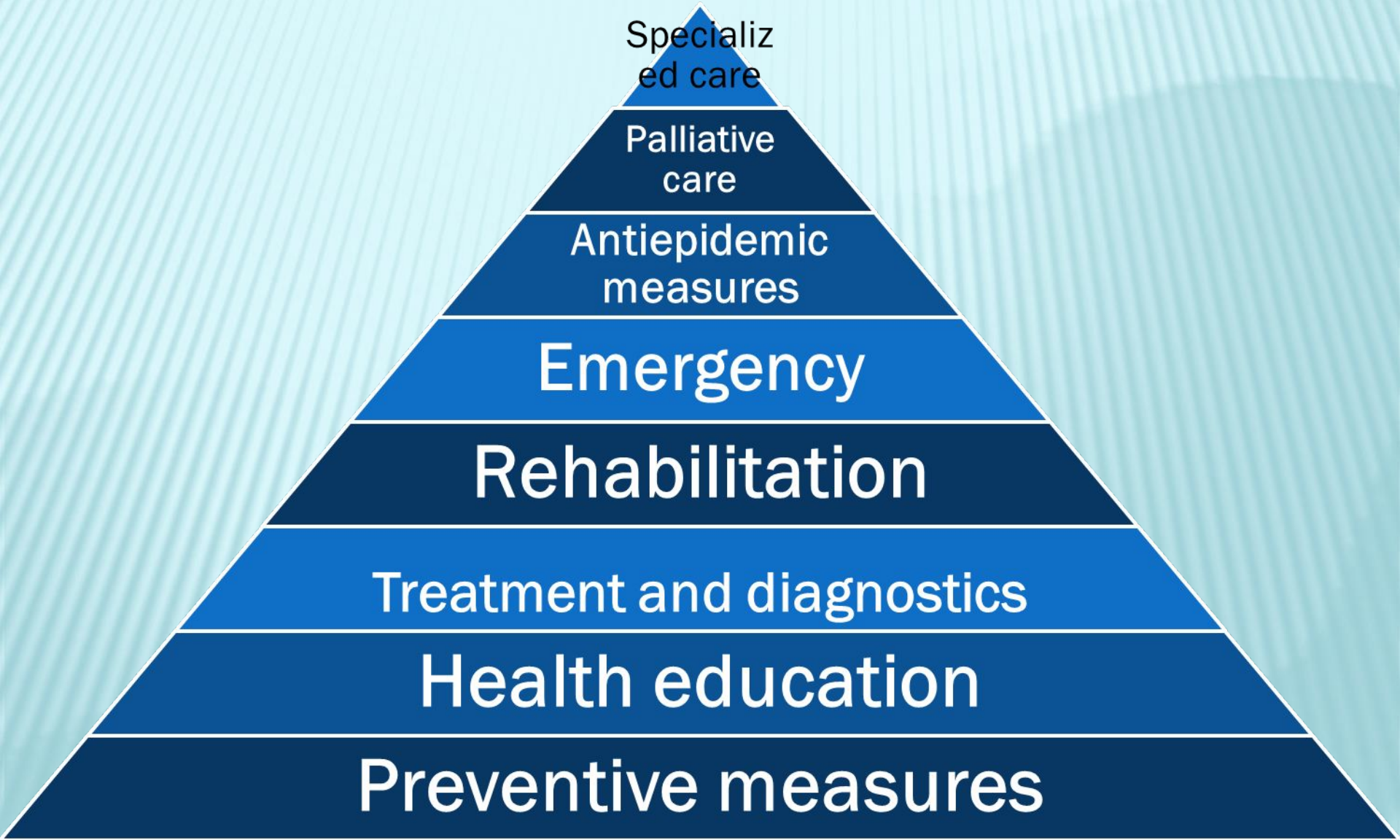
ZSMU

Department of general practice – family medicine

PROPHYLAXIS AS THE MAIN TASK OF A FAMILY DOCTOR

STRUCTURE OF PRIMARY CARE SERVICES



PREVENTIVE MEDICINE

- consists of measures taken to prevent diseases, (or injuries) rather than curing them or treating their symptoms.
- This contrasts in method with curative and palliative medicine, and in scope with public health methods (which work at the level of population health rather than individual health).

TYPES OF PREVENTION

Depending on the state of health, or risk factors or significant pathology they distinguish:

- **Primary**
- **Secondary**
- **Tertiary**

PRIMARY PREVENTION

- Methods to avoid occurrence of disease (vaccination, rational work and rest, good nutrition, physical activity, the environment, etc.).
- Most population-based health promotion efforts are of this type.

PRIMARY PREVENTION. FOR EXAMPLE:

- education about good nutrition, the importance of regular exercise, and the dangers of tobacco, alcohol and other drugs
- education and legislation about proper seatbelt and helmet use
- regular exams and screening tests to monitor risk factors for illness
- immunization against infectious disease
- controlling potential hazards at home and in the workplace

SECONDARY PREVENTION

- Methods to diagnose and treat existent disease in early stages before it causes significant morbidity
- Complex of measures aimed at significant risk factors, which under certain conditions can lead to the emergence, exacerbation or relapse.
- The most effective means is a preventive medical examination as a method of early detection of disease, and treatment.

