Etio-pathogenesis and laboratory diagnosis of atherosclerosis
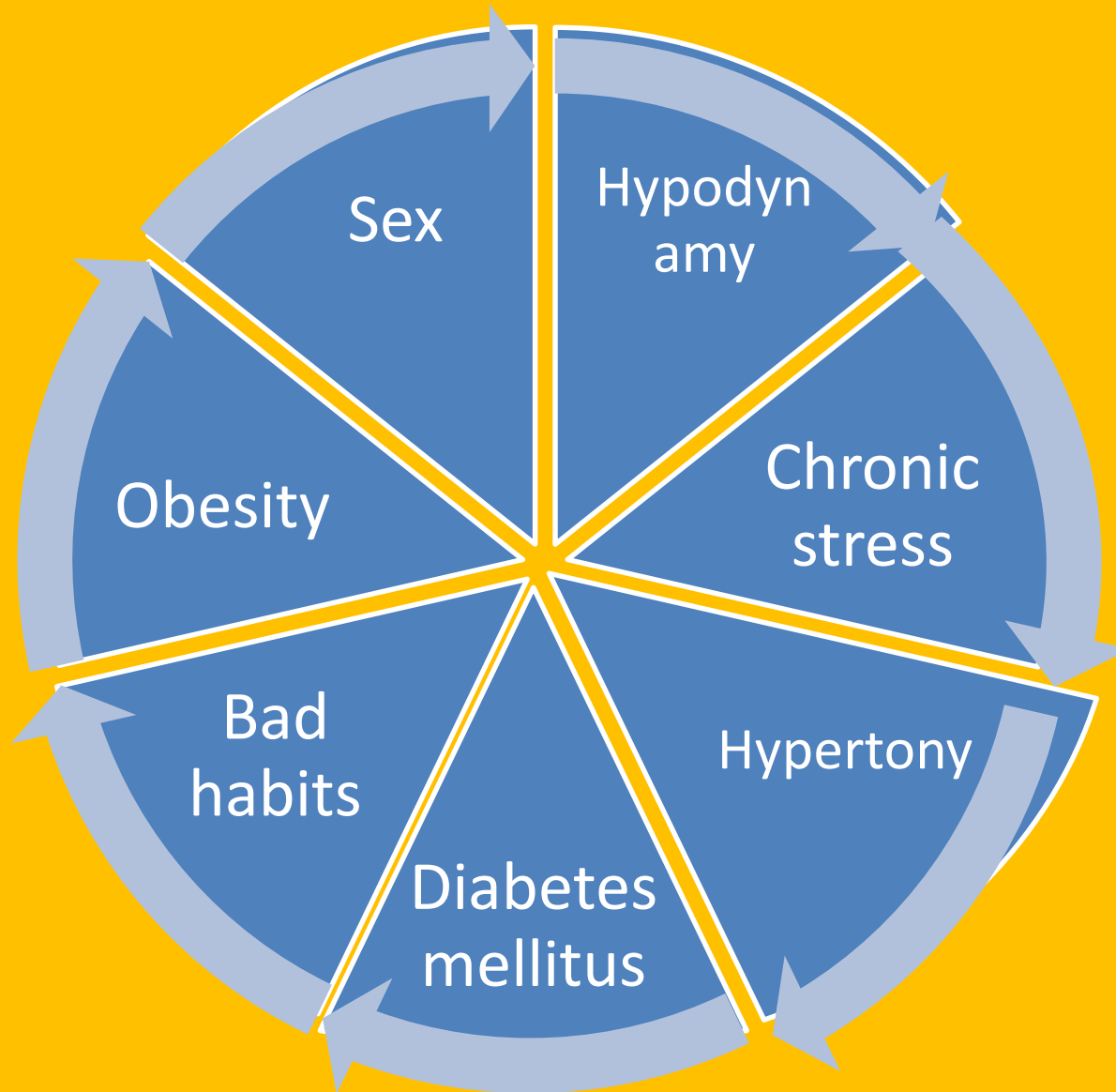