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The importance of patients compliance to medical treatment on: an example of clinical case

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COMPLIANCE WITH MEDICAL RECOMMENDATIONS 1.2.

Compliance with medical recommendations, especially with drug therapy, has been recognized to represent a complex challenge since its first mentioning by Hippocrates about 2400 years ago. An in-depth scientific approach towards this problem, however, can only be traced over the past three decades with a strong increase in published studies over this period of time

http://ndt.oxfordjournals.org/content/16/7/1317.full

COMPLIANCE WITH MEDICAL RECOMMENDATIONS 2.2.

Major barriers to compliance are thought to include the complexity of modern medication regimens, poor "health literacy" and lack of comprehension of treatment benefits, the occurrence of undiscussed side effects, the cost of prescription medicine, and poor communication or lack of trust between the patient and his or her health-care provider. Efforts to improve compliance have been aimed at simplifying medication packaging, providing effective medication reminders, improving patient education, and limiting the number of medications prescribed simultaneously.

http://ndt.oxfordjournals.org/content/16/7/1317.full

ASSESSMENT OF TOTAL CARDIOVASCULAR (CV) RISK

Estimation of total CV risk is easy in particular subgroups of patients, such as those with antecedents of established cardiovascular disease (CVD), diabetes, coronary heart disease (CHD) or with severely elevated single risk factors.

In all of these conditions, the total CV risk is high or very high, calling for intensive CV risk-reducing measures

The Systematic COronary Risk Evaluation (SCORE) model has been developed based on large European cohort studies. The model estimates the risk of dying from CV (not just coronary) disease over 10 years based on age, gender, smoking habits, total cholesterol and SBP.

http://www.esh2013.org/wordpress/wp-content/uploads/2013/06/ESC-ESH-Guidelines-2013.pdf

CARDIOVASCULAR RISK STRATIFICATION CHART WITH RECOMMENDED FOLLOW-UP FREQUENCY FOR EACH CATEGORY

Other risk factors, OD or disease		Blood pressure (mmHg) Normal SBP 120-129 or DBP 80-84	High normal SBP 130-139 or DBP 85-89	Grade 1 HT SBP 140-159 or DBP 90-99	Grade 2 HT SBP 160-179 or DBP 100-109	Grade 3 HT SBP ≥180 or DBP ≥110
No other risk factor	Risk level	Average risk	Average risk	Low added risk	Moderate added risk	High added risk
	Follow up visits /year	0	0	2	2	3.5
1-2 risk factors	Risk level	Low added risk	Low added risk	Moderate added risk	Moderate added risk	Very high added risk
	Follow up visits /year	3.5	3.5	2	2	3.5
3 or more risk factors, MS, OD or Diabetes	Risk level	Moderate added risk	High added risk	High added risk	High added risk	Very high added risk
	Follow up visits /year	3.5	3.5	3.5	3.5	3.5
Established CV or renal disease	Risk level	Very high added risk	Very high added risk	Very high added risk	Very high added risk	Very high added risk
	Follow up visits /year	3.5	3.5	3.5	3.5	3.5

https://openi.nlm.nih.gov/detailedresult.php?img=2774288_1471-2296-10-70-1&req=4

FACTORS—OTHER THAN OFFICE BP—INFLUENCING PROGNOSIS; USED FOR STRATIFICATION OF TOTAL CV RISK

Risk factors
Male sex
Age (men ≥55 years; women ≥65 years)
Smoking
Dyslipidaemia
Total cholesterol >4.9 mmol/L (190 mg/dL), and/or
Low-density lipoprotein cholesterol >3.0 mmol/L (115 mg/dL), and/or
High-density lipoprotein cholesterol: men <1.0 mmol/L (40 mg/dL), women <1.2 mmol/L (46 mg/dL), and/or
Triglycerides >1.7 mmol/L (150 mg/dL)
Fasting plasma glucose 5.6–6.9 mmol/L (102–125 mg/dL)
Abnormal glucose tolerance test
Obesity [BMI ≥30 kg/m^2 (height^2)]
Abdominal obesity (waist circumference: men ≥102 cm; women ≥88 cm) (in Caucasians)
Family history of premature CVD (men aged <55 years; women aged <65 years)

Asymptomatic organ damage
Pulse pressure (in the elderly) ≥60 mmHg
Electrocardiographic LVH (Sokolow–Lyon index >3.5 mV; RaVL >1.1 mV; Cornell voltage duration product >244 mV*ms), or
Echocardiographic LVH [LVM index: men >115 g/m^2; women >95 g/m^2 (BSA)][a]
Carotid wall thickening (IMT >0.9 mm) or plaque
Carotid–femoral PWV >10 m/s
Ankle-brachial index <0.9
CKD with eGFR 30–60 mL/min/1.73 m^2 (BSA)
Microalbuminuria (30–300 mg/24 h), or albumin–creatinine ratio (30–300 mg/g; 3.4–34 mg/mmol) (preferentially on morning spot urine)

Diabetes mellitus
Fasting plasma glucose ≥7.0 mmol/L (126 mg/dL) on two repeated measurements, and/or
HbA_{1c} >7% (53 mmol/mol), and/or
Post-load plasma glucose >11.0 mmol/L (198 mg/dL)
Established CV or renal disease
Cerebrovascular disease: ischaemic stroke; cerebral haemorrhage; transient ischaemic attack
CHD: myocardial infarction; angina; myocardial revascularization with PCI or CABG
Heart failure, including heart failure with preserved EF
Symptomatic lower extremities peripheral artery disease
CKD with eGFR <30 mL/min/1.73m^2 (BSA); proteinuria (>300 mg/24 h).
Advanced retinopathy: haemorrhages or exudates, papilloedema

http://eurheartj.oxfordjournals.org/highwire/markup/594338/expansion?width=1000&height=500&iframe=true&postprocessors=highwire_figures%2Chighwire_math%2Chighwire_oup_table_images

HYPERTENSION AND TOTAL CARDIOVASCULAR RISK-1.2

The relationship between blood pressure (BP) values and CV and renal morbid- and fatal events has been addressed in a large number of observational studies.