SECONDARY PREVENTION. FOR EXAMPLE:

- telling people to take daily, low-dose aspirin to prevent a first or second heart attack or stroke
- recommending regular exams and screening tests in people with known risk factors for illness
- providing suitably modified work for injured workers

TERTIARY PREVENTION

- Methods to reduce negative impact of existent disease by restoring function and reducing disease-related complications
- Set of measures for the rehabilitation of patients.
- Tertiary prevention is aimed at social, labor, psychological and medical (functional recovery of organs and body systems) rehabilitation

TERTIARY PREVENTION. FOR EXAMPLE

- cardiac or stroke rehabilitation programs
- chronic pain management programs
- patient support groups

QUATERNARY PREVENTION

- Methods to mitigate or avoid results of unnecessary or excessive interventions in the health system

PREVENTION

- For many health problems, a combination of primary, secondary and tertiary interventions are needed to achieve a meaningful degree of prevention and protection.
- While primary and secondary prevention interventions are clear in areas like cancer or heart disease, such distinctions may be less useful in talking about musculoskeletal disorders.

PROPHYLAXIS

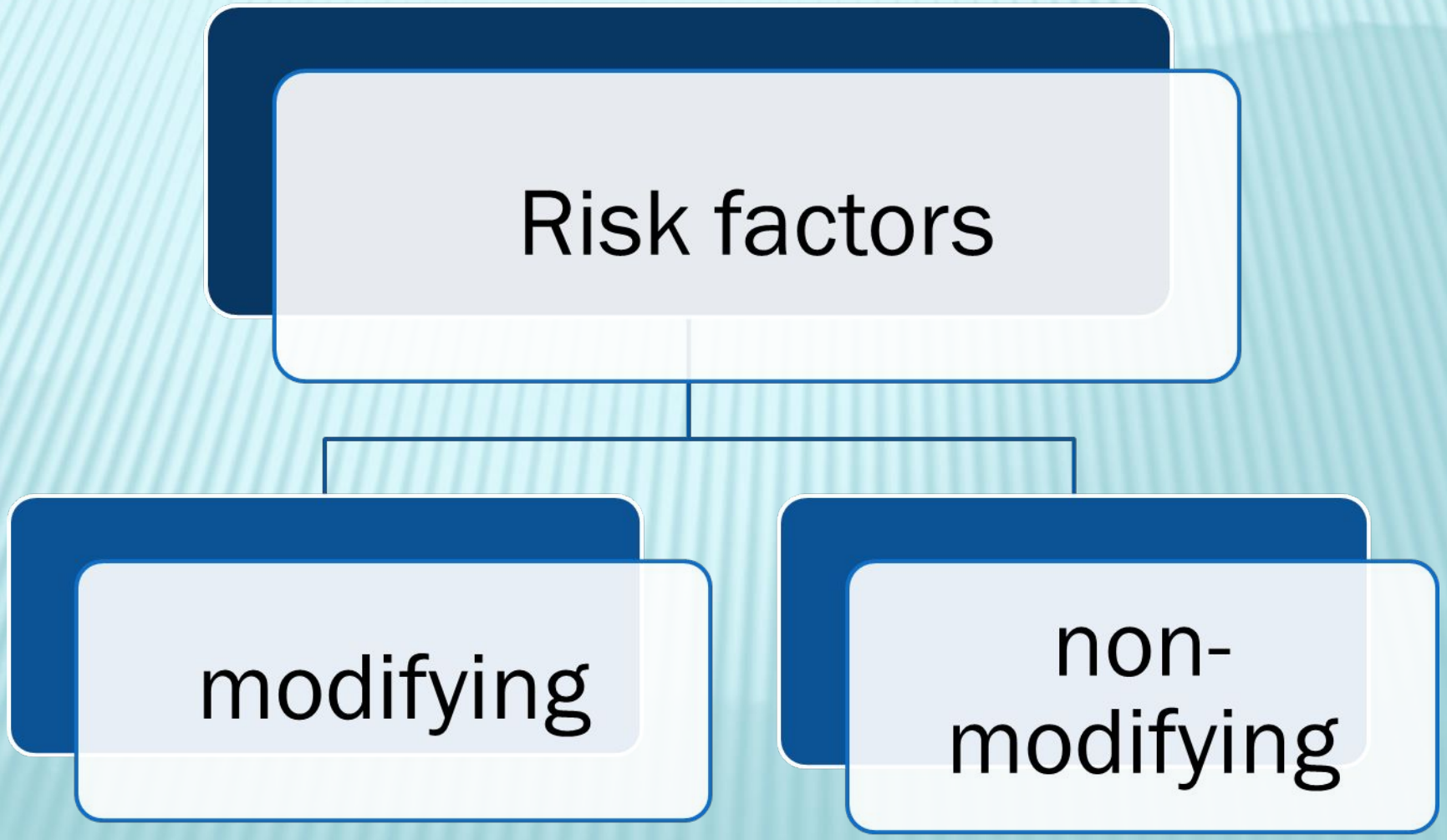
- (Greek: προφυλάσσω *to guard or prevent beforehand*)
- is any medical or public health procedure whose purpose is to prevent, rather than treat or cure, a disease or other medical issue.
- prophylactic measures are divided between: *primary* prophylaxis (to prevent the development of a disease) and *secondary* prophylaxis (whereby the disease has already developed and the patient is protected against worsening of this process)

RISK FACTORS

RISK FACTOR

- In epidemiology, a **risk factor** is a variable associated with an increased risk of disease or infection.
- The term "risk factor" was first coined by former Framingham Heart Study Director Dr. William B. Kannel a 1961 article in Annals of Internal Medicine.