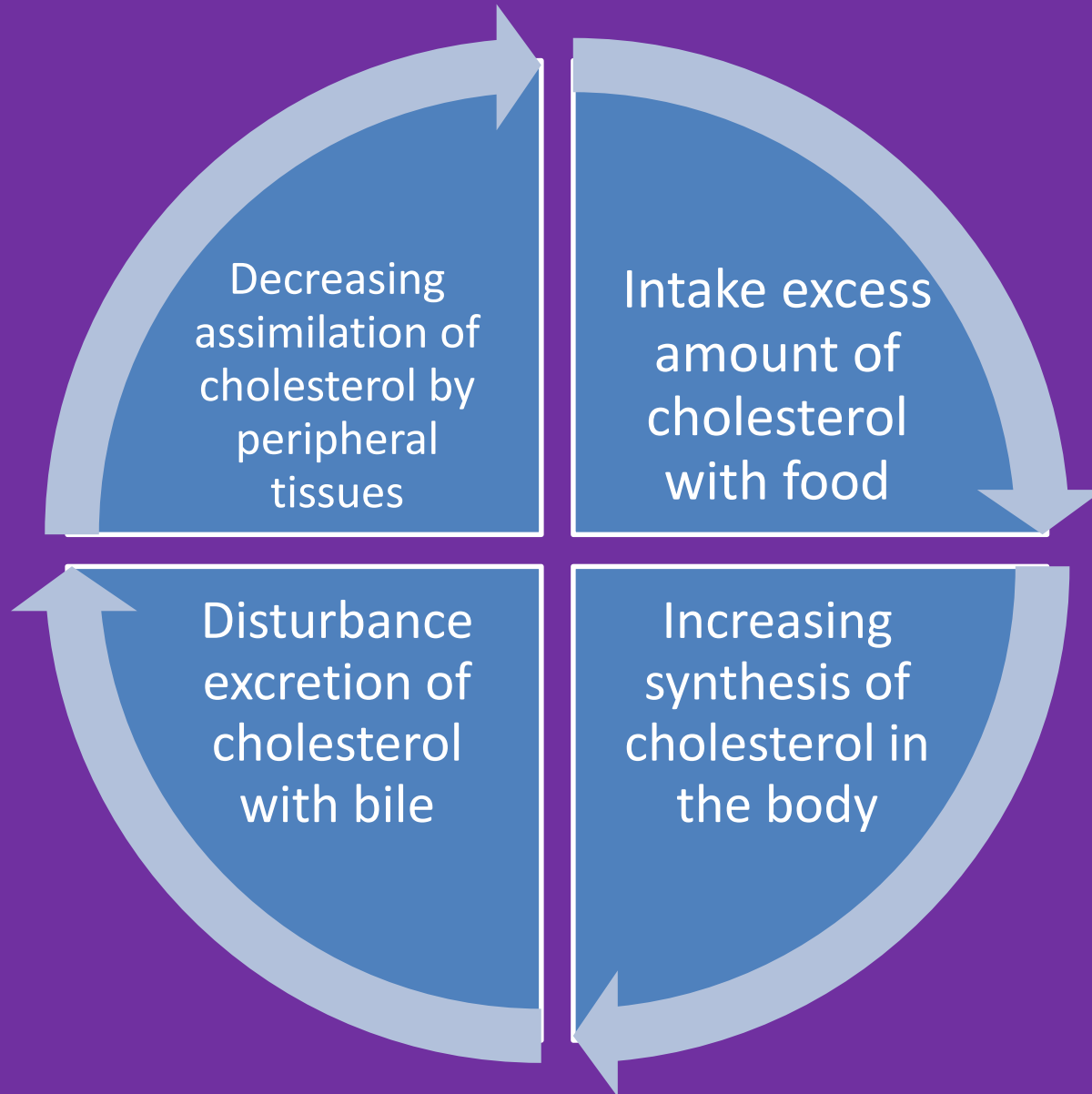
Risk factors of atherosclerosis