<u>The results can be summarized as follows:</u>

- Office BP bears an independent continuous relationship with the incidence of several CV events [stroke, myocardial infarction, sudden death, heart failure and peripheral artery disease (PAD) as well as of end-stage renal disease (ESRD)

http://www.esh2013.org/wordpress/wp-content/uploads/2013/06/ESC-ESH-Guidelines-2013.pdf

HYPERTENSION AND TOTAL CARDIOVASCULAR RISK-2.2

- The relationship with BP extends from high BP levels to relatively low values of 110–115 mmHg for systolic BP (SBP) and 70–75 mmHg for diastolic BP (DBP). SBP appears to be a better predictor of events than DBP after the age of 50 years and in elderly individuals pulse pressure (the difference between SBP and DBP values) has been reported to have a possible additional prognostic role
- The relationship between BP and CV morbidity and mortality is modified by the concomitance of other CV risk factors. Metabolic risk factors are more common when BP is high than when it is low

http://www.esh2013.org/wordpress/wp-content/uploads/2013/06/ESC-ESH-Guidelines-2013.pdf

TYPE 2 DIABETES

Characterized by a combination of insulin resistance (IR) and beta cell failure, in association with obesity (typically with an abdominal distribution)and sedentary lifestyle—major risk factors forT2DM. Insulin resistance and an impaired first-phase insulin secretion causing postprandial hyperglycaemia characterize the early stage of T2DM. This is followed by a deteriorating second-phase insulin response and persistent hyperglycaemia in the fasting state. T2DM typically develops after middle age and comprises over 90% of adults with DM. However, with increasing obesity in the young and in non-Europid populations, there is a trend towards a decreasing age of onset

http://eurheartj.oxfordjournals.org/content/ehj/34/39/3035.full.pdf

HYPERGLYCAEMIA, INSULIN RESISTANCE, AND CARDIOVASCULAR DISEASE

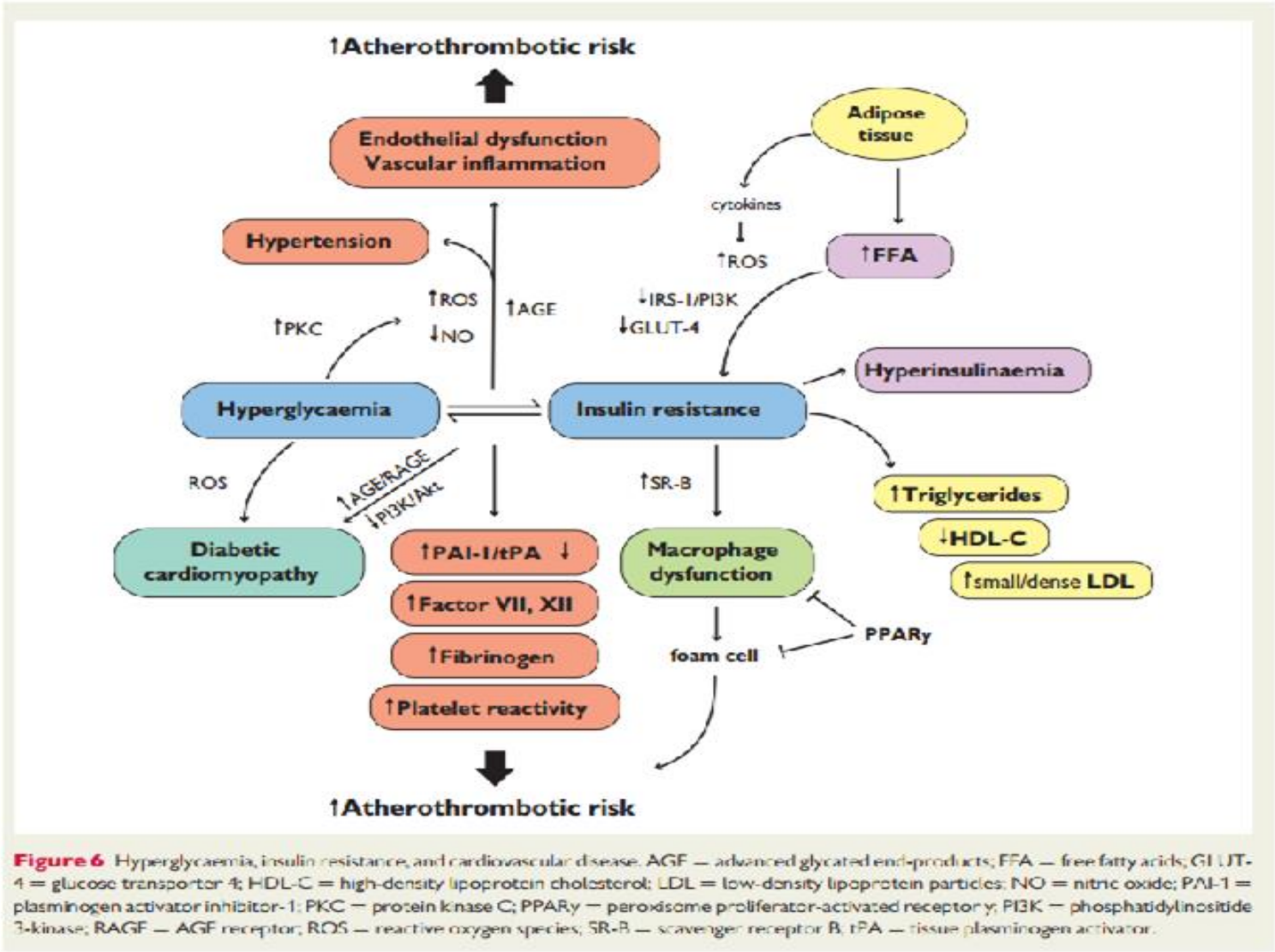


Figure 6 Hyperglycaemia, insulin resistance, and cardiovascular disease. AGE — advanced glycated end-products; FFA — free fatty acids; GLUT-4 = glucose transporter 4; HDL-C = high-density lipoprotein cholesterol; LDL = low-density lipoprotein particles; NO = nitric oxide; PAI-1 = plasminogen activator inhibitor-1; PKC — protein kinase C; PPARγ — peroxisome proliferator-activated receptor γ; PI3K — phosphatidylinositide 3-kinase; RAGE — AGE receptor; ROS — reactive oxygen species; SR-B — scavenger receptor B; tPA — tissue plasminogen activator.

http://eurheartj.oxfordjournals.org/content/ehj/34/39/3035.full.pdf

COMPARISON OF 2006 WORLD HEALTH ORGANIZATION (WHO) AND 2003/2011 AND 2012 AMERICAN DIABETES ASSOCIATION (ADA) DIAGNOSTIC CRITERIA