CLASSIFICATION OF RISK FACTORS



RISK FACTORS OF CARDIOVASCULAR DISEASES

- An epidemic of chronic non-epidemic diseases, including cardiovascular, related to life style and appearance because of physiological risk factors.
- Cardiovascular disease is a leading cause of death. It is important to identify patient and treatment factors that are related to successful cardiovascular risk reduction in general pra

CLASSIFICATION OF RISK FACTORS OF CVD

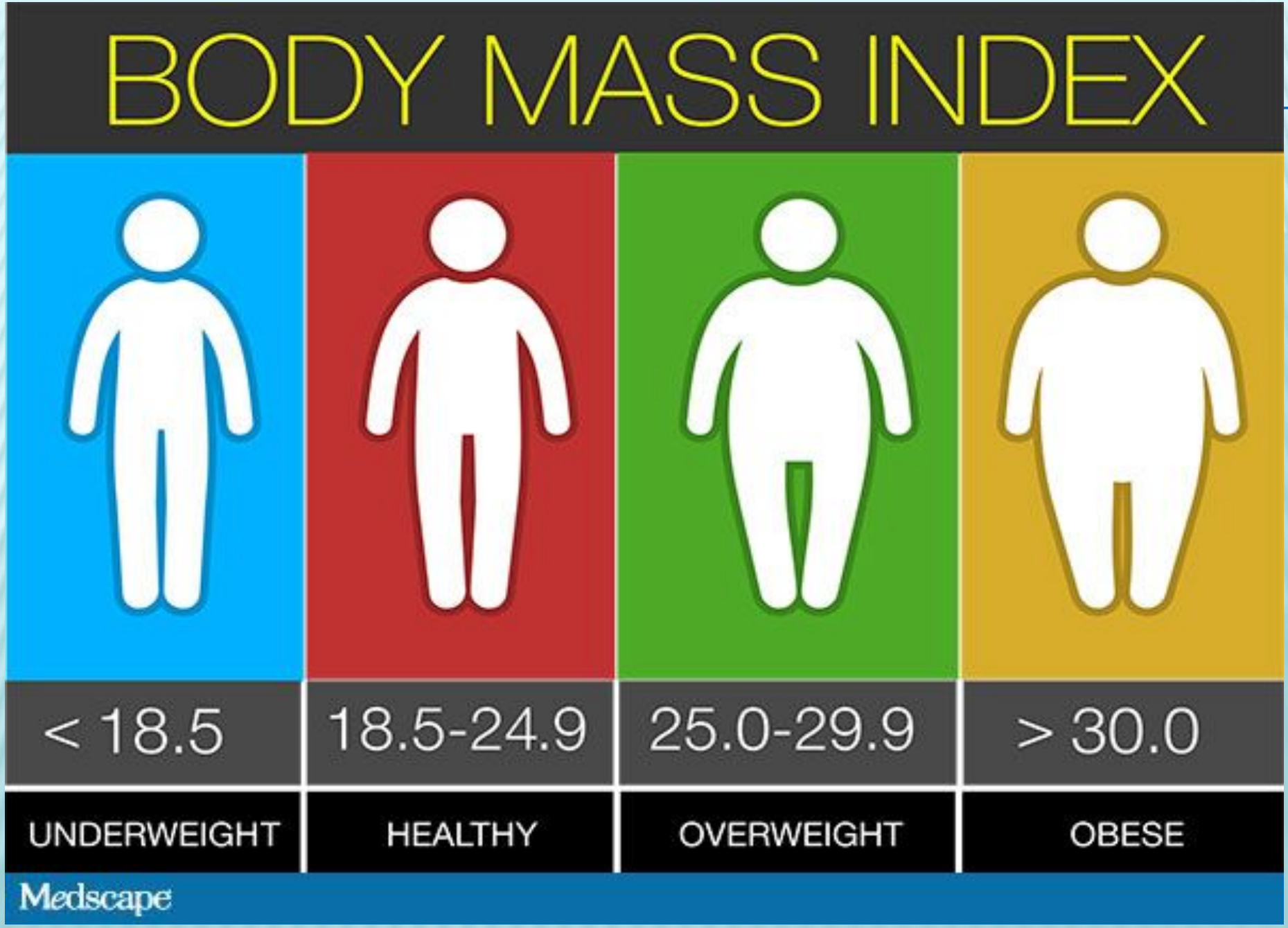
Biological (non-modifiable) factors:

- age
- sex or gender (male)
- genetic predisposition (dyslipidemia, hypertension, glucose intolerance, diabetes, and obesity)