Causes of hypercholesterolemia

- Decreasing assimilation of cholesterol by peripheral tissues
- Intake excess amount of cholesterol with food
- Disturbance excretion of cholesterol with bile
- Increasing synthesis of cholesterol in the body

The level of lipid indices of plasma

| Lipids of plasma	mmol/l	mg/dl
Total cholesterol	<5.0	<190
Cholesterol of LDLP	<3.0	<115
Cholesterol of HDLP	≥1.0 (men), ≥1.2 (women)	≥40 (k), ≥ 46 (women)
Triglycerides	<1.7	<150

Classification of hypercholesterolemia

Character of the level	Total cholesterol mmol/l	Cholesterol in LDLP, mmol/l
Optimal	<5.0	<3.0
Moderate level	5.0-5.9	3.0-3.9
High level	≥6.0	≥4.0

Aterogenlık əmsalı

- AC = Cholesterol – cholesterol of HDLP : cholesterol of HDLP
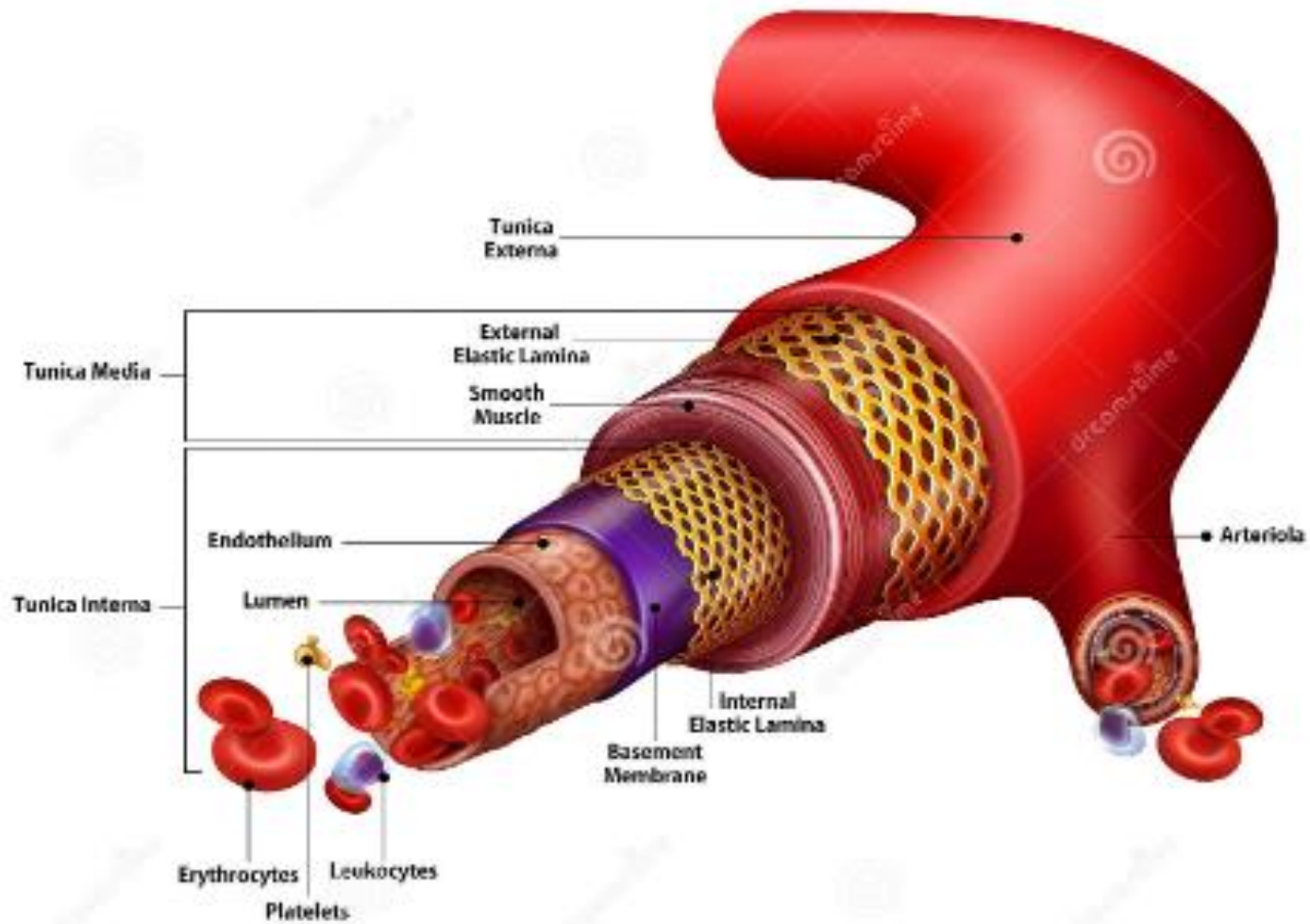- AC is about 2-3 in norm.

