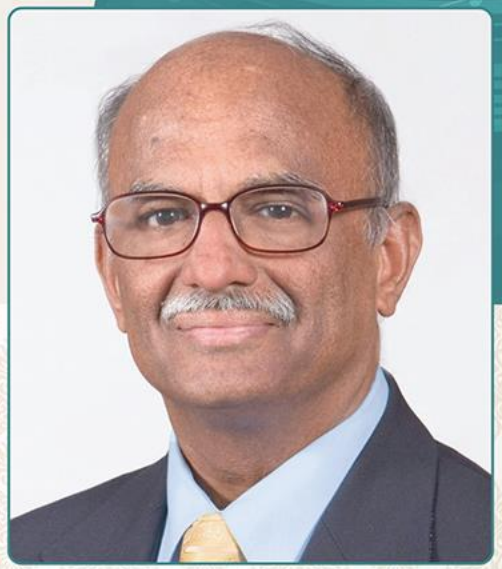
CMHC
Cardiometabolic Health Congress

CARDIOVASCULAR DISEASE IN THE

SOUTH ASIAN/ASIAN AMERICAN POPULATION

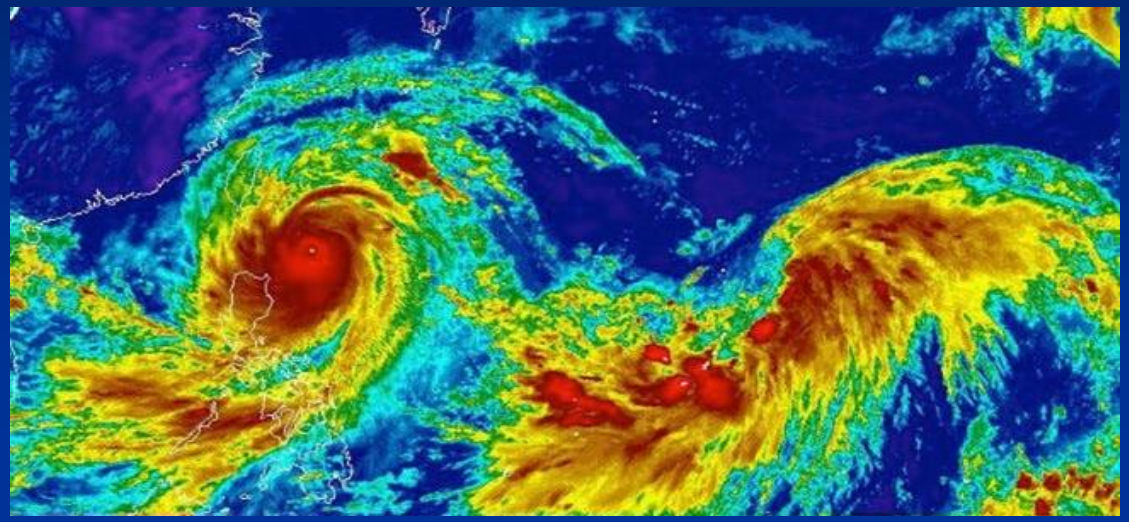
A LOOMING TYPHOON AND A CALL TO ACTION



HOSTED BY:

Dr. Kris Vijay

A Looming Typhoon of ASCVD and a Call to Action in South Asians for risk prevention



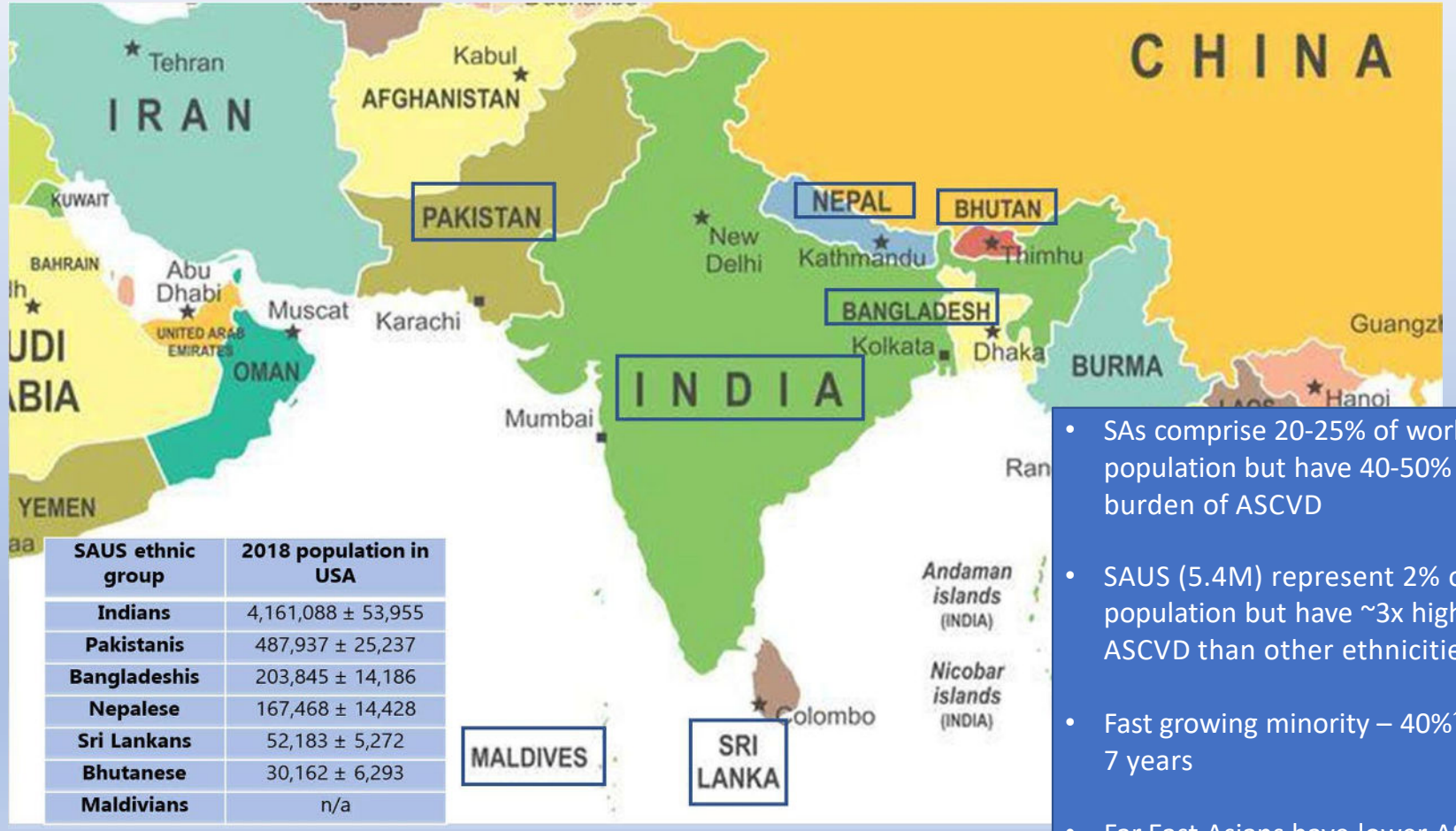
Kris Vijay, MD, FACC, FNLA, FHFSA
Clinical Professor of Medicine, University of Arizona
Medical Director, Arizona Heart Foundation
Heart Failure and Preventive Cardiologist

Outline

- Demographics and Epidemiology
- IGT,T2DM, Intra abdominal depot
- MASALA, INTERHEART and Volgman
- Differences in RF leading to higher risk
- Thrifty gene, adiponectin and cytokines as hypothesis
- Genetic basis?
- Resources
- Summary

- **WHO,WHERE AND WHEN**
- **WHAT AND WHY**
- **HOW TO WE TACKLE THE EPIDEMIC?**

South Asians in US (SAUS)



SAUS ethnic group	2018 population in USA
Indians	4,161,088 ± 53,955
Pakistanis	487,937 ± 25,237
Bangladeshis	203,845 ± 14,186
Nepalese	167,468 ± 14,428
Sri Lankans	52,183 ± 5,272
Bhutanese	30,162 ± 6,293
Maldivians	n/a

- SAs comprise 20-25% of world's population but have 40-50% of global burden of ASCVD
- SAUS (5.4M) represent 2% of US population but have ~3x higher risk of ASCVD than other ethnicities in the US
- Fast growing minority – 40%↑ in past 7 years
- Far East Asians have lower ASCVD risk than White Americans

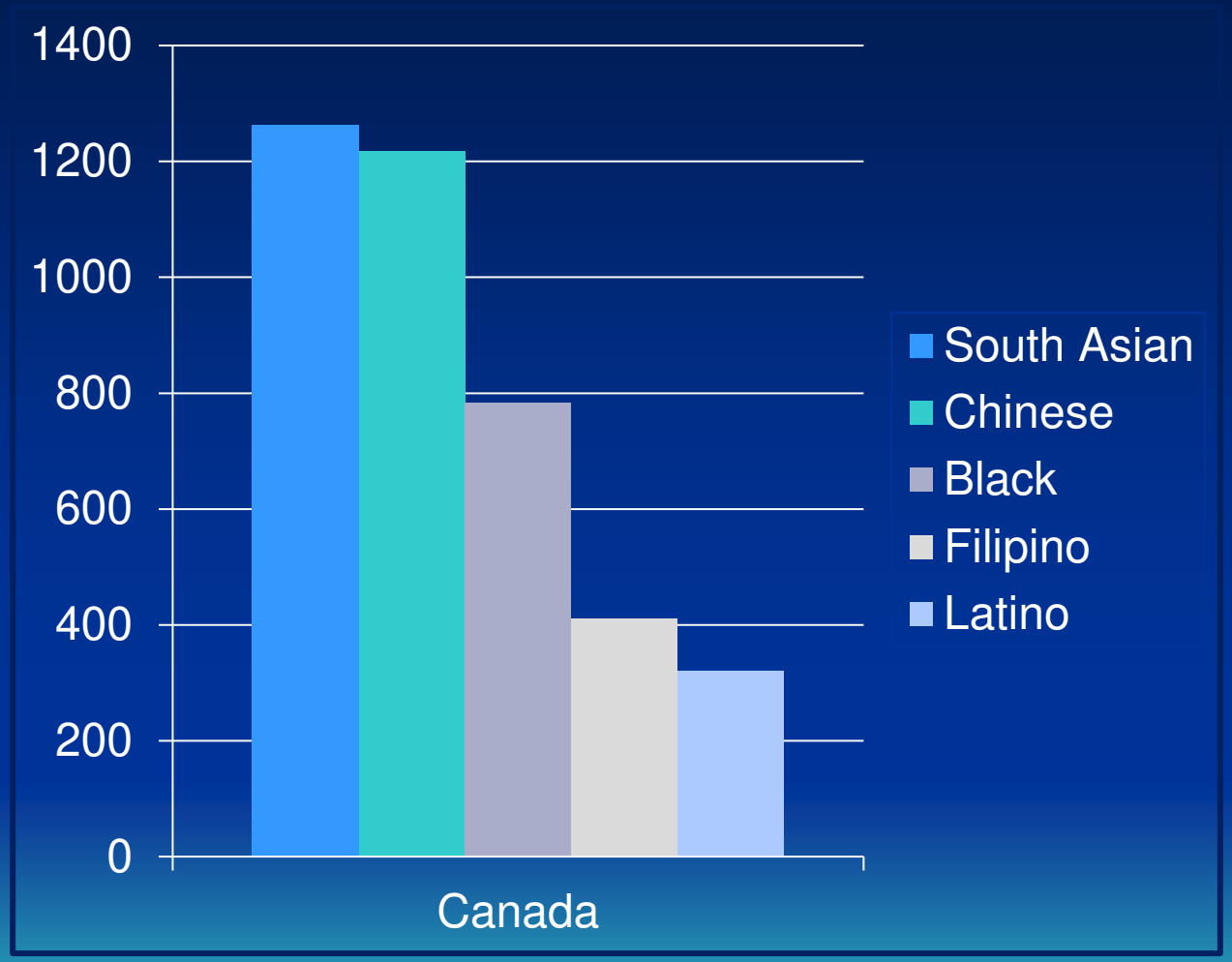
Largest Ethnic Groups

Statistics Canada 2016 (in thousands)

2021: Canada statistics:
2.5 M Canada
4.8 M USA
2 M in UK

32 M around the world outside of South Asia

1.9 B SA around the World: 1 in 4



Statistics Canada, "Immigration and Ethnocultural Diversity: Key Results from the 2016 Census," *The Daily*, October 25, 2017.

Statistics Canada 2021, *The Daily*, October, 10, 2022

Global Mortality

Ischemic heart disease and cerebrovascular disease - 2011

IHD

Figure 15 World map showing the global distribution of ischemic heart disease mortality rates in males (age standardized, per 100 000) (*1*).

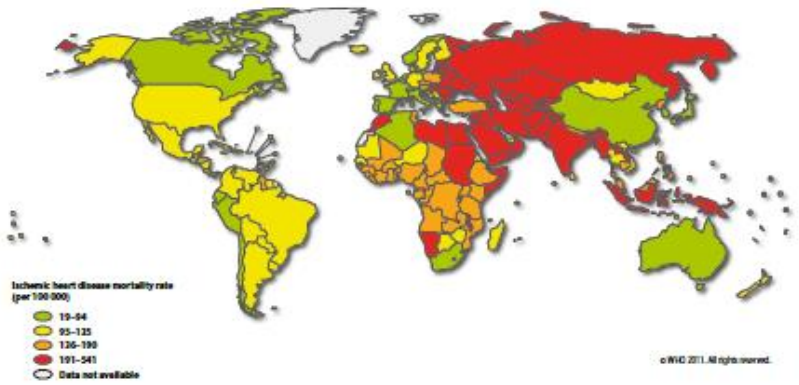
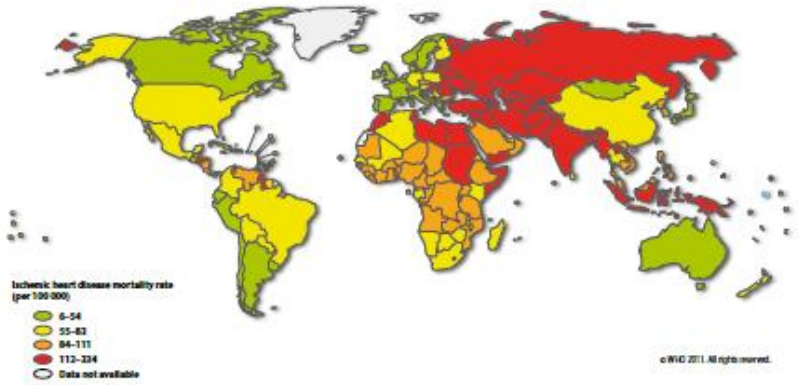


Figure 16 World map showing the global distribution of ischemic heart disease mortality rates in females (age standardized, per 100 000) (*1*).



CeVD

Figure 17 World map showing the global distribution of cerebrovascular disease mortality rates in males (age standardized, per 100 000) (*1*).

