Importance of cardiovascular disease prevention in primary healthcare

Ingrid Schusterova

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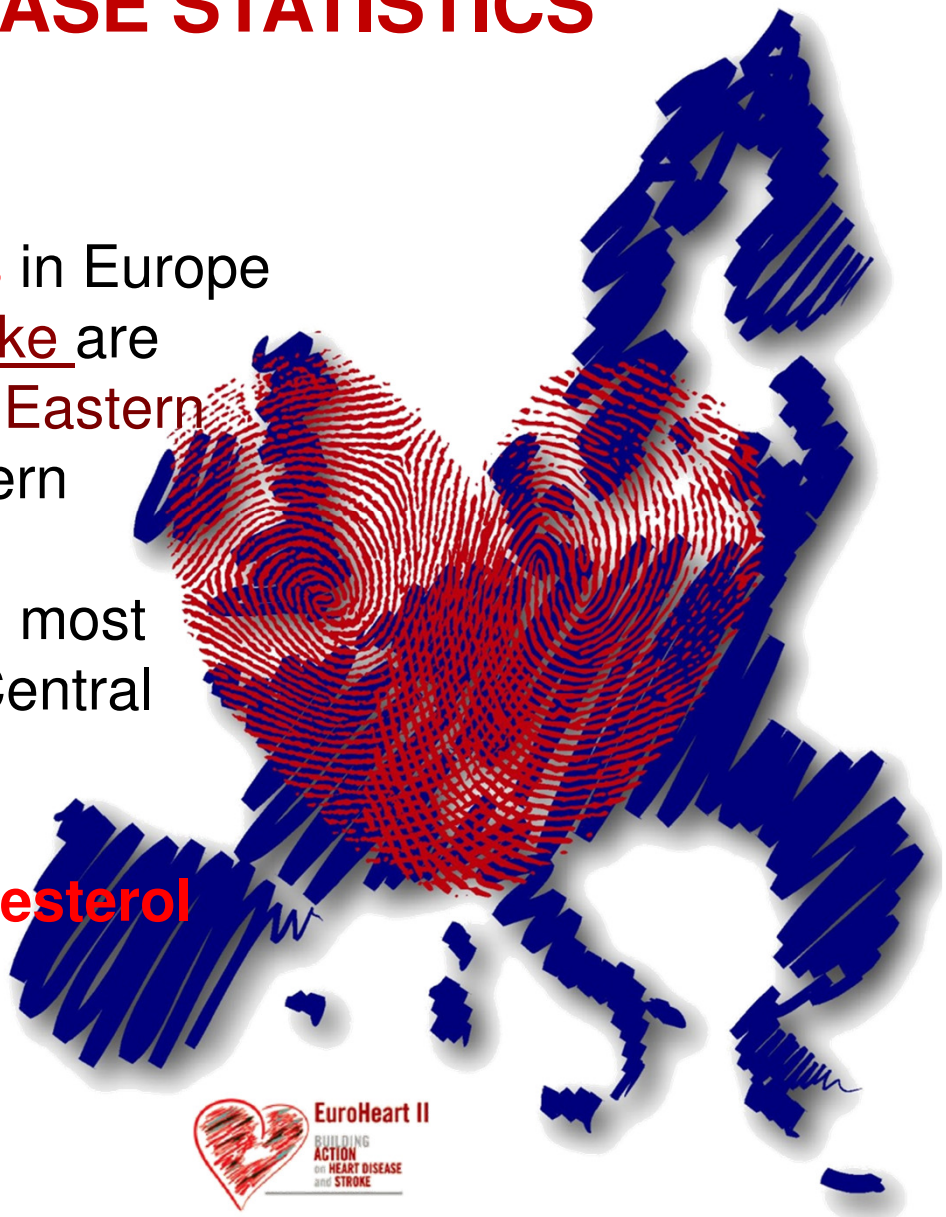
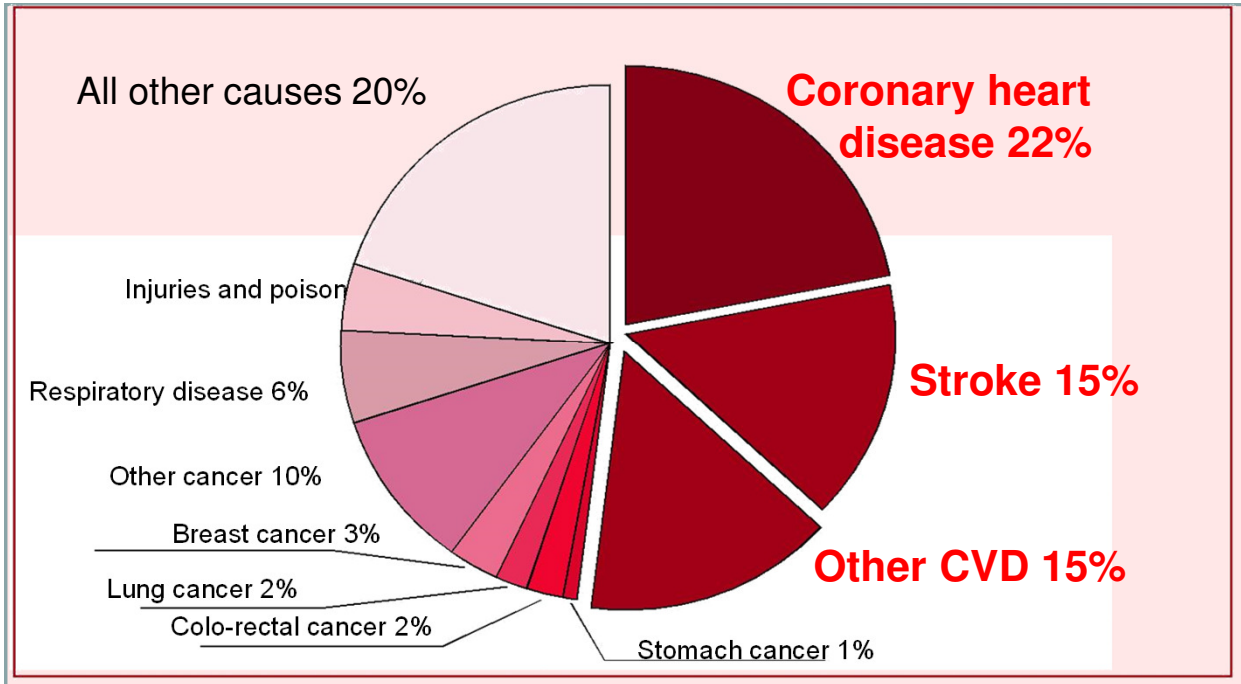
EUROPEAN CARDIOVASCULAR DISEASE STATISTICS 2012 EDITION

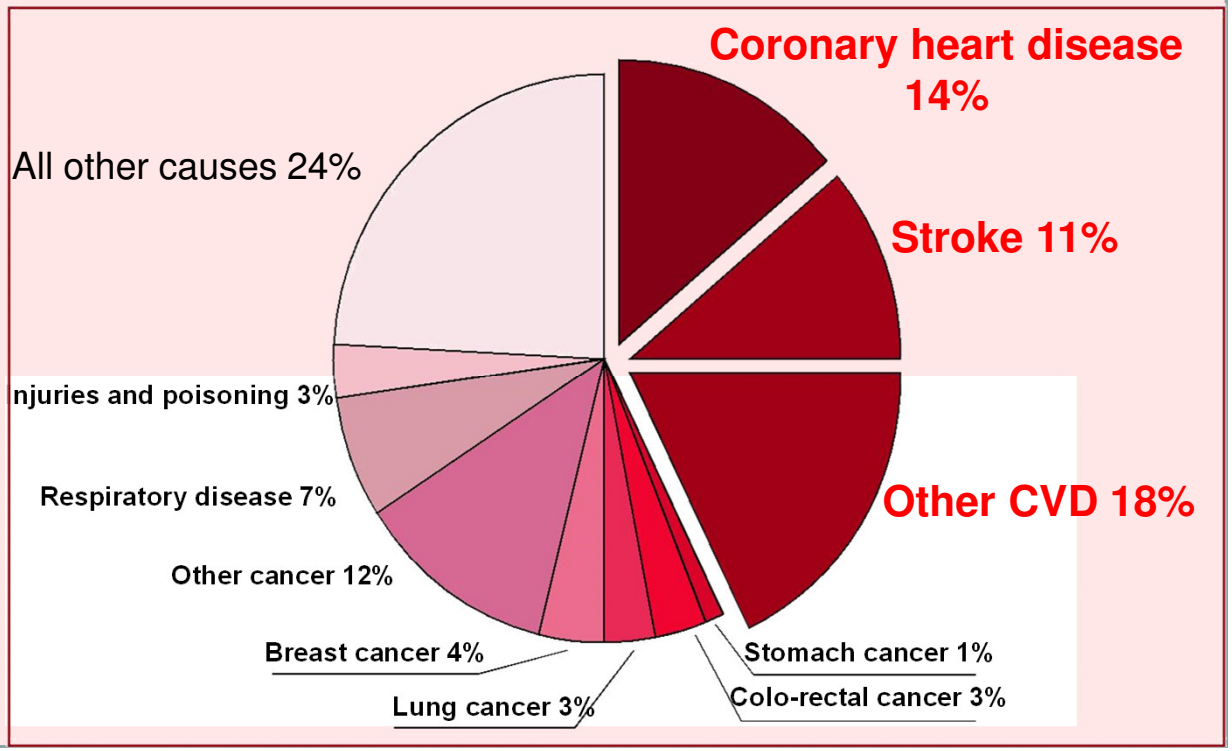
- **CVD causes 47% of all deaths** in Europe
- **Death rates** from CHD and stroke are generally **higher** in Central and Eastern Europe than in Northern, Southern and Western Europe
- **CVD mortality** is **now falling** in most European countries (including Central and Eastern Europe)
- **EuroAspire III.** (after 10y) in Europe → **↓ smoking, ↓ cholesterol (up to 50 %), BUT ↑ arterial hypertension, ↑ obesity, ↑ DM**





Deaths by cause, men
European Union
latest available year

Deaths by cause, women
European Union
latest available year



❖ CV disease actual in children?