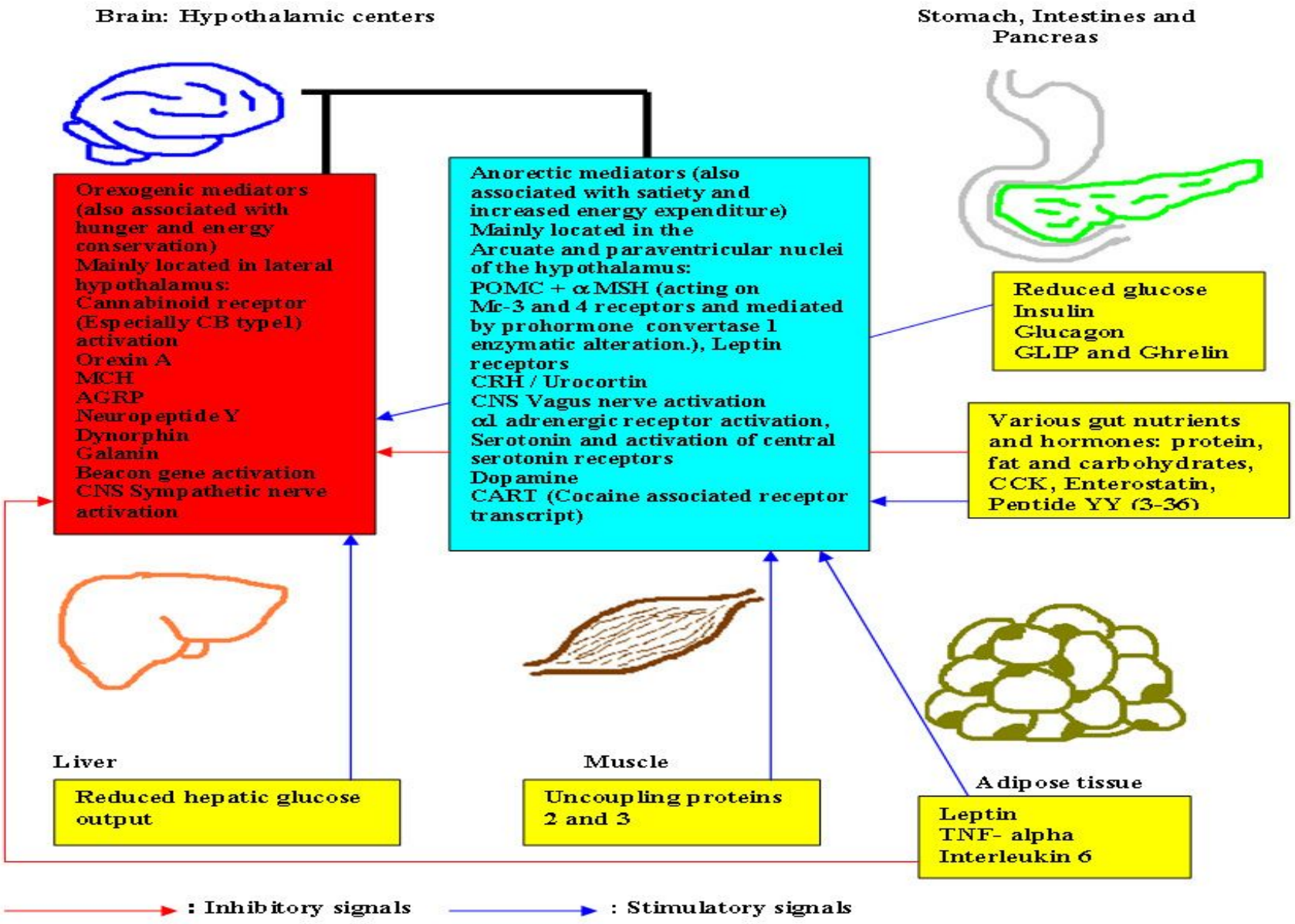
CLASSIFICATION OF RISK FACTORS OF CVD

Anatomical, physiological and metabolic (biochemical) features:

- dyslipidemia
- arterial hypertension
- obesity and the distribution of body fat
- diabetes mellitus


BODY MASS INDEX
< 18.5
18.5-24.9
25.0-29.9
> 30.0
UNDERWEIGHT
HEALTHY
OVERWEIGHT
OBESE
Medscape

Neuro-circuits related to the pathogenesis of Obesity and the Feeding Satiety cycle.



Relation Between BMI and Relative Risk for Comorbidities

- Women (BMI, 26 vs <21 kg/m^2)
  - Risk for coronary heart disease 2 times greater
  - Risk for diabetes 8 times greater
- Men (BMI, 26 vs < 21 kg/m^2)
  - Risk for coronary heart disease 1.5 times greater
  - Risk for diabetes 4 times greater

Risk for hypertension and risk for cholelithiasis 2 to 3 times greater among men and women with a BMI of 26 kg/m^2 vs <21 kg/m^2

Willett WC, et al. *N Eng J Med.* 1999;341:427-434.[13]

Figure 1

Obesity Comorbidities

Cardiovascular: Essential hypertension, coronary artery disease, left ventricular hypertrophy, cor pulmonale, obesity associated cardiomyopathy, accelerated atherosclerosis, pulmonary hypertension of obesity

Central nervous system: Stroke, idiopathic intracranial hypertension, meralgia paresthetica

Gastrointestinal tract: Gall bladder disease (cholecystitis and cholelithiasis), Non alcoholic steatohepatitis (NASH), fatty liver infiltration, reflux esophagitis.