Types of lipoproteins
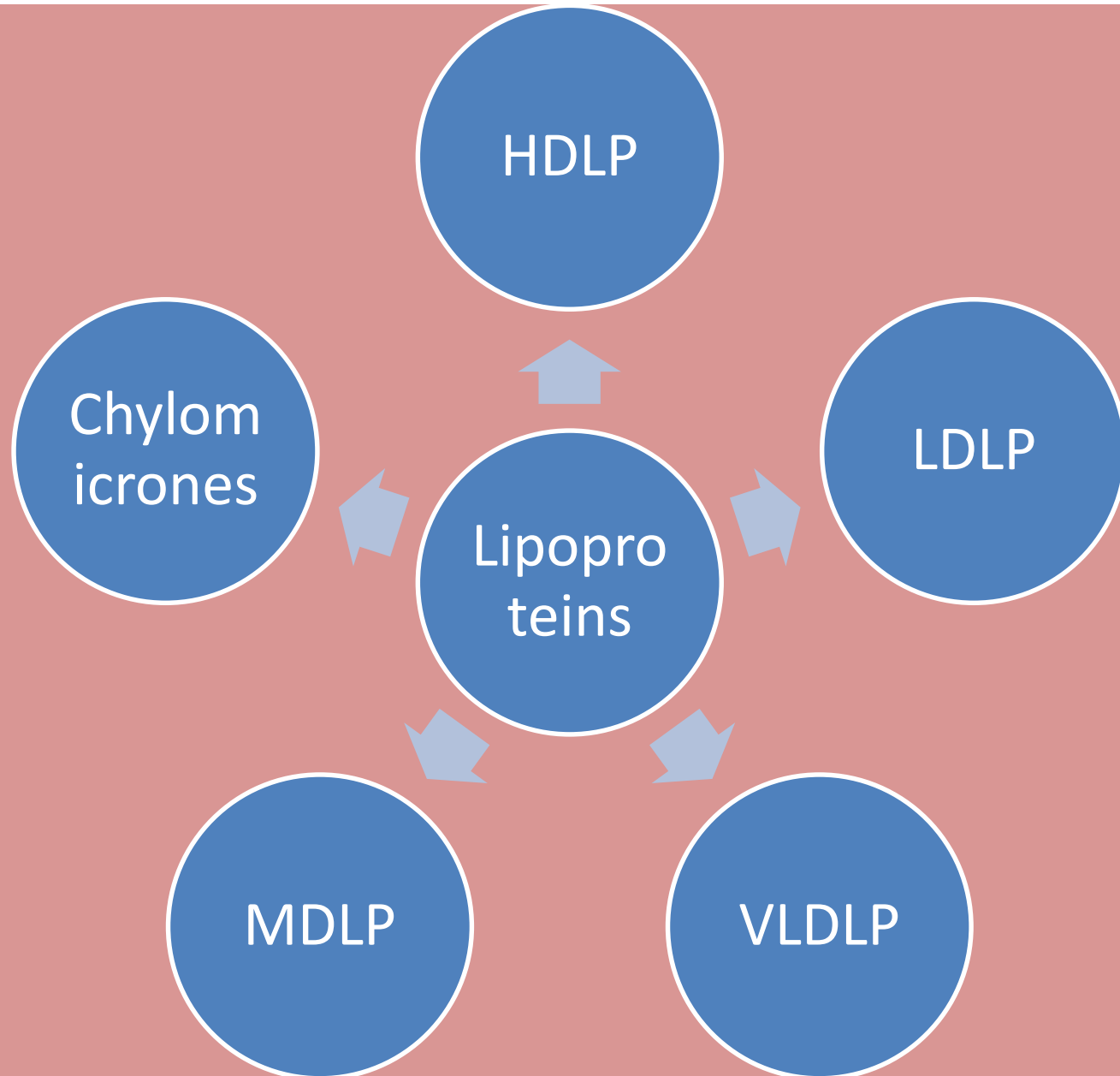
Structure of artery