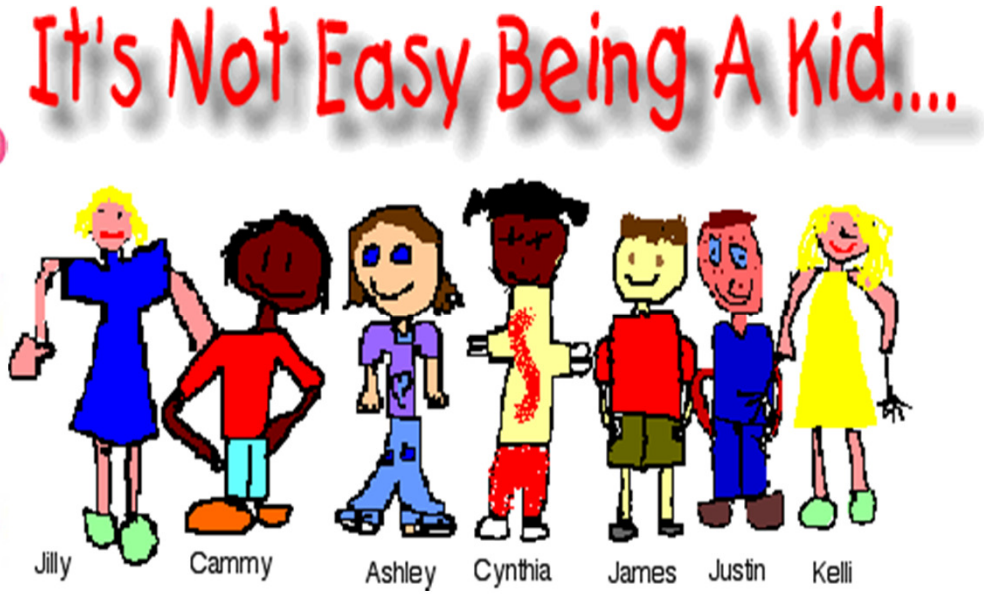
? Disease of older....

AHA - TOP MYTHS

“I’m too young to worry about heart disease...”

IMPORTANCE OF CARDIOVASCULAR DISEASE PREVENTION IN PRIMARY HEALTHCARE

- **FOCUS ON CHILDREN AND ADOLESCENTS**



Pathological Atherosclerosis Study

„PDAY (Pathologial determinants of Atheroslerosis in Youth) Study“ → **760** subjets died of external causes (accidents, homicides, and suicides) by necropsy (15 – 34 y.)
→ histological examination of coronary arteries

The postmortem extent of fatty streaks and raised lesions were associated with CV RF

- HDL cholesterol
- LDL cholesterol
- obesity
- arterial hypertension
- smoking

Mc GILL, H. C. a spol., *Circulation*, 102 (4), 2000;
Mc GILL, H. C. a spol., *Circulation*, 117 (4), 2008.

Antenatal risk factor and CV risk

- Antenatal factors (intra-uterine growth retardation, prematurity, maternal factors and inflammation) → are associated with early CV changes and hypertension early in life

McCloskey, K.: *Acta Paediatr.,* 2014, Zanardo V., *Hypertens Res*, 2013

Tracking of cardiovascular risk factors from childhood to adulthood

Reduction of RF in childhood → ↓ CV morbidity and mortality

SRINIVASAN, S. R. ET AL., Bogalusa Heart Study, 1996; KAVEY,W. R. E., ET AL., *Circulation,* 2003*;* Suyog M.: Pune Children's Study, 2014. (Dietary Intervention Study in Children Trial, Child and Adolescent Trial for Cardiovascular Health Study

Circulation
JOURNAL OF THE AMERICAN HEART ASSOCIATION

American Heart Association®

ADULTS

2013 ACC/AHA Guideline on the Assessment of Cardiovascular Risk:

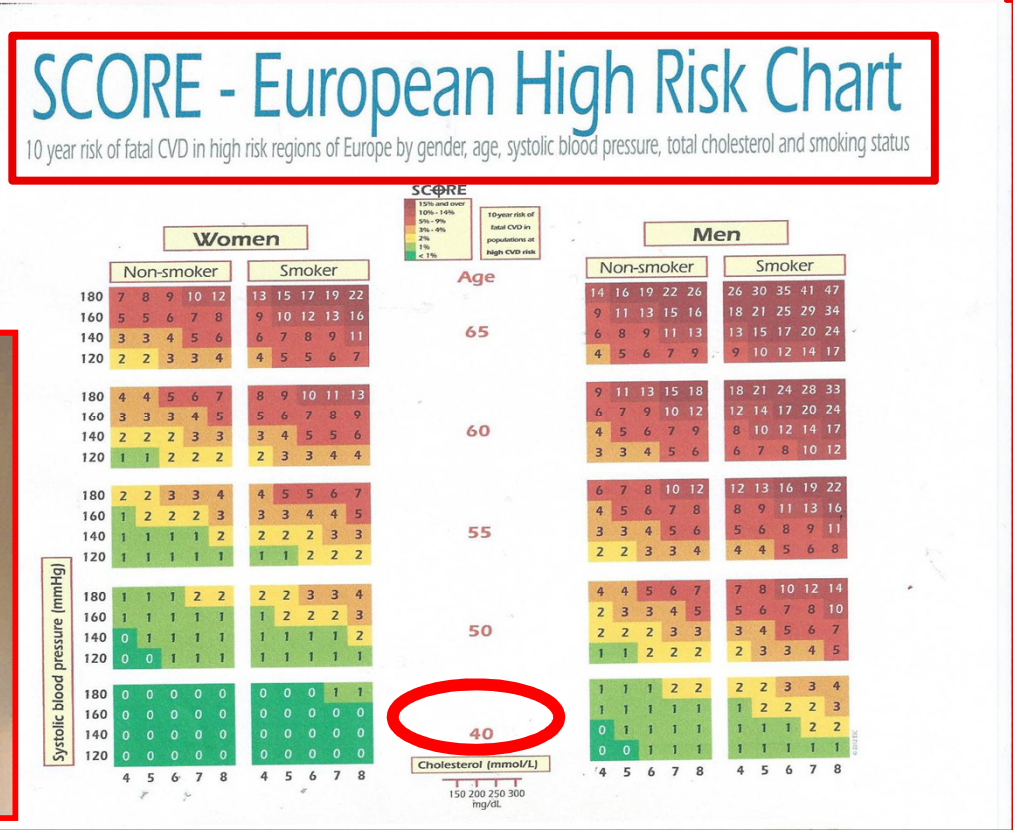
A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines

David C. Goff, Jr, Donald M. Lloyd-Jones, Glen Bennett, Sean Coady, Ralph B. D'Agostino, Sr, Raymond Gibbons, Philip Greenland, Daniel T. Lackland, Daniel Levy, Christopher J. O'Donnell, Jennifer Robinson, J. Sanford Schwartz, Susan T. Shero, Sidney C. Smith, Jr, Paul Sorlie, Neil J.

Circulation. published online November 12, 2013;

The *Framingham Risk Score* - estimate the 10-years CV risk

And kids ?