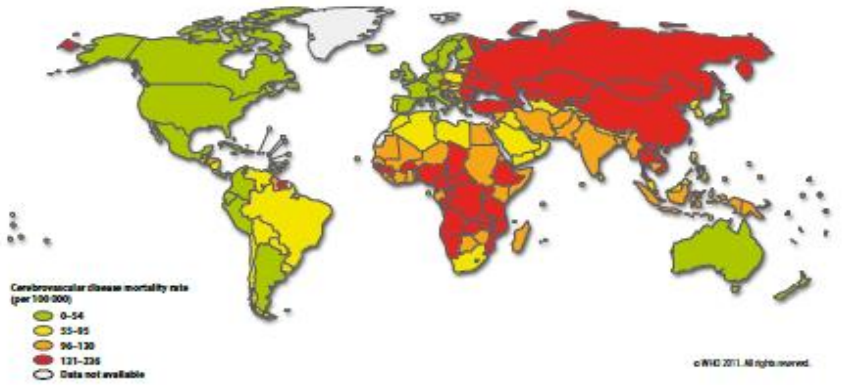
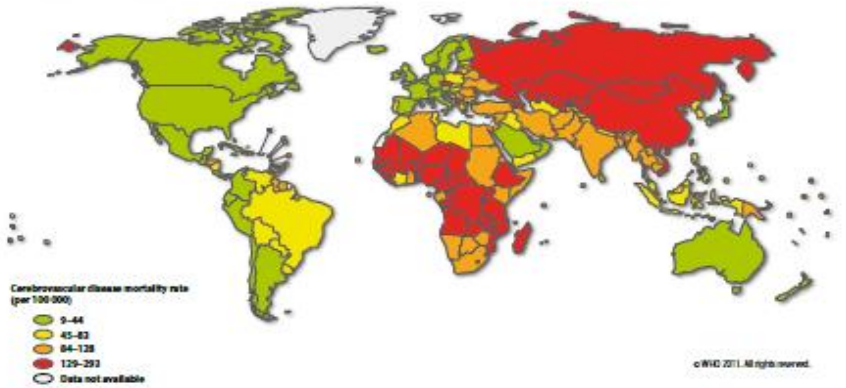
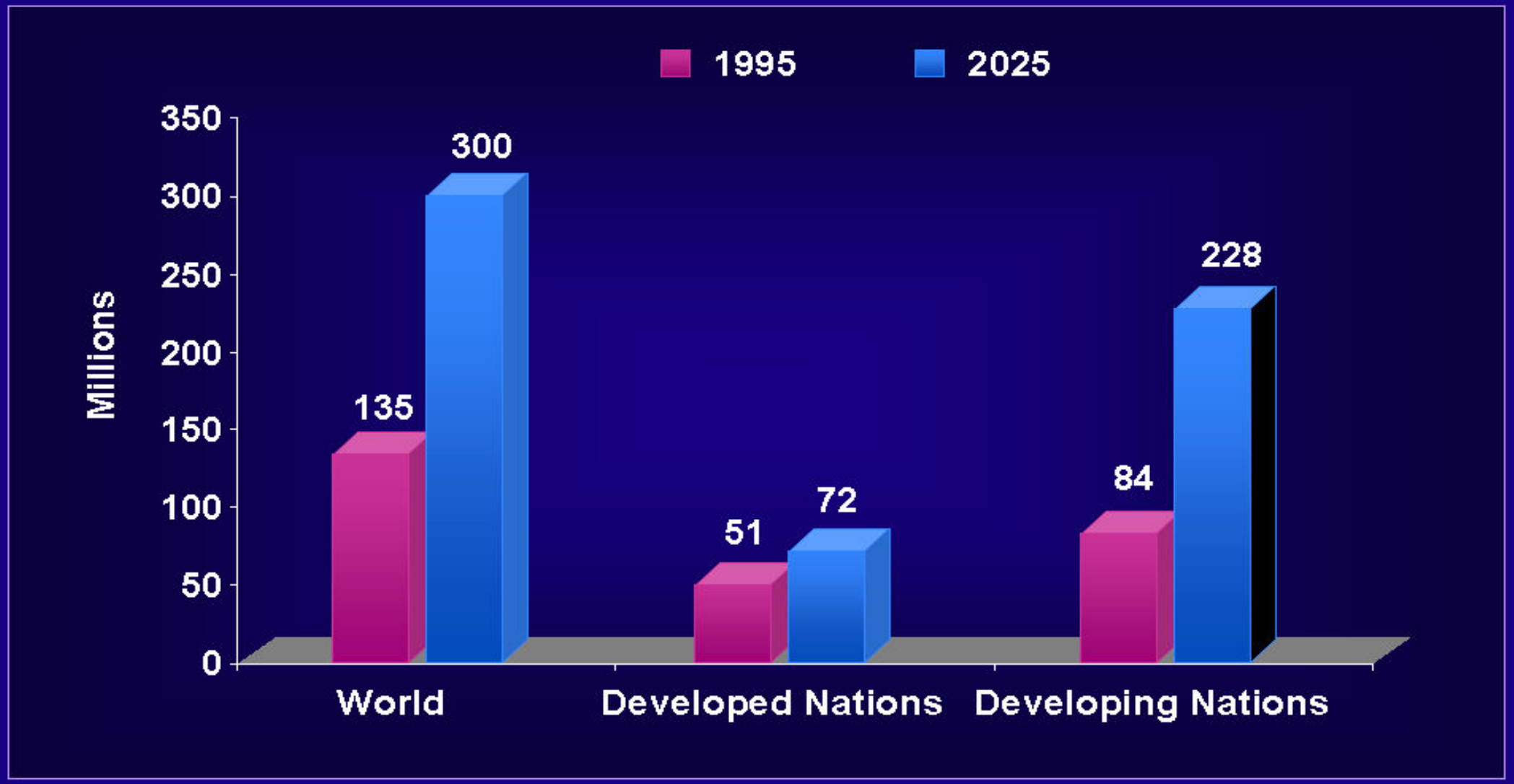


Figure 18 World map showing the global distribution of cerebrovascular disease mortality rates in females (age standardized, per 100 000) (*1*).



WHO, 2011

Estimated Prevalence of Diabetes in Global Adult Population—1995-2025



Adapted from King H, et al. *Diabetes Care*. 1998;21:1414-1431.

Diabetes Prevalence in 2022 according to WHO

- **537 million** adults (20-79 years) are living with diabetes - 1 in 10.
- This number is predicted to rise to **643 million** by 2030 and
- **783 million** by 2045.

Data from Clinical Trials

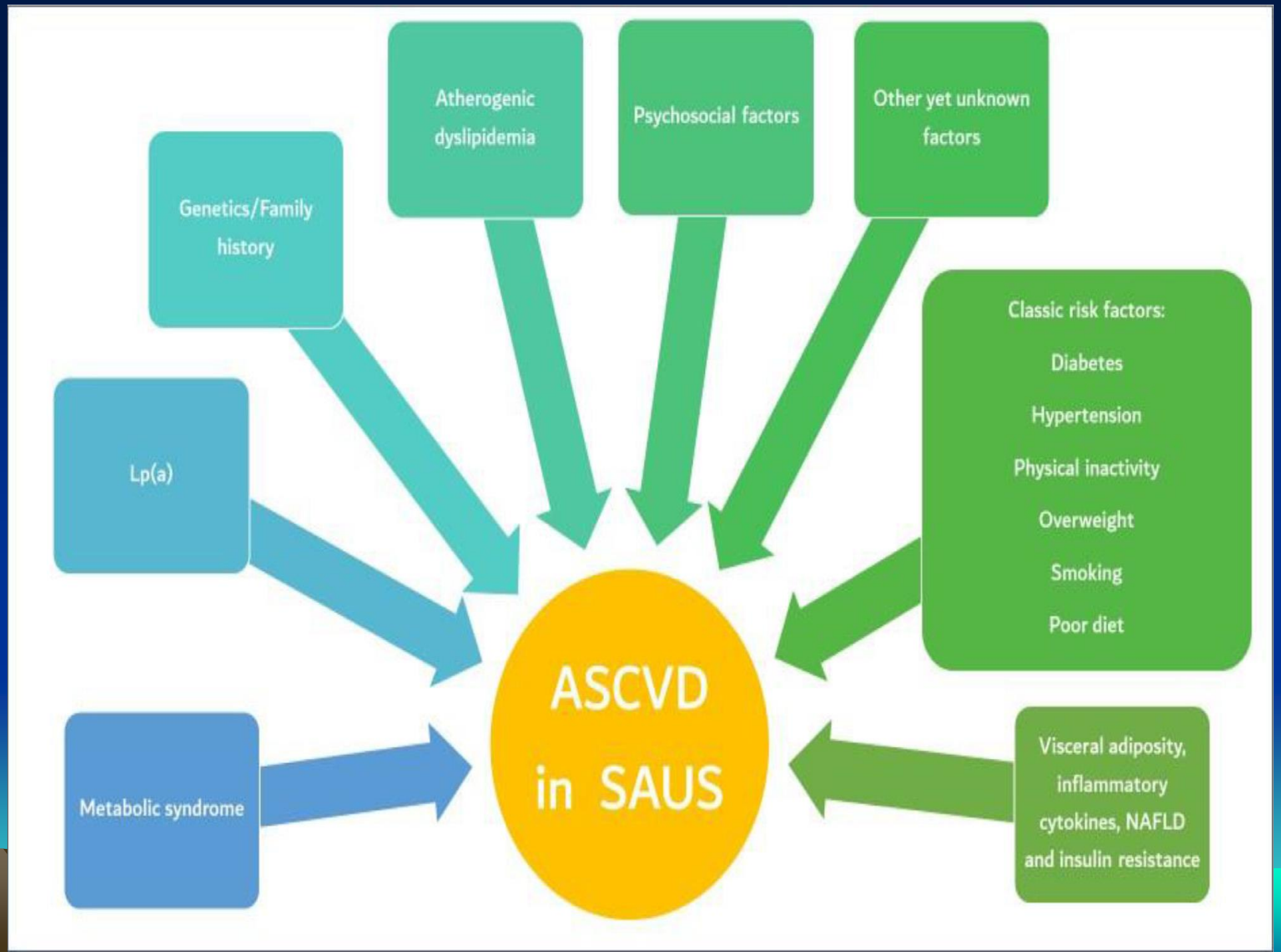
- NHANES
- INTERHEART
- PURE
- CARRS
- MASALA
- MESA
- GlasVegas
- SAHARA
- WHO

Lipid, Sugar and Inflammation

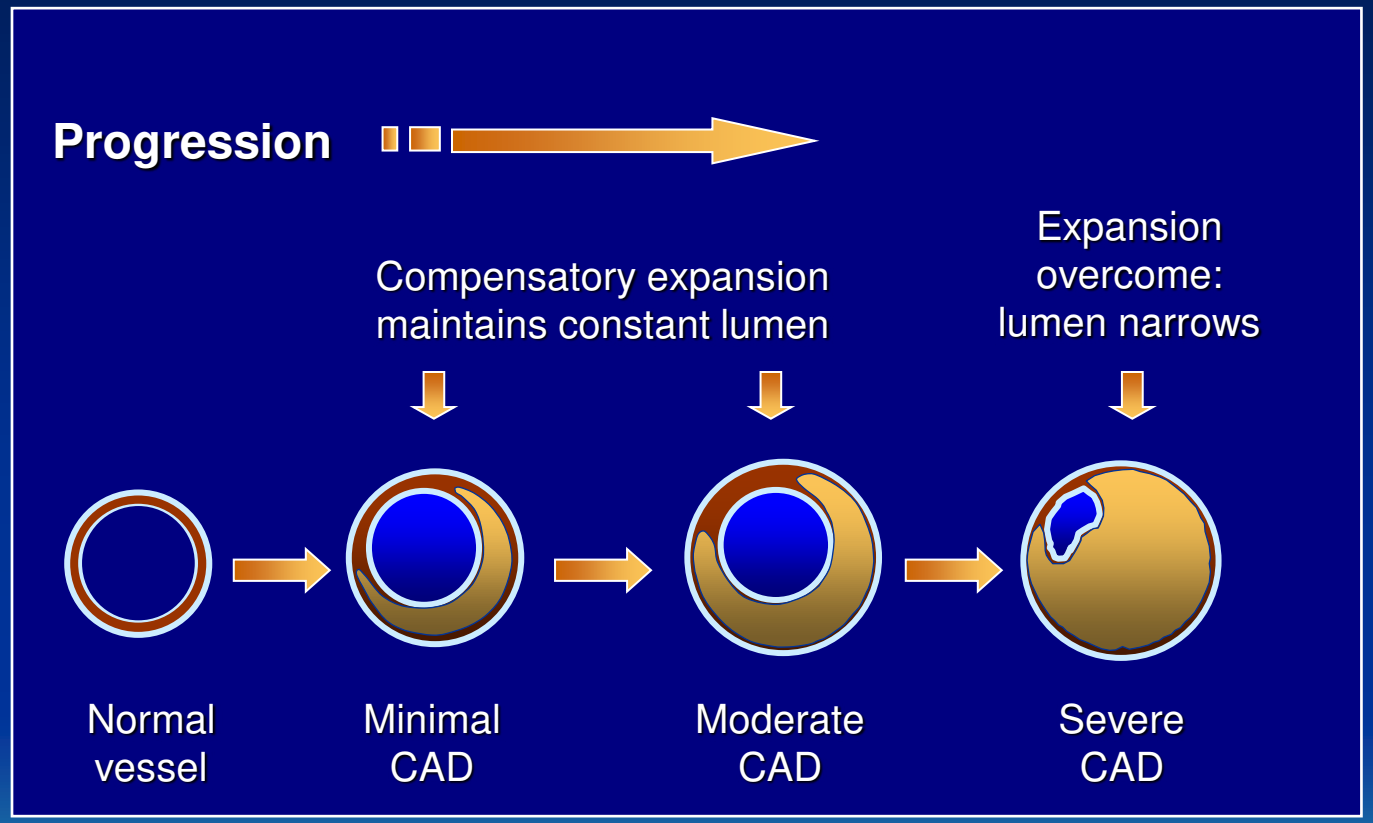
- Lipid abnormalities in SAs are closely intertwined with prevalence of insulin resistance, diabetes and outcome of CAD
- Characteristic lipid profiles: higher triglyceride levels, higher lipoprotein (a) levels, increased ratio of apolipoprotein B to apolipoprotein A-1 (apoB/apoA-1), smaller HDL size and increased LDL particle number, and lower levels of HDL , increased CETP, and proinflammatory state
- From 117 to 366 M T2DM by 2030, the predicted increase in prevalence of 151% in the Indian subcontinent during this period is concerning.
- SAs have approximately 2 to 4-fold increased prevalence of diabetes compared to other native ethnic groups.
- Prevalence of T2DM is 18-29 % and Met Syndrome is 33-37 %; 21% from U.K, 12.8% from Singapore, 15.3% from Mauritius, 13.1% from Fiji, 9.8% from South Africa, 9.9% from Tanzania and 15. 3 % from Canada.

ASCVD risk markers

- SAs develop ASCVD and CV events 10- 20 years earlier than Caucasians
- Smaller Coronary artery diameter or extraluminal plaque accumulation similar to transplant vasculopathy making luminal diameter smaller ?
- South Asians have the second highest levels of lipoprotein (a) after African Americans and this may explain some of the increased CAD risk in this ethnic group.
- Low daily consumption of fruits and vegetables, lack of regular exercise, and high waist hip ratio.
- Underestimation of CAD risk in SAs by most of the current scoring systems


Atherogenic dyslipidemia
Psychosocial factors
Other yet unknown factors
Genetics/Family history
Classic risk factors:
Diabetes
Hypertension
Physical inactivity
Overweight
Smoking
Poor diet
Lp(a)
ASCVD in SAUS
Metabolic syndrome
Visceral adiposity, inflammatory cytokines, NAFLD and insulin resistance