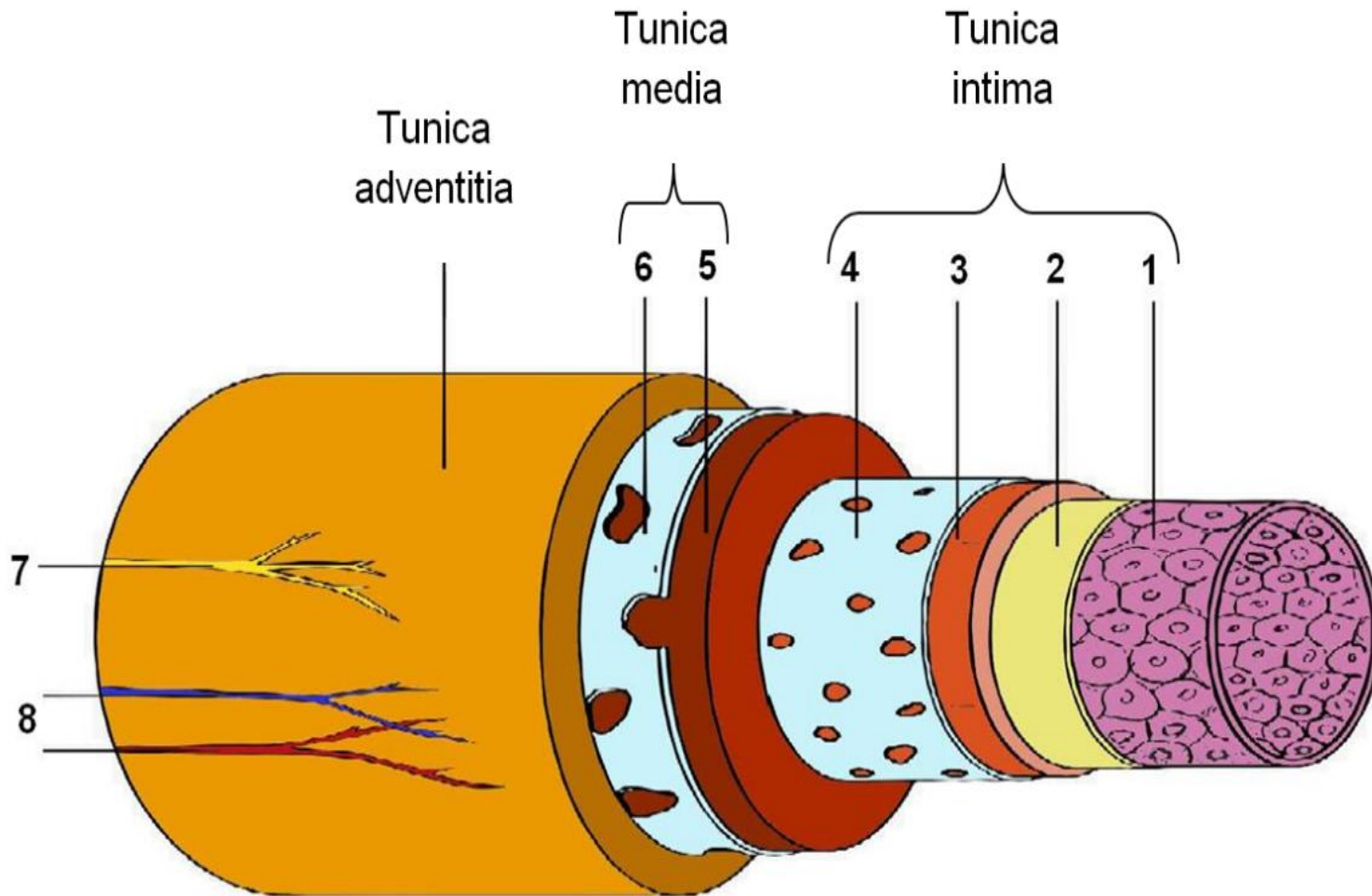
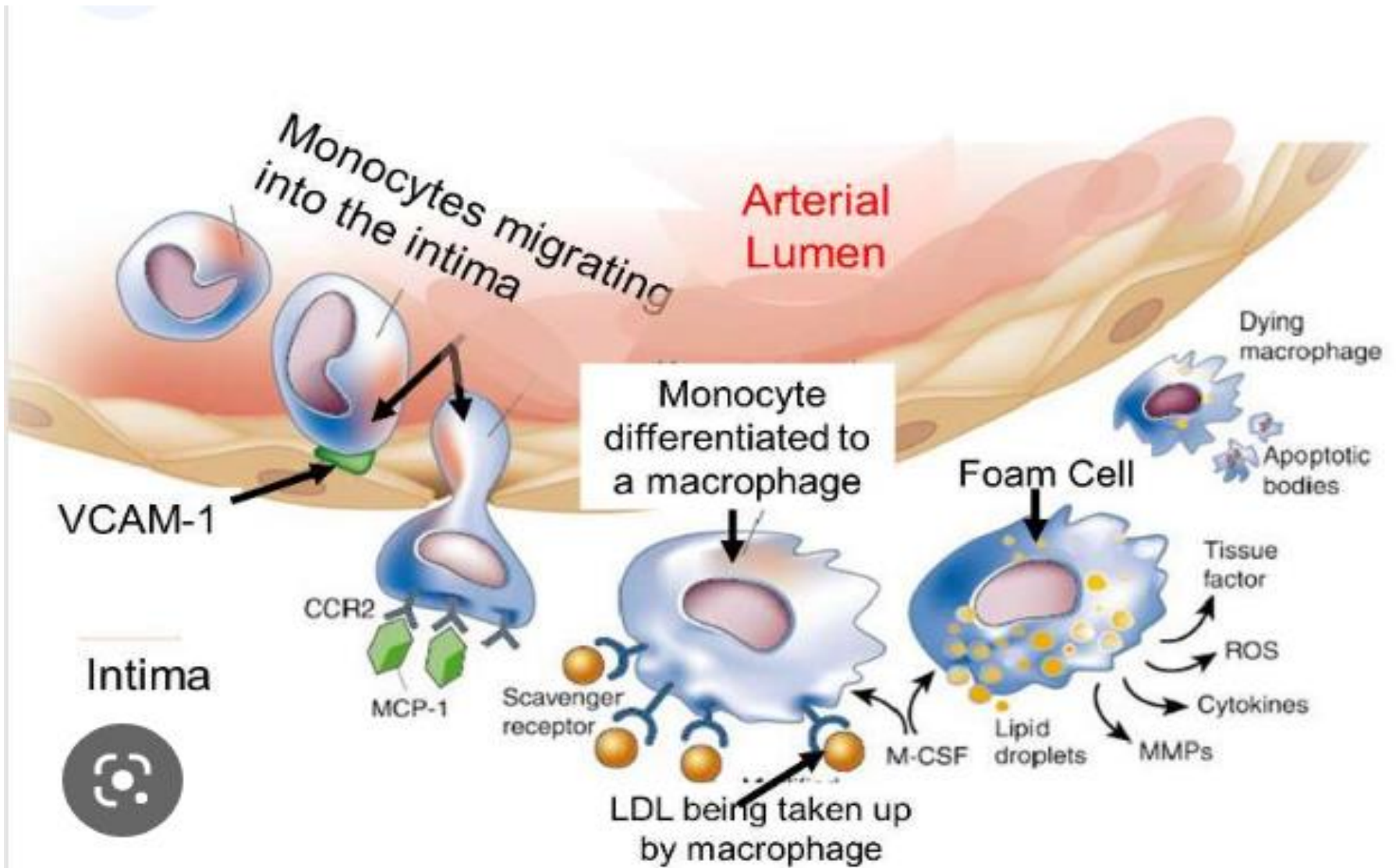# Structure of artery

