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# Chronic rheumatic heart disease.

# Combined defect of the mitral and tricuspid valve, combined mitral defect with stenosis predominance.

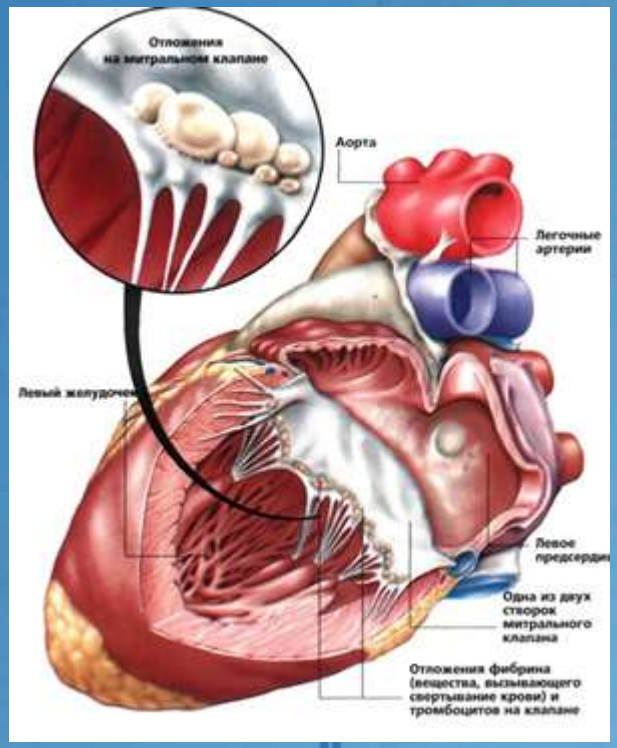
# Heart Failure II-B stage, IV FC. Permanent atrial fibrillation, tachysystolic form.

CLINICAL CASE

Patient curated by a
Student of group VI-55
Valeriya Strikhar

Supervisors:
Candidate of Medical Science, Associate Professor L.A. Martimyanova
Head of Department, Doctor of Medical Science, Professor N.I . Iabluchanskyi

# Neglected disease of poverty




- Rheumatic heart disease is often missed in its early stages. It begins with a common throat infection caused by streptococcus bacteria (strep throat), which in some children sets off an abnormal immune reaction that damages heart valves. This reaction, called rheumatic fever, has symptoms that are vague and easily confused with other conditions.

- People affected often look and feel healthy again once their outward symptoms are resolved, but with further streptococcal infections the rheumatic fever returns, worsening their heart damage. Often rheumatic heart disease is only detected when it is so advanced that only expensive and complicated heart surgery can save the person's life.