National Heart, Lung, and Blood Institute

NIH National Heart, Lung, and Blood Institute

Expert Panel on Integrated

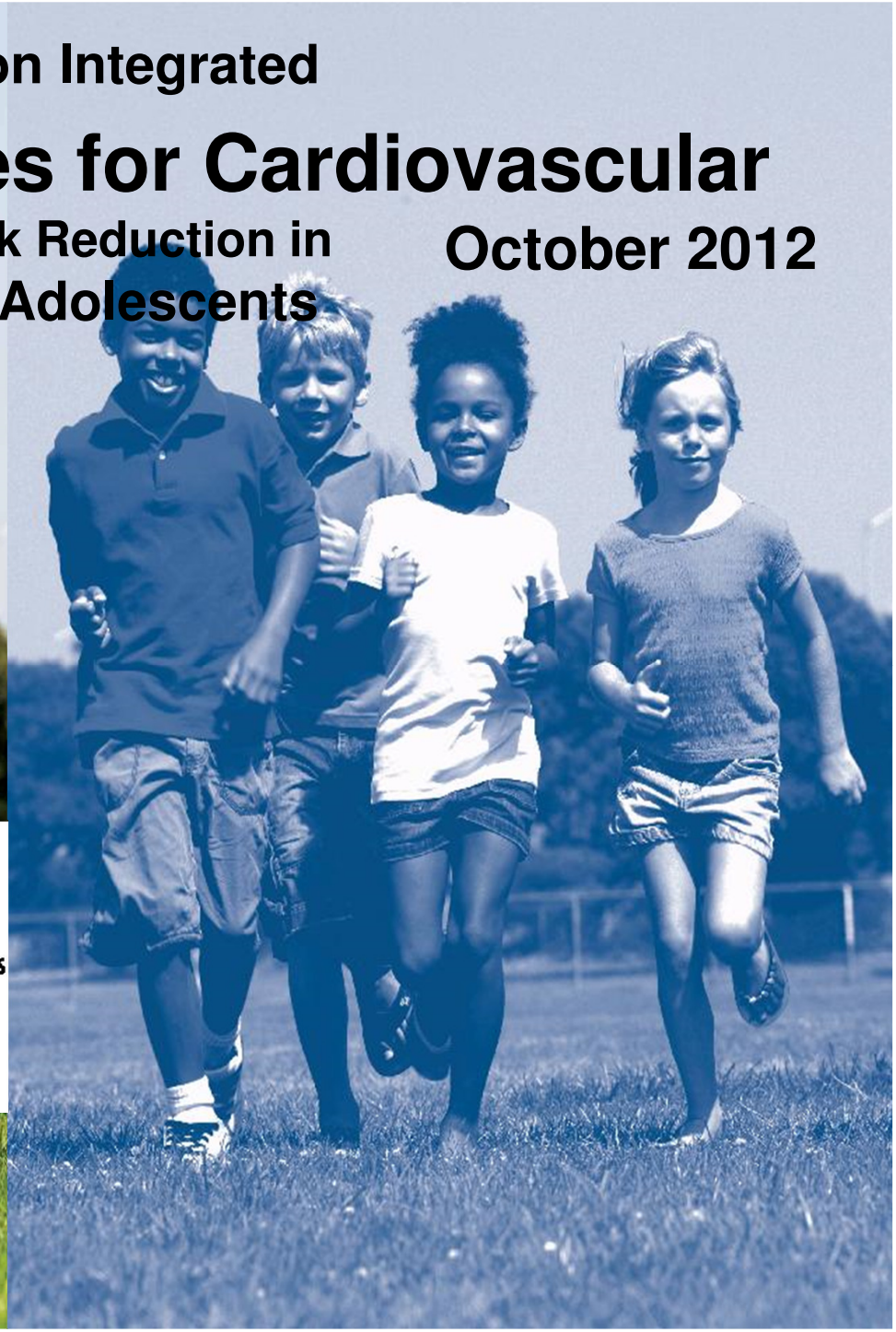
Guidelines for Cardiovascular

Health and Risk Reduction in Children and Adolescents

October 2012

U.S. Department of Health and Human Services
National Institutes of Health

National Heart Lung and Blood Institute



What next ... ? Treatment ...?

Evaluated Risk Factors

- Family history
- Age
- Gender
- Nutrition/diet
- Physical inactivity
- Tobacco exposure
- BP
- Lipid levels
- Overweight/obesity
- Diabetes mellitus
- Predisposing conditions
- Metabolic syndrome
- Inflammatory marker
- Perinatal factors

PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents: Summary Report

EXPERT PANEL ON INTEGRATED GUIDELINES FOR CARDIOVASCULAR HEALTH AND RISK REDUCTION IN CHILDREN AND ADOLESCENTS *Pediatrics* 2011;128;S213; originally published online November 14, 2011; DOI: 10.1542/peds.2009-2107C

...comprehensive evidence-based guidelines that address the known risk factors for CVD to assist all primary pediatric care providers in both the promotion of cardiovascular health and the identification and management of specific risk factors from infancy into young adult life...

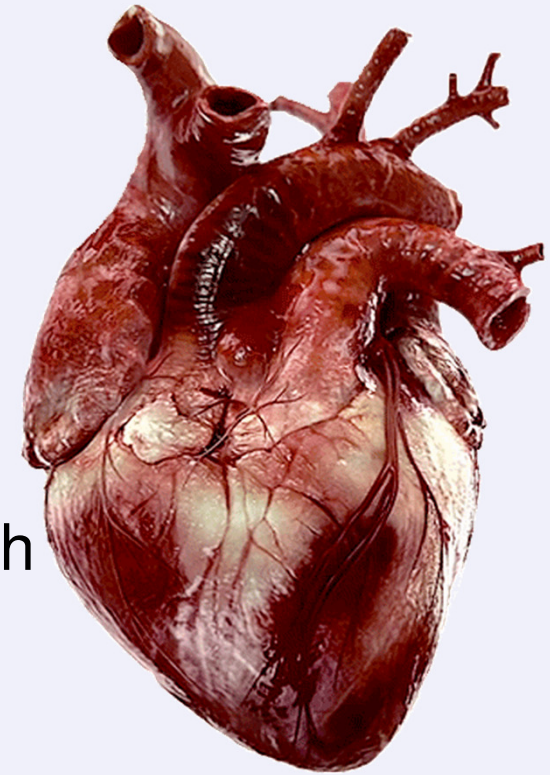
AHA Special Report: Defining and Setting National Goals for Cardiovascular Health Promotion and Disease Reduction
The AHA's Strategic Impact Goal Through 2020 and Beyond

Goal/Metric	Poor Health Definition	Intermediate Health Definition	Ideal Health Definition
Current smoking			
Children 12–19 y	Tried prior 30 days		Never tried; never smoked whole cigarette
Body mass index			
Children 2–19 y	>95th Percentile	85th–95th Percentile	<85th Percentile
Physical activity			
Children 12–19	None	>0 and <60 min of moderate or vigorous activity every day	≥60 min of moderate or vigorous activity every day
Healthy diet score			
Children 5–19 y	0–1 Components	2–3 Components	4–5 Components
Total cholesterol			
Children 6–19 y	≥200 mg/dL	170–199 mg/dL	<170 mg/dL
Blood pressure			
Children 8–19 y	>95th Percentile	90th–95th Percentile or SBP ≥120 or DBP ≥80 mm Hg	<90th Percentile
Fasting plasma glucose			
Children 12–19 y	≥126 mg/dL	100–125 mg/dL	<100 mg/dL

Circulation. 2010; 121: 586-613

Assessment of Cardiovascular Risk in Asymptomatic Young I.

IN ALL PATIENTS



1. Step:

Asses global CV risk – CV RFs

- Low CV risk – ideal health
- Intermediate CV risk- intermediate health
- High CV risk – poor health

2. Step:

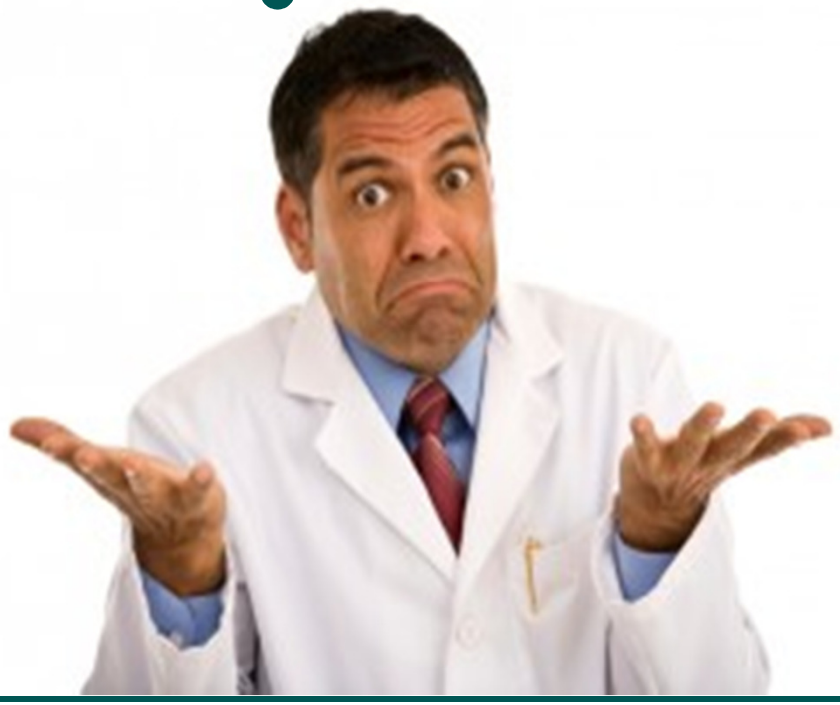
Family history (parents and grandparents)

Assessment of Cardiovascular Risk in Asymptomatic Young II.