Diagnose/ measurement	WHO 2006[3]/2011[7]	ADA 2003 and 2012[5,6]
Diabetes		
HbA_{1c}	**Can be used** If measured ≥6.5% (48 mmol/mol)	**Recommended** ≥6.5% (48 mmol/mol)
	Recommended	
FPG	≥7.0 mmol/L (≥126 mg/dL)	≥7.0 mmol/L (≥126 mg/dL)
	or	**or**
2hPG	≥11.1 mmol/L (≥200 mg/dL)	≥11.1 mmol/L (≥200 mg/dL)
IGT		<7.0 mmol/L (<126 mg/dL)
FPG	<7.0 mmol/L (<126 mg/dL)	
		Not required
2hPG	≥7.8–<11.1 mmol/L (≥140–<200 mg/dL)	If measured 7.8–11.0 mmol/L (140–198 mg/dL)
IFG		
FPG	6.1–6.9 mmol/L (110–125 mg/dL)	5.6–6.9 mmol/L (100–125 mg/dL)
	If measured	--
2hPG	<7.8 mmol/L (<140 mg/dL)	

http://eurheartj.oxfordjournals.org/content/ehj/34/39/3035.full.pdf

DIABETES MELLITUS AND ATRIAL FIBRILLATION

Individuals with atrial fibrillation (AF) are at substantially increased risk of stroke and have twice the mortality rate from CVD as those in sinus rhythm. Diabetes mellitus is frequent in patients with AF. Community studies demonstrate the presence of DM in 13% of patients with AF. DM and AF share common antecedents, such as hypertension, atherosclerosis and obesity: however, the independent role of DM as a risk factor for AF has not been established.

http://eurheartj.oxfordjournals.org/content/ehj/34/39/3035.full.pdf

OUR PATIENT PROFILE

- 66 years old (05.06.1949)
- Male
- Retired
- Lives in a village
- Hospitalized routinely on 28.10.15 to the second cardiological department of CCH UZ

COMPLAINTS

Main

- Disruptions of the heart beats and heart palpitations which are not related to physical activity (appeared at rest, night and during every day physical activity)
- Shortness of breath when walking (observed during usual physical exertion), disappearing after the rest
- Unstable blood pressure (increasing of BP despite taking hypotensive drugs - lisinopril, amlodipine)

Additional:

- Dry mouth
- Intermittent numbness in the toes

MEDICAL HISTORY

- Essential hypertension more than 30 years with the maximum blood pressure (BP) over 200/140 mm Hg
- The usual BP is about 140/90 mm Hg (antihypertensive drugs – lisinopril 10 mg, amlodipine 5 mg but sometimes he misses the dosage)
- Since 2012, the attacks of palpitations (heart rate over 130 beats / min)
- Since 2012, is hospitalized 1-2 times a year for a planned examination and treatment to the cardiology department (Diagnosis: Arterial hypertension stage II, 3 grade. Persistent Atrial Fibrillation. HF II-A stage, FC III). Intakes warfarin 5 mg per day. Does not check INR regularly.
- Last admission in November 2014
- Current worsening from 27.10.2015 when the aggravation of the complaints has been happening, that ‘s why he was hospitalized to the second cardiological department of CCH UZ for examination and correction of the treatment

HISTORY OF LIFE

- Was born in a full family, developed according to age
- Denies tuberculosis, malaria, viral hepatitis, sexually transmitted diseases and AIDS
- Denies allergic reactions to drugs
- Diabetes mellitus since 2010 year, intakes “Siofor” (metformin) 500 mg twice a day. Hasn’t been controlling his glucose level
- Previous smoker. Denies smoking over 20 years
- Denies alcohol consumption
- Sedentary life style
- Hasn’t been following recommended low-carb diet
- Hasn’t checked his lipid profile over 6 months
- Hereditary (father-essential hypertension)

OBJECTIVE STATE:1.2

- The general condition is satisfactory, consciousness is clear, emotionally stable, optimistic mood
- Hypersthenic, height 178 cm, weight 95 kg, BMI = 30 kg / m^2, waist-to-hip ratio 1,15
- Skin, visible mucous membranes are pale pink and clean
- Peripheral lymph nodes are not palpable
- The thyroid is not palpable

OBJECTIVE STATE:2.2

- **Respiratory System:** Pulmonary percussion –resonant sound? auscultation - weakened vesicular breathing, no adventitious sounds
- **Cardiovascular system:** Heart borders extended to the left on 1,5 cm of midclavicular line, HR =72 bpm irregularly irregular. Ps= 72 bpm. No pulse deficiency
- Heart sounds are muted, accent of the II tone above the aorta. Systolic murmur above the aorta
- BP dextr = BPsin= 170/100 mm Hg (on the background of antihypertensive therapy)
- **Gastrointestinal system:** Abdomen-is soft, painless, symmetrical, no discrepancies of the abdominal muscles. No visible peristalsis. Liver edge is smooth, painless , palpated 1.5 cm below the costal arch. Spleen and pancreas are not palpable
- Symmetrical mild shin pitting edema

EXAMINATION

Examination in the hospital

- Complete blood test
- General urine test
- Biochemical blood test (Liver and renal function tests)
- Blood lipid spectrum
- Blood glucose level (Hb A1c)
- Blood electrolytes (K, Na)
- INR
- ECG
- EchoCG
- Endocrinologist

Additional instrumental methods

- Ultrasonography of the abdomen (liver, gallbladder, pancreas, kidneys)

Recommended examination

- Complete blood test
- General urine test
- Microalbuminuria
- Biochemical blood test (Liver and renal function tests)
- Blood lipid spectrum
- Blood glucose level (Hb A1c)
- Random glucose test
- Blood electrolytes (K, Na)
- INR
- ECG
- EchoCG
- Ophtalmologist
- Endocrinologist
- Neurologist consultations

Additional instrumental methods

- Ultrasonography of the abdomen (liver, gallbladder, pancreas, kidneys)

COMPLETE BLOOD TEST (29.10.15)

MEASURE	RESULT	RATE
Hemoglobin	180	M 130 - 160 g / l
Erythrocytes	5.05	M 4.0-5.0 T / l
Color index	1.06	0,85 – 1,15
Leukocytes	7.2	4,0 – 9,0 g/L
ESR	12	M 2-12 mm/h
Platelets	295	160-320 g/L
Band Neutrophils	1	1-6 %
Segmented Neutrophils	56	47-72 %
Eosinophils	3	0,5-5,0%
Basophils	0	1-1,0 %
Monocytes	6	3-11 %
Lymphocytes	34	19-37%
Hematocrit	51.3	M 40-50%