http://eurheartj.oxfordjournals.org
http://www.medclub.ru

# Pathological anatomy

# Cardiac dysfunction

https://www.world-heart-federation.org

# Global advocacy


www.world-heart-federation.org/rhd


http://www.who.int/cardiovascular_diseases

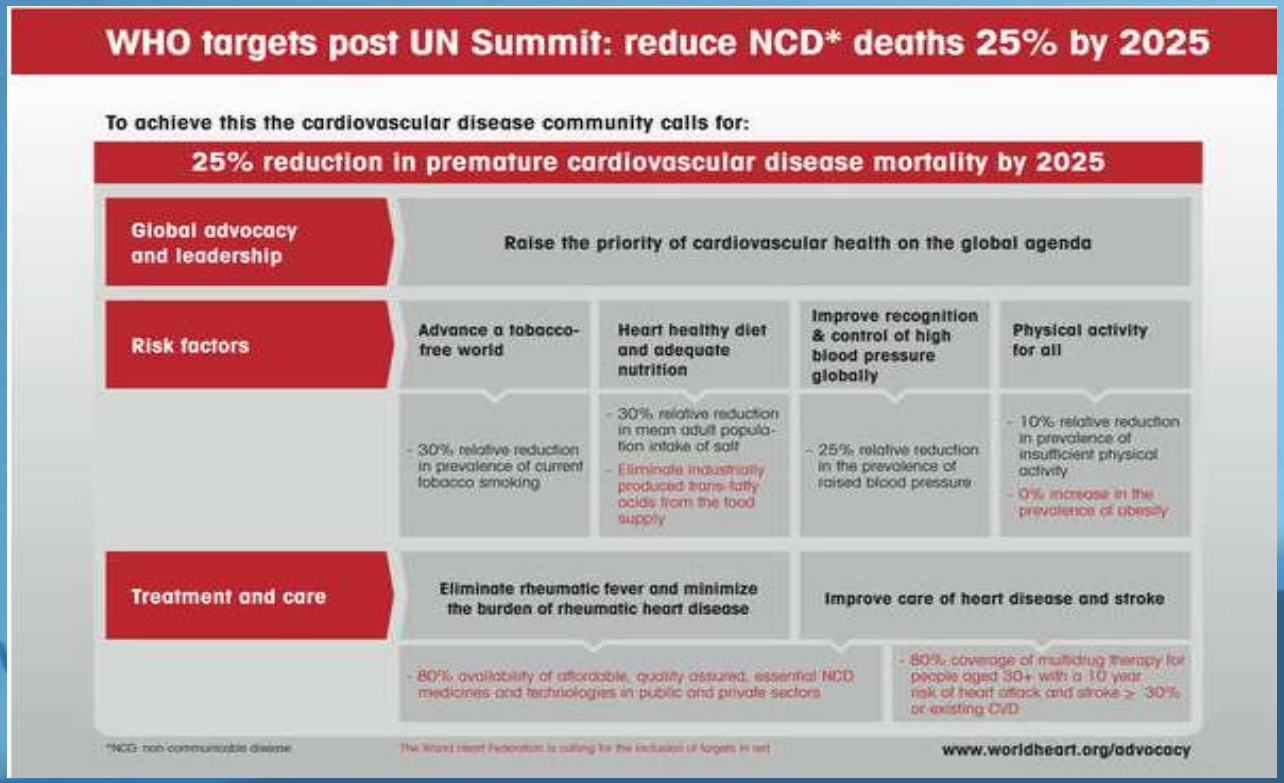

http://www.escardio.org


http://www.cardiosource.org/acc


http://www.heart.org

# World Heart Federation (Congress 2012):

Rheumatic heart disease affects children and young people living in conditions of poverty, poor sanitation and overcrowding. Practically eliminated in wealthy countries, it is still common in Africa, Asia and the Pacific. **Over 15 million people around the world suffer from the condition, which kills 350 000 people a year** and is the most common acquired heart disease found among children and young people in developing countries.




https://www.world-heart-federation.org

# Online Rheumatic Heart Disease Network (RHDnet)

RHDnet is a public health resource developed by the World Heart Federation to support rheumatic heart disease control around the world. The site contains resources for health professionals including best practice tools (sample databases, management guidelines, and staff training resources) as well as links to other programme resources. RHDnet is the first dedicated, global network that attempts to connect and support clinicians and others interested in ARF and RHD control. A members' discussion forum has also been developed to link clinicians and specialists around the world and facilitate communication on various aspects of rheumatic fever and rheumatic heart disease control including secondary prophylaxis, the use of echocardiography and issues around cardiac surgery. A section has also been developed for interested members of the community.

# Patient profile

- 75 years old (28.01.1937).
- Retired.
- Lives in a village.
- Urgent admission on 20.10.12
  to ICU CCH UZ.
- Was transferred to the first cardiological department at CCH UZ on 23.10.2012.

# Complaints

Main:

•Pressure-like pain in the heart region when laying down on the back or left side without irradiation.
•Periodical feeling of a heart beat disruption.

*Complaints disappear within 20-30 minutes when seated (excess oedema on the lower extremities is noted) or within an hour when laying down on the right side.*

•Oedema of the lower extremities go off after administration of diuretics (veroshpiron).
•Constant shortness of breath at rest, aggravated by low physical activity and talking.
•Unsteadiness when walking and mild exercise.
•Constant noise in the ears.
•Cold extremities.

Additional:

•Pain in the left shoulder (applies diklak 5% cream).
•Pain in the large joints (elbows, knees) depending on the weather change.

# Medical history

- During WWII suffered angina and acute arthritis, the treatment was not pursueded. Was sent to MLEC evaluation, however the disability group declined.
- In 1959 (after the birth of her daughter) was diagnosed with valvular mitral valve.
- In 1998, for the first time mentioned the increase in blood pressure to the level of 140/90 mmHg
- Since 1998, 1-2 times a year is hospitalized in a hospital for a planned treatment in the cardiology department (Diagnosis: CHD: cardiosclerosis. Chronic rheumatic heart disease. A combined defect of the mitral valve. Arterial hypertension stage II, I stage of severity. CH II-B stage FC IV).
- Thrice was admitted to the ICU due to a sharp increase in complaints during physical or emotional stress.
- Last admission in June 2012, was discharged with the current diagnosis. 18/10/2012 at night had chocking episode, which was unsuccessfully treated with karvaltab. By the morning the complaints dissappeared.
- 10/20/2012 had another chocking episode, after which was hospitalized to the ICU CDB number 5.

# History of life

- Was born in a full family, developed according to age.
- Diabetes, tuberculosis, malaria, viral hepatitis, sexually transmitted diseases and AIDS denies.
- In 1970 - hysterectomy with appendages.
- 1980 - TBI. After the trauma complained of constant noise in the ears.
- 2010 - The in-hospital pneumonia during routine treatment of the underlying disease.
- Heredity: father died at age 82 of heart failure, his mother at age of 73 - cancer of the colon.
- Allergic history: notes the presence of allergy to one of the cardiovascular drugs prescribed by the attending physician at the hospital. The allergy was treated with antihistamines (loratadine, Claritin).
- Do not smoke. Does not consume alcohol.

# Objective state-1:

- Moderate state, consciousness is clear, active.
- Normal constitution, weight 60 kg, height 157 cm, BMI = 24.3.
- Pronounced cyanosis of the lips, tongue clean, damp.
- The thyroid gland is not clearly defined.
- Peripheral lymph nodes are not enlarged
- Pale skin, acrocyanosis.
- Gray hair at age of 40.
- Musculoskeletal system is normal. Soreness in paravertebral points in the cervical and thoracic regions. Moderate edema of both legs.
- Ripple on the legs on the back of the foot is reduced, trophic disorders of the skin of the lower extremities.

# Objective state-2:

- **Respiratory system:** The chest of the normal form, the thoracic type of breathing, RR - 20 times / min. Palpation: voice trembling is moderate, equally balanced over the areas of the chest. Percussion: clear lung sounds. Auscultation: breathing is hard, no additional noise.