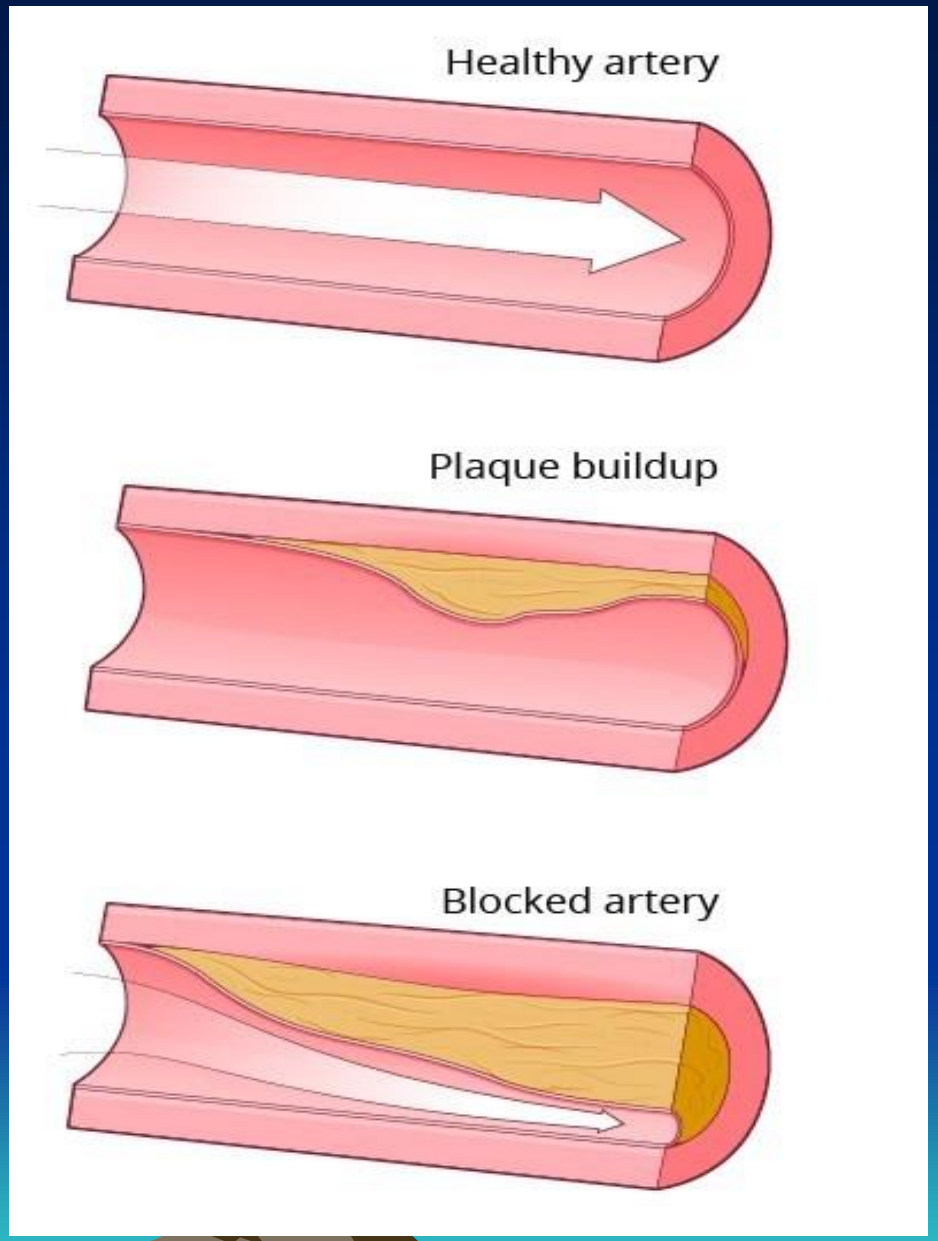
Coronary Remodeling



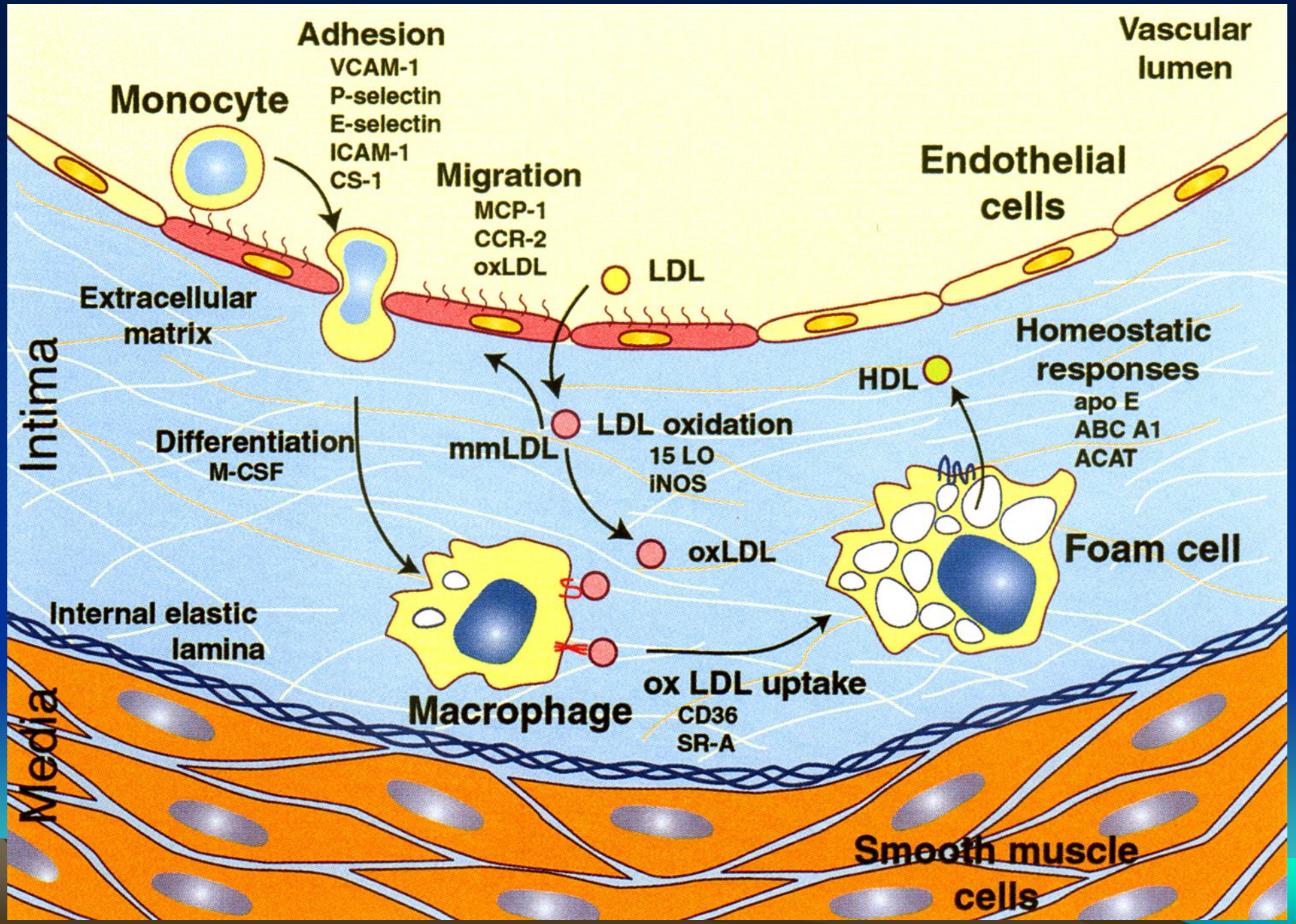
(Adapted from Glagov et al.)

Glagov et al, *N Engl J Med*, 1987.

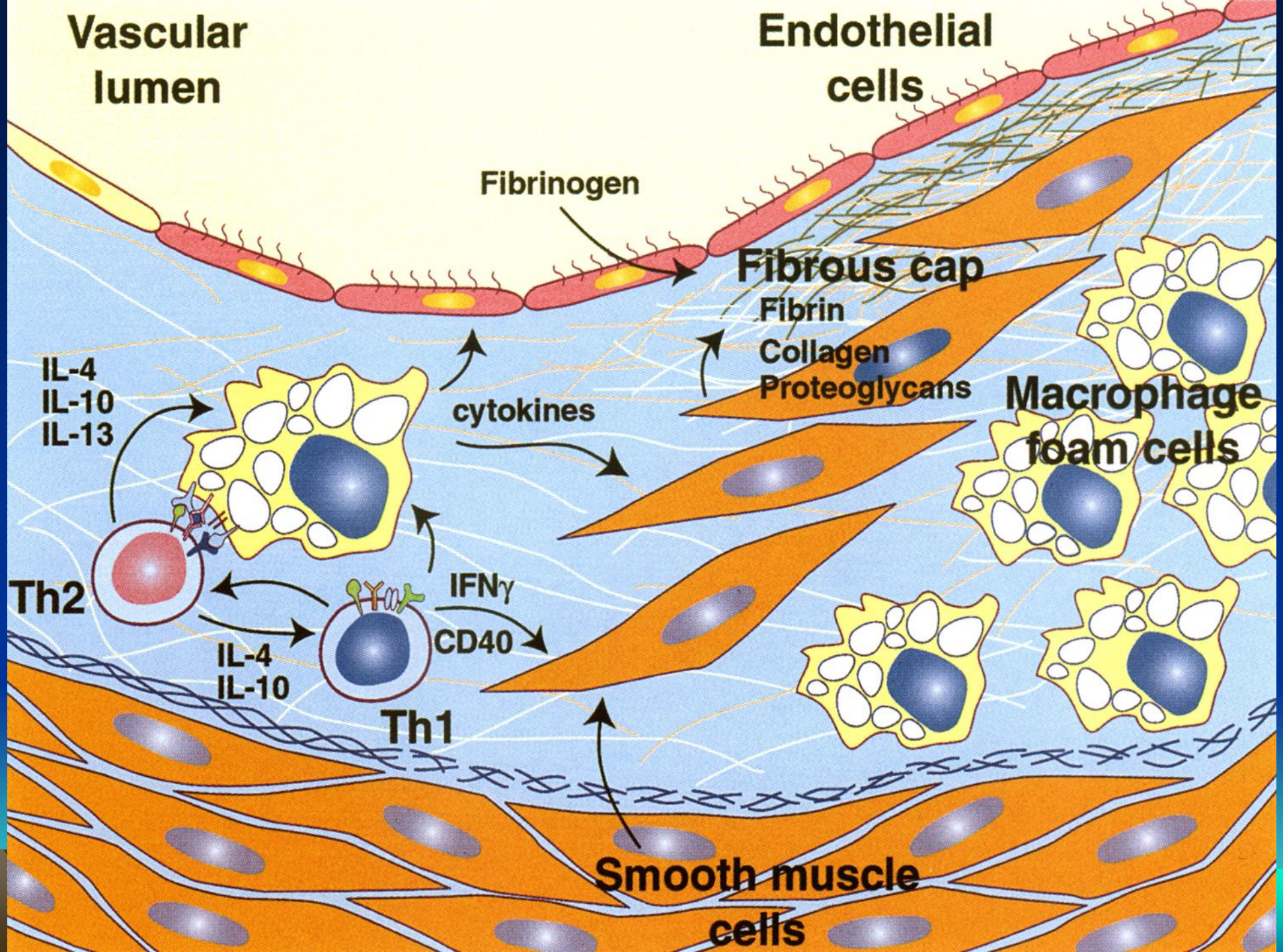
Plaque in arteries



PLAQUE GENESIS



Glass C, Witztum JL. *Cell*. 2001;104:503-516.



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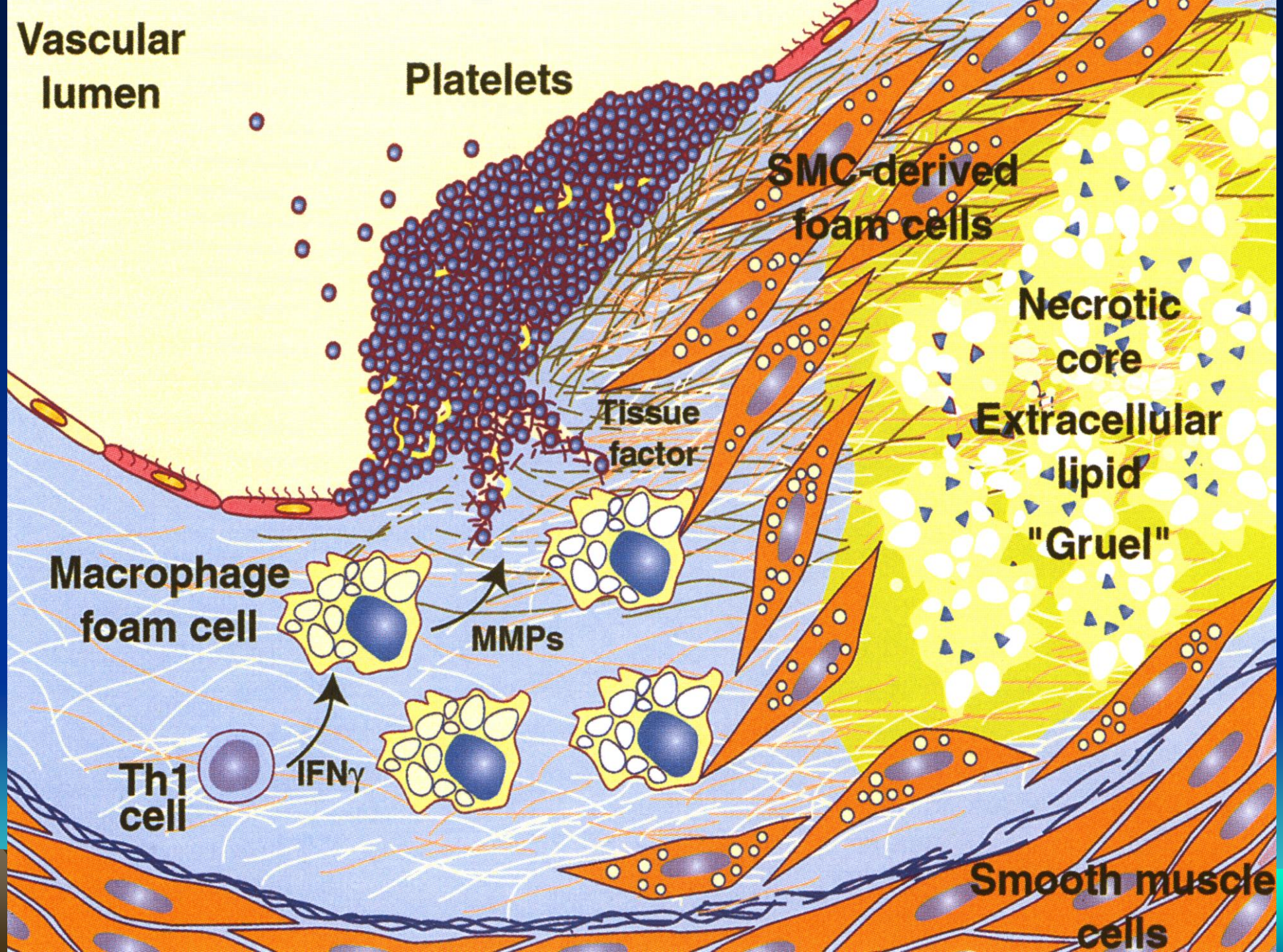
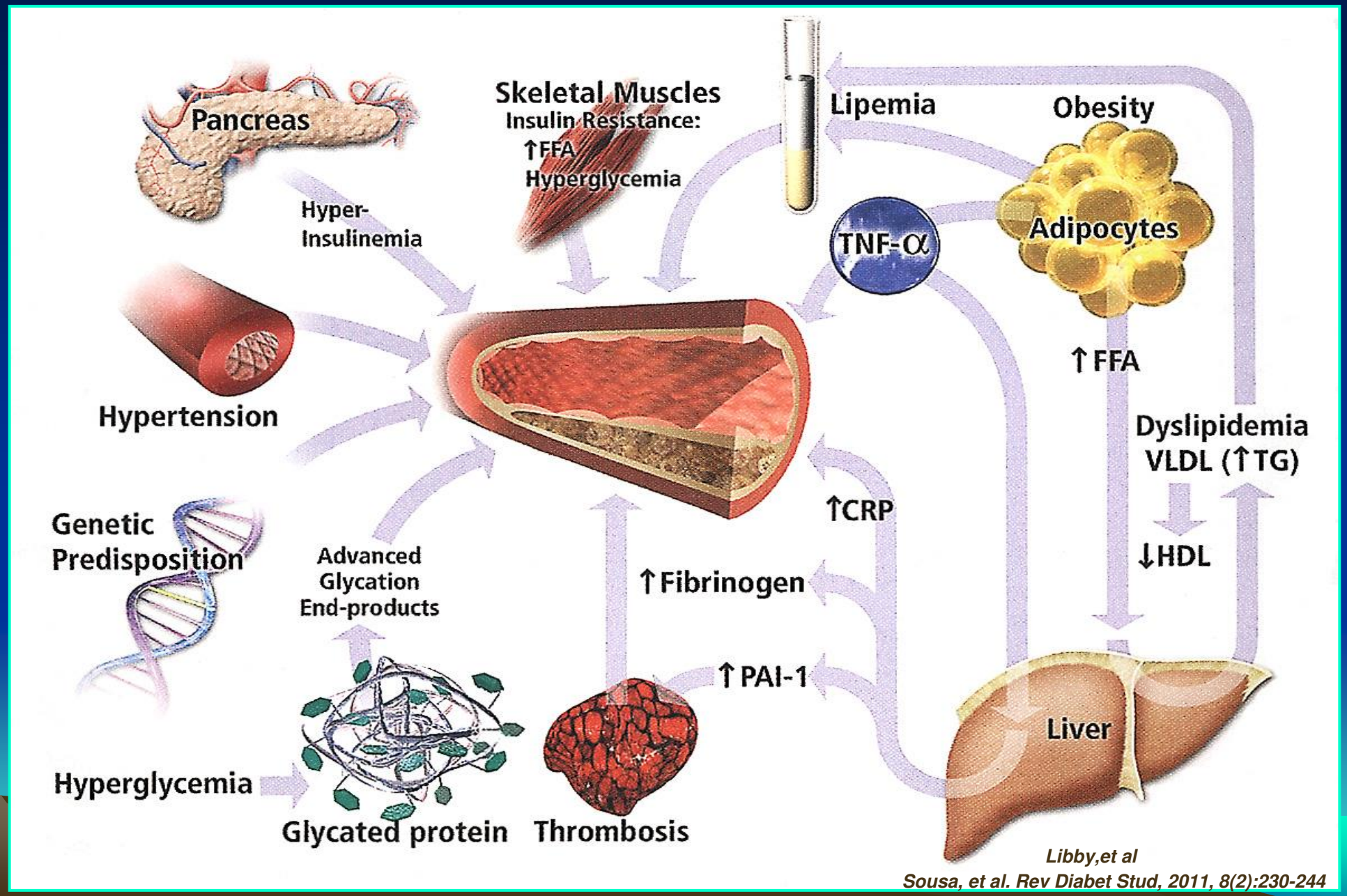


Glass C, Witztum JL. *Cell*. 2001;104:503-516.