Respiratory tract: Obstructive sleep apnoea, obesity hypoventilation syndrome (Pickwickian syndrome), increased predisposition to respiratory infections, increased incidence of bronchial asthma.

Malignancies: Association with endometrial, prostate, gall bladder, breast and colon cancer, ?? lung cancer

Psychologic: Social stigmatization, depression

Orthopedic: Osteoarthrosis, Coxa vara, Slipped capital femoral epiphyses, Blount's disease and Legg-Calve-Perthes disease, chronic lumbago

Metabolic: Insulin resistance, hyperinsulinemia, Type 2 Diabetes mellitus, dyslipidemia (characterized by high total cholesterol, high triglycerides, normal or elevated LDL and low HDL)

Reproductive: Anovulation, early puberty, infertility, hyperandrogenism and polycystic ovaries in women, hypogonadotrophic hypogonadism in men.

Obstetric and Perinatal: Pregnancy related hypertension, fetal macrosomia and pelvic dystocia.

Increased surgical risk and postoperative complications including wound infection, deep venous thrombosis, pulmonary embolism and postoperative pneumomia.

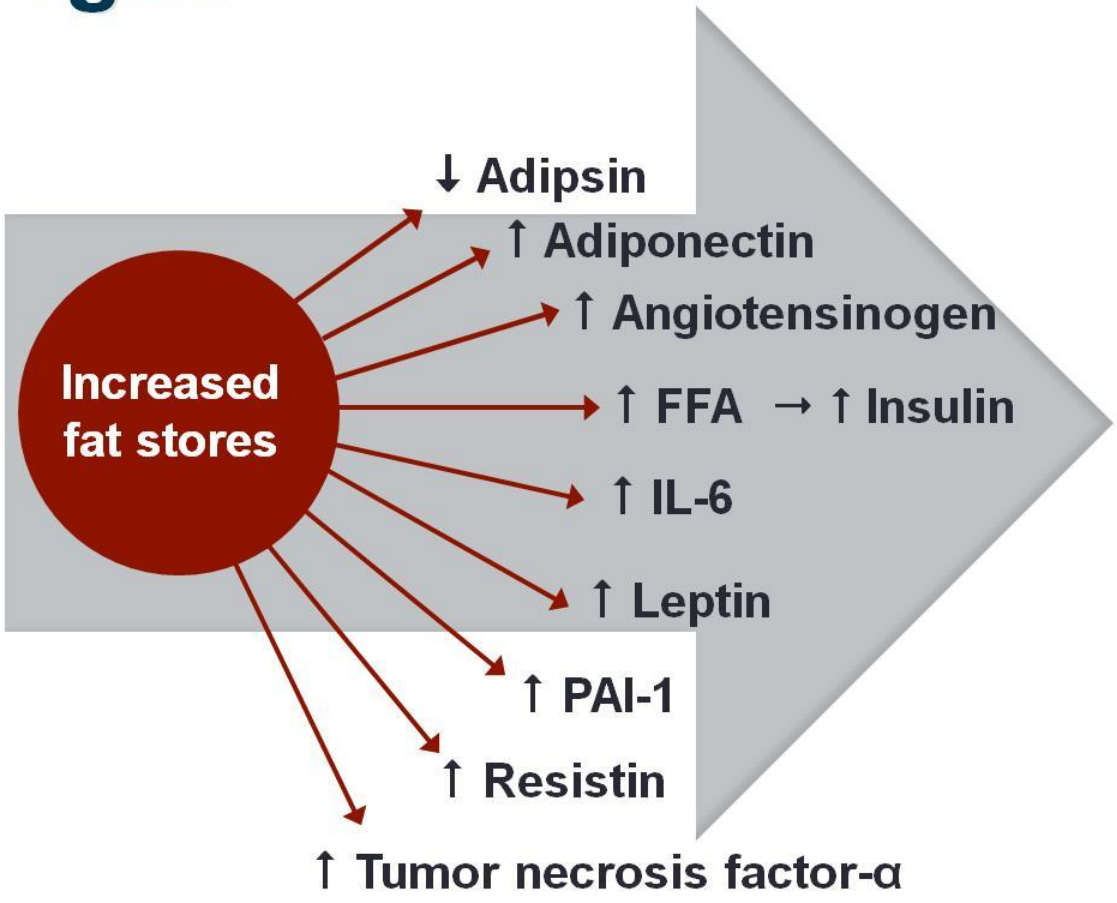
Pelvic problems: Stress incontinence

Cutaneous: Intertrigo (both bacterial and/or fungal), acanthosis nigricans, hirsuitism, increased risk for cellulites, carbuncles.