- **Cardiovascular system:** Palpation: The apical impulse is weakened. Percussion: heart enlarged to the top right. Auscultation: cardiac arrhythmic activity. First tone at the apex is reinforced, diastolic murmur, the murmor growth when patient is in horizontal position laying on a left side. The emphasis of the second tone on the pulmonary artery. Heart rate - 94 beats / min, blood pressure - 110/70 mm. Hg. Art.

- **Gastrointestinal system:** stomach is soft, painless, no discrepancies of the abdominal muscles, the left and right part of the abdomen are symmetrical. No visible peristalsis. Scar in the suprapubic area, 4 cm above the symphysis pubis length of 10-12 cm Liver palpation smooth, painless, stands out costal 1.5 cm spleen and pancreas are not palpable.

- **Urinary system:** no change.

# Minimal necessary examination

- Complete blood test, urine test
- Biochemical blood test (total protein, total bilirubin, AST, ALT, glucose, creatinine, creatine kinase MB, urea, creatine, asl-o, CRP)
- ECG dynamics
- Cardiac ultrasound and Doppler

**Additional research methods**

- Ultrasonography of the abdomen
- **X-ray of the left shoulder joint** (at the time of supervision was not met)
- **Radiography of cervical spine** (no)

# General blood test

| index | Units of measurement | Result | Norm |
|---|---|---|---|
| erythrocytes | Mlns/mkm | 4,4 | 4.3-6.2 |
| Hemoglobin | g/l | 126 | 120-140 |
| color index | | | 0,85 -1,15 |
| **ESR** | Mm/h | **19** | 2-15 |
| **Thrombocytes** | g/l | **147** | 180-320 |
| Leukocytes | $10^3$/mkl | 4,2 | 4,0 – 9,0 |
| Eosinophils | % | - | 1-5 |
| stab | % | 6 | > 5 |
| segmented | % | 70 | 45-70 |
| lymphocytes | % | 18 | 25-40 |
| monocytes | % | 6 | 4-10 |

**Conlcusion:** thrombocytopenia, increased ESR

# General urine test

| index | Units of measurement | Result | Norm |
|---|---|---|---|
| density | Kk/$m^3$ | 1,018 | 1,015-1,025 |
| pH | | 5,5 | 5,0-7,0 |
| **Protein** | g/l | **0,056** | - |
| Sugar | Moll/l | нет | - |
| Leukocytes | | 1-3 | 1-2 |
| color | | Stramineous | Stramineous |