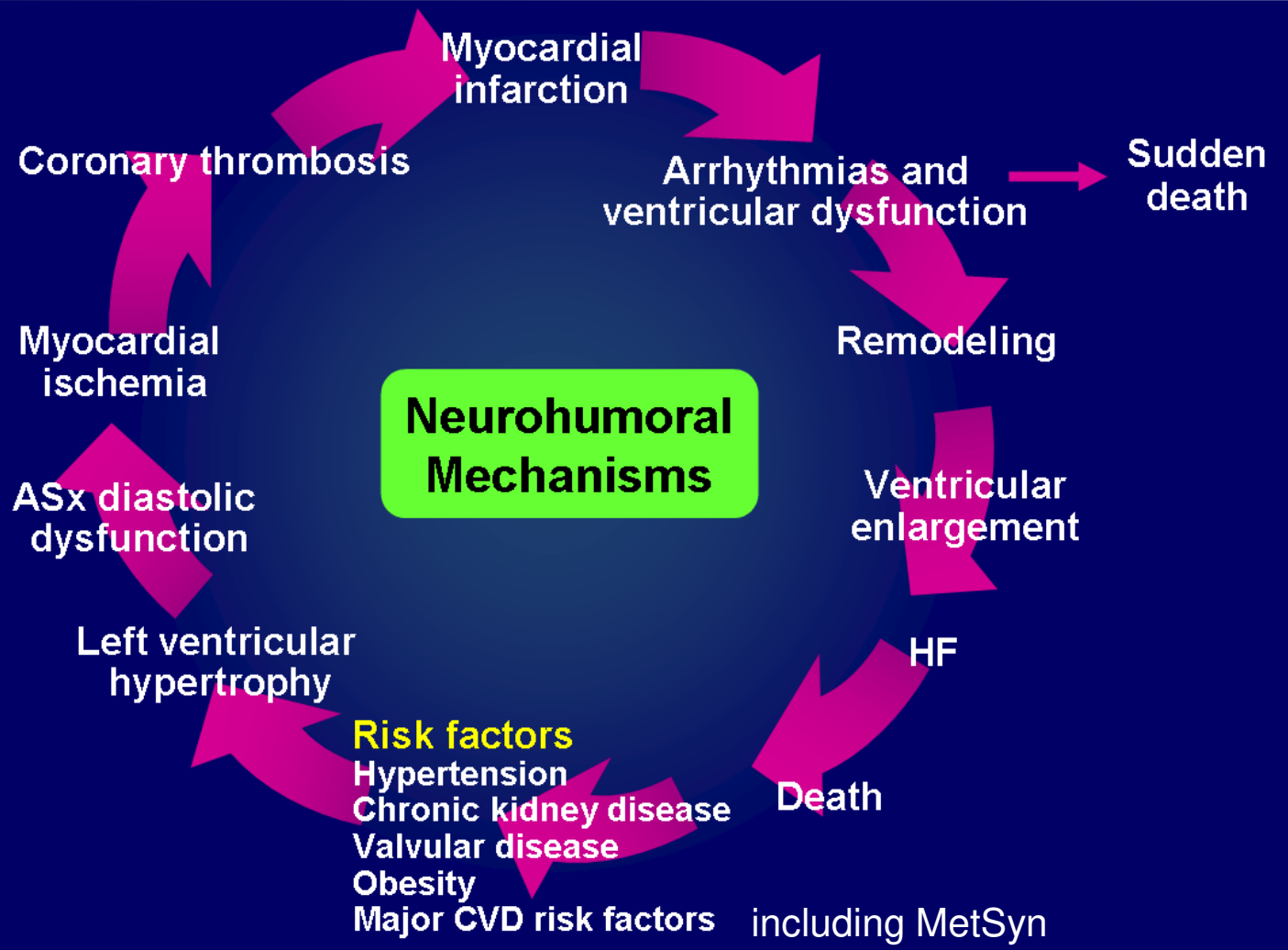
Mechanisms of CV Disease in Diabetes



Libby,et al

Sousa, et al. Rev Diabet Stud, 2011, 8(2):230-244

From Risk Factors to Heart Failure



Adapted from Dzau V, Braunwald E. *Am Heart J*. 1991;121:1244-1263.
Chobanian AV et al. *JAMA*. 2003;289:2560-2572.

Facts from the WHO

- CHD strikes South Asians at an *earlier age* (almost 33% earlier) and with higher mortality rates than other demographics.
- Furthermore, 50% of all heart attacks in Indian men occur under 50 years of age and 25% of all heart attacks occur under 40 years of age.
- India accounts for approximately 60% of the world's heart disease burden, despite having less than 20% of the world's population.
- It is also known as the world's capital for diabetes. It is estimated that in Hyderabad, India, 20% of the entire adult population is diabetic.

https://www.who.int/southeastasia/

Dysglycemia in South Asian Adolescents

School-based cross-sectional study involving 90 South Asian and 1248 European pupils aged 13-16 years.

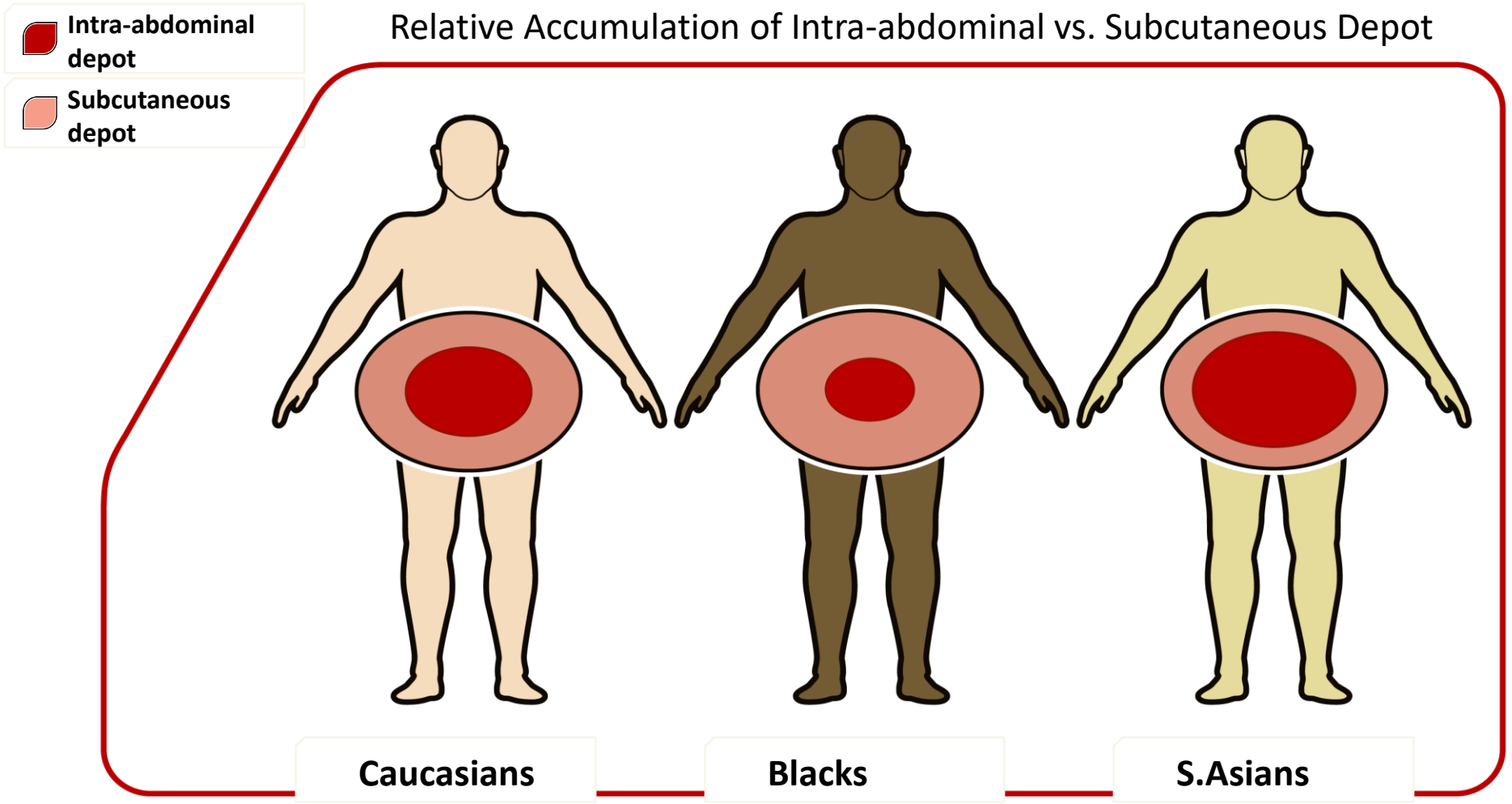
Compared to European pupils, South Asians had:

- 17% higher fasting plasma insulin levels
- 14% higher fasting glucose levels
- 24% higher incidence of IFG

These differences remained significant even after adjustment for central adiposity

Whincup et al. Diab Med 2005

Intra-abdominal fat vs. Subcutaneous



Misra, A, et al. Obesity-related non-communicable diseases: South Asians vs White Caucasians, February 2011, International journal of obesity (2005) 35(2):167-87

The Mediators of Atherosclerosis in South Asians Living in America (MASALA) Study: Body composition, IGT and T2DM

- Harmonized data from MESA and MASALA
- N= 2615; SA: 747, W: 745, C: 244, AA: 394, H: 485
- Assessment of body composition: CT scan : Abd visceral fat, Liver fat Atten, Abd IM fat, Pericardial fat
- Results: Higher burden of PF and CAC in SA

Kanaya,A, Khandula, N, et al. Mediators of Atherosclerosis in South Asians Living in America (MASALA) Study: Objectives, Methods, and Cohort Description, Clin Cardiol. 2013 Dec; 36(12): 713–720.

MESA and MASALA

- Higher OR for IFG and T2DM compared with
  W(7.04),H (6.94), C (3.6), AA(3.44),H(6.94)
- Abd VF associated with IFG, other BC parameters with T2DM in SA. T2DM was prevalent in 23 % of SA
- No difference in body composition to explain the added risk

INTERHEART Study

- 12,000 cases of initial MI and 14,000 controls
- Over 90% of global MI risk can be attributed to 9 modifiable risk factors (smoking, DM, lipids, central obesity, hypertension, diet, physical activity, alcohol consumption, and psychosocial factors)
- SAs presented at earlier ages (53 yrs. vs. 58 yrs.)
- Regular physical activity, daily intake of fruits and vegetables) were significantly lower among SA
- T2DM,High apoB/apoA-1 ratio were significantly higher.
- When compared to other ethnic groups, apoB/apoA-1 ratio, low daily consumption of fruits and vegetables, lack of regular exercise, and high waist hip ratio were higher.

Yusuf S, et al. INTERHEART study case-control study. Lancet 2004;364;937-52.

Volgman, Palaniappan data

- Earlier onset, higher incidence, and higher standardized mortality rates from ASCVD in South Asians compared with NHWs.
- A higher proportional mortality rate from IHD compared with other Asian ethnic groups and NHWs in the US.
- A **2-4 fold higher prevalence of T2DM, a higher incidence of new-onset diabetes mellitus, and a higher prevalence of IGT compared with NHWs**.

Volgman, et al.Circulation. 2018 Jul 3;138(1):e1-e34

Volgman, Palaniappan

- SA born in the US show evidence of an altered metabolic profile (elevated plasma insulin levels, altered plasma lipid profile, and higher truncal skin-fold thickness) in young adulthood compared with young adults of European descent in the United States.

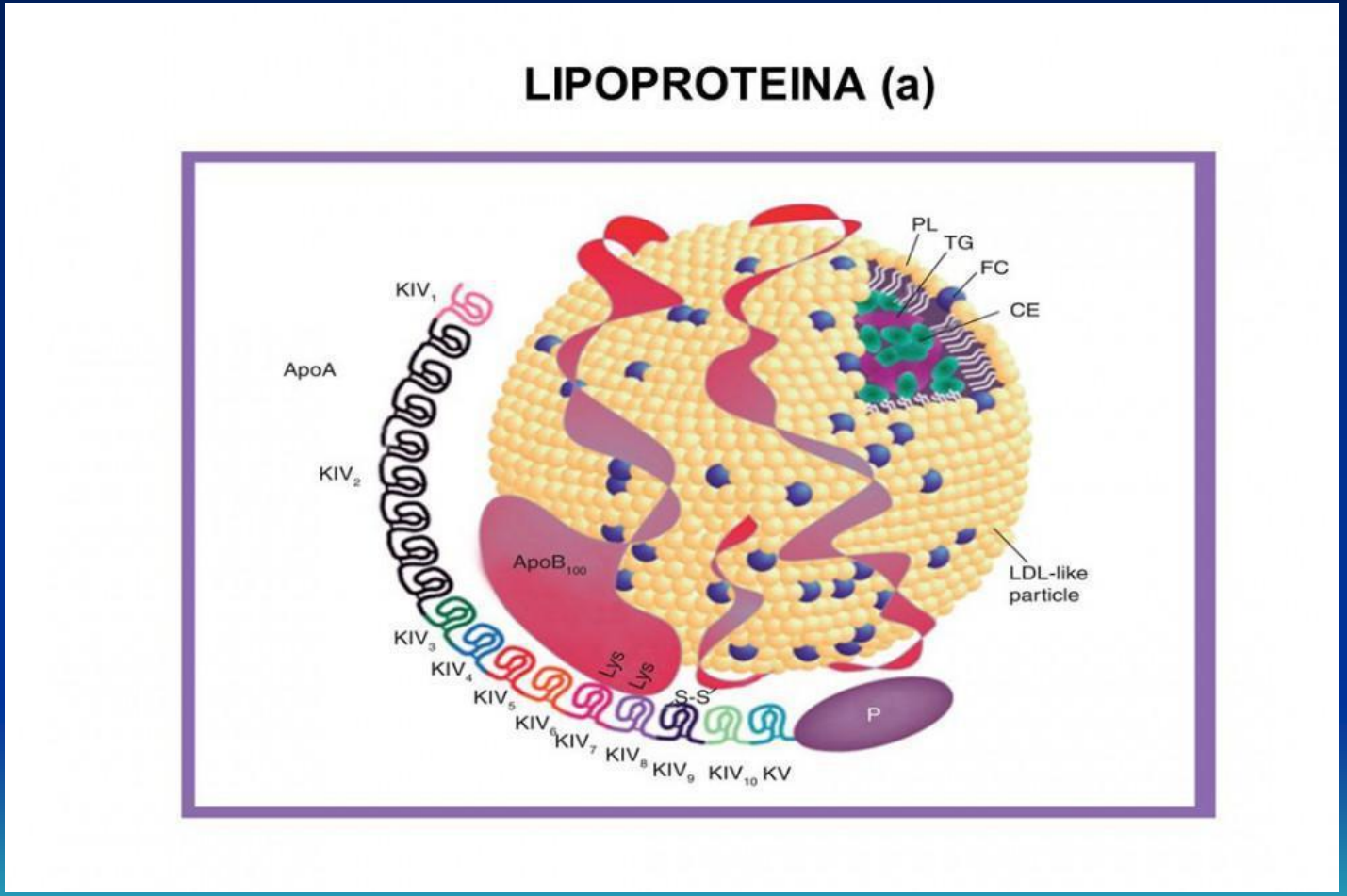
Volgman, Palaniappan data

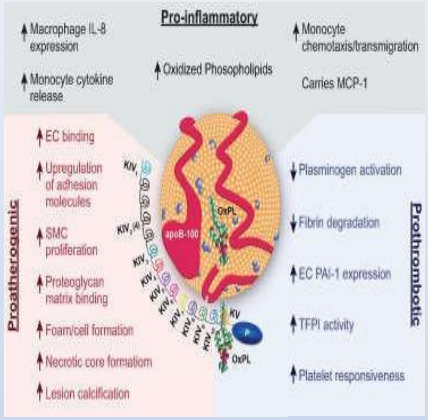
- **Women with gestational diabetes mellitus were 3.2 times** more likely to develop diabetes mellitus than those without.
- Increased risk of AMI in South Asian patients with high WHR.
- Compared to those living in India ,**SA in the United States have higher plasma levels of TG,TC, LDL-C and lower levels of HDL-C.**