Extremities: venous varicosities, lower extremity venous and/or lymphatic edema

Miscellaneous: reduced mobility, difficulty maintaining personal hygiene

How Obesity Causes Disease: Adipose Tissue as an Endocrine Organ



- Inflammation
- Dyslipidemia
- T2D
- Hypertension
- ASCVD
- Thrombosis
- Arthritis

Bays HE, et al. *Expert Rev Cardiovasc Ther*. 2008:343-368[14]; Bray, G. *J Clin Endocrinol Metab*. 2004;89:2583-2589[15]; Eckel RH, et al. *Lancet*. 2005;365:1415-1428.[16]

Figure 2

Secondary Causes of Obesity

1. Hypothyroidism
2. Cushing's syndrome
3. Insulinoma
4. Hypothalamic obesity
5. Polycystic ovarian syndrome
6. Genetic syndromes such as Prader Willi, Alstroms, Bardet Biedl, Cohens, Borjeson Forsmsman Lehmann and Frohlich's syndrome
7. Growth hormone deficiency
8. Oral contraceptive use
9. Pregnancy
10. Medication related: including phenothiazines, sodium valproate, carbamazepine, tricyclic antidepressants, lithium, glucocorticoids, megesterol acetate, the thiazolidine diones, the sulphonylureas, insulin, adrenergic antagonists, serotonin anatagonists especially cyproheptadine.
11. Smoking cessation
12. Eating disorders: especially binge eating disorder, bulimia nervosa and night eating disorder
13. Hypogonadism
14. Pseudohypoparathyroidism
15. Tube feeding related obesity

ALCOHOL AND THE BRAIN: THE GOOD AND THE BAD

- Excessive alcohol consumption can have disastrous health consequences.
- Heavy use is associated with increased risk for injury;
- spousal or child abuse;

ALCOHOL AND THE BRAIN: THE GOOD AND THE BAD

- risky sexual practices;
- and serious medical consequences, such as liver disease, hypertension, and gastrointestinal cancers.
- Chronic excessive alcohol use can wreak particular havoc on the brain, increasing the risk for dementia, stroke, and psychosocial impairment [Centers for Disease Control and Prevention. Fact sheets -- alcohol use and health. http://www.cdc.gov/alcohol/fact-sheets/alcohol-use.htm Accessed February 5, 2014.].

ALCOHOL AND THE BRAIN

- But mild to moderate consumption* has been linked to various health benefits, including many with implications for the brain.
- *The US Food and Drug Administration defines "moderate alcohol consumption" as up to 1 drink per day for women and up to 2 drinks per day for men.
- One drink is equivalent to 12 fluid ounces of regular beer, 5 fluid ounces of 12% alcohol wine, or 1.5 fluid ounces of distilled spirits.

ALCOHOL AND THE BRAIN

ALCOHOL AND THE BRAIN

Mild to moderate consumption:

- Antiatherogenic
- Anti-inflammatory
- Improved cholesterol profiles
- Improved clotting function
- Improved insulin sensitivity
- Lower stroke risk

Heavy consumption:

- Hypertension
- Increased hemorrhagic stroke risk

BOOZE AND THE BRAIN

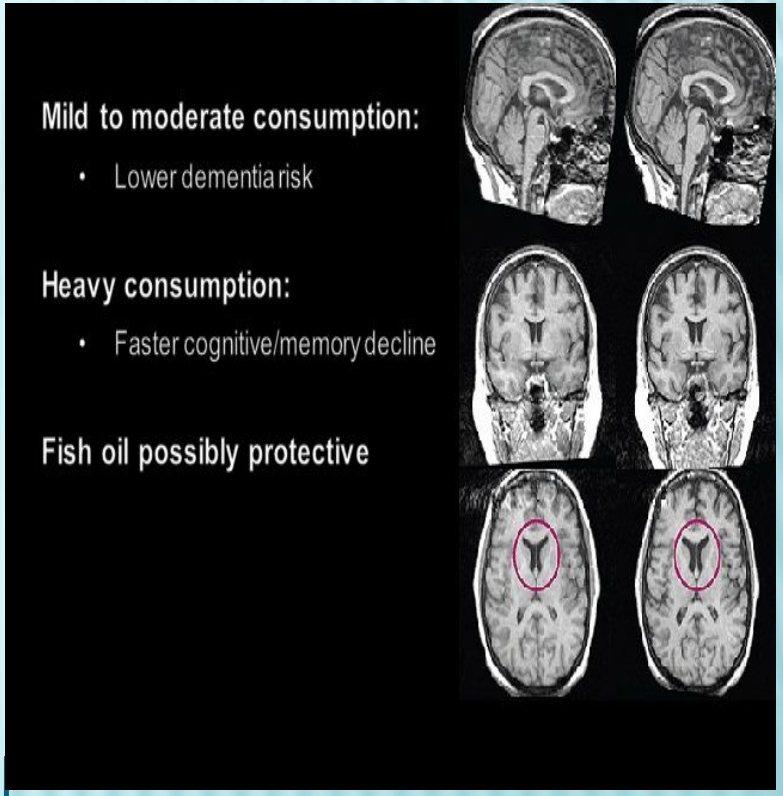
- Numerous studies suggest that mild to moderate intake is protective against cardiovascular disease, perhaps owing to the effects of alcohol itself and to antioxidant polyphenol compounds.
- Red wine reportedly has the most benefit, whereas beer -- particularly dark beers, such as stouts and porters -- also has purported cardiovascular benefits, though to a lesser degree.
- Specifically, alcohol consumption reportedly has antiatherogenic and anti-inflammatory effects and has been tied to improved cholesterol profiles, platelet and clotting function, and insulin sensitivity, all factors with potentially beneficial neurologic ramifications. [de Gaetano G, Di Castelnuovo A, Rotondo S, Iacoviello L, Donati MB. A meta-analysis of studies on wine and beer and cardiovascular disease. Pathophysiol Haemost Thromb. 2002;32:353-355: Matos RS, Baroncini LA, Précoma LB, et al. Resveratrol causes antiatherogenic effects in an animal model of atherosclerosis. Arq Bras Cardiol. 2012;98:136-142.
- Bertelli AA, Das DK. Grapes, wines, resveratrol, and hearth health. J Cardiovasc Pharmacol. 2009;54:468-476.