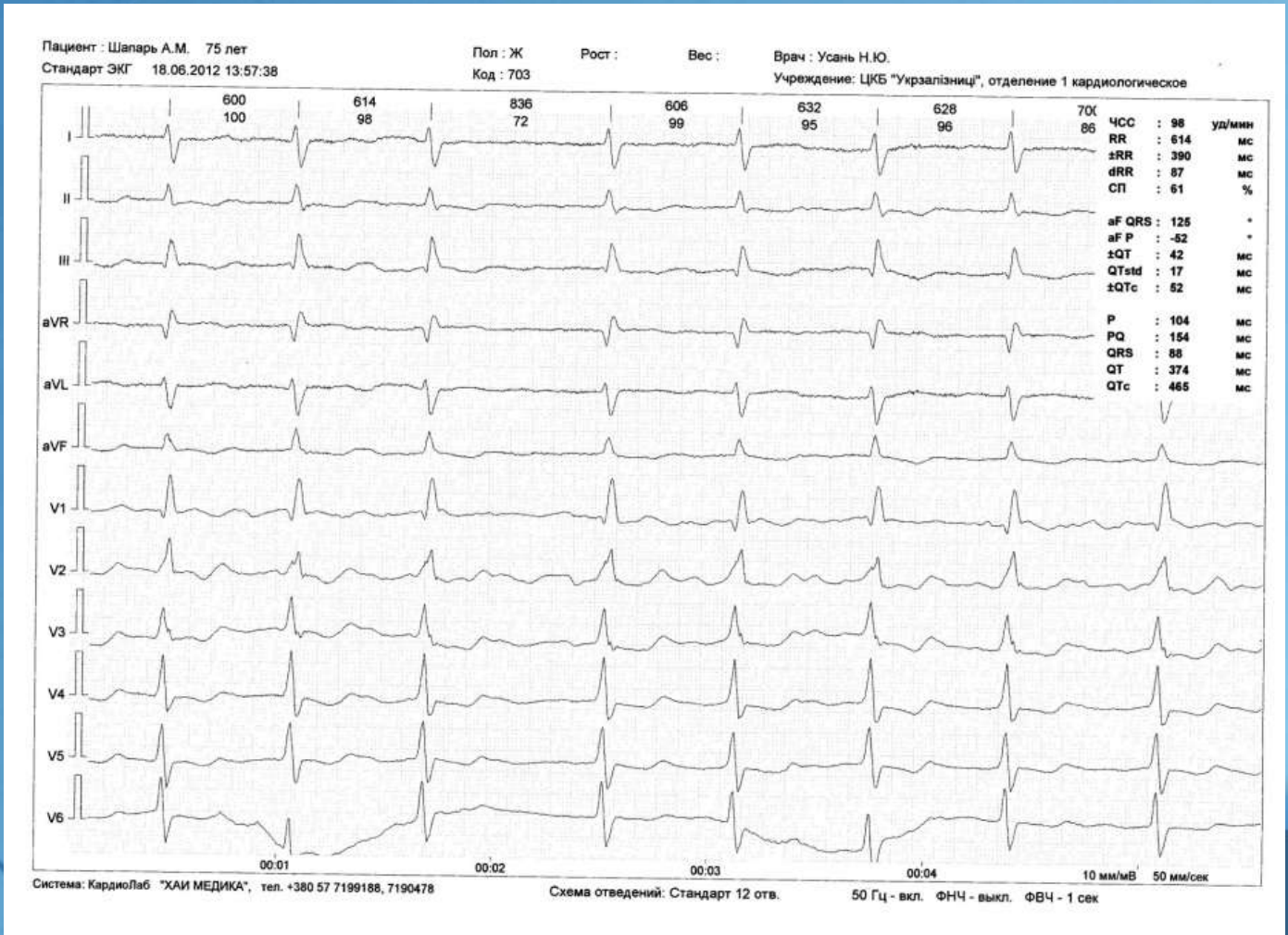
**Conclusion:** proteinuria

# Biochemical blood test

| index | Units of measurement | Result | Norm |
|---|---|---|---|
| total protein | g/l | 68 | 65-85 |
| **total bilirubin** | Mkmoll/l | **21,5** | 3-19 |
| AsAt | U/l | 16 | 31 |
| AlAt | U/l | 27 | 31 |
| **Glucose** | Mkmoll/l | **9,9** | 3,9-6,4 |
| **Creatinine** | Mkmoll/l | **103** | 53-97 |
| **Creatinekinase MB** | U/l | **30** | 0-24 |
| **Urea** | mmoll/l | **7,1** | 2,6-6,7 |
| creatine phosphokinase | U/l | 112 | 24-170 |
| Asl-O | | **Not performed** | |
| CRP | | **Not performed** | |

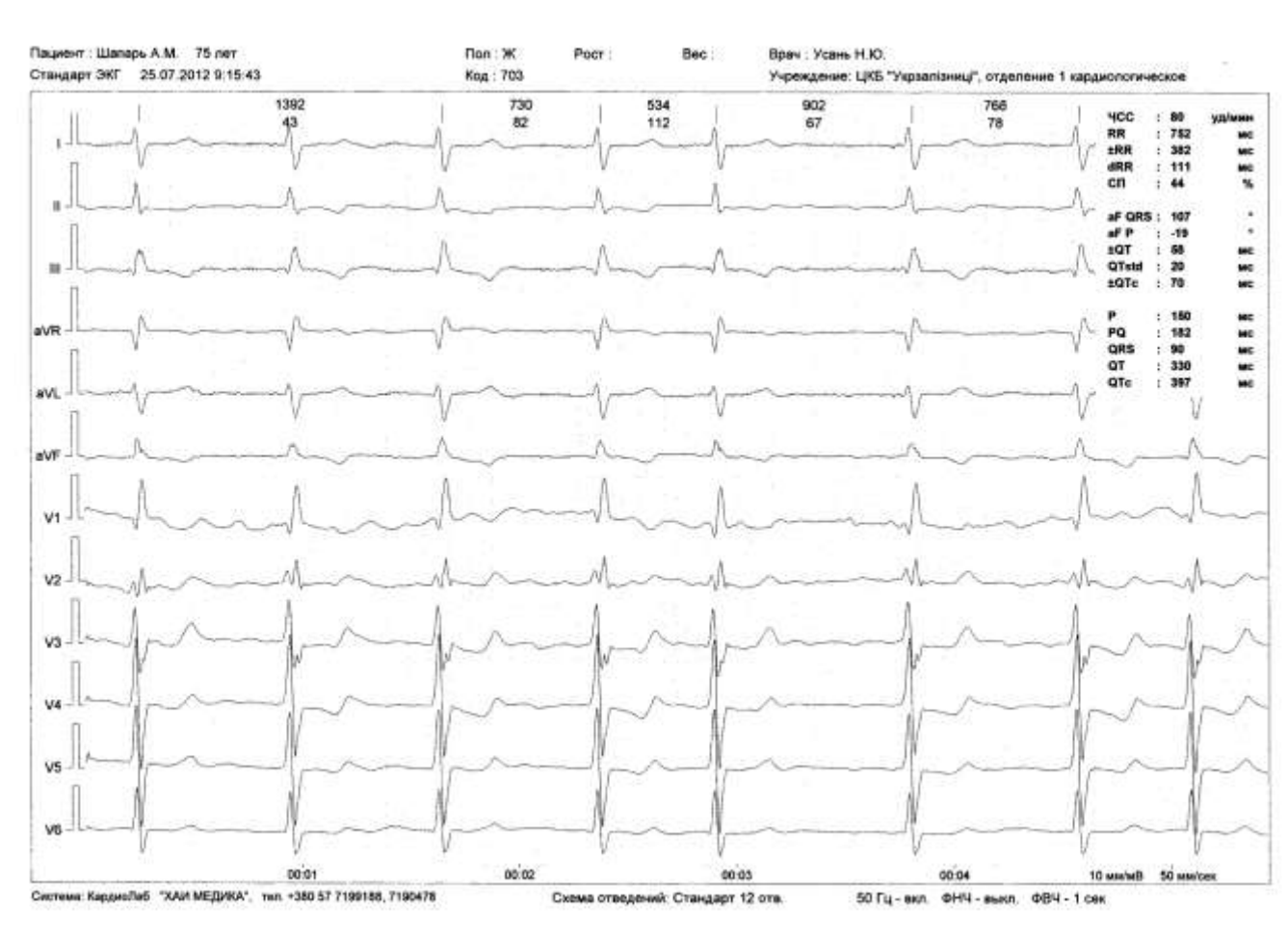
**Conclusion:** hyperbilirubinemia, hyperglycemia, increased levels of creatinine, creatine kinase MB, and urea