Pathogenesis of Atherosclerosis.mp4
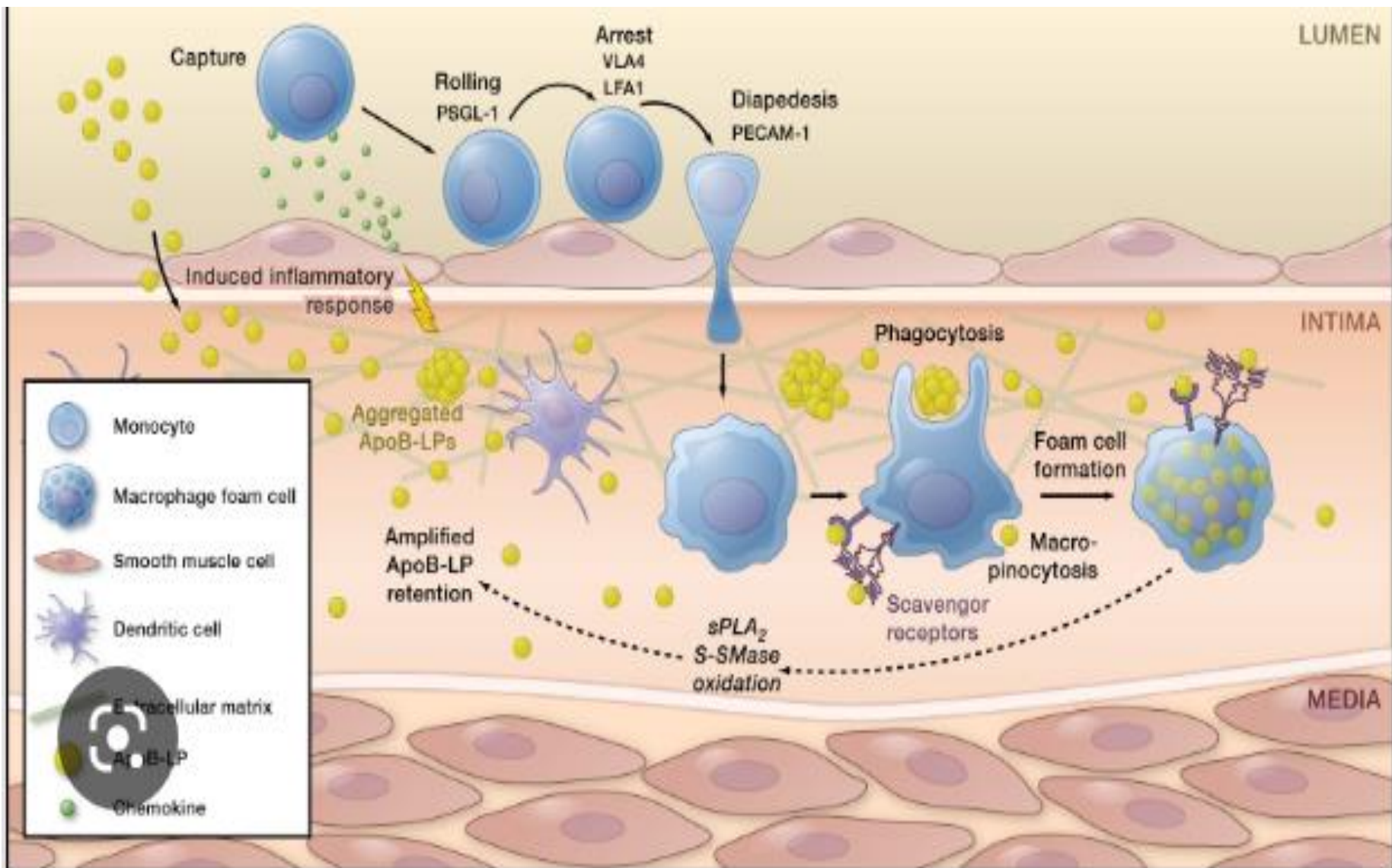
Subsequence of narrowing of vascular lumen in atherosclerosis
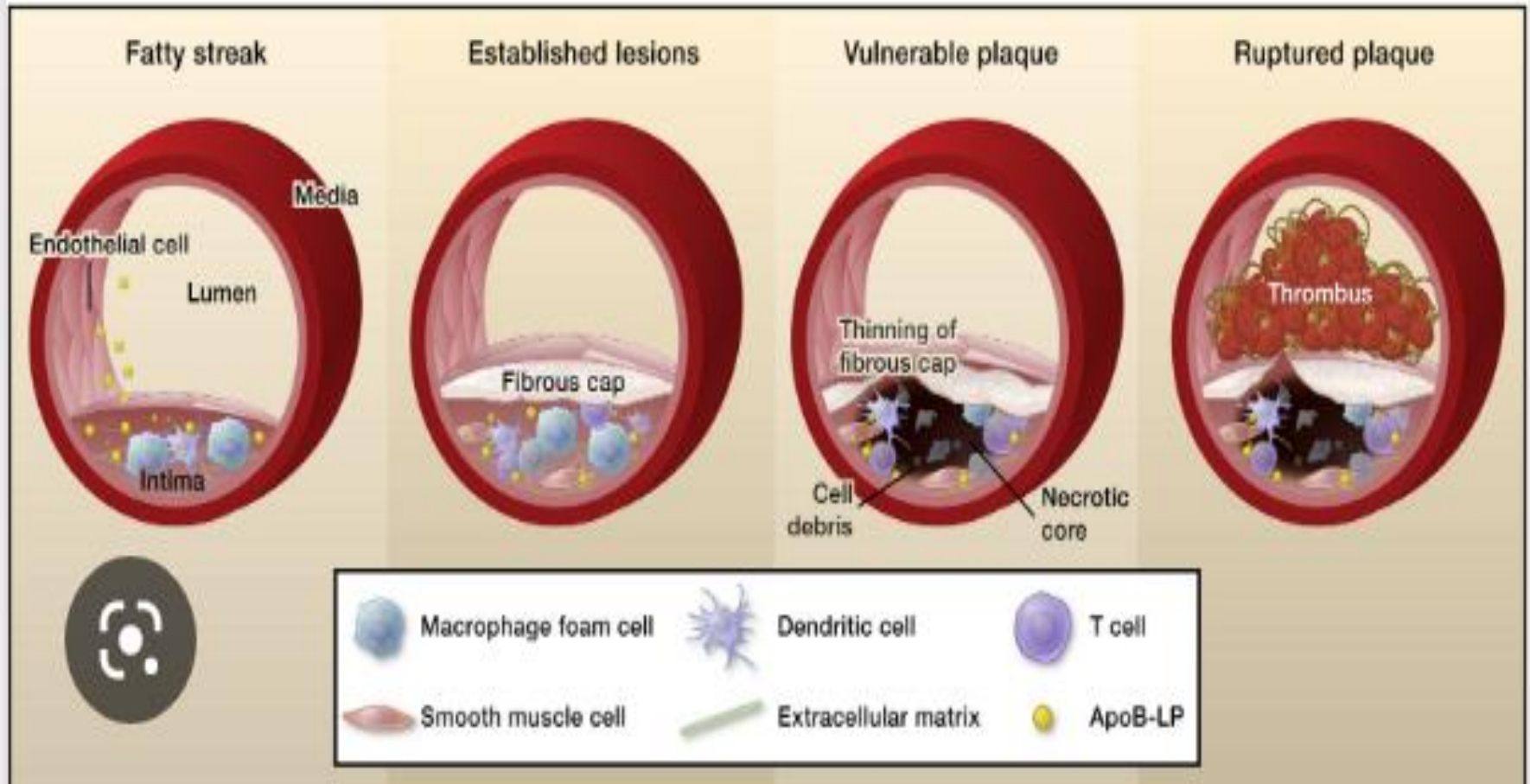
External signs of predisposition to atherosclerosis