Conclusion: hyperhemoglobinemia, erythrocytosis, hemoconcentration

GENERAL URINE TEST (29.10.15)

MEASURE	RESULT	NORMAL RANGE
SPECIFIC GRAVITY	1.019	1,001-1,040
REACTION	7.0	5,0-7,0
PROTEIN	0.023	to 0.033 g / l
GLUCOSE	**174.5 mmol/l (23 g/l)**	Absent
LEUCOCYTES	2-3	6-8
EPITHELIUM TRANSITION	Not detected	Not detected
BACTERIA	Not detected	Not detected

Conclusion: glycosuria

BIOCHEMICAL BLOOD TEST (29.10.15)

MEASURE	RESULT	NORMAL RANGE
AsAt	37	<37 u/L
AlAt	31	<41 u/L
Fasting glucose	**17.27**	4,2-6,1 mmol/l
Creatinine	107	80-115 mcmol/L

Conclusion: hyperglycemia. Patient reported that he ate a big cake the day before the test and he didn't remember if he took a metformine in the evening

Creatinine clearance		NORMAL RANGE
By Cockcroft -Golt	81 ml/min or 66 ml/min/1.73 m2	**Men** (younger than age 40): 107-139 milliliters per minute (mL/min). GFR declines with age, even in the absence of chronic kidney disease, from an average of 116 mL/min/1.73 m^2 at age 20 to about 75 mL/min/1.73 m^2 at age 70
MDRD	62 ml/min/1.73 m2	
CKD-EPI (2011)	62 ml/min/1.73 m2	

Conclusion: decreased kidney function

FASTING GLUCOSE TEST (30.10.15)

RESULT	NORMAL RANGE
13,1	4,2-6,1 mmol/l

Conclusion: hyperglycemia

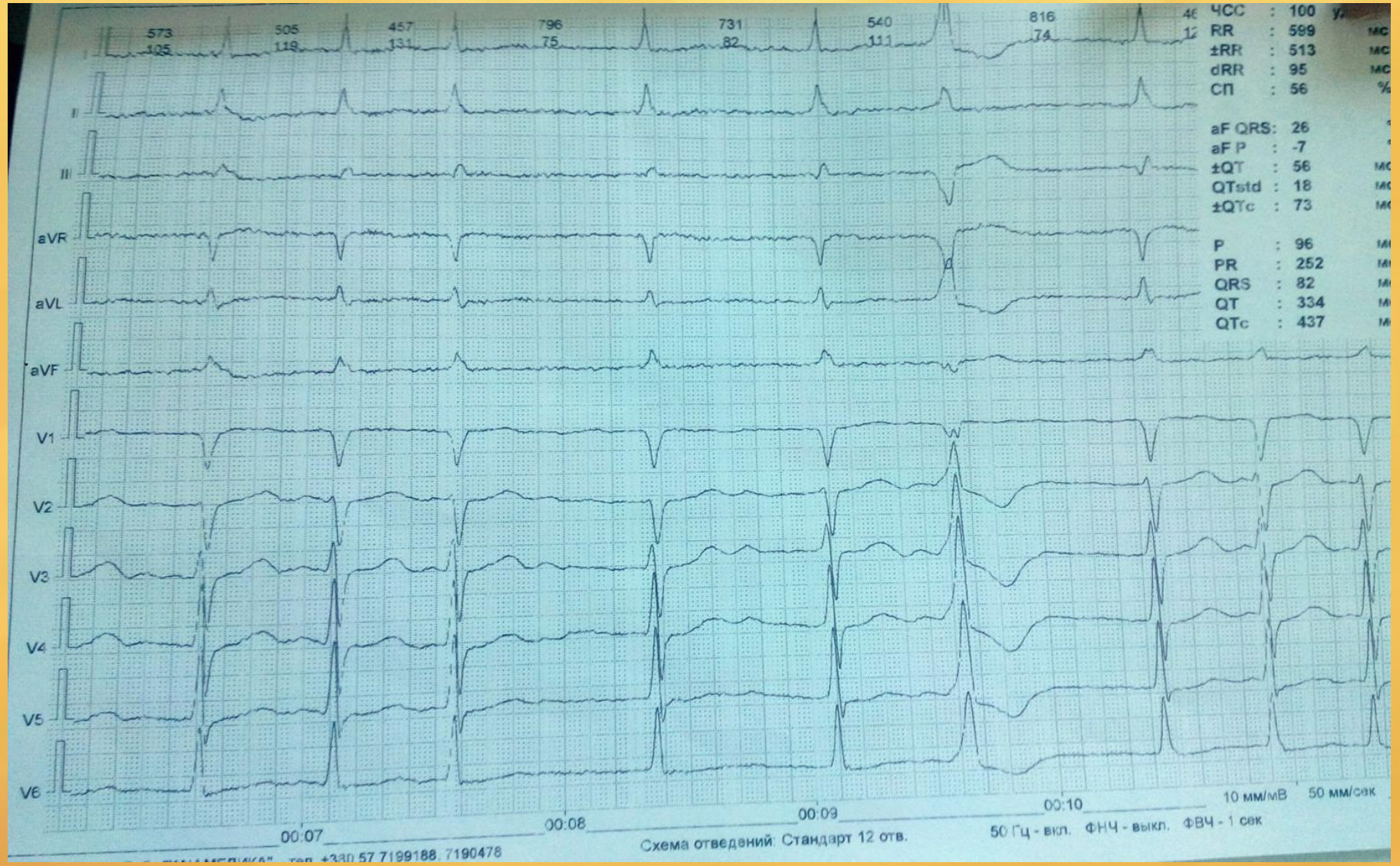
BLOOD LIPID SPECTRUM (29.10.15)

MEASURE	RESULT	RATE	Targets for patient with T2DM
TOTAL CHOLESTEROL	**7,04**	≤ 5,2 mmol / l (<4,5)	≤ 4,5 mmol / l
VLDL	**1,67**	<1,0 mmol / l	
LDL	**4,1**	<3,5 mmol / l	<1.8 mmol/L
HDL- cholesterol levels	1,2	>0,9 mmol / l	
Triglycerides	**3,73**	≤2,3 mmol / l	
COEFFICIENT of atherogenicity	**4,86**	To 3,0 mmol/l	

Conclusion: II b type of dyslipidemia

http://eurheartj.oxfordjournals.org/content/ehj/34/39/3035.full.pdf

ECG (28.10.15)



