chronic heart failure and reduced ejection fraction is true?

A. Beta-blocker therapy should be started with the maximum daily dose for rapid improvement of symptoms

B. The initiation of beta-blocker therapy is easier to tolerate in patients who still have edema

C. The initiation of beta-blocker therapy is easier for patients without edema (‘dry patients’)

D. Patients with decompensated heart failure should be started on beta-blockers immediately

E. Beta-blocker therapy is contraindicated in patients with left ventricular ejection fraction less than 40%.

34. Which drugs are included in the first line of therapy in the management of patients with chronic heart failure with reduced ejection fraction according to the European Society of Cardiology guidelines?

A. Calcium channel blockers

B. Nitrates

C. Angiotensin-neprilysin receptor inhibitors/angiotensin antagonists

D. Digoxin

E. Selective sinus node I(f) channel inhibitors

35. You are treating a 75-year-old patient with congestive heart failure and severe edema syndrome. Which of the following side effects does NOT require adjustment or discontinuation of therapy?

A. Hyperkalaemia

B. Hypokalaemia

C. Orthostatic hypotension

D. Hyperbilirubinaemia

E. Low glomerular filtration rate

36. A 70-year-old man complains of shortness of breath, cough, swelling of the legs, chest pain at walking up to 150-200 m. Last year he had a myocardial infarction. Also, he has a persistent atrial fibrillation. He regularly takes the recommended therapy. ECG: trigeminy, downsloping ST depression. What possible cause of these symptoms?

A. Intoxication with nitrates

B. Digitalis intoxication

C. Beta-blockers overdose

D. Diuretic resistance

E. ACE inhibitors overdose

37. A 72-year-old patient with permanent atrial fibrillation complains of palpitation. He has congestive heart failure with reduced EF. What is the best rhythm control medication for this patient?

A. Digoxin

B. Propafenone

C. Ethacizine

D. Flecainide

E. Sotalol

38. A 68-year-old man has coronary artery disease and permanent atrial fibrillation, heart failure with mildly reduced EF. He constantly takes dabigatran. Which method of monitoring the effectiveness of anticoagulant therapy is appropriate?

A. Platelets in the blood
B. International normalised ratio
C. No control is required
D. Fibrinogen level
E. Prothrombin time

39. A 60-year-old patient has stable angina, FC II, and chronic heart failure. Which of the following criteria is the most reliable in the diagnosis of systolic heart failure?

A. Blood pressure 100/70 mm Hg
B. Heart rate 100/min
C. Left ventricular ejection fraction 40%.
D. Negative T-waves in V1-V4leads
E. Dilatation of the left ventricle

40. A 67-year-old man complains of shortness of breath, palpitations, swelling of the legs. He has been ill for 3 years, the symptoms increased gradually. Borders of the heart are extended to the left. Heart sounds are muffled, arrhythmic. The liver protrudes from under the edge of the rib arch by 4cm. Edema of the lower extremities. BP 110/70 mm Hg, heart rate – 110 bpm. ECG: atrial fibrillation. Echocardiography: EF 36%. What is the best rhythm control medication for this patient?

A. Verapamil
B. Propranolol
C. Carvedilol
D. Ivabradine
E. Diltiazem

41. A 36-year-old man complains of shortness of breath at night. His father died at the age of 40 from heart failure. He denies bad habits and chronic diseases. Pulse - 107 per minute. Blood pressure - 100/64 mm Hg. Cardiac and pulmonary exams are notable for bibasilar crackles and a systolic apical murmur. Echocardiography: significant dilatation of all heart chambers, LVEF - 28%. What is the most likely diagnosis?

A. Dilated cardiomyopathy

B. Constrictive pericarditis

C. Ischemic cardiomyopathy

D. Acute myocarditis

E. Hypertrophic cardiomyopathy

42. A 39-year-old man complaints of shortness of breath, chest pain, palpitations. He had an acute viral infection 2 months ago. Objectively: respiratory rate - 30/min, heart rate – 100 bpm, BP - 125/70 mm Hg. Heart sounds are arrhythmic, systolic murmur at the apex. Echocardiography: moderate LV dilatation, moderate mitral insufficiency, myocardial contractility is preserved, LVEF - 50%. What is the preliminary diagnosis?

A. Acute myocarditis

B. Hypertrophic cardiomyopathy

C. Rheumatic heart disease

D. Acute coronary syndrome

E. Dilated cardiomyopathy

43. A 64-year-old man with an acute ST-elevation myocardial infarction has shortness of breath at minimal exertion and at rest. Objectively: acrocyanosis, swollen cervical veins. Heart rate 110 bpm, blood pressure - 90/60 mm Hg, SpO2 82%. Cardiac auscultation revealed muffled sounds. Pulmonary exam is notable for decreased breath sounds. Echocardiography performed showing 1.5 sm circumferential echo-free space. Which of the following is the best therapy for this patient?