# ECG 18.06.2012




Atrial fibrillation, tachysystolic form, isoelectric axis deviation to the right, signs of left ventricular hypertrophy, Ventricular rate- 98 beats / min

# ECG 27.07.2012




Isoelectric axis deviation to the right, signs of left ventricular hypertrophy, Ventricular rate – 80 beats/min

# Echocardiography

**Conclusion**:
Mitral stenosis 1 $cm^2$. Calcification of the mitral valve.
Mitral regurgitation II degree.
Dilatation of the right heart and the left atrium.
Tricuspid regurgitation III degree.

* These data correspond to severe mitral stenosis

*М.Фрид, С.Грайнс "Кардиология" (пер. с англ.), 1996*

# Ultrasonography of the abdomen

**Conclusion:**

Diffuse changes in the liver and pancreas.

Non-significant ascites.

Hepatosplenomegaly.

# Basic clinical syndromes

- Valvular syndrome
- Congestive heart failure
- Atrial fibrillation
- Hepatosplenomegaly
- Diabetes mellitus
- Chronic kidney disease
- Articular syndrome
- Uric syndrome

# HRB heart to ICD-10

- I05-I09 Chronic rheumatic heart disease
- I05 Rheumatic mitral valve disease. Included: the state, classified in the following categories I05.0 and I05.2-I05.9, sophisticated or refined as rheumatic excluded: cases updated as nonrheumatic (I34. -)
- I06 Rheumatic aortic valve disease. Excluded: cases unspecified as rheumatic (I35. -)
- I07 Rheumatic tricuspid valve disease. Included: cases updated or refined as rheumatic excluded: cases updated as nonrheumatic (I36. -)
- **I08 lesions of multiple valves.** Included: cases updated or refined as rheumatic Excluded: endocarditis, the valve is not specified (I38) Rheumatic diseases of endocardium, valve is not specified (I09.1)
- **I08.1 combined lesions of mitral and tricuspid valves**
- I09 Other rheumatic heart disease

# Heart failure

**Clinical stage heart failure (by NDStrazhesko and V.H.Vasilenko)**

| Stages | clinical signs |
|---|---|
| I | Primary, latent, manifests only during exercise in the form of shortness of breath, tachycardia, excessive fatigue. At rest, hemodynamics and function of organs is not impaired; reduced work capacity |
| II | Signs of hemodynamic instability. Disorder in metabolism and function of other organs |
| IIA | Failure of the right or the left heart. Stagnation and dysfunction of other organs mostly appear by the end of the working day (disappear after a night of rest) |
| **IIБ** | **The failure of the right or left heart. Stagnation of blood are more pronounced and appear at rest (do not disappear after a night's rest, may be slightly reduced)** |
| III | Final, CH dystrophy with severe hemodynamic persistent violations of metabolism and function of all organs, the development of irreversible changes in the structure of organs and tissues, disability |

# Heart failure

**Functional class of heart failure (according to the criteria of the New York Heart Association - NYHA)**

| FC | Clinical signs |
|---|---|
| I | Patients with cardiac disease whose ordinary physical activity does not cause shortness of breath, fatigue or palpitations |
| II | Patients with cardiac disease and mild limitation of physical activity. Shortness of breath, fatigue and palpitations apper during normal physical activity |
| III | Patients with cardiac disease and severe limitation of physical activity. No complaints at rest, but even minor physical activity cause dyspnea, fatigue, palpitations |
| **IV** | **Patients with heart disease which experience described above symptoms during any type of physical activity and at rest** |

# Atrial fibrillation

| underlying disease | ALFA, 1999, (756 participants) | AFASAK*, 1997, (677 participants) | CARAF**, 2001, (899 participants) |
|---|---|---|---|
| **Arterial hypertension** | **39,4** | **41,8** | **39,4** |
| **Valvular degect** | **15,2** | **14,5** | **14,8** |
| **CH (NYHA, II-IV ФК)** | **50,0** | **68,2** | **17,6** |
| IHD and AMI | 16,6 | 24,7 | 42,0 |
| cardiomyopathy | 15,2 | - | - |
| COPD | 11,2 | - | - |
| thyrotoxicosis | 3,1 | 2,5 | 2,9 |
| Diabetis | 10,7 | 13,2 | 9,0 |
| Isolated AF | 29,3 | - | - |

* - chronic AF; ** - first time AF

Godtfredsen, 2002 r.