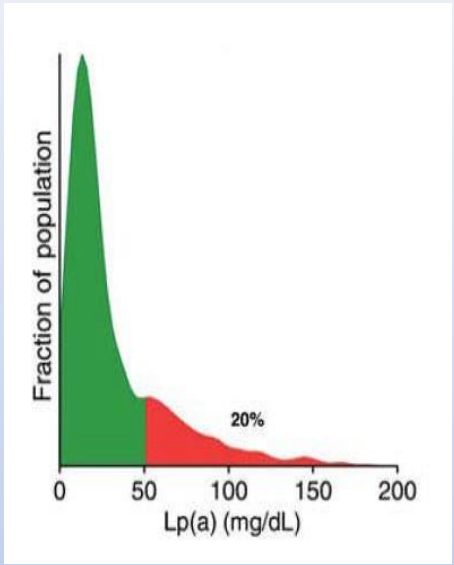
Volgman et al. Circulation. 2018 Jul 3;138(1):e1-e34

Lp(a) structure and function

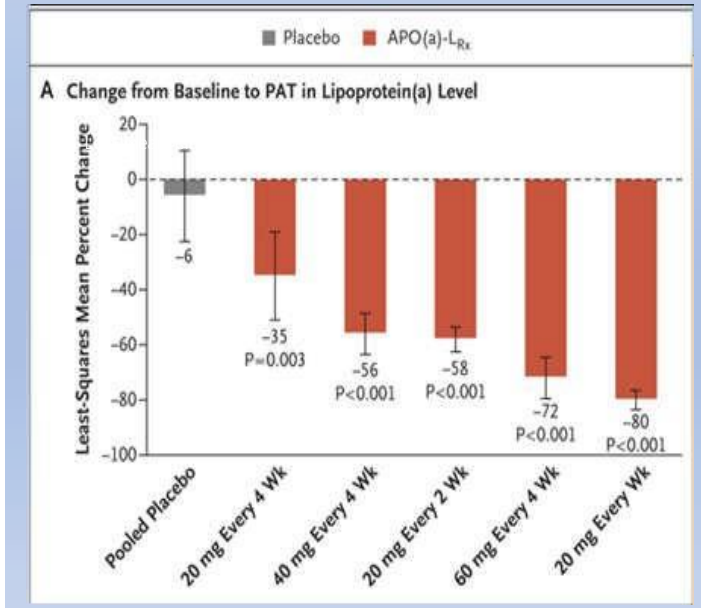
- LDL like particle in which a large glycoprotein and 2 apo (a) are covalently bound to one molecule of apoB100 by a disulfide bridge.
- Apo(a) contains 5 cysteine domains known as Kringles.
- KIV has Homology with Plasminogen
- Antifibrinolytic
- Prothrombotic







Skewed distribution of Lp(a) levels in the population



In a dose ranging phase 2 trial of an GalNac ASO, AKCEA-APO(a)-LRx, 20 mg SQ q wk ↓ed Lp(a) levels by 80% at 6 mo

Study	NCT04023552 Lp(a)HORIZON (CTQJ230A12301)
Indication	Cardiovascular risk reduction
Phase	Phase 3
Patients	7,680
Primary Outcome Measures	Time to the first occurrence of MACE (cardiovascular death, non-fatal MI, non-fatal stroke and urgent coronary re-vascularization)
Arms/Intervention	TQJ230 80 mg injected monthly subcutaneously or matched placebo
Target Patients	Patients with a history of Myocardial infarction or Ischemic Stroke, or a clinically significant symptomatic Peripheral Artery Disease, and Lp(a) ≥ 70 mg/dL
Read-out Milestone(s)	2024
Publication	TBD

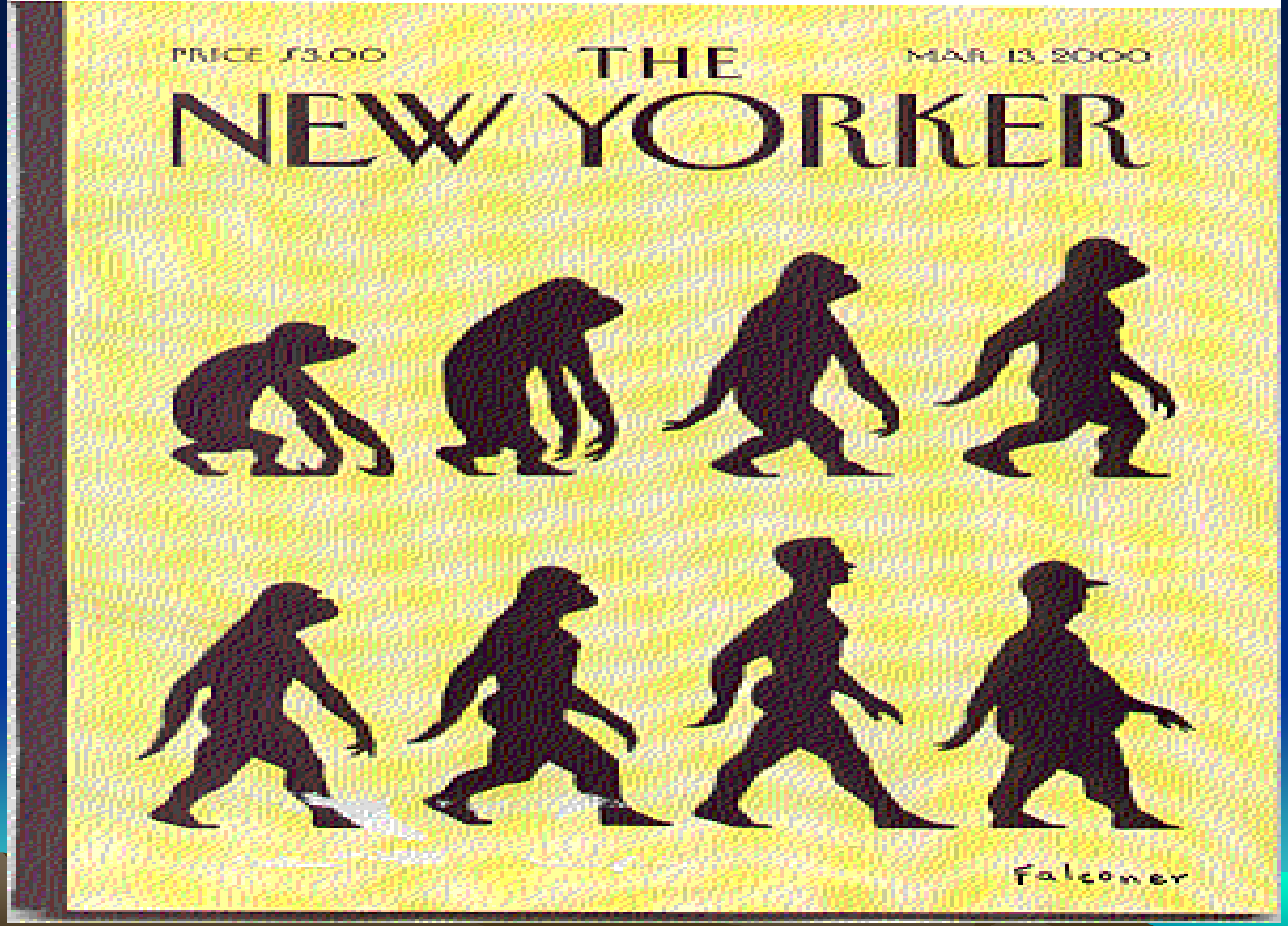
Lp(a) and HORIZON trial of Pelacarsen

Burgess SB, Ference BA, et al. 2018; JAMA Cardiology doi: 10.1001/jamacardio.2018.1470
Nordestgaard BG, et al. Eur Heart J. 2010;31:2844-53
Tsimikas et al, NEJM Jan 16, 2020

Differences in Risk factors

	Caucasians	Blacks	Hispanics	South Asians	Native Americans
CAD	8.5%	7.9%	5.7-6.3%	**7.2- 11 %**	5.6%
Diabetes MetS	6.8% 45%	14% 31%	11% 44%	**18- 29 %** **33- 37 %**	18% 34- 40 %
HTN	33%	43%	27%	13- 30 %	25%
LDL> 130 HDL< 40 TG> 150	30% 29% 33%	34% 16% 15%	41% 31% 35%	**35 %** **37%** **70%**	31% TC 19% 28%
ApoB/ Apo A1 Stroke	31% 2.4%	30% 4.5%	Unknown 2%	**46- 61%** Unknown	Unknown Unknown
BMI>25	72%	70%	77%	**28%**	78%

Vijayaraghavan, et al, Cardiorenal Medicine , 2019;9(4):240-251. doi: 10.1159/000499341. Epub 2019 May 10.



The New Yorker, March 13, 2000

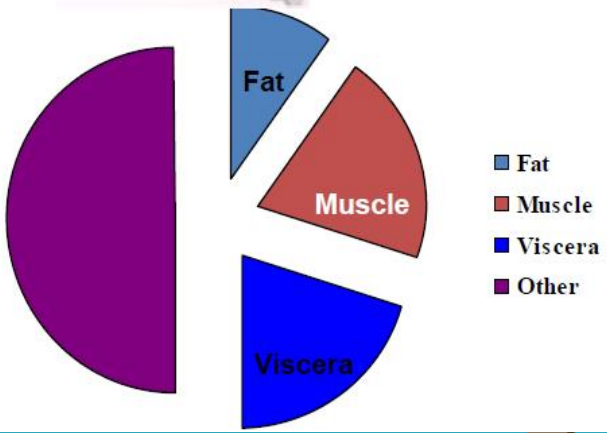
Body composition in Newborn

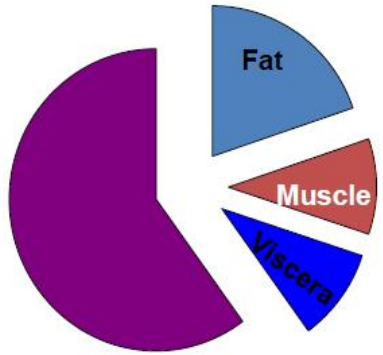
Body Composition of Newborn

- Birth weight
- Head (Brain)
- Length (Skeleton)
- Skin folds (Fat)
- Abdomen (Viscera)
- Mid-arm (Muscle)

White Caucasian, 3500 g

Indian, 2700 g





Yajnik et al, JCEM, 2002; Yajnik et al, Int J Ob, 2003

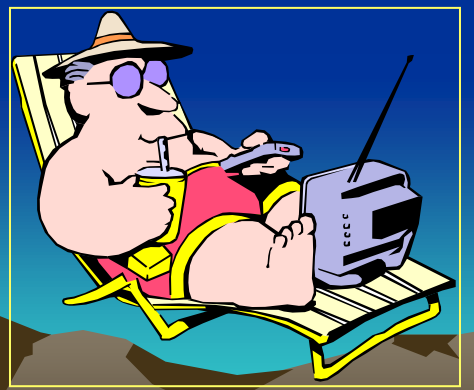
Environment, "Thrifty Genotype" and the Metabolic Syndrome

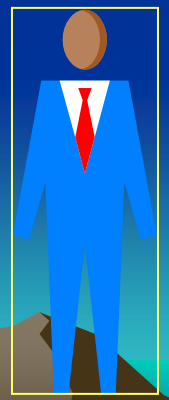
- Genes that convert and store simple sugars to abdominal fat
- Selective advantage in times of famine

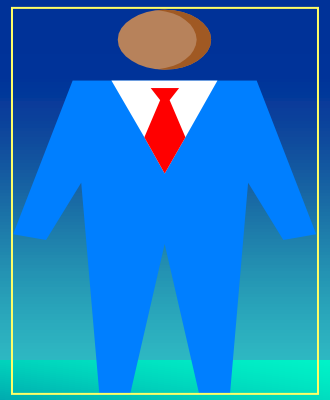
Low caloric intake
High energy expenditure
Low BMI and WHR

URBANIZATION

High caloric intake
Low energy expenditure
High BMI and WHR







Gupta, SA and CV risk, Circulation. 2006 Jun 27;113(25):e924-9. doi: 10.1161/CIRCULATIONAHA.105.583815.

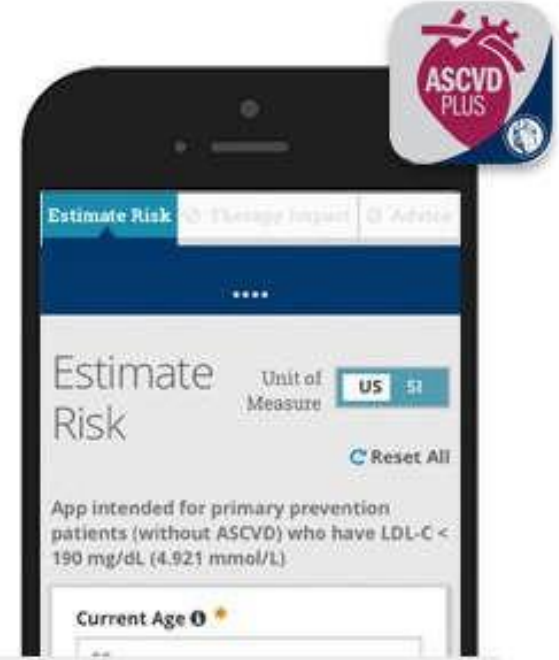
Genetic Basis for increased risk

- *Genetic contribution to ASCVD in SA :*
- *LDR, APO C3, LPA, APOA5,*
- *PCSK9, NPC1L1, ASOR1, ANG*

- Genetic variants at 6 new loci as being associated with DM (*GRB14*, *ST6GAL1*, *VPS26A*, *HMG20A*, *AP3S2*, and *HNF4A*)
- Variants in the chromosome 9p21 locus in North Indian population related to early ASCVD
- **PNLA 3 and TCF7L2 genotypes associated with NAFLD and Prediabetes in SA**
- Variations in Drug metabolism mediated by genes such as SLCO1B1,ABCG2, Cyp2C9,OAT proteins

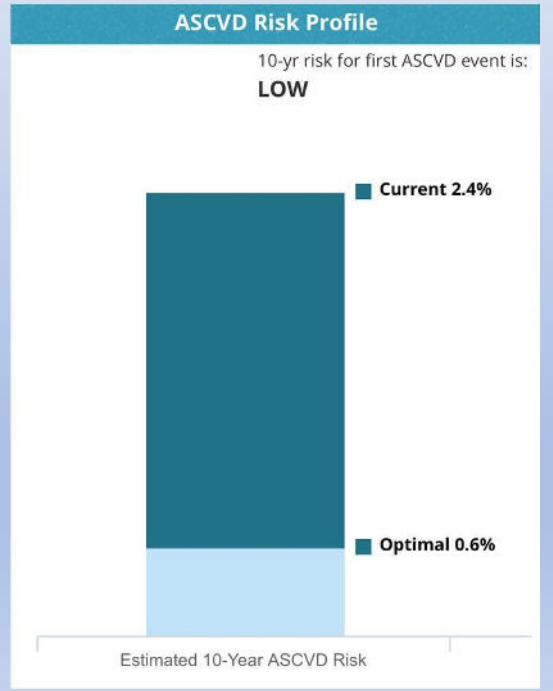
My Clinic Patient

40 yo PhD moved from Bangladesh at age 22. Father: MI age 49. He is a nonsmoker. His BMI is 31, waist 36”, BP is 133/70 (no meds), exam is otherwise unremarkable. FBG is 90, HbA1c 5.8%. How would you manage this patient?