<u>Conclusion:</u> atrial fibrillation with ventricular contraction rate 72 b/min. Premature left ventricle contraction. Deviation of the heart electrical axis to the left

ECHOCARDIOGRAPHY:1.2

Name	Result	Normal
1) Acoustic window	middling	normal
2) Aorta	38 mm. Thickening of the walls	20-37 mm
3) Aortic Valve	Opening 15,6 mm. ECHO density thickening is increased. The pressure gradient 4 mm Hg	17-26 mm
4) Left Atrium	Antero-posterior size: 43.2 mm	To 38 mm
5) Mitral Valve	Physiological regurgitation 1 degree	
6)Posterior wall of the LV	12 mm. LV cavity – not enlarged. Contraction – normokinetic.	6-11 mm
7) Interventricular septum	12 mm	6-11 mm
8) Right Ventricle	D.: 20 mm. Thickness of the wall 6.0 (3-6 mm)	D.: (9-26 mm). Thickness of the wall 3-6 mm

ECHOCARDIOGRAPHY:2.2

Name	Result	Normal
9) Right Atrium	45 mm	<44 mm
10) Tricuspid Valve	Physiological regurgitation 1 degree	
11) Pulmonary Valve	Physiological regurgitation 1 degree SysPresPA=17 mmHg	SysPresPA= 17-30 mm Hg
12)Ejection Fraction	53%	55-78%

Conclusion: sclerotic changes of aortic walls, aortic and mitral valves. Dilation of the ascending aorta . The aortic stenosis (atherosclerotic). Dilatation of both atriums. Left ventricular hypertrophy. Signs of increasing diastolic stiffness of the left ventricular wall

ULTRASONOGRAPHY OF THE ABDOMEN (29.10.15)

Conclusion: Hepatomegaly. Liver steatosis. Diffuse parenchymal changes of the liver. Stagnation of the bile in the gallbladder. Gallbladder cholesterosis. Diffuse changes of the pancreas parenchyma without increasing of its size . Microstones in the kidney

CONSULTATION OF ENDOCRINOLOGIST

- **Conclusion:** Diabetes mellitus type 2, moderate severity, decompensation
- **Prescription:** increase the dosage of metformin to 1000 mg twice a day

BASIC CLINICAL SYNDROMES

- Atherosclerosis (sclerotic changes of aortic valve, mild atherosclerotic aortic stenosis)
- Arterial hypertension *
- Arrhythmias (permanent (constant) AF)
- Heart failure
- Dyslipidemia*
- Hypertensive heart (LVH, atrial enlargement, increased diastolic stiffness)
- Hepatomegaly, liver steatosis
- Erythrocytosis, hemoconcentration
- Hyperglycemia / glycosuria syndrome*
- Obesity: BMI = 30 kg / m2, waist-to-hip ratio 1,15*
- * - features of metabolic syndrome

The clinical diagnosis according to current classifications

CARDIOVASCULAR RISK STRATIFICATION CHART WITH RECOMMENDED FOLLOW-UP FREQUENCY FOR EACH CATEGORY

Blood pressure (mmHg)						
Other risk factors, OD or disease		Normal SBP 120-129 or DBP 80-84	High normal SBP 130-139 or DBP 85-89	Grade 1 HT SBP 140-159 or DBP 90-99	Grade 2 HT SBP 160-179 or DBP 100-109	Grade 3 HT SBP ≥180 or DBP ≥110
No other risk factor	Risk level	Average risk	Average risk	Low added risk	Moderate added risk	High added risk
	Follow up visits /year	0	0	2	2	3.5
1-2 risk factors	Risk level	Low added risk	Low added risk	Moderate added risk	Moderate added risk	Very high added risk
	Follow up visits /year	3.5	3.5	2	2	3.5
3 or more risk factors, MS, OD or Diabetes	Risk level	Moderate added risk	High added risk	High added risk	High added risk	Very high added risk
	Follow up visits /year	3.5	3.5	3.5	3.5	
Established CV or renal disease	Risk level	Very high added risk	Very high added risk	Very high added risk	Very high added risk	Very high added risk
	Follow up visits /year	3.5	3.5	3.5	3.5	3.5

https://openi.nlm.nih.gov/detailedresult.php?img=2774288_1471-2296-10-70-1&req=4

DEFINITIONS AND CLASSIFICATION OF OFFICE BLOOD PRESSURE LEVELS (MMHG)

Category	Systolic		Diastolic
Optimal	<120	and	<80
Normal	120-129	and/or	80-84
High normal	130-139	and/or	85-89
Grade 1 hypertension	140-159	and/or	90-99
Grade 2 hypertension	160-179	and/or	100-109
Grade 3 hypertension	≥180	and/or	≥110
Isolated systolic hypertension	≥140	and	<90

http://www.esh2013.org/wordpress/wp-content/uploads/2013/06/ESC-ESH-Guidelines-2013.pdf

CLASSIFICATION OF HYPERTENSION STAGES (RECOMMENDATIONS OF THE ASSOCIATION OF CARDIOLOGISTS OF UKRAINE 2008)

Stage	The degree of target organ damage
I	Objective changes in the target organs are absent
II	There is objective evidence of target organ damage without symptoms with their hand or dysfunction: Left ventricular hypertrophy (on ECG, ultrasound, Ro) Generalized narrowing of retinal arteries Microalbuminuria and / or a small increase in serum creatinine (y m. - 115 - 133 mmol / L at x. - 107 - 124 mmol / l) Carotid artery disease - a thickening of the intima-media> 0.9 mm or the presence of atherosclerotic plaques
III	There is objective evidence of target organ damage with symptoms from their side and impaired heart - myocardial infarction, heart failure II A - III stage; brain - stroke, transient ischemic attack, acute hypertensive encephalopathy, vascular dementia; fundus - hemorrhage and retinal exudates with papilledema the optic nerve or without; kidney - concentration of plasma creatinine in males> 133 umol / L, y Women> 124; vessels - dissecting aortic aneurysm; peripheral arterial occlusion

http://www.mif-ua.com/education/symposium/arterialnaya-gipertenziya-v-2014-g-klassifikacii-diagnostika-lechenie#test_end