# Atrial fibrillation (evaluation forms)

| Type | Description |
|---|---|
| First time diagnosed | First time diagnosed AF, regardless of the duration of arrhythmia or the nature of the course and severity of the symptoms of AF |
| paroxysmal | Arrhythmias stop independently, without external interference, last for no more than 48 hours |
| persistent | AF episodes that last more than 7 days and require medical correction |
| long-term persistent | Persists for more than a year on the moment of a decision of cardiac correction |
| **Permanent** | **The patient and the doctor noted the permanent AF** |

Четвертый Национальный конгресс кардиологов Украины, 2000 г.

# Atrial fibrillation (EHRA)

| Class EHRA | manifestations |
|---|---|
| I | No symptoms |
| II | Mild symptoms, normal daily activities are not affected |
| **III** | **Severe symptoms, changed daily activities** |
| IV | Disabling symptoms, normal daily activities can not be performed |

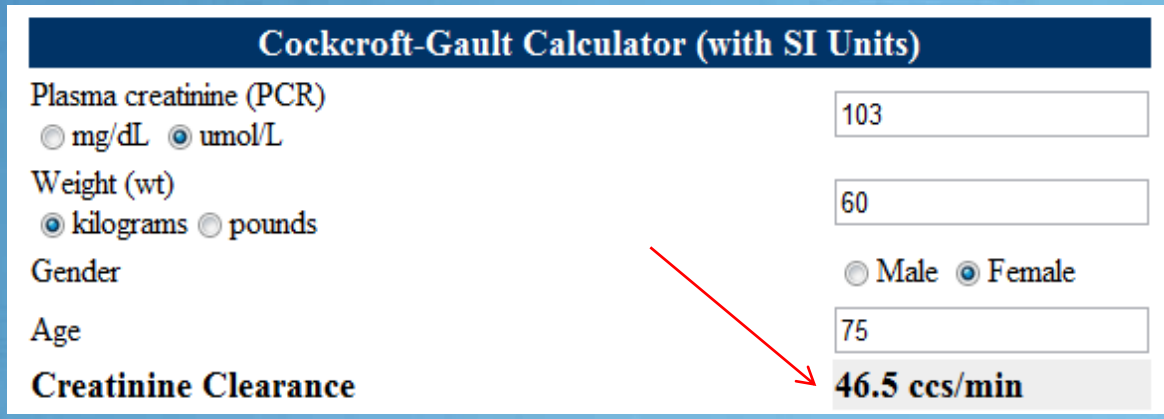
European Heart Rhythm Association, 2010

# Atrial fibrillation (HR)

| Form | HR |
| --- | --- |
| Normosystolic | 60-89 bpm |
| Bradysistolyc | < 60 bpm |
| **Tachysystolic** | **> 90 bpm** |

# CKD. criteria for diagnosis

$$GF = \frac{(140 - \text{age in years}) * \text{body weight in kg}}{(72 * \text{creatinine levels in blood, mg\%}) * 0.85 \text{ (in women)}}$$




| Stage | Characteristic | GF (ml/ьшт/1,73m²) | Creatinine (mkmol/l) |
|---|---|---|---|
| I | CKD with normal or elevated GF | >90 | <123 |
| II | CKD with chronic renal failure with a moderate or low GF | 60-89 | 123-176 |
| **III** | **XCKD with chronic renal failure, with an average decrease in GF** | **30-59** | 177- 352 |
| IV | CKD with chronic renal failure in patients with severe decrease in GF | 15-29 | 353-528 |
| V | CKD with terminal renal failure | <15 | >528 |

Рекомендации общества нефрологов Украины, 2005

# Clinical diagnosis

- Chronic rheumatic heart disease. Combined mitral and tricuscipid valve defects, combined mitral defect with stenosis predominance.
- HF II-B stage, IV FC.
- Permanent atrial fibrillation, tachysystolic form.
- CKD stage III
- Type 2 diabetes
- Chronic arthritis (shoulder joint?)
- Osteochondrosis of the cervical spine?

# Recommendations for further examination

- lipidogram
- Daily glycemic profile, HbA1c
- BP control
- Ophthalmologist consultation
- Radiography of the left shoulder and cervical spine
- Biochemical blood test: CRP, asl-o.

# Drug treatment (assigned in the hospital)

**Veroshpiron** *(Spironolactone)* - 50 mg per day
**Bisoprolol** (*Bisoprolol*) - 5 mg 1 time a day
**Cardiomagnil** (*acetylsalicylic acid* + *magnesium hydroxide*) - 75 mg 1 time per day
**Lozap** (*Losartan*) - 12,5 mg 1 time a day

**Diklak-gel 5%** (*Diclofenac*) - applied to the skin around the painful joint

# Assessing the risks

Given the age, history and comorbidities, the patient may be attributed to a group of risk - from surgical treatment refused.

In the age over 70 years, heart failure worsens the prognosis and outcome of surgery.

Unreasonably prolonged therapeutic management of patients with mitral heart disease leads to the progression of malformations and heart failure, which in turn reduces the tolerance to surgery. Postoperative mortality in this group was 37,1% (NYHA).

Факторы риска и оптимизация отбора на хирургическое лечение больных с митральными пороками сердца, 2005. Старжевская, Л.Е.

# Recommendations for treatment of the patient

1. Anticoagulants (vitamin K antagonists and aspirin) in patients with persistent atrial fibrillation, thromboembolic events in history, with mitral stenosis and prosthetic heart valves. Mandatory monitoring of INR - international normalized ration (PT).
2. Treatment of heart failure, according to its type.
3. Treatment of type 2 diabetes (diet).