BOOZE AND THE BRAIN

- Light to moderate alcohol intake has also been linked with a lower risk for both ischemic and hemorrhagic stroke [Jimenez M, Chiuve SE, Glynn RJ, et al. Alcohol consumption and risk of stroke in women. Stroke. 2012;43:939-945]
- However, heavy consumption is associated with increased risk for hemorrhagic stroke and more severe ischemic cerebral events [Casolla B, Dequatre-Ponchelle N, Rossi C, Hénon H, Leys D, Cordonnier C. Heavy alcohol intake and intracerebral hemorrhage: characteristics and effect on outcome. Neurology. 2012;79:1109-1115; Ducroquet A, Leys D, Al Saabi A, et al. Influence of chronic ethanol consumption on the neurological severity in patients with acute cerebral ischemia. Stroke. 2013;44:2324-2326.]
- It should be pointed out that many of the studies looking at the impact of alcohol on cardiovascular health were observational and do not prove causality.

COGNITION AND DEMENTIA

- Limited alcohol use has also been associated with a lower risk for dementia
- Heavy consumption appears to be severely detrimental to the brain. One study found that middle-aged men who drink more than 2.5 drinks daily are more likely to undergo faster decline in all cognitive areas -- particularly memory -- over a period of 10 years (*Neurology*, January 2014)
- Animal studies suggest that fish oil might be protective against alcohol-induced dementia by attenuating the neuronal degeneration caused by heavy



THE DEVELOPING BRAIN

Image from Thinkstock

PSYCHOSOCIAL IMPACT

- Excessive alcohol use can contribute to psychiatric pathology, with nearly one third of abusers suffering from a mental illness.
- Alcohol is well known to have considerable psychosocial ramifications for those who abuse it, including increased risk for legal troubles, social and occupational impairment, and domestic abuse, and a higher likelihood of attempting and committing suicide.
- Overindulging can also bring about symptoms that mimic a wide range of psychiatric conditions, including mood, anxiety, psychotic, sleep, sexual, delirious, and amnestic disorders.
- The psychiatric manifestations of alcohol may be partially mediated by its influence on neurotransmitter function, particularly the loss of serotonergic function. Women are far more vulnerable to the serotonergic imbalance caused by heavy drinking than are men.

THE NEUROSCIENCE

- The alcohol produces increases in dopamine in the mesocorticolimbic reward pathway.
- In social drinkers, subjective intoxication during intravenous ethanol administration activates reward circuitry, including the nucleus accumbens. This activation contributes to the subjective experience of pleasure and weakens responses to fearful stimuli.
- Heavy drinkers exhibit blunted nucleus blunted activation with alcohol consumption, suggesting that they experience a reduced pleasure response. In social drinkers, alcohol also enhances nucleus accumbens activation to a risky choice and dampens the response in striatum, thalamus, and insula to both positive and negative outcomes. Thus, risky behavior may be experienced as more rewarding under the influence of alcohol, whereas consequences are less salient.

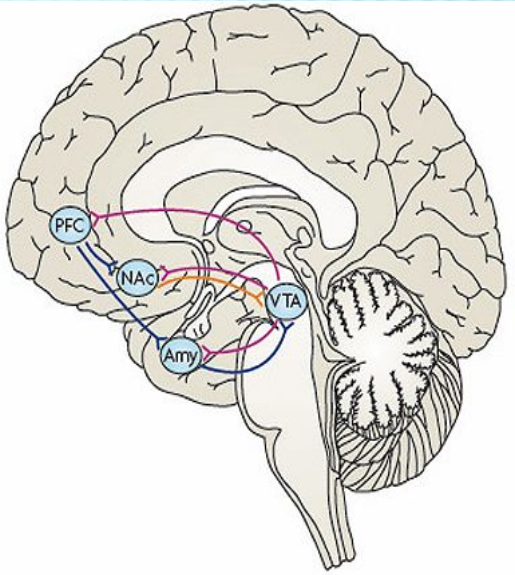


Image courtesy of nimh.nih.gov

ALCOHOL AND THE BR

Alcohol has complex interactions both acutely and chronically, with many brain systems that vary considerably with the age and genetic makeup of the drinker. In moderation, alcohol may benefit the brain.

However, the psychiatric, neurologic, and other medical costs of excessive consumption can quickly outweigh the benefits.

Thus, there is a need for improved diligence among clinicians to appreciate the prevalence and ramifications of heavy alcohol use on both brain and general health and to facilitate screening and treatment for alcohol misuse disorders.