THE NEW YORK HEART ASSOCIATION (NYHA) FUNCTIONAL CLASSIFICATION (FUNCTIONAL CAPACITY) OF CHF

Class	Patient Symptoms
I	No limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, dyspnea (shortness of breath).
II	Slight limitation of physical activity. Comfortable at rest. Ordinary physical activity results in fatigue, palpitation, dyspnea (shortness of breath).
III	Marked limitation of physical activity. Comfortable at rest. Less than ordinary activity causes fatigue, palpitation, or dyspnea.
IV	Unable to carry on any physical activity without discomfort. Symptoms of heart failure at rest. If any physical activity is undertaken, discomfort increases.

http://www.heart.org/HEARTORG/Conditions/HeartFailure/AboutHeartFailure/Classes-of-Heart-Failure_UCM_306328_Article.jsp#.VnJyxEqLQdU

AMERICAN HEART ASSOCIATION HEART FAILURE STAGES

Class	Objective Assessment
A	No objective evidence of cardiovascular disease. No symptoms and no limitation in ordinary physical activity.
B	Objective evidence of minimal cardiovascular disease. Mild symptoms and slight limitation during ordinary activity. Comfortable at rest.
C	Objective evidence of moderately severe cardiovascular disease. Marked limitation in activity due to symptoms, even during less-than-ordinary activity. Comfortable only at rest.
D	Objective evidence of severe cardiovascular disease. Severe limitations. Experiences symptoms even while at rest.

http://www.sunshineheart.com/patients/classification-of-heart-failure/

THE EUROPEAN RHYTHM ASSOCIATION (EHRA) CLASSIFICATION OF AF-RELATED SYMPTOMS

EHRA Class	Explanation
I	No symptoms
II	Mild – normal daily activity not affected
III	Severe – normal daily activity affected
IV	Disabling – normal daily activity discontinued

http://namcp.org/md_resource_centers/Afib/symptoms.html

LIPOPROTEIN PATTERNS (FREDRICKSON PHENOTYPES)

Phenotype	Elevated Lipoprotein(s)	Elevated Lipids
I	Chylomicrons	TGs
IIa	LDL	Cholesterol
IIb	**LDL and VLDL**	**TGs and cholesterol**
III	VLDL and chylomicron remnants	TGs and cholesterol
IV	VLDL	TGs
V	Chylomicrons and VLDL	TGs and cholesterol

LDL = low-density lipoprotein; TGs = triglycerides; VLDL = very-low-density lipoprotein.

http://www.merckmanuals.com/professional/endocrine-and-metabolic-disorders/lipid-disorders/dyslipidemia

TYPES OF ATRIAL FIBRILLATION

- **Paroxysmal:** Refers to atrial fibrillation that comes and goes on its own. Episodes may last anywhere from a few minutes to several hours and sometimes days, but not lasting longer than 7 days. No medical treatment is needed to stop the episodes of atrial fibrillation
- **Persistent:** Atrial fibrillation episodes that last longer than 7 days. Also includes A-Fib lasting less than 7 days, but needing medicine or electrical cardioversion to stop the irregular rhythm
- **Permanent:** Persistant atrial fibrillation that lasts longer than one year. Medicine and electrical cardioversion have failed and a normal heart rhythm cannot be restored without further intervention or there are contraindications to its restoration

http://eurheartj.oxfordjournals.org/content/ehj/34/39/3035.full.pdf

CHA2-DS2-VASC RATING SCALE RISK OF THROMBOEMBOLIC COMPLICATIONS IN PATIENTS WITH ATRIALFIBRILLATION / FLUTTER

	RISK FACTOR	POINTS
C	Congestive heart failure/left ventricular dysfunction	1
H	**Hypertension**	**1**
A_2	Age ≥75 years	2
D	**Diabetes mellitus**	**1**
S_2	Stroke/transient ischaemic attack/thromboembolism	2
V	**Vascular disease (prior myocardial infarction, peripheral artery disease, aortic plaque)**	**1**
A	**Age 65–74 years**	**1**
Sc	Sex category (i.e. female gender)	1

Conclusion: total points 4. The expected frequency of strokes per year 4,8%

https://www.thrombosisadviser.com/en/atrial-fibrillation/af-is-a-major-stroke-risk-factor

SCALE HAS-BLED: RISK FACTORS FOR BLEEDING

(ESC GUIDELINES FOR THE MANAGEMENT OF ATRIAL FIBRILLATION, 2011)

	Condition	Points
H	Hypertension: (uncontrolled, >160 mmHg systolic)	1
A	Abnormal renal function: Dialysis, transplant, Cr >2.6 mg/dL or >200 µmol/L Abnormal liver function: Cirrhosis or Bilirubin >2x Normal or AST/ALT/AP >3x Normal	1 1
S	Stroke: Prior history of stroke	1
B	Bleeding: Prior Major Bleeding or Predisposition to Bleeding	1
L	Labile INR: (Unstable/high INRs), Time in Therapeutic Range < 60%	1
E	Elderly: Age > 65 yearsMedication	1
D	Prior Alcohol or Drug Usage History (Antiplatelet agents, NSAIDs)	1

Conclusion: HAS-BLED score- 2. The patient has a HIGH risk of bleeding. The risk of major bleeding within 1 year in patients with atrial expressed as bleeds per 100 patient years: 1.88 - 3.2%

http://www.globalrph.com/has-bled-score.cgi

ANTICOAGULATION TACTICS BASED ON THE CHADS2 SCORE

SCORE	RISK	ANTICOAGULATION THERAPY	CONSIDERATIONS
0	Low	Aspirin or no treatment	No antithrombotic therapy (or aspirin)
1	Moderate	Aspirin or Warfarin	Aspirin daily or raise INR to 2.0-3.0, depending on factors such as patient preference
2 or greater	Moderate or High	Warfarin	Raise INR to 2.0-3.0, unless contraindicated (e.g. clinically significant GI bleeding, inability to obtain regular INR screening)

http://www.gpnotebook.co.uk/simplepage.cfm?ID=x20110126111707933383

CLASSIFICATION OF DIABETES MELLITUS SEVERITY (WHO, 1995)

- Easy (I degree) - is characterized by a low level of blood glucose, which is less than 8 mmol / l fasting small daily glycosuria (from trace to 20 g / l). Compensation condition is maintained by dietary intervention
- Moderate - fasting blood glucose increased to 14 mmol / L, blood glucose fluctuations throughout the day, daily glycosuria usually does not exceed 40 g / l, occasionally develops ketosis or ketoacidosis. Diabetes compensation is achieved by diet and oral hypoglycemic agents or insulin administration
- Severe (III degree) form - characterized by high levels of blood glucose (fasting more than 14 mmol / l), significant fluctuations in blood sugar content during the day, a high level of glycosuria (more than 40-50 g / l). Patients require constant insulin dose of 60 ML and more, they have identified a variety of diabetic angioneuropathy

https://www.staff.ncl.ac.uk/philip.home/who_dmc.htm/

CLASSIFICATION OF DIABETES ON THE EXTENT GLYCEMIC CONTROL (WHO, 1995)