«Серцево-судинні захворювання. Класифікація, стандарти діагностики та лікування кардіологічних хворих» а ред. проф. В. М. Коваленка, 2007

# Recommendations for treatment of the patient

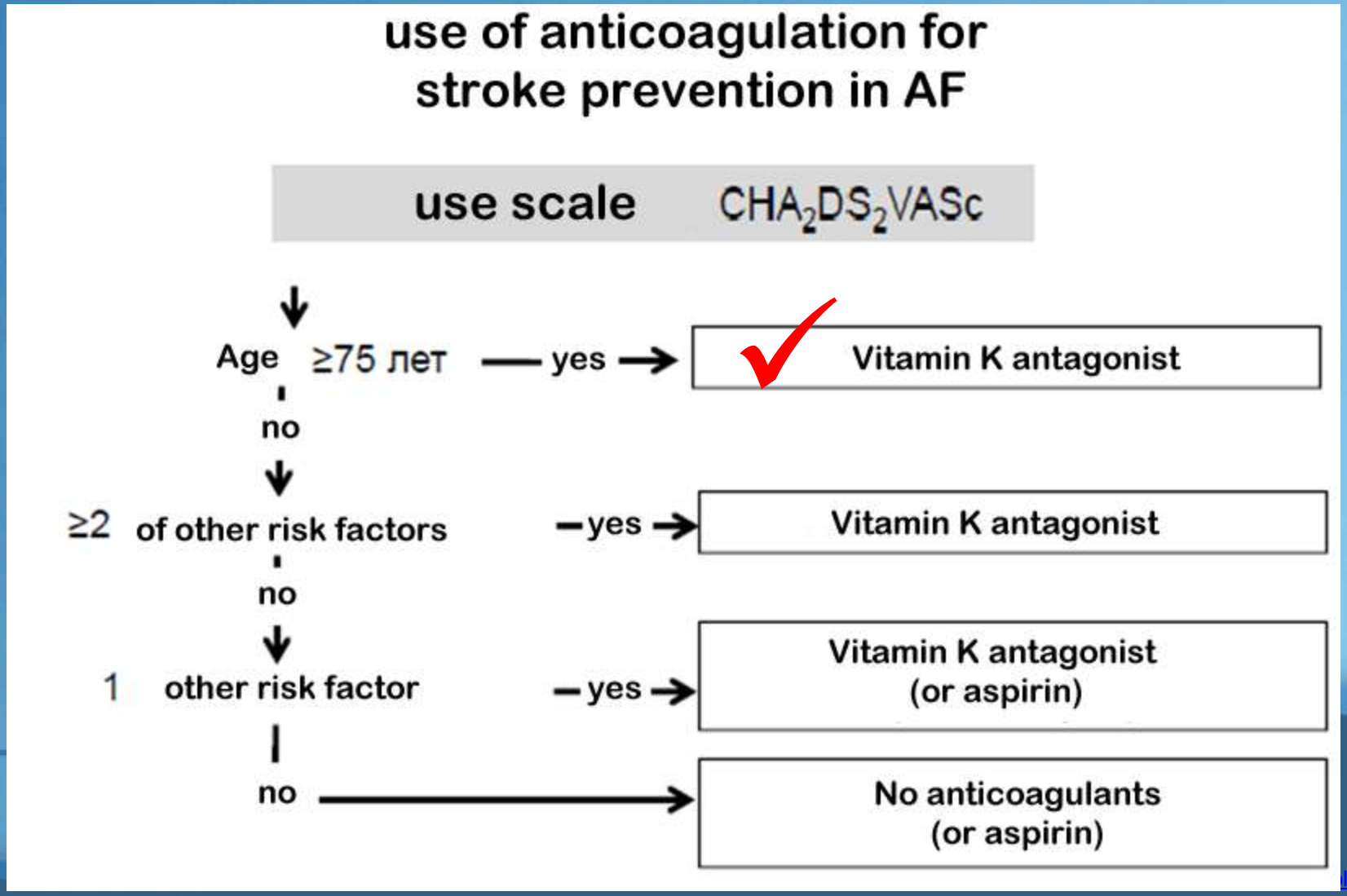
## CHA2DS2-VASc Score for Atrial Fibrillation Stroke Risk

Calculates stroke risk for patients with atrial fibrillation, possibly better than the CHADS2 score.

| | |
|---|---|
| **Age?** | ☐ < 65 years old +0<br>☐ 65-74 years old +1<br>☐ ≥ 75 years old +2 |
| **Congestive Heart Failure History?** | ☐ Yes +1 |
| **Hypertension History?** | ☑ Yes +1 |
| **Stroke/TIA/Thromboembolism History?** | ☐ Yes +2 |
| **Vascular Disease History?** (previous MI, peripheral arterial disease or aortic plaque) | ☐ Yes +1 |
| **Diabetes Mellitus?** | ☑ Yes +1 |
| **Female?** | ☑ Yes +1 |
| **Score** | 5 |

**Stroke risk was 6.7% per year according to Yip et. al's 2010 stroke study and the European Society of Cardiology' guidelines.**

# Recommendations for treatment of the patient




logy (ESC). Guidelines for the management of atrial fibrillation.