- Patients with low CV risk → do not need other tests, follow up....

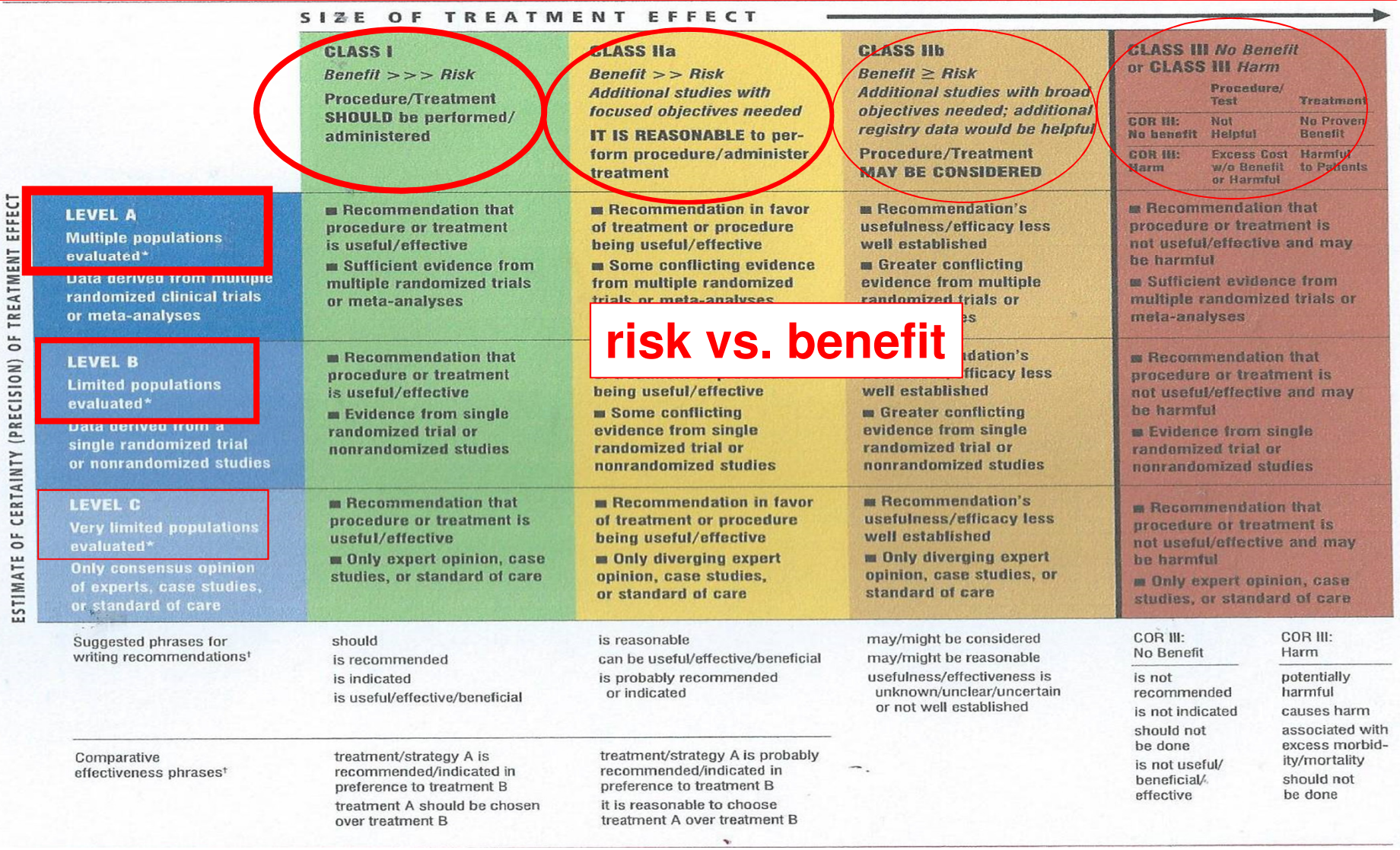
- Patients with intermediate and high CV risk→ other tests and examinations, more strictly approach...

I have the child with increased CV risk
What next
???



You found me and what ?

ACCF/AHA Writing Committee, ACCF/AHA Guideline. Guideline for Assessment of Cardiovascular Risk in Asymptomatic Adults Applying Classification of Recommendations and Level of Evidence



Greenland P et al. *JACC*, 2010

Indication of examination for CV risk assessment in asymptomatic young with low risk

NO benefit – CLASS III

- **Genotype, genetic consultation**
- **Complete lipids and lipoproteins spectrum**
  ! only basic lipids spectrum
- **Natriuretic peptides**
- **CRP** – low risk patients
- **TTE** - asymptomatic patients – without hypertension (? obesity, multiple risk factors)
- **Brachial/Peripheral Flow-Mediated Dilation**
- **Stress echocardiography**
- **Myocardial perfusion scan** - low and intermediate risk
- **Calcium score** - low risk
- **CTA**
- **MRI**

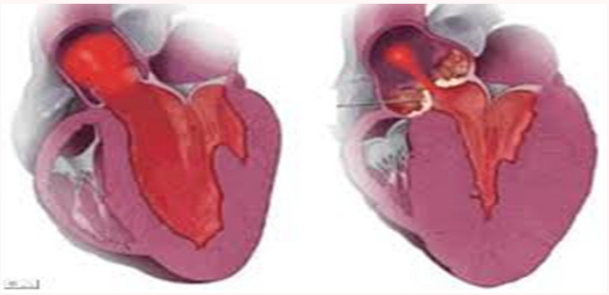
Indication of examination for CV risk assessment in asymptomatic young with intermediate and high CV risk

CLASS IIa, IIb

- **CRP**
- **Hemoglobin A1C (glykated hemoglobin)**
- **Fosfolipase A2 associated with lipoproteíns (Lp-PLA2)**
- **Microalbuminuria**
- **ECG** – hypertension and DM - with and without
- **TTE** - asymptomatic patients with arterial hypertension
- **IMT** - asymptomatic with intermediate risk
- **Ankle-Brachial Index** - intermediate risk
- **Stress ECG** - intermediate risk
- **Myocardial perfusion scan** - asymptomatic with DM or patients with serious family history
- **Calcium score** - intermediate risk

Echocardiography

LV assesment → LV Hypertrophy

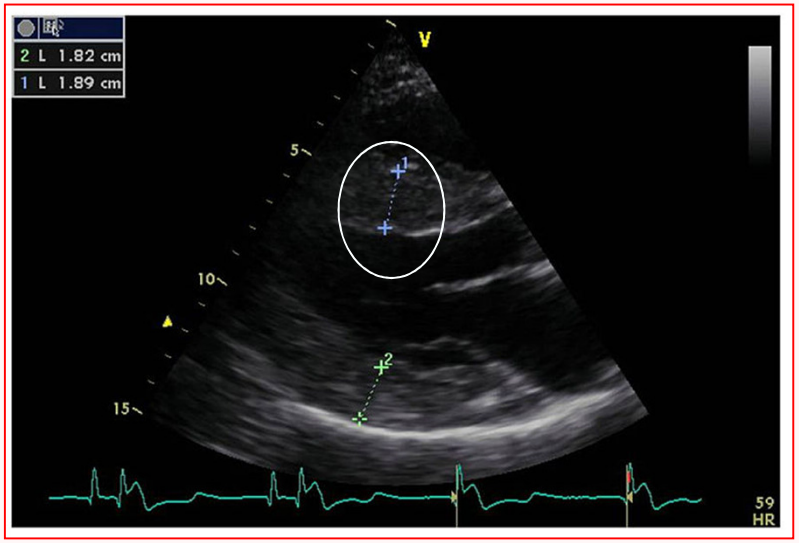


WHY ?