- Perceptible and premature aging
- Disperancy between the age and appearance of the patient
- Premature graying of hair in the head and anterior part of the thorax (in men) of the patient
- Xantoma and xantelesms (yellow lipid spots in tendom and in eyelid)

Diagnostic methods of atherosclerosis
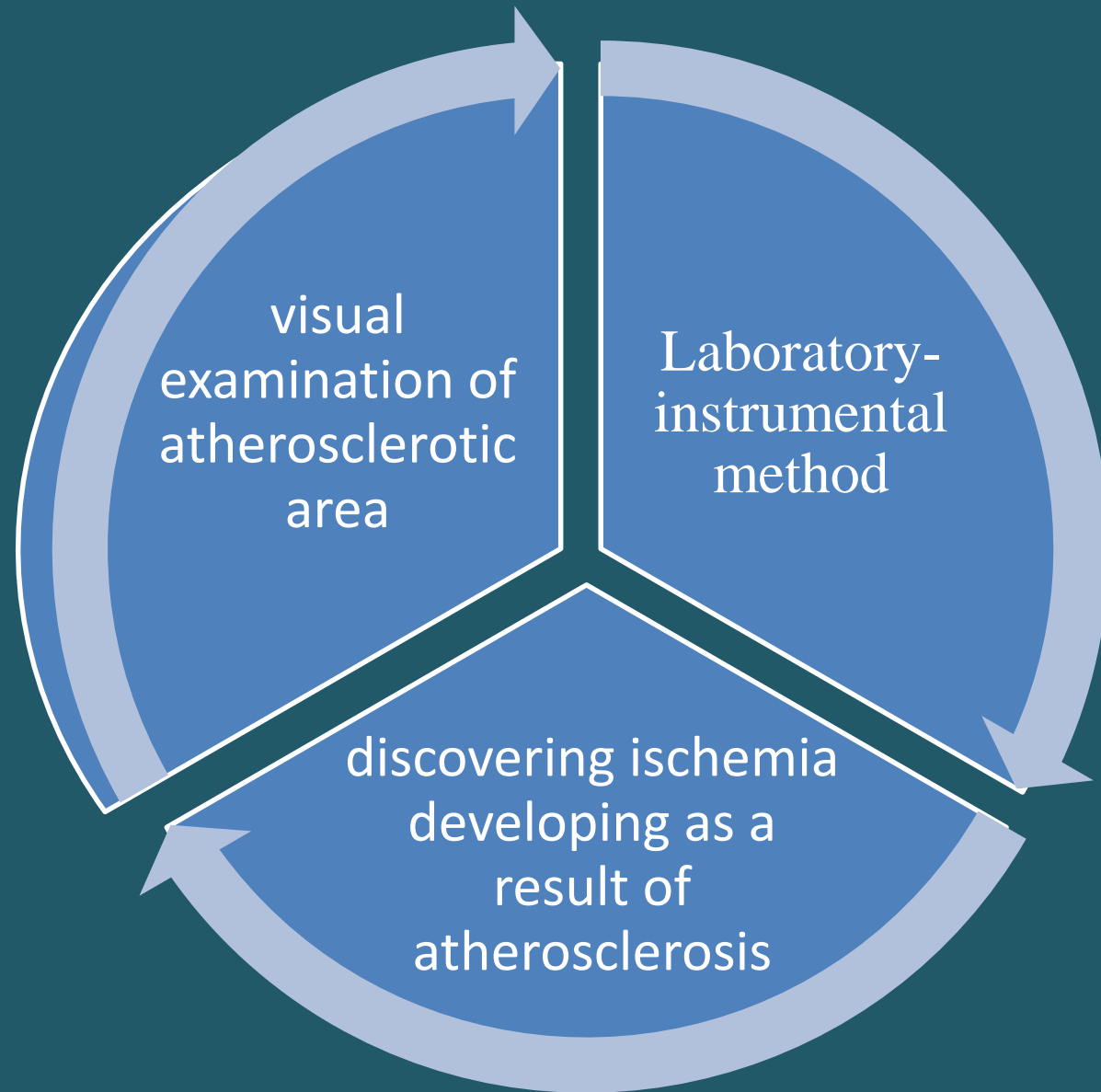
Laboratory instrumental method