Sex: **Male**
Race: **Other**

Values	Current
Age:	40
Total Cholesterol (mg/dL)	204
HDL Cholesterol (mg/dL)	32
LDL Cholesterol (mg/dL)	130
Systolic Blood Pressure (mm Hg)	133
Diastolic Blood Pressure (mm Hg)	70
Diabetes:	No
Smoker:	Never
Treatment for Hypertension:	No
Aspirin Therapy:	No
Statin:	No

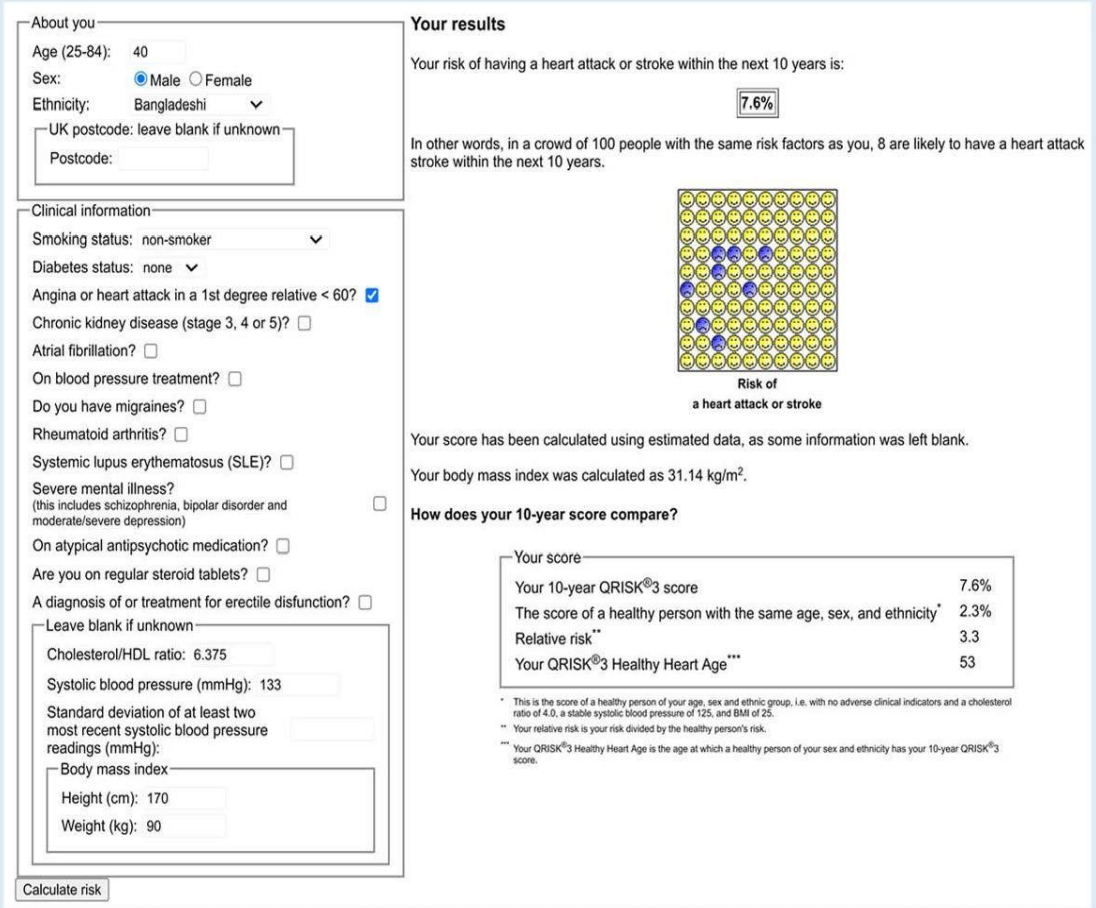


Risk calculators differ in predicting risk in SAUS

Sex: Male
Race: White

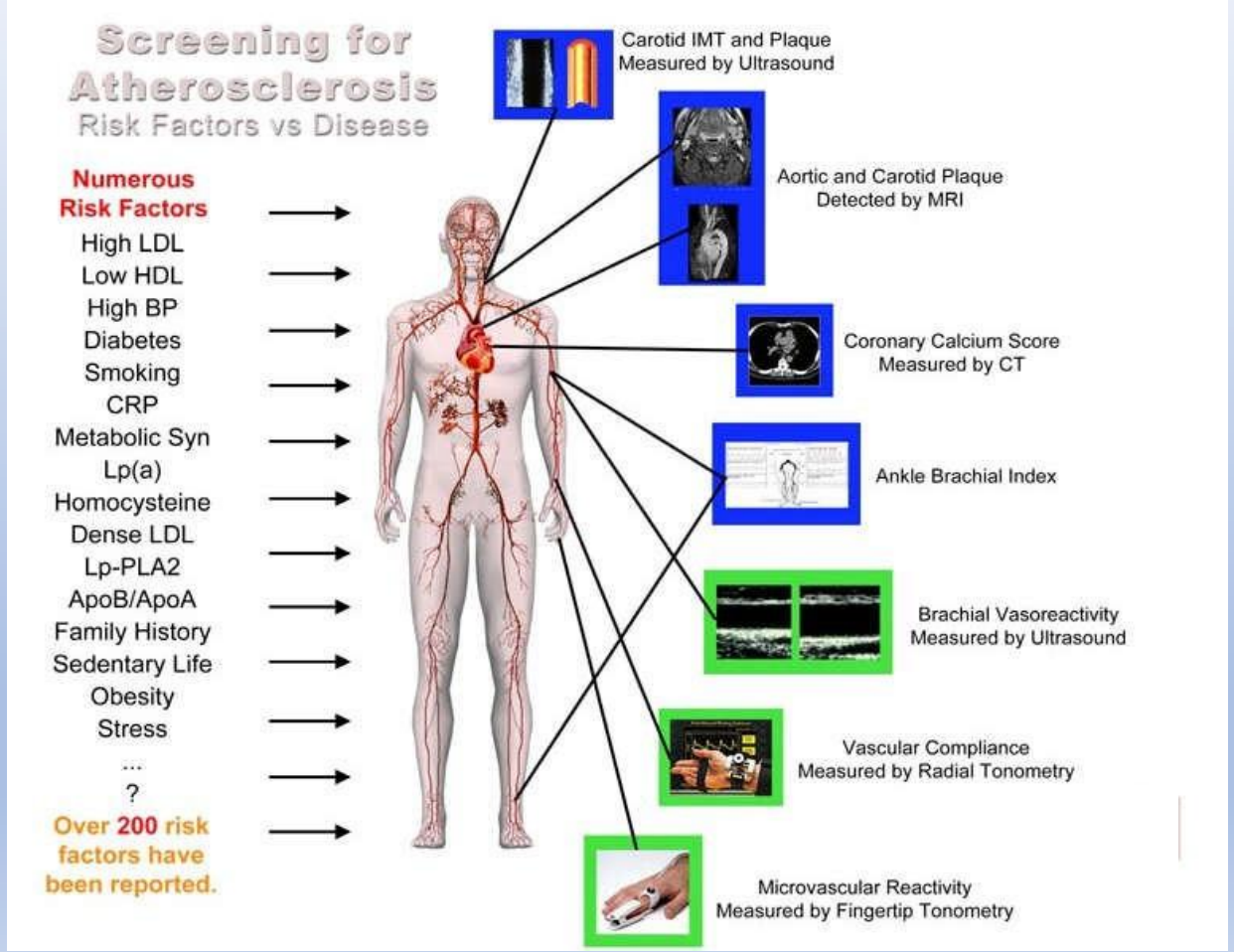
Values	Current
Age:	40
Total Cholesterol (mg/dL)	204
HDL Cholesterol (mg/dL)	32
LDL Cholesterol (mg/dL)	130
Systolic Blood Pressure (mm Hg)	133
Diastolic Blood Pressure (mm Hg)	70
Diabetes:	No
Smoker:	Never
Treatment for Hypertension:	No
Aspirin Therapy:	No
Statin:	No

ACC PCE risk calculator
10-year: 2.4%
Optimal: 0.6%



QRISK3 risk calculator
10-year: 7.6%
Heart age: 53 years

So many screening tools - which one to use?



Tools for early detection

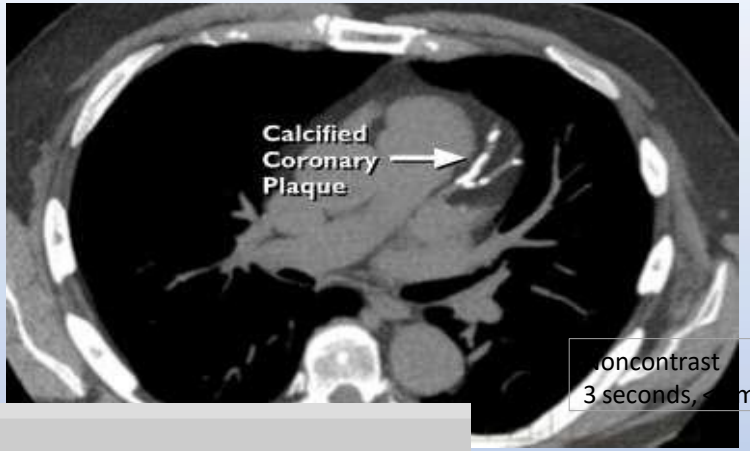
- Risk calculator: QRISK3
- *CACS (coronary artery calcium scoring)*
- *Lp(a) (>75 nmol/L in ~25% of SAUS)*

Select cases:

- *Coronary CT Angiography with AI/ML imaging*
- *Advanced lipoprotein testing: sdLDL, particle #,...*
- *Visceral fat (adiposopathy) - DXA scan vs CAC scan*
- *Genetic scores*

Anand et al, Metabolism, 1998

Expansion of Coronary CT calcium scans and lower LDL-C targets for SAUS



oncontrast
3 seconds, msV

Journal of Clinical Lipidology (2020) 14, 173–175

Journal of Clinical Lipidology

Low-density lipoprotein cholesterol goals in the secondary prevention of cardiovascular diseases in the Indian population—Is 30 the new 70?

Check for updates

Prevention of Atherosclerotic Cardiovascular Disease in South Asians in the US: A Clinical Perspective from the National Lipid Association

Dinesh K. Kalra, MD*, Krishnaswami Vijayaraghavan, MD, Geeta Sikand, MA, RDN, Nihar R. Desai, MD, MPH, Parag H. Joshi, MD, MHS, Anurag Mehta, MD, Wahida Karmally, DPH, RDN, Anish Vani, MD, Shoeb J. Sitafalwalla, MD, Raman Puri, MD, P. Barton Duell, MD, Alan Brown, MD

*Rush University Medical Center, Chicago, IL, USA (Dr Kalra); Abrazo Arizona Heart Hospital, Phoenix, AZ, USA (Dr Vijayaraghavan); University of California Irvine School of Medicine, Irvine, CA, USA (Ms Sikand); Yale School of Medicine, New Haven, CT, USA (Dr Desai); University of Texas Southwestern Medical Center, Dallas, TX, USA (Dr Joshi); Emory University School of Medicine, Atlanta, GA, USA (Dr Mehta); Columbia University Irving Medical Center, New York, NY, USA (Dr Karmally); New York University Langone Health, New York, NY, USA (Dr Vani); Advocate Lutheran General Hospital, Park Ridge, IL, USA (Dr Sitafalwalla); Lipid Association of India, New Delhi, India (Dr Puri); Oregon Health and Science University, Portland, OR, USA (Dr Duell); Advocate Lutheran General Hospital, Park Ridge, IL, USA (Dr Brown)

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Journal of Clinical Lipidology (2020) 14, 161–169

Journal of Clinical Lipidology

Clinical Lipidology Roundtable Discussion

JCL roundtable: South Asian atherosclerotic risk

Check for updates

Dinesh K. Kalra, MD, FACC, FSCCT, FSCMR, Geeta Sikand, MA, RD, CLS, FNLA, Krishnaswami Vijayaraghavan, MD, MS, FACP, FACC, FHFSA, FNLA, John R. Guyton, MD, FNLA*

Lipid Clinic, Division of Cardiology, Rush Medical College, Chicago, IL, USA (Dr Kalra); Preventive Cardiology & Cholesterol Management Program, University of California Irvine School of Medicine, Irvine, CA, USA (Ms Sikand); Abrazo Arizona Heart Institute and Hospital, Division of Cardiology, Department of Medicine, University of Arizona College of Medicine, Phoenix, AZ, USA (Dr Vijayaraghavan); and Division of Endocrinology, Metabolism, and Nutrition, Department of Medicine, Duke University Medical Center, Durham, NC, USA (Dr Guyton)

Journal of the American Heart Association

EDITORIAL

Bridging the Racial Disparity Gap in Lipid-Lowering Therapy

1 2 3 Dinesh K. Kalra, MD

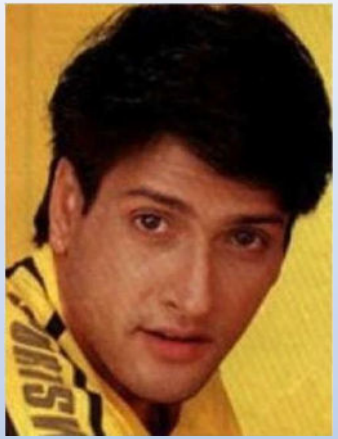
Epidemic of ASCVD in SAs at a young age

Chiranjeevi Sarja

- Kannada actor
- No risk factors
- Died age 39 in Bengaluru in June 2020 after c/o chest pain, dyspnea

Abir Goswami

- Actor
- Died age 37 in Bengaluru in May 2013 while on treadmill



Inder Kumar

- Cardiac arrest at age 44 in July 2017

Barriers to optimization

1. What are the barriers to the mobilization of SAUS to participate in strategies aimed at ASCVD and T2DM risk and other risk factor prevention?

2. What are the best evidence-based strategies for increasing the participation of SAUS individuals in research studies and preventive healthcare delivery?

Challenges and strategies to overcome barriers to delivering preventive CV care in SAUS

The 4 As

- Accessibility
- Availability
- Affordability
- Acceptability

Accessibility to ASCVD preventive care

- An analysis of Canadian Community Health Survey data (2001–2013) concluded that SAs are more likely to report poor self-rated health than Whites.
- Low SES, racial and cultural discrimination, geographical constraints (e.g., distance from healthcare center, lack of access to transportation), language barriers, and traditional hierarchies within families have been reported to obstruct optimal health- care delivery.
- These factors are a concern particularly for SA women who are not as independent as men due to an implicit gender bias in the SA culture.
- Frequently, SAUS maintain traditional religious, dietary, and health- care practices, which may not align with modern Western or allopathic medicine.
- Lack of support from families and communities in seeking healthcare and making health- care decisions may discourage SAUS from engaging in risk-reducing health-promoting behaviors.

Access to Care

- Lack of English language proficiency, unfamiliarity with local services, and lack of attention to cultural factors by healthcare providers may pose a challenge to health-care service access for SAUS.
- Underrepresentation of SAUS in CV-related research studies, which results in limited validation of the trial results to SAUS.
- Heterogeneity within subgroups of SAUS makes it difficult to generalize findings to individuals hailing from underrepresented countries, such as Bhutan or Sri Lanka.
- Furthermore, there is a multitude of diverse dietary patterns, lifestyles, and baseline health risks based on differences in origin, culture, and religion even though they all emigrated from the same geographic region of South Asia.
- For example, even within India itself, there are over 50 different dietary patterns, languages, diverse healthcare beliefs, and traditions that make broad generalizations difficult.

Availability

- Healthcare providers may lack knowledge about SA ancestry being a high-risk condition.
- There is little health education performed in schools regarding the risk of ASCVD and T2DM.
- This may be due to a lack of funding and/or lack of availability of teachers who are well versed to educate the children on this topic. Most schools have stopped Health science as a topic in their curriculum
- Availability of technology , diagnostic procedures and therapeutic choices may not be optimal for many SAs

Affordability

- Healthier food choices, such as fruits and vegetables, may not be affordable to some in the lower socioeconomic strata
- Gym memberships and exercise equipment may be too ex- pensive for some SAUS families.
- Certain CV-preventive medications may not be covered by some health plans or the copay costs may be unaffordable for some SAUS patients.
- "Food is Medicine" as the theme should be adopted sooner in SA opulation with funding available from White House –Rockefeller Foundation grants of more than 8 B USD

Acceptability

- SAUS individuals who are not well acculturated may lack a feeling of belonging, have education or training-related deficits, logistical issues or opportunity cost, and fear or inhibition.

- Logistical concerns include the cost of participating in research studies, time away from work or family, and transportation challenges.

- An entrenched belief system of not accepting allopathic care, but prefer ayurvedic or otherwise instead of traditional care
- A magnified perception of the risk of treatment-related side effects, fear of finding out their health status or experiencing the stigma of being labeled with a health condition
- Prior poor experiences with the healthcare system, mistrust of research, inability to participate in prevention programs due to substance abuse or mental health issues, and a fear of being reported to immigration enforcement.