A. Pleural puncture

B. Norepinephrine infusion

C. Intra-aortic balloon counterpulsation

D. Pericardiocentesis

E. Oxygen therapy with a non-reversible mask

44. A 67-year-old man suddenly felt shortness of breath and chest pain. He had cholecystectomy 5 days ago. Physical exam is notable for a central cyanosis. Blood pressure -90/60 mm Hg, heart rate - 110/min, central venous pressure -33 mm H2O. ECG - right axis deviation, right bundle branch block. What is the likely cause of heart failure?

A. Pulmonary embolism

B. Acute bleeding

C. Aortic dissection

D. Acute myocardial infarction

E. Hypovolemic shock

45. A 78-year-old female suddenly felt shortness of breath at night, that worse in the supine position. Objectively: pale skin, sweating, blood pressure - 210/140 mm Hg, heart rate - 120/min. Bibasilar crackles are heard on pulmonary auscultation. What drug should be prescribed for the treatment?

A. Intravenous furosemide and nitroglycerin

B. Intravenous enalapril and furosemide

C. Intravenous digoxin and nitroglycerin

D. Intravenous labetalol and furosemide

E. Intravenous nitroglycerin and captopril per os

46. A 31-year-old drug addicted man complains of shortness of breath, fever, leg swelling for the last month. On exam, there is jugular venous distension, hepatomegaly. Cardiac exam reveals a holosystolic murmur heard best at the lower sternal border, becoming louder with inspiration. What is the possible cause of heart failure?

A. Pulmonary valve insufficiency

B. Aortic valve insufficiency

C. Tricuspid valve insufficiency

D. Exudative pericarditis

E. Mitral valve insufficiency

47. A 35-year-old woman complains of shortness of breath and palpitations, which have been increasing in frequency and have become progressively more severe during last month. She has been experiencing these symptoms within a week after COVID-19 vaccination. Respiratory rate 22/min, heart rate - 90/min, BP - 120/80 mm Hg, SpO2 90%. ECG: sinus tachycardia. Echocardiography: dilatated left ventricle, LVEF - 38%. Y suspects. Which of the following tests is the most informative to confirm the myocarditis?

A. Cardiac catheterisation

B. Echocardiography

C. ECG

D. Coronary angiography

E. Cardiac MRI

48. A 52-year-old patient complaints of shortness of breath during physical activity, palpitations, swelling of the lower extremities, and right upper quadrant heaviness. Cardiac auscultation revealed muffled first sound and systolic murmur at the apex, that radiates to the left axillary region. Echocardiography showed significant left ventricular dilatation, LVEF - 36%, pulmonary hypertension. What is diagnosis?

A. Hypertrophic cardiomyopathy

B. Aortic stenosis

C. Rheumatic heart disease

D. Post-infarction cardiosclerosis

E. Dilated cardiomyopathy

49. The administration of iron carboxymaltose infusion to patients with congestive heart failure and iron deficiency significantly increases the risk of the following complications:

A. Gastrointestinal bleeding

B. Allergic reactions

C. Phlebitis

D. Heart arrhythmia

E. None of the above

50. A 58-year-old man is admitted to the hospital after experiencing 2 days of severe dyspnea. Three weeks ago, he had an ST elevation myocardial infarction that was treated with thrombolytics. He reports excellent adherence to his medical regimen that includes atorvastatin, lisinopril, metoprolol, and aspirin. On examination, his heart rate is 44 beats/min, his blood pressure is 100/45 mmHg, his lungs have bilateral crackles, and his cardiac examination is notable for elevated neck veins, bradycardia, and 2+ bilateral leg edema. There are no gallops or new murmurs. ECG shows sinus bradycardia and evidence of the recent infarct, but no acute changes. Which of the following is the most appropriate next management step?

A. Begin dopamine

B. Hold metoprolol

C. Refer for pacemaker placement

D. Refer for urgent coronary angiography

E. Measure TSH

Standard answers

1. A	11. B	21. A	31. B	41. A
2. C	12. C	22. C	32. B	42. A
3. C	13. A	23. D	33. C	43. D
4. D	14. C	24. D	34. C	44. A
5. E	15. E	25. E	35. D	45. A
6. E	16. D	26. E	36. B	46. C
7. E	17. A	27. D	37. A	47. E
8. C	18. B	28. C	38. C	48. C
9. D	19. A	29. B	39. C	49. E
10. B	20. B	30. D	40. C	50. B

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