# Recommendations for treatment of the patient

## HAS-BLED Score for Major Bleeding Risk

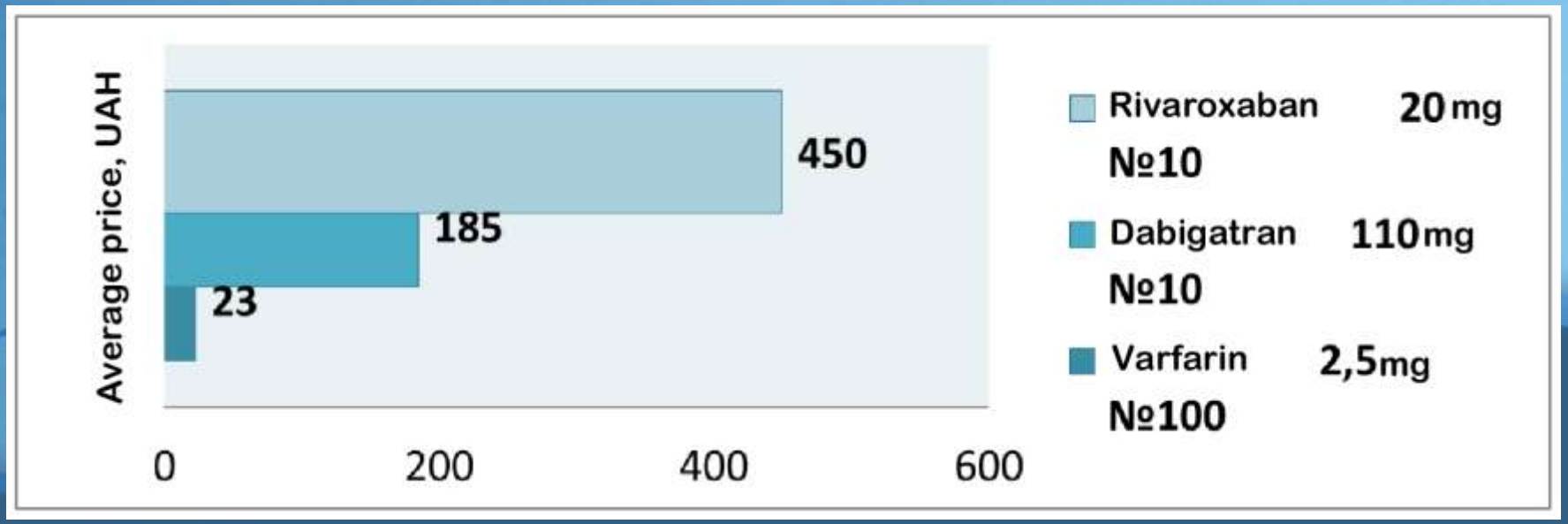
Estimates risk of major bleeding for patients on anticoagulation to help determine risk-benefit in atrial fibrillation care.

| | | |
|---|---|---|
| **Hypertension History?** (uncontrolled, >160 mmHg systolic) | ☑ Yes +1 | |
| **Renal Disease?** (Dialysis, transplant, Cr >2.6 mg/dL or >200 µmol/L) | ☑ Yes +1 | ← |
| **Liver Disease?** (Cirrhosis, Bilirubin >2x Normal, AST/ALT/AP >3x Normal) | ☐ Yes +1 | |
| **Stroke History?** | ☐ Yes +1 | |
| **Prior Major Bleeding or Predisposition to Bleeding?** | ☐ Yes +1 | |
| **Labile INR?** (Unstable/high INRs, | ☐ Yes +1 | |
| **Age ≥65?** | ☑ Yes +1 | ← |
| **Medication Usage Predisposing to Bleeding?** | ☑ Yes +1 | ← |
| **Alcohol Usage History?** | ☐ Yes +1 | |
| **Patient has none of these** | None Present | |
| **Score** | 3 points | |

**Risk was 8.9% in one validation study and 8.70 bleeds per 100 patient-years in another validation study.**

# Recommendations for treatment of the patient

- **Warfarin -** one of the most effective drugs for the treatment of atrial fibrillation and stroke prevention. However, a significant disadvantage of this tool is in the necessasaty of regular blood tests aimed to adjust the dosage of the drug. Wrong dose of warfarin can significantly reduce its effectiveness and might not lead to a desired result.
- **Dabigatran, Rivaroxaban –** alternatives to warfarin. These medications reduce the risk of stroke in patients with atrial fibrillation with a clinically significant reduction in the risk bleeding for 35 - 75%.



# Corrections to the treatment. Drug-free treatment

- **Control of physcial activity:** reduction of physical activity is recommended;
- **Diet:** the restriction or withdrawal of food containing animal fats and rapidly absorbed carbohydrates, as well as limiting salt intake and salt-containing products.

# Corrections to the treatment. Conservative treatment

**Furosemide** (prescribed in CKD III) - 40 mg in the morning before the disappearance of edema
**Lozap** 12.5 mg once a day (followed by titration)
**Bisoprolol** - 5 mg once a day (followed by titration)
**Cardiomagnil**- 75 mg once a day
**Warfarin** - starting dose is 5 mg per day at the same time (with subsequent titration and control of INR 4 days after treatment)

**Diklak Gel 5%** - applied to skin around the painful joint


Thank you for your attention!