Risk Summary in SAs

- **Lipid abnormalities in SAs are closely intertwined with prevalence of insulin resistance, diabetes and outcome of CAD**
- **From 117 to 366 M T2DM by 2030, the predicted increase in prevalence of 151% in the Indian subcontinent during this period is concerning.**
- **SAs have approximately 2 to 4-fold increased prevalence of diabetes compared to other native ethnic groups.**
- **Prevalence of T2DM is 18-29 % and Met Syndrome is 33-37 %; 21% from U.K, 12.8% from Singapore, 15.3% from Mauritius, 13.1% from Fiji, 9.8% from South Africa, 9.9% from Tanzania and 15. 3 % from Canada.**

Risk Summary in SAs

- Characteristic lipid profiles: higher triglyceride levels, higher lipoprotein (a) levels, increased ratio of apolipoprotein B to apolipoprotein A-1 (apoB/apoA-1), smaller HDL size and increased LDL particle number, and lower levels of HDL , increased CETP, and proinflammatory state
- Smaller Coronary artery diameter or extraluminal plaque accumulation similar to transplant vasculopathy making luminal diameter smaller ?
- South Asians have the second highest levels of lipoprotein (a) after African Americans and this may explain some of the increased CAD risk in this ethnic group.
- Low daily consumption of fruits and vegetables, lack of regular exercise, and high waist hip ratio.
- Underestimation of CAD risk in SAs by most of the current scoring systems

Recommendations for South Asians

Parameter	Desirable levels for South Asians
Waist circumference	<80 cm for women; <90 cm for men
Body mass index	<23 men and women
Blood pressure	<130/70 mm Hg
Total cholesterol	<120 mg/dL (high-risk South Asians)
LDL cholesterol	<70 mg/dL (high-risk South Asians) * <50 for people with CAD or diabetes† < 30 for very high risk
Non–HDL cholesterol	<100 mg/dL (high-risk South Asians) * <100 for people with CAD or diabetes† <80 for very high risk
Triglycerides	<100 mg/dL
HDL cholesterol	>50 mg/dL for all and < 80 mg /dL
HbA1c	<6.5%
Lipoprotein(a)	<30 mg/dL

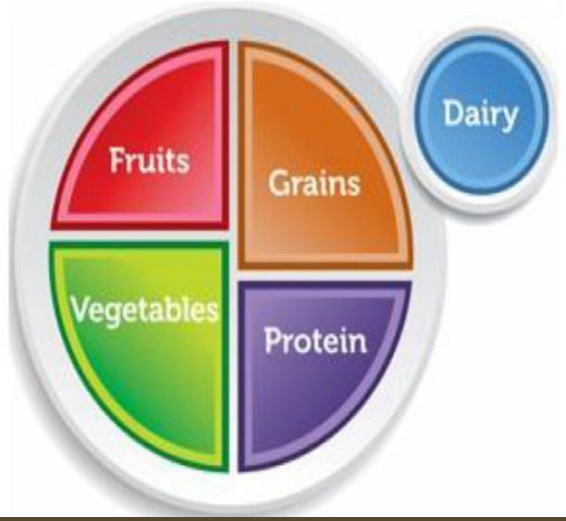
Dietary modification

Enjoy

Whole grains: whole wheat, millets
Vegetables, legumes, beans, fruits, nuts, seeds, nut butters (almond, peanut)
Skim milk, low fat paneer, tofu, soybeans, fish, lean skinless poultry, egg whites

Cook with

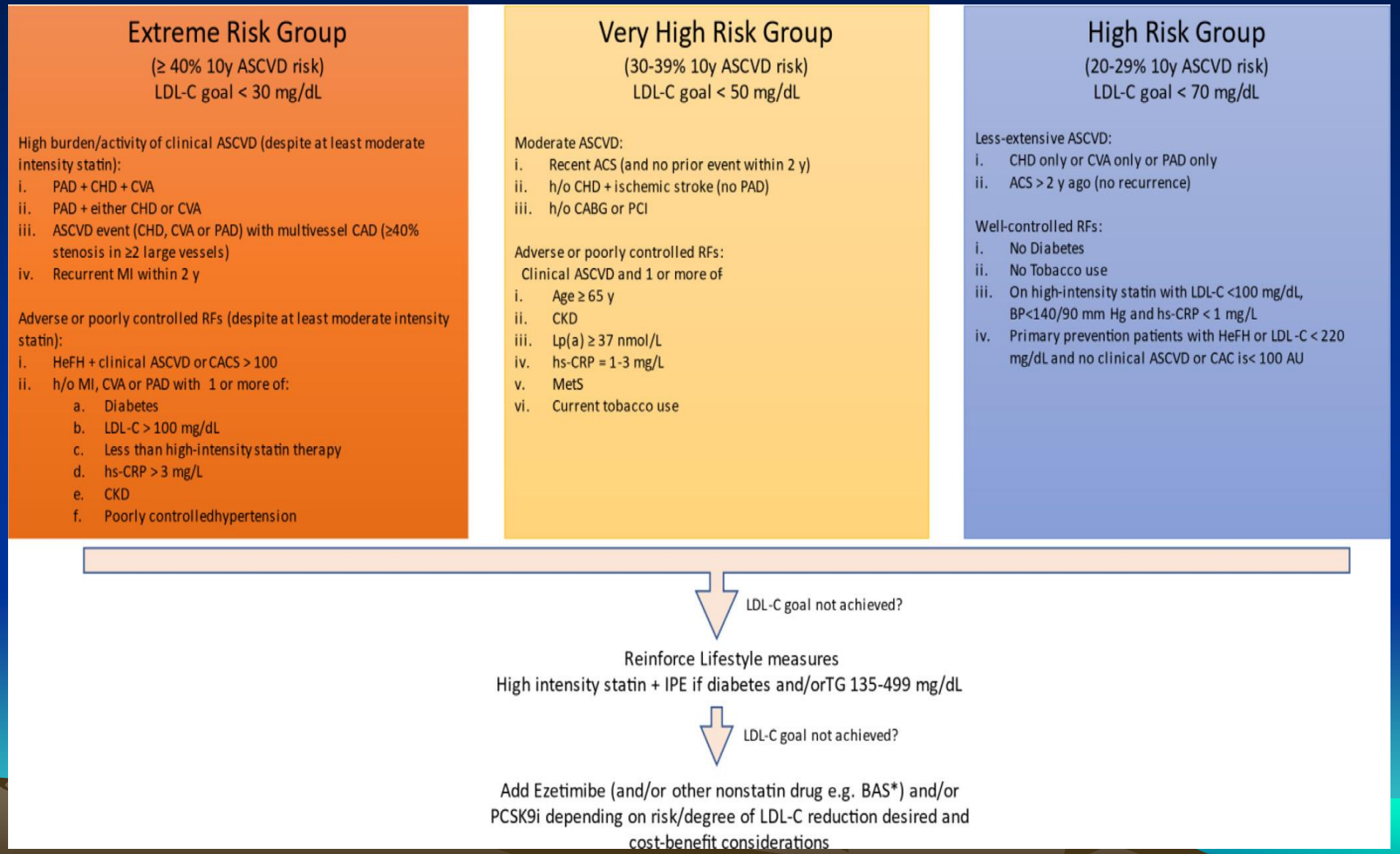
Olive oil, canola oil, safflower oil



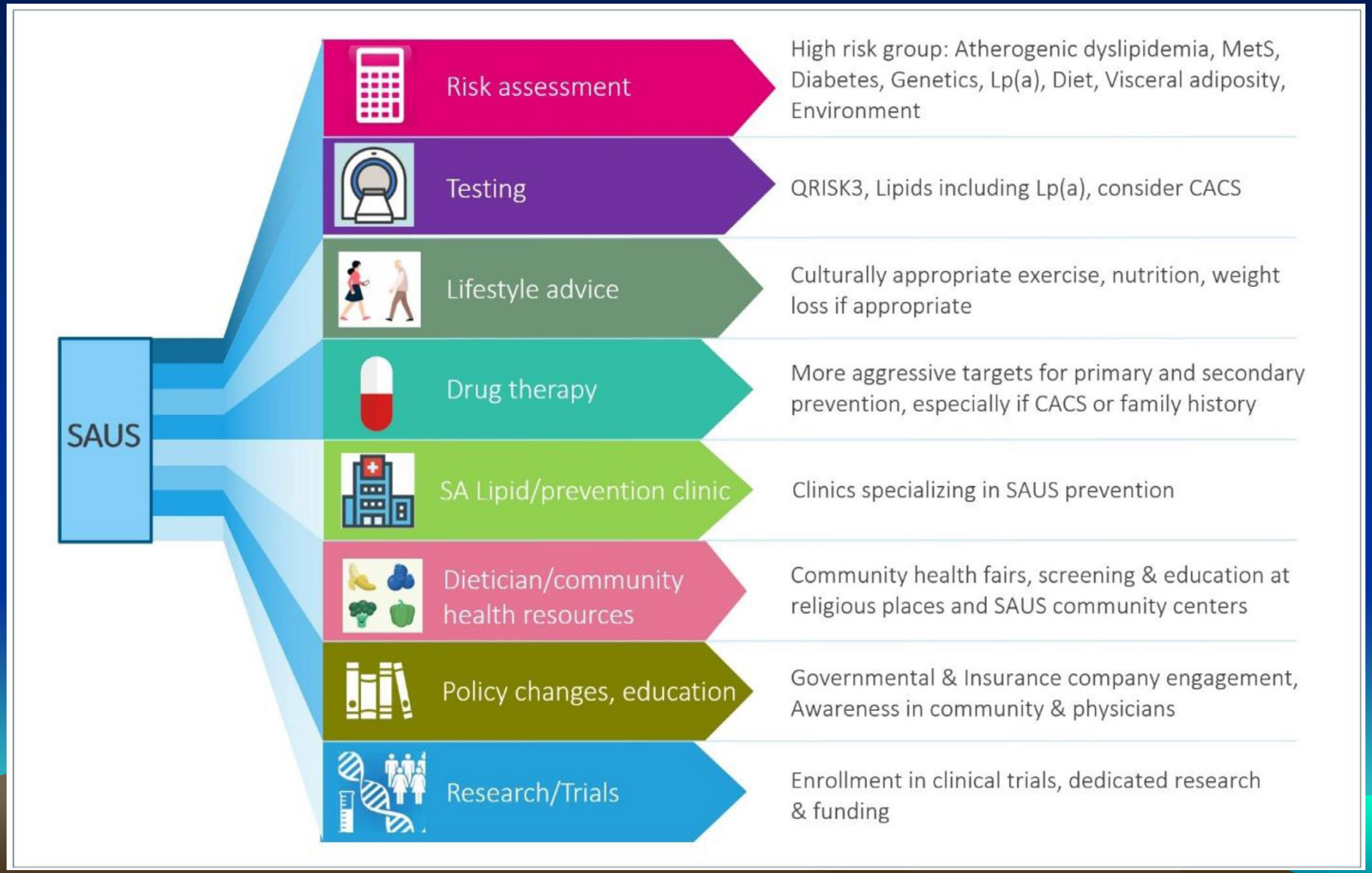
Avoid

Ghee, butter, palm oil, coconut products, mustard oil
Fried foods
Sugary products, processed foods
Adding salt to foods

Algorithm based lipid modification



Global Risk Reduction Algorithm



Call to action to address ASCVD risk in SAUS

- Increase awareness and educate the medical community about the higher prevalence of ASCVD events in SAUS and encourage the widespread utilization of risk assessment tools, such as the QRISK-3 calculator, which is calibrated and validated in SAs, as well as CAC scoring when appropriate

- Utilize goals to engage in shared decision making and to initiate preventive therapy including lifestyle modification and statins

- Develop culturally competent materials based on initiatives like 'Go Red' for women, AHA's Life Essential 8, and My Life Check, CMHC Certification

- Deploy new digital communication technologies to empower lifestyle modifications, e.g., track eating habits and exercise as well as pertinent biomarkers.

Call to Action

- Identify culturally appropriate interventions by conducting focus groups to identify the SAUS community's needs, develop training programs for patients and clinicians and deploy peer educators, and implement culturally-tailored community initiatives for abdominal adiposity and weight management programs in community centers.

- Perform faith-based interventions in temples, churches, mosques, and community centers where SAs congregate, including health fairs and free screening programs, including biomarker testing.

- Achieve policy change through advocacy by developing partnerships with the ACC, AHA, ADA, CMHC, and the Academy of Nutrition and Dietetics to promulgate specific nutrition recommendations for SAUS

- Encourage more participation of SAUS in clinical trials for new, as well as approved, therapies that have been shown to reduce ASCVD risk in largely White populations

Call to Action

- Utilize Data for early detection: EMR, Claims, Pharmacy, Nationwide HCUPS database
- Healthcare delivery Institutions : El Camino, Advocate
- Professional Societies: NLA, ACC, AHA, AACE, LAI, ADA
- Industry

Call to Action

- Community engagement and grassroots advocacy
- HR 3131: Senate: Health, ED, Labor and Pensions committee
- Faith based educational interventions
- Health fairs: Cricket matches. Events
- Health Promotion in schools
- Media, Technology, track and monitor, wearables
- Educate non Sas about SA risk
- Large Registry Pragmatic Intervention Trial

Intervention for SAs

- Lifestye modification, Diet, Fish
- Abdominal obesity to be aggressively managed
- Increase muscle strength and muscle mass with weight training exercises
- Consider ASA, Statins, Ezetimibe, Bempedoic acid, other lipid lowering agents, PCSK -9 antibody, Inclisiran, EPA
- Metformin, SGLT2i , GLP 1 RA, and ACEi or ARB (if high BP or diabetes to protect onset of kidney disease)
- Stress management with Yoga, Bhangra, Garba (YOBHAGA), Meditation, Spirituality, humor, Unconditional love (all to decrease Inflammatory markers)

Ongoing Studies in USA

- Translating a Heart Disease Lifestyle Intervention Into the Community
- MASALA (Mediators of Atherosclerosis in South Asians Living in America)
- San Francisco HealthPals (Chronic Cardiovascular Risk Outpatient Management in South Asians Using Digital Health Technology)
- Change of Fructose to Fat in South Asians

On Going Studies in UK

- United Kingdom GlasVEGAS Study (Glasgow Visceral & Ectopic Fat With Weight Gain in South Asians)
- AIMHY-INFORM (Comparison of Optimal Hypertension Regimens)
- A CALIBER Study Specific CVDs such as stroke and heart attack have been shown to vary by ethnic group.
- FISH MEAL (Effect of Fish Intake on Metabolic Health in a Diabetic South Asian Population)

On Going Studies in Canada

- START (South Asian Birth Cohort Study)
- SAHARA (South Asian Heart Risk Assessment Project)
- CLASS-ACT (Colesevelam, Lipids and Sugars, South Asian Canadian Trial)
- NAMASTE study in T2DM education