- Total analysis of the blood
- Total analysis of urine
- Total cholesterol
- LDLP
- HDLP
- VLDLP
- Triglycerides
- PTİ
- Glycozylated hemoglobin
- - C-reaktive protein
- Homosistein

Total analysis of the blood

- **Erythrocytes**
- **Leykoformula**
- **Hematocrit**
- **MCH**
- **MCHC**
- **Trombocytes**
- **Color index**
- **Retikulocytes**
- **Eritropoetin**
- **Target cells**
- **MCV**
- **Jolli bodies**
- **Kebot ring**
- **Toxic granularity of neutrophils**
- **ESR**

Indicies	Norm
Hematocrit	40-54%-in men, 36-42% in women
MCHC-	30-48%.
MCH	27-33 pgr.
Hypersegmentation of neutrophiles	Absent in norm
Basophilic granularity of erythrocytes	Absent in norm
Kebot ring	Absent in norm
Reticulocytes	2.0-10 %.
Erythrocytes	4-5 10^{12}gr/l
Plasmatic cells	Absent in norm
Trombocytes	180-320 10^9/l.
Color index	0.9-1.1
Erythropoietin	25-75 mED/ml
MCV	80-96 femtolitrdir
Jolli body	Absent in norm

Types of leukocytes	Norm %
Myelocytes	-
Metamyelocytes	-
Sticnuclear neutrophils	1-5
Segmented neutrophiles	40-70
Lymphocytes	20-45
Monocytes	3-8
Eosinophils	1-5
Basophils	0-1
Plasmocytes	-

Evaluation the level of glucose in the blood due to glycosylated hemoglobin

HbA$_{1c}$	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9
Glucose	2.6	3.6	4.4	5.4	6.3	7.2	8.2	9.1	10.0	11.0	11.9

HDLP –in norm: 0.8-2.2 mmol/l

VLDLP- in norm: 0.13-1.0 mmol/l

LDLP- in norm: 1.3-3.5 mmol/l

Triglycerides- in norm:0-1.71 mmol/l

Total lipids- in norm 4.5-7.0 gr/l.

Chylomicrons- absent in norm

Protrombin time- in norm: 11-13.3 second

Protrombin index- in norm: 80-120%

Creatinin-in norm: 80-120 mkmol/l.

Fibrinogen- in norm in plasma- 2.0-4.0 gr/l. olur.

Renin in norm- 1.6-4.5 mkg/l hour.

Aldosteron in norm - 15-70 nmol/l in plasma, 4.5-17.7 mkg/daily in urine

Total cholesterol in norm in blood is 3.5-5.0 mmol/l, moderate level is 5.0-6.0 mmol/l, high level is >6.0 mmol/l .

Indicies	Norm
Ammonia in urine	0.044 - 0.141 mmol/l.
Atypical cells	Absent in urine in norm
Acetone in urine	Absent in urine in norm
Total protein	Less than 0.033 gr/l.
Bilirubin	Does not observe in norm
Glucose	Does not observe, or a <0.3 gr/daily
Ketone bodiees	does not observe in norm
The amount of urine	800-1500 ml.
Leukocytes	up to 5- in vision area
Special mass of urine	1018-1025 gr/ml.
Reaction of urine	5.0-7.5
Color of urine	Transparent
Erythrocytes	Does not observe or single

Instrumental methods discovering ischemia developing as a result of atherosclerosis

During load tests to the patient the ECG is recorded:

a)velergometr

b) tredmil

Visual examination of atherosclerotic area

- Contrast solution is injected into artery and narrowing part of artery determined by X-ray examination and ultrasound examination