- **Phase of compensation** - good condition of the patient in whom treatment fails to reach normal levels of sugar in the blood and its complete absence in the urine
- **Phase of subcompensation** - unable to achieve such good results, but the blood glucose level is not much different from the normal, that is no more than 13.9 mmol / l, and the daily loss of the sugar in the urine is less than 50 g/l. Thus acetone in urine is absent
- **Phase of decompensation** - despite treatment, blood sugar rises more than 13.9 mmol / l and loss of glucose in the urine per night exceeds 50 g/l, acetone in urine appears

https://www.staff.ncl.ac.uk/philip.home/who_dmc.htm/

CLASSIFICATION OF OVERWEIGHT AND OBESITY

BMI	Classification
<18.5	Underweight
18.5-24.9	Normal weight
25-29.9	Overweight
30-34.9	Obesity Class I
35-39.9	Obesity Class II
≥ 40	Obesity Class III
50 and above	Super Obesity

https://www.nhlbi.nih.gov/health/educational/lose_wt/BMI/bmi_dis.htm

WAIST TO HIP RATIO

Waist to Hip Circumference Ratio Standards for Men and Women

		Disease Risk Related to Obesity			
	Age (years)	Low	Moderate	High	Very High
MEN	20-29	<0.83	0.83-0.88	0.89-0.94	>0.94
	30-39	<0.84	0.84-0.91	0.92-0.96	>0.96
	40-49	<0.88	0.88-0.95	0.96-1.00	>1.00
	50-59	<0.90	0.90-0.96	0.97-1.02	>1.02
	60-69	<0.91	0.91-0.98	0.99-1.03	>1.03
WOMEN	20-29	<0.71	0.71-0.77	0.78-0.82	>0.82
	30-39	<0.72	0.72-0.78	0.79-0.84	>0.84
	40-49	<0.73	0.73-0.79	0.80-0.87	>0.87
	50-59	<0.74	0.74-0.81	0.82-0.88	>0.88
	60-69	<0.76	0.76-0.83	0.84-0.90	>0.90

(Adapted from Heyward VH, Stolarcyzk LM: Applied Body Composition Assessment. Champaign IL, Human Kinetics, 1996, p82.)

http://nutritionfirstfitness.com/tools.php?tool=waisttohip

COMPLETE DIAGNOSIS OF OUR PATIENT IS:

HEALTH FACILITY DIAGNOSIS

Main: ARTERIAL HYPERTENSION STAGE II, 3 GRADE

HYPERTENSIVE HEART (LVH)

ISCHEMIC HEART DISEASE: CARDIOSCLEROSIS

PERMANENT ATRIAL FIBRILLATION, NORMOSYSTOLIC TYPE. HEART FAILURE, STAGE II A

VERY HIGH ADDED CV RISK

Co-morbidity: DIABETES MELLITUS TYPE II, MODERATE SEVERITY, DECOMPENSATION

OUR CLINICAL DIAGNOSIS

Main: SYSTEMIC ATHEROSCLEROSIS (ATHEROSCLEROSIS OF THE AORTA, MILD AORTIC STENOSIS)

ESSENTIAL ARTERIAL HYPERTENSION STAGE II, 3 GRADE. HYPERTENSIVE HEART (LVH)

PERMANENT ATRIAL FIBRILLATION, NORMOSYSTOLIC TYPE. EHRA II CLASS

HEART FAILURE WITH PRESERVED LEFT VENTRICLE SYSTOLIC FUNCTION, II FC, STAGE B.

DYSLIPIDEMIA II B TYPE (AFTER FREDRICKSON). VERY HIGH ADDED TOTAL CV RISK

Co-morbidity: DIABETES MELLITUS TYPE II, MODERATE SEVERITY, SUBCOMPENSATION. OBESITY I DEGREE. NONALCOHOLIC FATTY LIVER DISEASE

TREATMENT

- Lifestyle modification
- Medical intervention

THERAPEUTIC LIFESTYLE CHANGES

PARAMETER	TREATMENT GOAL
Weight loss (for overweight and obese patients)	Reduce by 5% to 10%
Physical activity	150 min/week of moderate-intensity exercise (eg, brisk walking) plus flexibility and strength training
Diet	• Eat regular meals and snacks; avoid fasting to lose weight • Consume plant-based diet (high in fiber, low calories/glycemic index, and high in phytochemicals/antioxidants) • Understand Nutrition Facts Label information • Incorporate beliefs and culture into discussions • Use mild cooking techniques instead of high-heat cooking • Keep physician-patient discussions informal

https://www.aace.com/files/dm-guidelines-ccp.pdf

HEALTHFUL EATING RECOMMENDATIONS

Carbohydrate	**Specify healthful carbohydrates (fresh fruits and vegetables, legumes, whole grains); target 7-10 servings per day** **Preferentially consume lower-glycemic index foods (glycemic index score <55 out of 100: multigrain bread, pumpernickel bread, whole oats, legumes, apple, lentils, chickpeas, mango, yams, brown rice)**
Fat	Specify healthful fats (low mercury/contaminant-containing nuts, avocado, certain plant oils, fish) Limit saturated fats (butter, fatty red meats, tropical plant oils, fast foods) and trans fat; choose fat-free or low-fat dairy products
Protein	Consume protein in foods with low saturated fats (fish, egg whites, beans); there is no need to avoid animal protein Avoid or limit processed meats
Micronutrients	Routine supplementation is not necessary; a healthful eating meal plan can generally provide sufficient micronutrients Chromium; vanadium; magnesium; vitamins A, C, and E; and CoQ10 are not recommended for glycemic control Vitamin supplements should be recommended to patients at risk of insufficiency or deficiency

https://www.aace.com/files/dm-guidelines-ccp.pdf

GLYCAEMIC TARGETS

PARAMETER	TREATMENT GOAL
A1C, %	<7.0% Glycaemic targets for elderly people with long-standing or more complicated disease should be less ambitious than for younger, healthier individuals. If lower targets cannot be achieved with simple interventions, an HbA1c of <7.5–8.0% (<58–64 mmol/mol) may be acceptable
FPG, mg/dL	<7.2 mmol/L (<120 mg/dL)
2-Hour PPG, mg/dL	<9–10 mmol/L (<160–180 mg/dL)

FPG = fasting plasma glucose; PPG = postprandial glucose.

http://eurheartj.oxfordjournals.org/content/ehj/34/39/3035.full.pdf

TREATMENT STRATEGY 1.2.