1. LVH → independent factor of CV morbidity a mortality

2. LVH → associated with arterial hypertension in childhood

3. LVH → present in obese and overweight children



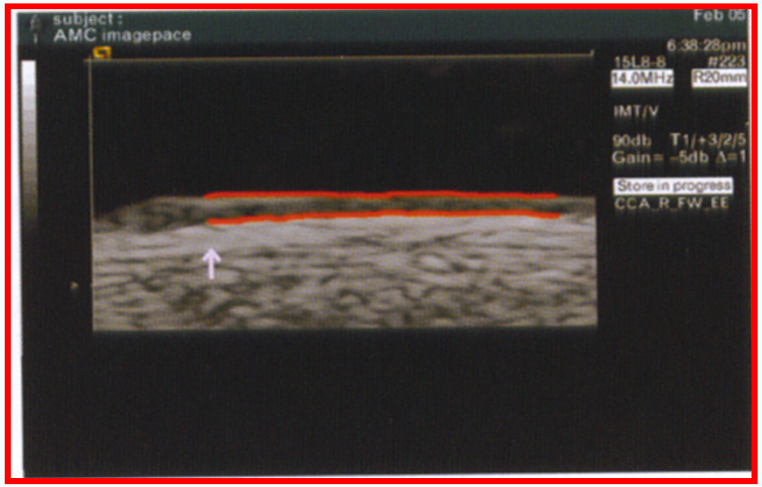
Schusterova, I. a spol.: *J Am Soc Echocardiogr*, 21, *2008*, č. 5, s. 596; *Pediatrics* 2011;128;S213; originally published online November 14, 2011

ULTRASONOGRAPHY OF CAROTID ARTERIES

IMT thickness = valid index of atherosclerosis

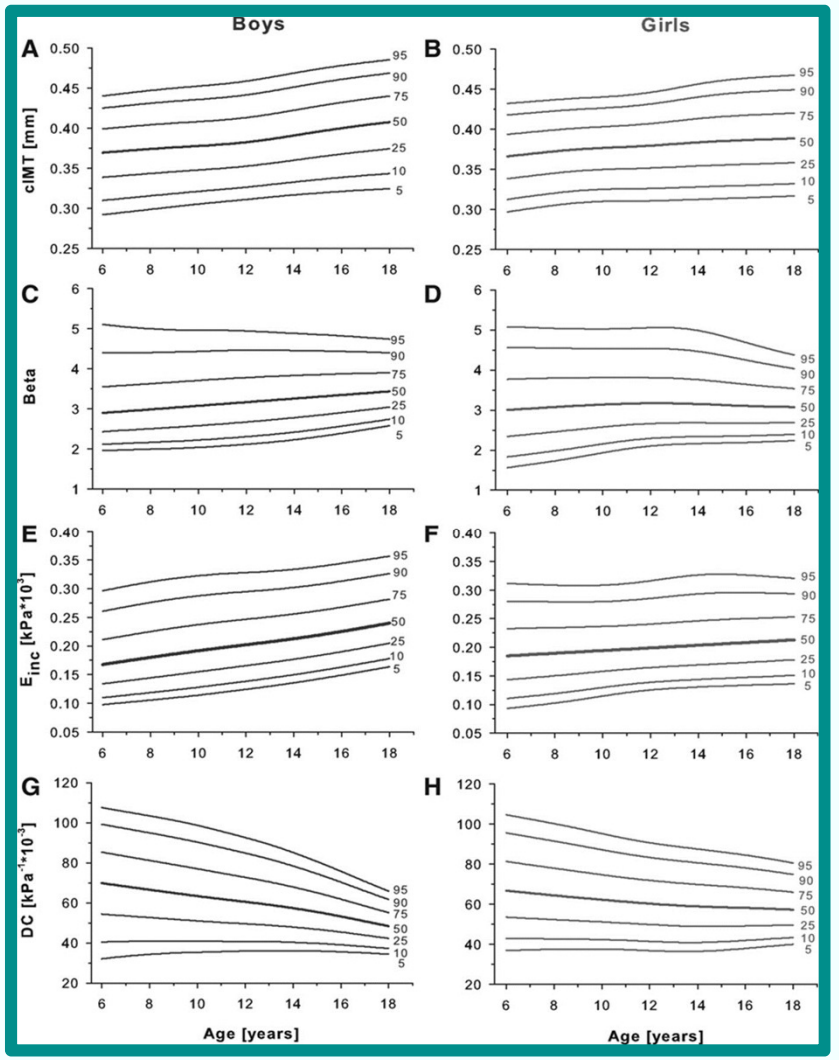
Assessment of subclinical AS

- DLP – FH
- Hypertension
- Type 1 DM
- Family history of myocardial infarction
- Cigarette smoking (passive and active)
- Obesity



***Schusterova et al.: JAHA, 4,* 2012**;

2013, AHA: Sex-specific percentile curves for carotid intima-media thickness (cIMT)



Doyon A et al. *Hypertension;* 2013

❖OUR 17 YEARS EXPERIENCES

"Specialized ambulance for preventive cardiology and disorders of lipids metabolism LF UPJŠ a DFN Kosice"

Project for primary prevention of cardiovascular disease in Slovak Republic... 1998

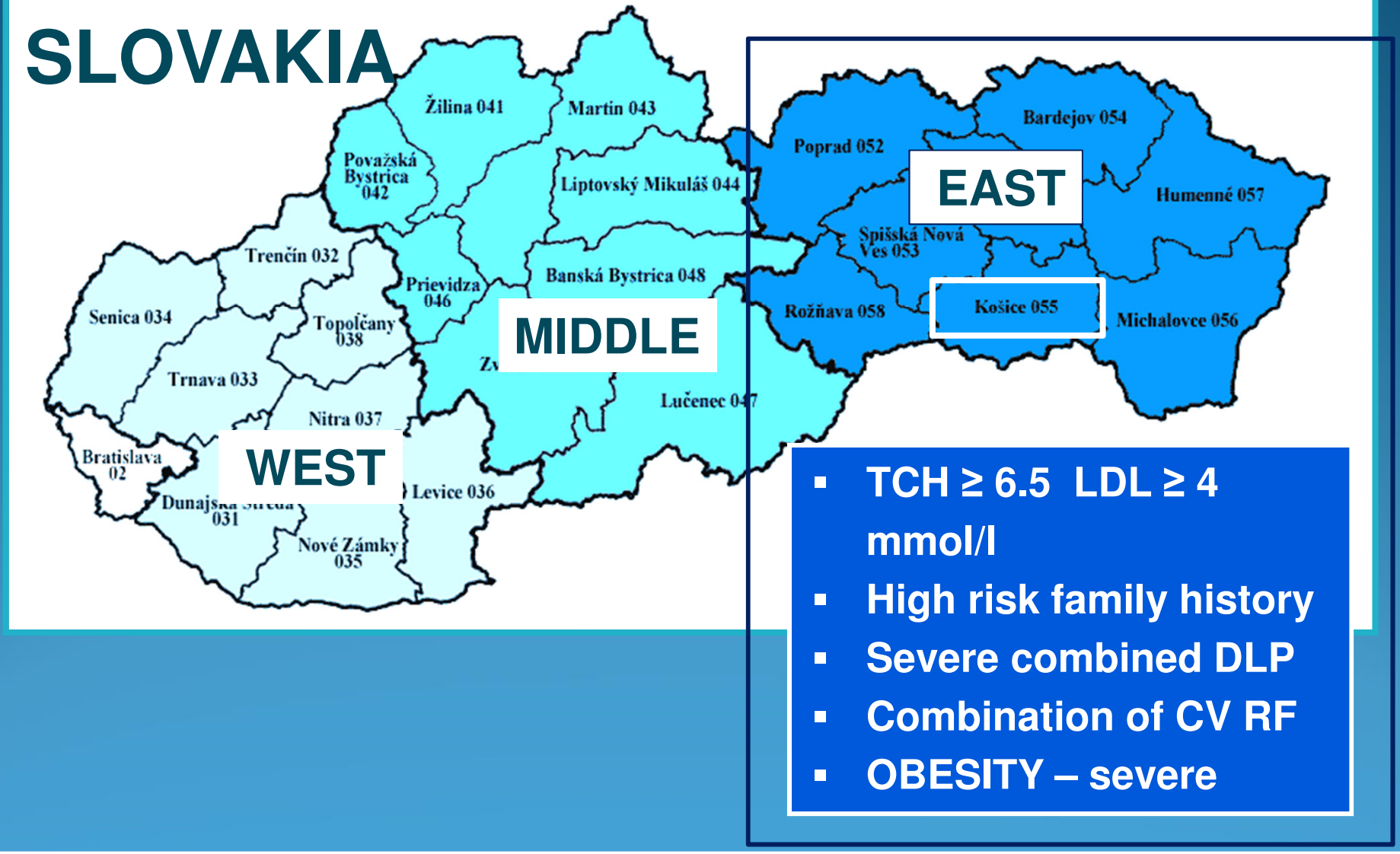
Ministry of Health Slovak Republic

National CV Program - for children and adults

Program for primary prevention of CV disease in children and adults, determined by law in y. 2004 - Ministry of Health SR

UNIQUE Universal cholesterol screening in children at 11. and 17- years and 40 years in SLOVAKIA