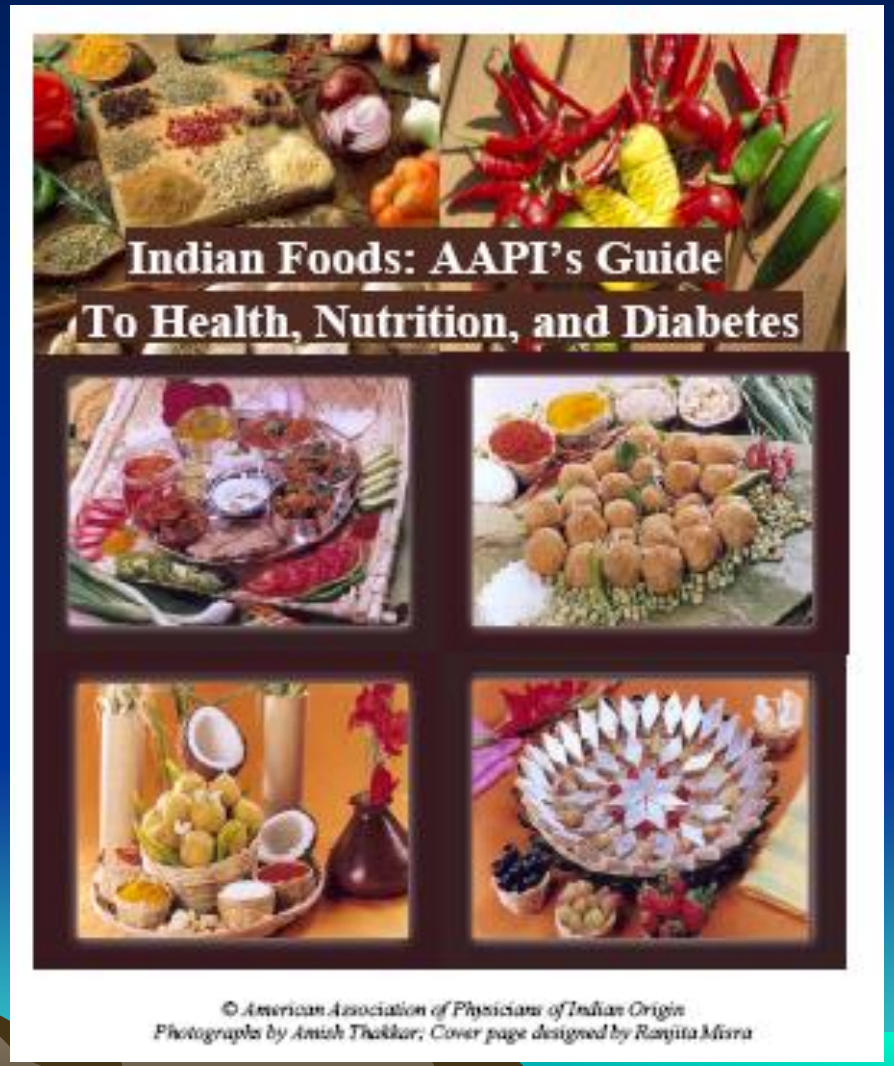
RESOURCES

South Asian Dietary Advice

Stanford University
School of Medicine
General Clinical Research Center

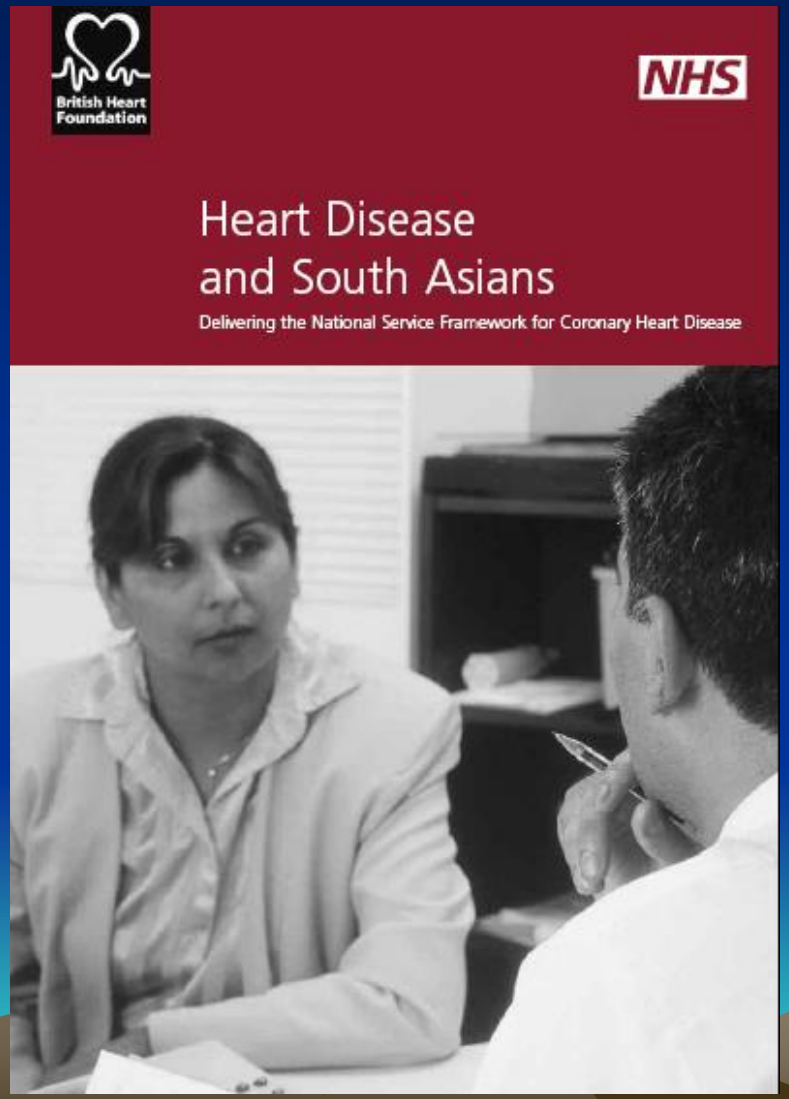
Various Recipes Available

Latha Palaniappan, MD, MS
Internal Medicine, Clinical Epidemiology
Stanford Center for Research in Disease Prevention
Phone: (650) 498-4427
E-mail: saiwwls@yahoo.com



RESOURCES

British Heart Foundation



RESOURCES

Clinician Update

- Gupta M, Singh N, Verma S.
- South Asians and Cardiovascular Risk: What Clinicians Should Know
- *Circulation* 2006;113 924-929

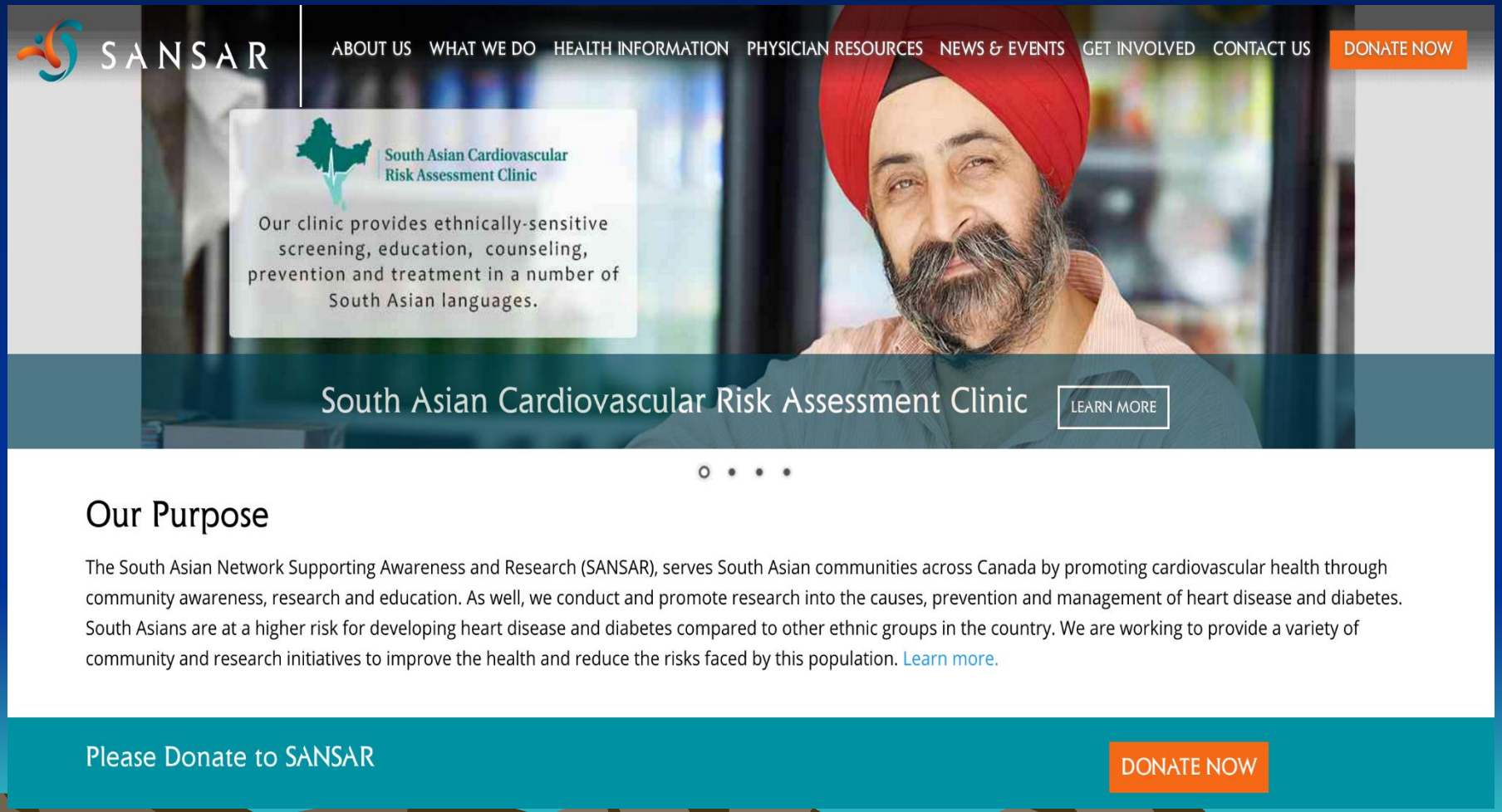
CLINICIAN UPDATE

South Asians and Cardiovascular Risk
What Clinicians Should Know

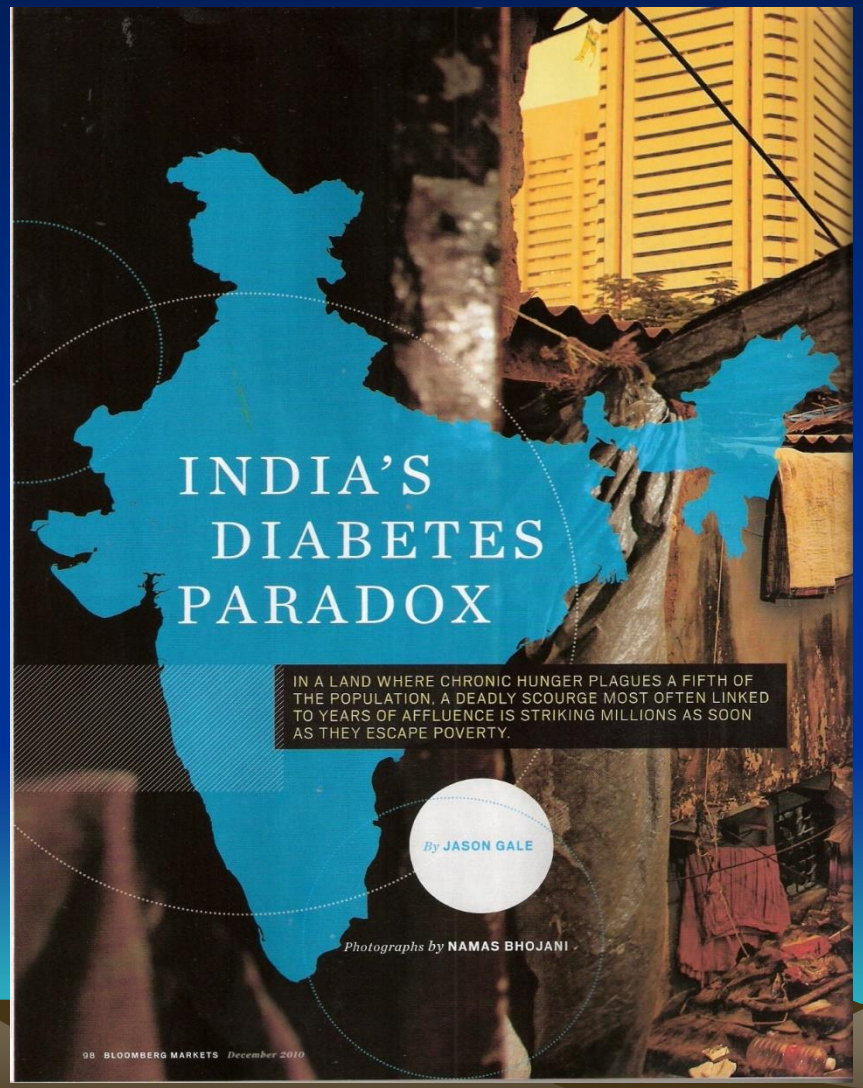
Milan Gupta, MD; Narendra Singh, MD; Subodh Verma, MD, PhD

RESOURCES

SANSAR website

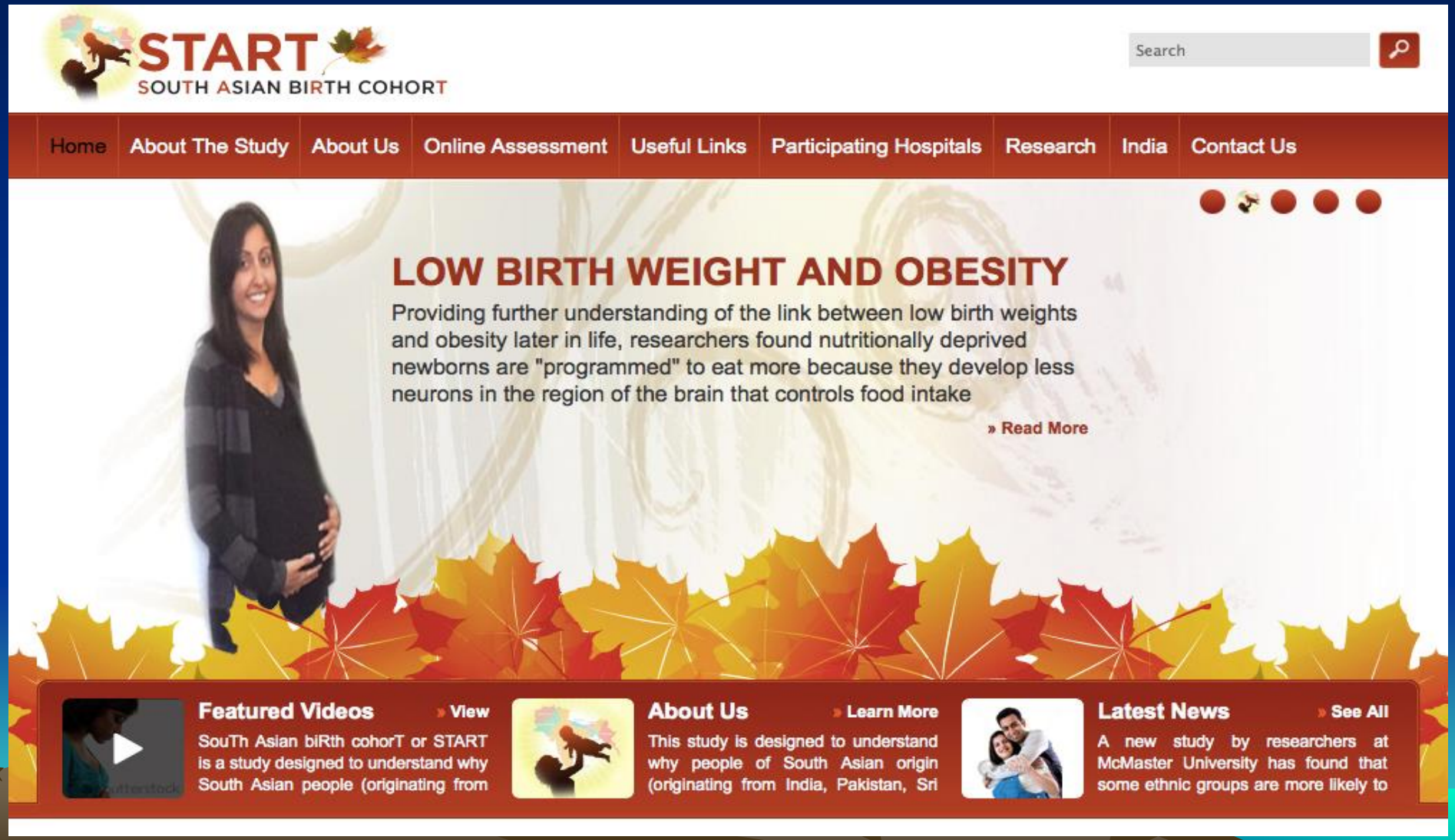


The Thin-Fat Paradox



START

Genetic and environmental causes of obesity in South Asian infants



Recent Publications

- Cardiometabolic-Renal Disease in South Asians: Consensus Recommendations from Cardio Renal Society of America : Cardiorenal Medicine Journal
- South Asian ancestry as a risk enhancer for ASCVD:
  Merits and challenges: Editorial JCL
- A Call To Action paper through SA Work Group of NLA addressing the “WHAT” and the “ HOW” of mitigating the epidemic of Diabetes and Heart Disease in SA community
- https://www.emedinexus.com/search.php?search=LAICON

“The rung of a ladder was never meant to rest upon, but only to hold a man’s foot long enough to enable him to put the other somewhat higher.”

-Aldous Huxley

CMHC
Cardiometabolic Health Congress

THURSDAY, MAY 25
9:00 AM PDT | 12:00 PM EDT

CARDIOVASCULAR DISEASE IN THE
SOUTH ASIAN/ASIAN AMERICAN POPULATION
A LOOMING TYPHOON AND A CALL TO ACTION

HOSTED BY:
Dr. Kris Vijay

Audience Questions?

Upcoming 2023 Meetings

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www.cardiometabolichealth.org