- **BP target** – The currently recommended blood pressure target is **140/85 mm Hg**. The Guidelines reconfirm that diuretics (including thiazides, chlorthalidone and indapamide), beta-blockers, calcium antagonists, angiotensin-converting enzyme (ACE) inhibitors and angiotensin receptor blockers are all suitable for the initiation and maintenance of antihypertensive treatment, either as monotherapy or in some combinations
- **Treatment of AF** - Strategy of **long-term rate control** (using B-blockers as a drug of a first line therapy especially for patients with HF). **Goal for the heart rate- 60-90 bits per min.** The following beta-blockers are recommended in heart failure and T2DM: metoprolol succinate in the slow release form (MERIT-HF), bisoprolol (CIBIS II) and carvedilol

http://eurheartj.oxfordjournals.org/content/ehj/34/28/2159.full.pdf

TREATMENT STRATEGY 2.2.

- **Treatment of AH and HF** - Angiotensin-converting enzyme inhibitors (ACE-I) and angiotensin receptor blocker. **ACE-I** is indicated in T2DM, hypertension, and heart failure, since it improves symptoms and reduces mortality. **Diuretics** are useful for the relief of dyspnoea and oedema in heart failure with fluid overload, irrespective of the EF. Loop diuretics are recommended, rather than thiazides, which have been shown to promote hyperglycaemia
- **Management of dyslipidaemia** - **Statin therapy** is recommended in patients with T2DM at very high-risk (i.e. if combined with documented CVD, severe CKD or with one or more CV risk factors and/or target organ damage) with an **LDL-C** target **of <1.8 mmol/L or at least a ≥50% LDL-C** reduction if this target goal cannot be reached. Reports from major RCTs demonstrate that statins are safe and well-tolerated. The frequency of adverse events, except for muscle symptoms, is rare. In the majority of cases of myopathy or rhabdomyolysis there are drug interactions with a higher-than-standard dose of statin

http://eurheartj.oxfordjournals.org/content/ehj/34/39/3035.full.pdf

HEALTH FACILITY TREATMENT

Drug therapy

- Bisoprolol 5 mg in the morning
- Torasemide 10 mg in the morning
- Perindopril 10 mg in the morning
- Amlodipine 10 mg in the morning
- Warfarin according to the scheme (starting dosage -5 mg per day at 5 p.m)

IV therapy

- Thiotriazoline 2. 0 + NaCl 0. 9% 10.0 N10
- “Asparcam” (Mg+K) 10,0 + NaCl 0. 9% 200.0 N10

RECOMMENDED TREATMENT 1.2

- Angiotensin-converting enzyme (ACE) inhibitor-PERINDOPRIL 8 mg in the morning

Diuretic – Torasemide 2, 5 MG in the morning

- Calcium channel blocker-AMLODIPINE 5 mg in the evening
- B- blocker-BISOPROLOL 5 mg in the morning (target HR – 60 b/m)
- Statin-ROSUVASTATIN (CRESTOR) 20 mg in the evening

RECOMMENDED TREATMENT 2.2

- Anticoagulant – WARFARIN according to the scheme 17:00; better - the new oral anticoagulants (NOAC- Dabigatran - 110 mg 2 times daily or Rivaroxaban - 15 mg p / day) .

Dabigatran given at a dose of 110 mg (or rivaroxaban 15 mg) was associated with rates of stroke and systemic embolism that were similar to those associated with warfarin, as well as lower rates of major hemorrhage. They do not require INR monitoring

- Oral hypoglycemic agents-METFORMIN 1000 mg 2 times a day

http://www.nejm.org/doi/full/10.1056/NEJMoa0905561

INR (FOR CORRECTION DOSAGE OF WARFARIN)

Date	Result	Dosage warfarin
29.10.15	1,04	weekly dosage 35 mg
02.11.15	1,52	Increase weekly dosage to 41 mg
05.11.15	2,47	weekly dosage 41 mg

WEEKLY DOSAGE 41 MG						
Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 2**	**Day 3**	**Day 4**
5 mg	6,5 mg	5 mg	6,5 mg	6,5 mg	5 mg	6,5 mg

1 tab. Warfarin =3 mg and 5 mg

Stable Patients: Dosing Algorithm To Achieve INR Of 2.0 - 3.0

INR	Action
>10.0	Stop warfarin. Contact patient for examination.
7.0-10.0	Stop warfarin for 2 days; decrease weekly dosage by 25% or by 1 mg/d for next week (7 mg total); repeat PT[3] in 1 week.
4.5-7.0	Decrease weekly dosage by 15% or by 1 mg/d for 5 days of next week (5 mg total); repeat PT in 1 week.
3.0-4.5	Decrease weekly dosage by 10% or by 1 mg/d for 3 days of next week (3 mg total); repeat PT in 1 week.
2.0-3.0	No change.
1.5-2.0	Increase weekly dosage by 10% or by 1 mg/d for 3 days of next week (3 mg total); repeat PT in 1 week.
<1.50	**Increase weekly dose by 15% or by 1 mg/d for 5 days of next week (5 mg total); repeat PT in 1 week.**

INR: International Normalized Ratio = $(x/y)^z$, where: x = Prothrombin Time of sample (sec), y = Mean Normal Prothrombin Time (sec), z = [ISI of Thromboplastin]

CONTROL OF COMPLIANCE TO MEDICAL RECOMMENDATIONS (diet, weight, physical activity, drug treatment) !

RECOMMENDATIONS FOR FURTHER EXAMINATION

- Holter electrocardiogram monitoring(ECGs)
- Daily glycemic profile, Glucouse tolerance test, HbA1C
- Creatinine after 2 weeks to exclude kidney disease
- Ophthalmologist, neurologist consultation
- TREDMIL-test to exclude silent myocardial ischemia
- ECHO for evaluation of diastolic function of LV
- Lipid profile (LDL), ALT (liver) +/- CK (rhabdomyolysis) – control of efficacy and safety of rosuvastatin
- Blood electrolytes (K)

PROGNOSIS

- Prognosis for life - non-compliance to doctor's appointments – non-satisfactory
- The prognosis for recovery - an unfavorable


THANK YOU FOR ATTENTION!