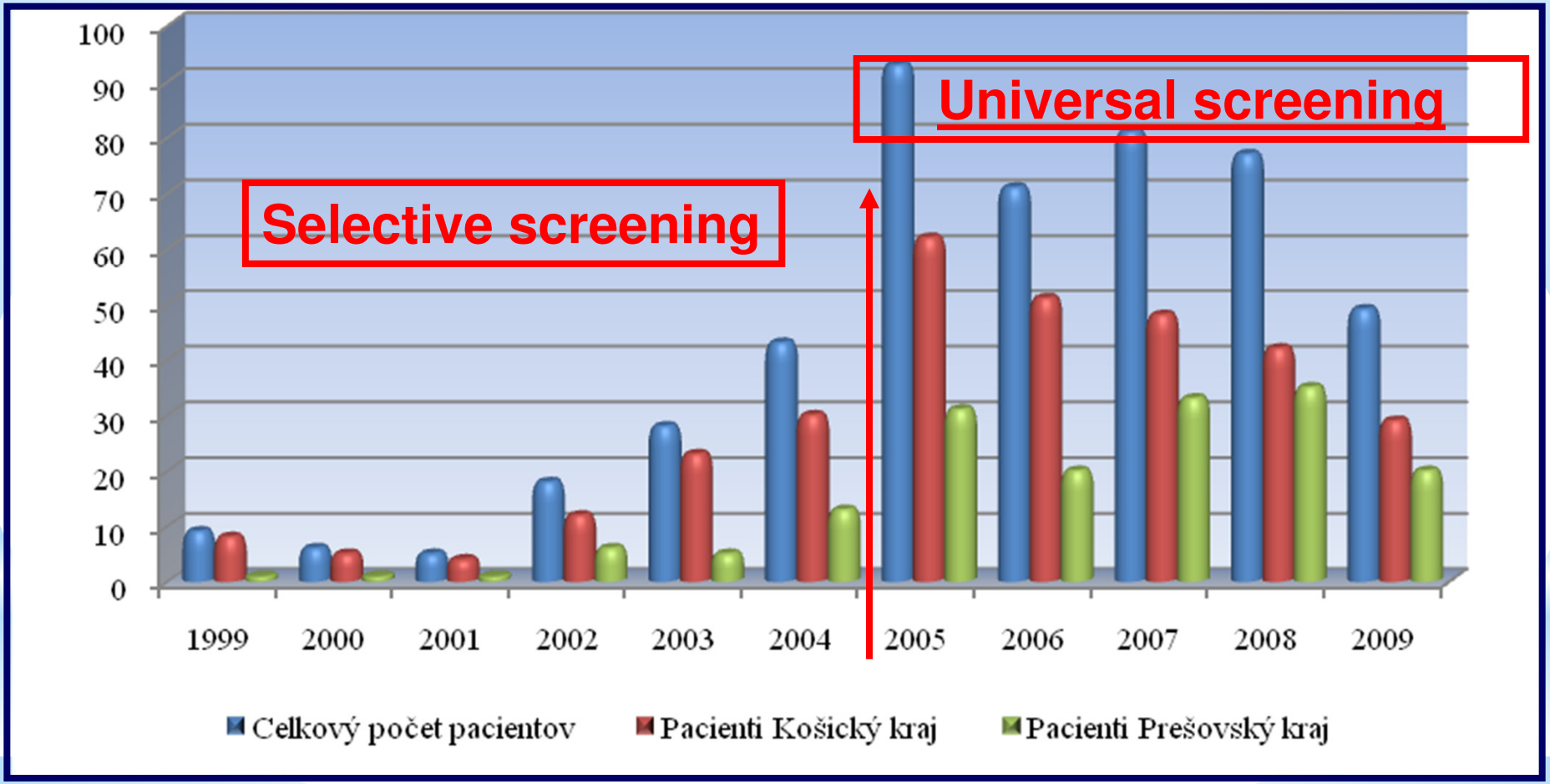
SPECIALIZED AMBULANCES FOR CHILDREN WITH VERY HIGH CV RISK



- TCH ≥ 6.5 LDL ≥ 4 mmol/l
- High risk family history
- Severe combined DLP
- Combination of CV RF
- OBESITY – severe

PRIMARY PREVENTION OF CV DISEASE IN CHILDREN AND ADOLESCENTS IN PRAXIS

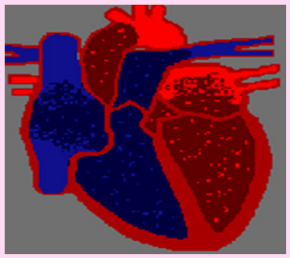
SPECIALIZED AMBULANCE FOR PREVENTIVE CARDIOLOGY AND LIPIDS METABOLIC DISORDERS, KOSICE, SLOVAKIA



Number of patients between y. 1999-2009

Specialized ambulance for preventive cardiology and lipids metabolic disorders

AMBULANCE FOR PREVENTIVE CARDIOLOGY



Presence of others CV RF (risk profile) → Aggression of therapy

Arterial hypertension (ABPM)

CV capacity (stress ECG)

Echocardiography (LVH)

USG carotid arteries (AS changes)

AMBULANCE FOR LIPIDS METABOLISM DISORDERS

Management of DLP and obesity

Family history

Complete biochemical tests

Basic lipids

! Examination of relatives

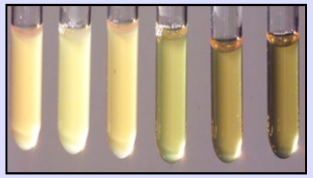
Additional - individually

Extended lipids

Genetic examination

DNA analysis (FH)

Hematological exam



! TEAM WORK

+ other specialists: endocrinologist, genetic, psychologist, dietary assistant, rehabilitation workers, hematologist

EDUCATIONAL COURSES
for children and parents, leaflets, brochures

Je problematika aterosklerózy a dyslipidémie (poruchy látkovej premeny tukov) aktuálna aj v detskom veku?

MUDr. Jana Šaligová, MUDr. Ľudmila Potočňáková

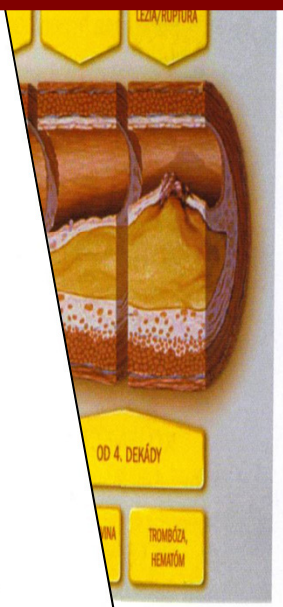
ATEROSKLERÓZA (kôrnatenie ciev) *je* dlhodobé ochorenie cievnej steny, pri ktorom dochádza k ukladaniu tukových a ďalších látok z
cievnej steny.

AKO ZNIŽ

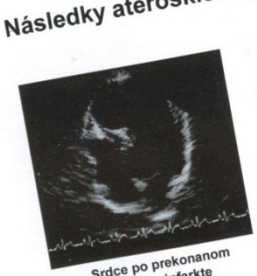
1. Diéta

obmedzenie živočíšnych tukov
olivový olej, rastlinné oleje
sladené limonády,

! NECESSARY TO COOPERATE WITH PARENTS →
education, life style and diet changes of all family
PARENTS → CHILDREN´S MOTIVATION



Následky aterosklerózy – kôrnatenia ciev



Srdce po prekonanom veľkom infarkte

Normálne, zdravé srdce

NOVÉ PRÍSTUPY V PREVENCII ATEROSKLEROTICKÝCH SRDCOVO-CIEVNYCH OCHORENÍ V DETSKOM VEKU.

MUDr. I. Schusterová, PhD
Ambulancia preventívnej kardiológie
piatok: 7,30 - 15,30 hod.

MUDr. J. Šaligová, MUDr. Ľ. Potočňáková
Ambulancia pre poruchy metabolizmu lipidov
pondelok a utorok: 7,30 - 15,30 hod.

diétna asistentka: M. Maníková
detská sestra: M. Redayová

Detská fakultná nemocnica Košice
Detské centrum, Obrancov mieru č. 18
Tel. číslo: (55) 633 15 03

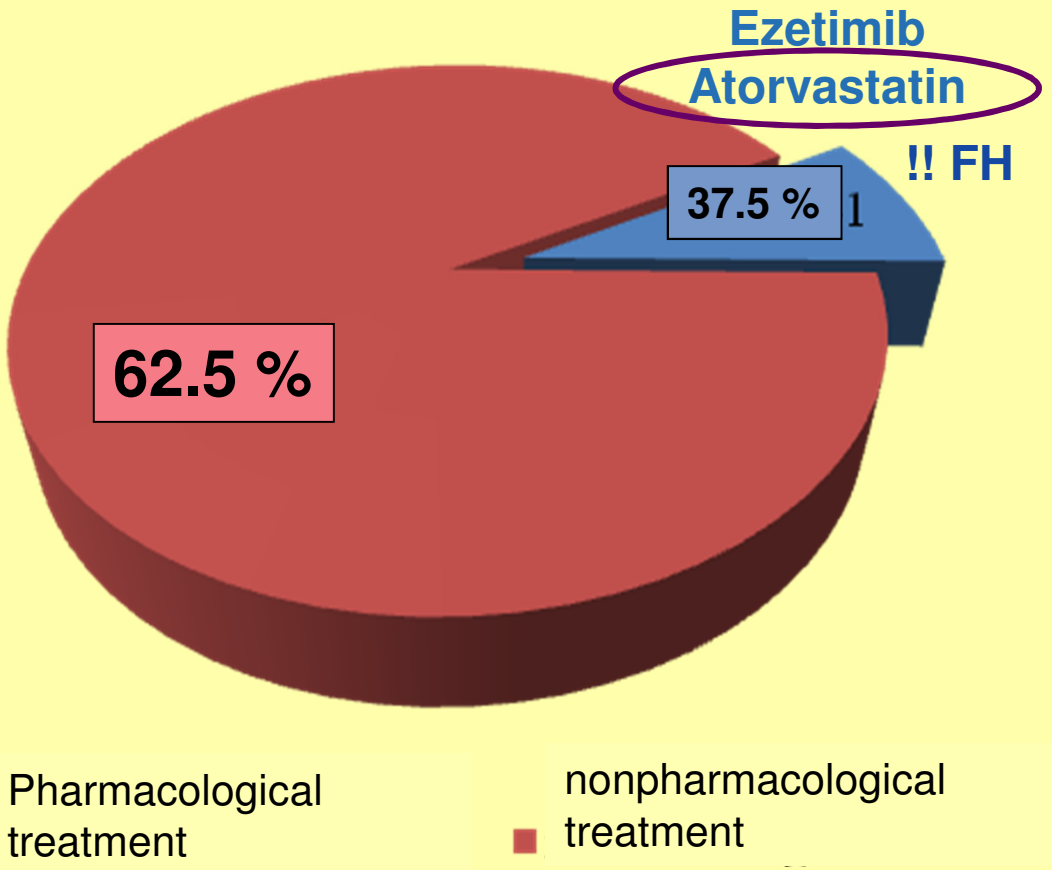
Our results…

Specialized ambulance for preventive cardiology and lipids metabolic disorders

PREVALENCE OD DYSLIPIDEMIA IN OUR CLINIC

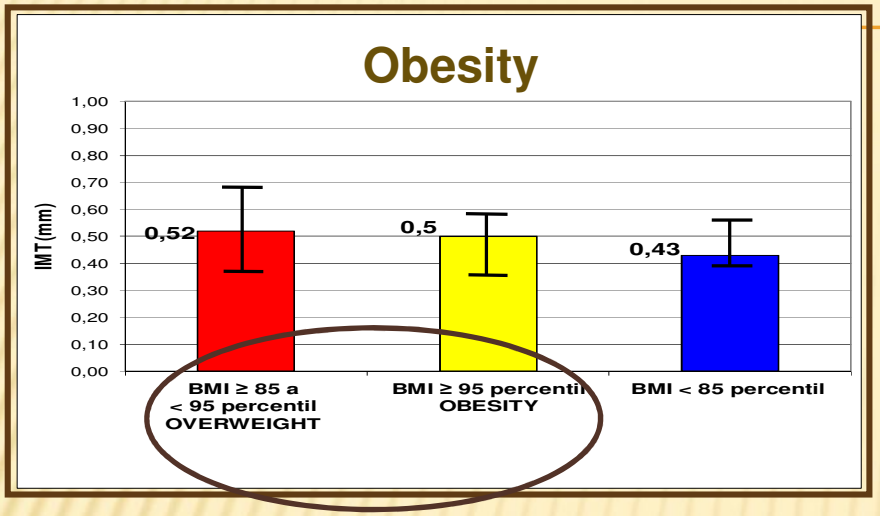
Dyslipidemia			Absol. Number of pats	Relative number of pts (%)
PRIMARY DLP	Isolated hypercholesterolemia	Polygenic hypercholesterolemia	199	41.45
		Familial hypercholesterolemia	55	11.45
		Hyperalphalipoproteinemia	15	3.13
	Combined DLP		68	14.16
	Isolated hypertriglyceridemia		14	2.92
	Hypocholesterolemia		26	5.41
SEKUNDARY DLP	Hypercholesterolemia in other metabolic disorders		1	0.2
	Hypercholesterolemia in hypothyreosis		2	0.4
Other metabolic disorders			29	6.04

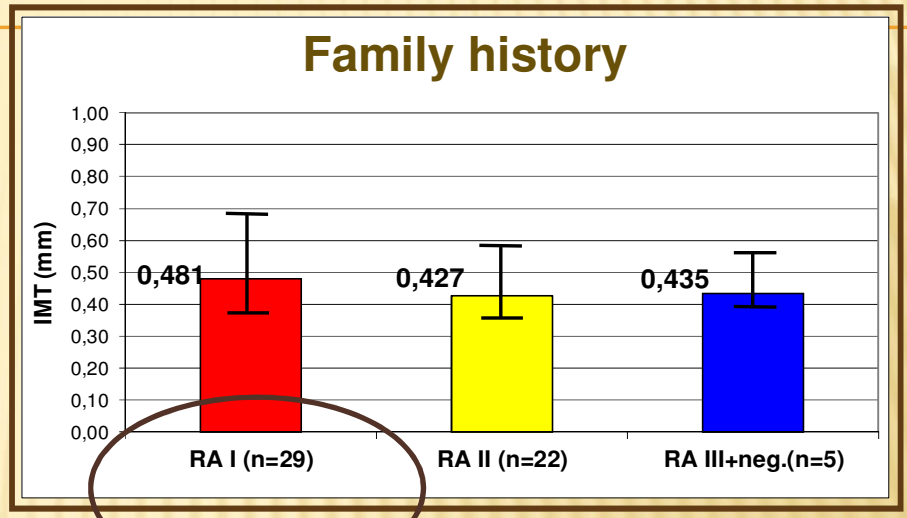
TREATMENT OF DYSLIPIDEMIA IN OUR CLINIC

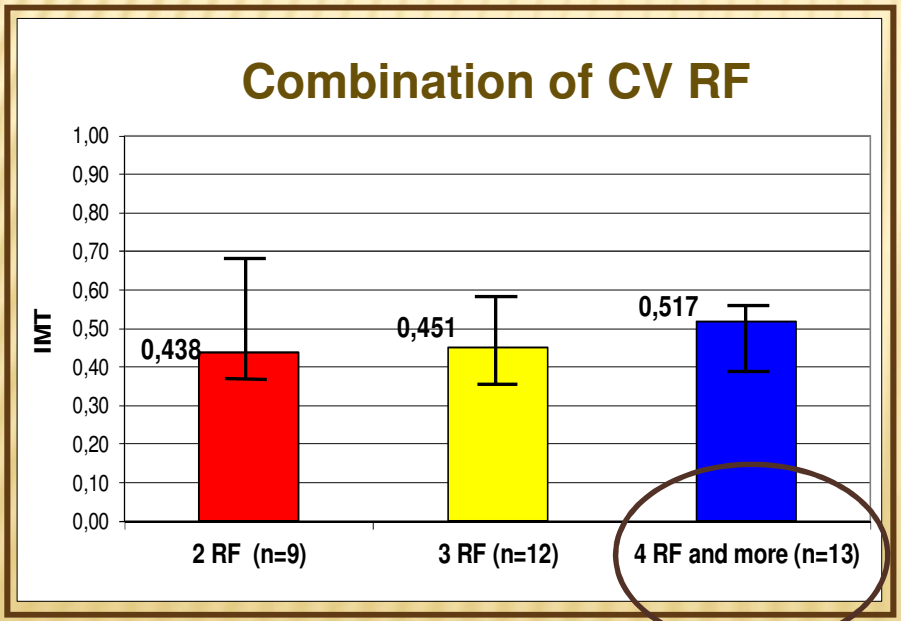


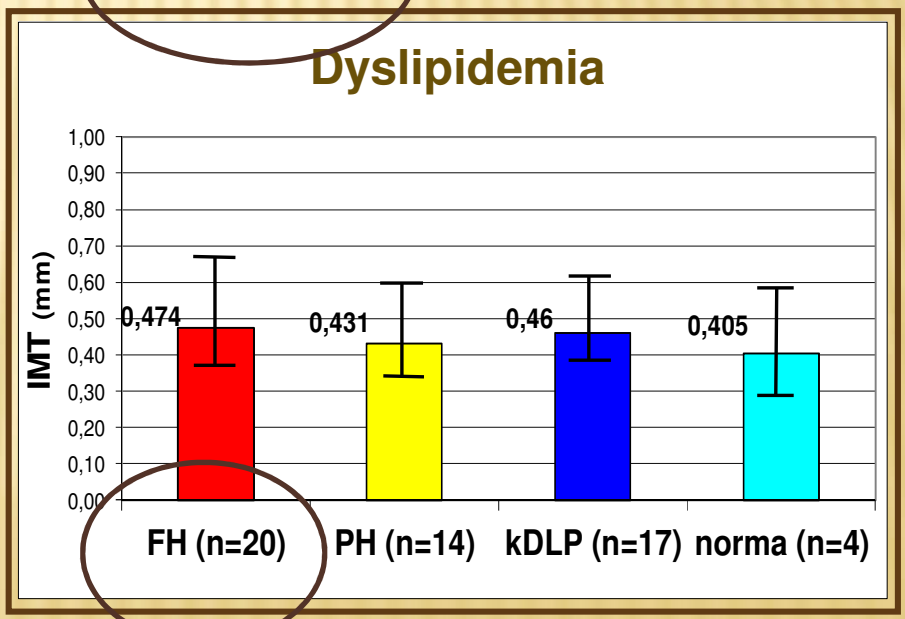
Saligova J., Schusterova I., *JIMD*, 29., Suppl. 1, 2006, p. 148.

IMT AND ITS ASSOCIATIONS WITH CV RF



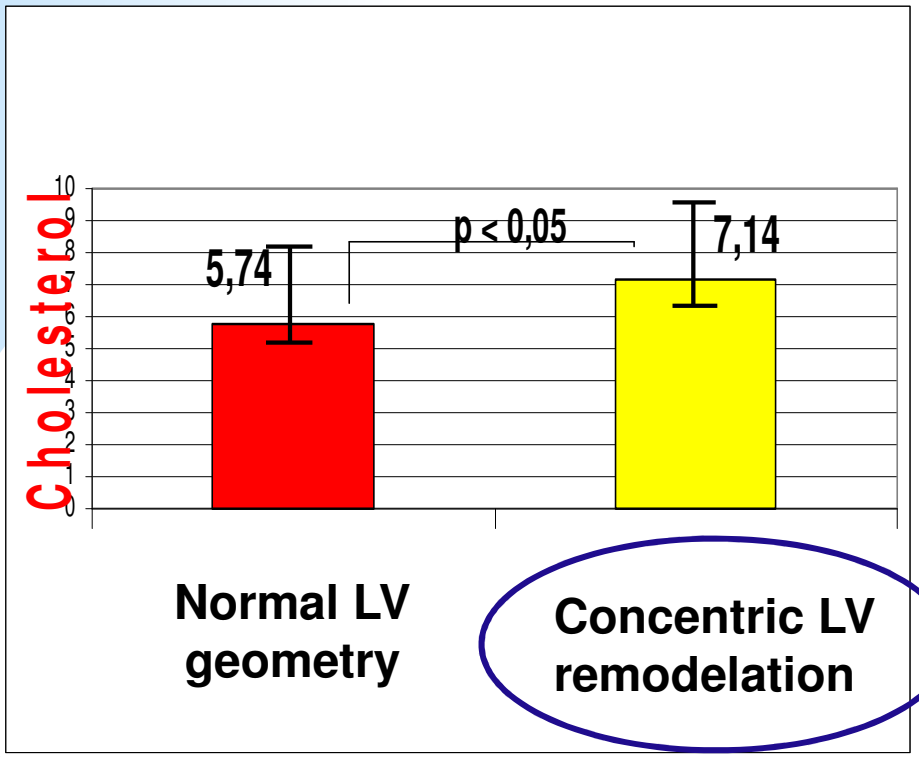




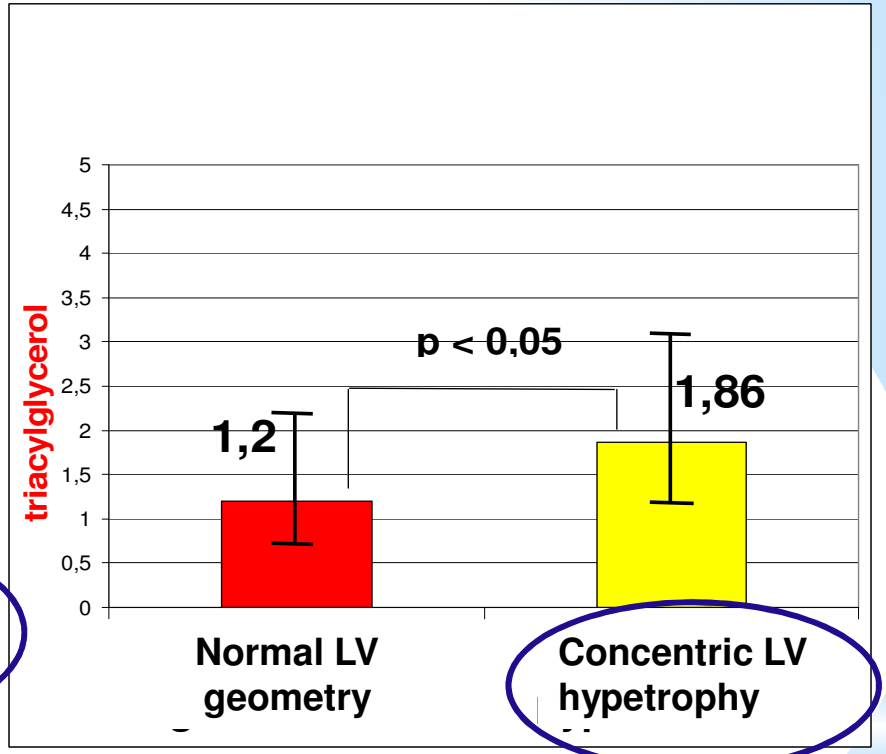


Schusterova I. et al.:Eur J of Cardiovasc Prev Rehabil, 2006,

LV geometry and dyslipidemia



↑ LVMI ↔ RWTh



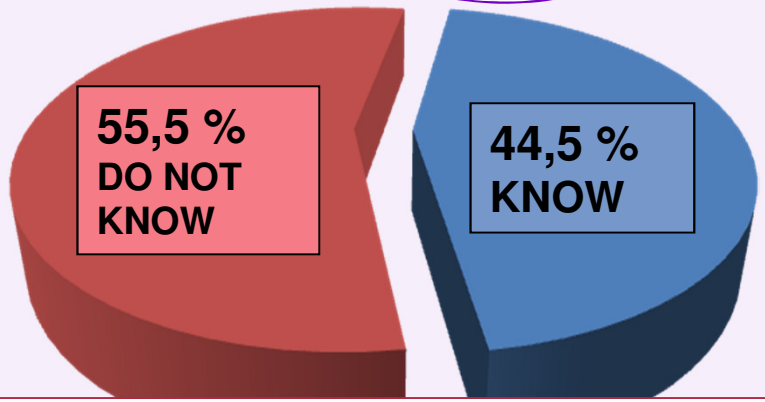
↑ LVMI
↑ RWTh

Dyslipidemia has a negative influence on LV geometry

Schusterová I. et al., Atherosclerosis Suppl., 2005

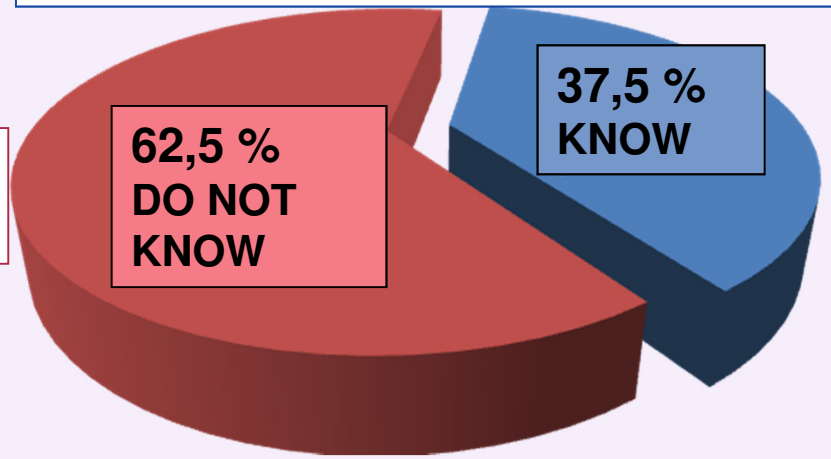
Knowledge of our nation...

! 50 % parents do not know about their DLP and 62 % do not take any medication



Knowledge about their own BP - mothers

Knowledge about their own BP - fathers



Instead of conclusion...

" People always prefer to listen to the doctors who prescribe them a lot of drugs, as those who encourage them good nutrition "

(Paul Heinrich Dietrich HOLBACH)

Nonpharmacological treatment- laugh treats...

- **↑ HDL cholesterol**
- **↓ inflammatory markers**
- **↓ body weight** → 10-15 minutes of laught =↓ body weight 2 kg/year
- **strengthen heart** → 5 min of laugh = 10 minutes rowing

Donna Krupa, *American Physiological Society,* 2009, 14th *European Congress on Obesity*, Atens, 2005


Thank you for your attention !
KOSICE, SLOVAKIA - WINTER