Evaluation of cardiovascular risk

EVALUATION OF CARDIOVASCULAR RISK

- **SCORE** - is the abbreviation of English words, which translated means "the systematic assessment of coronary risk";
- The above scale proposed by the expert group of the European Society of Cardiology in 2003, was developed based on the results of prospective studies conducted in 12 European countries (the total number surveyed

SCORE

According to SCORE there such degrees of risk for cardiovascular complications:

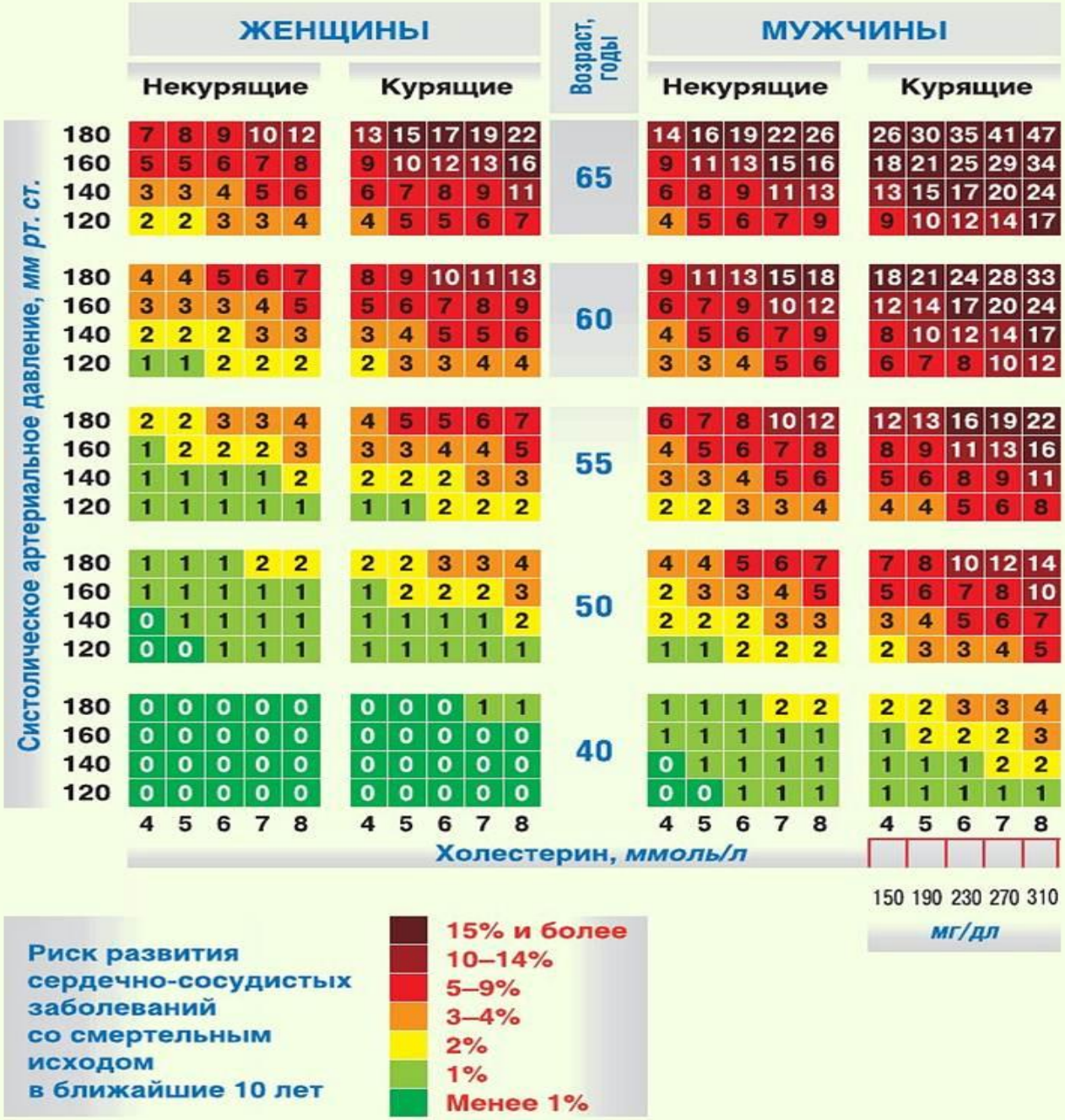
<4% - low risk;

4,1-5% - moderate risk;

5,1-8,0% - high risk;

> 8% - a very high risk

Шкала SCORE для определения риска смерти от сердечно-сосудистого заболевания в ближайшие 10 лет



SCORE

- The scale SCORE consists of two halves: the left for women and the right for men.
- In each half columns are available for smokers and non-smokers.
- The columns are made up of 5 large squares, age-appropriate (bottom-up: 40, 50, 55, 60 and 65).
- In a larger square rows match the level of systolic pressure and columns - the level of cholesterol.
- The numbers in the cells shows percent of risk

SCORE

- Note that only three categories of people who automatically belong to the high risk group, do not require a risk assessment on a scale SCORE: these patients with diagnosed coronary heart disease, with diabetes and those who have extremely high levels of individual risk factors. The rest of the population is subject to a

WHAT IS THE ADVANTAGE OF THIS SCALE?

- It makes it possible not only to determine the level of risk, but also to predict its dynamic future.
- Identify specific ways to reduce it.
- With SCORE scale is possible to predict the overall cardiovascular risk by age 60 years in the future, which is extremely important for young people who have an absolute chance of death from cardiovascular disease is low, but determined adverse risk factor profile, which worsens with age .

RISK FACTORS FOR RESPIRATORY DISEASES

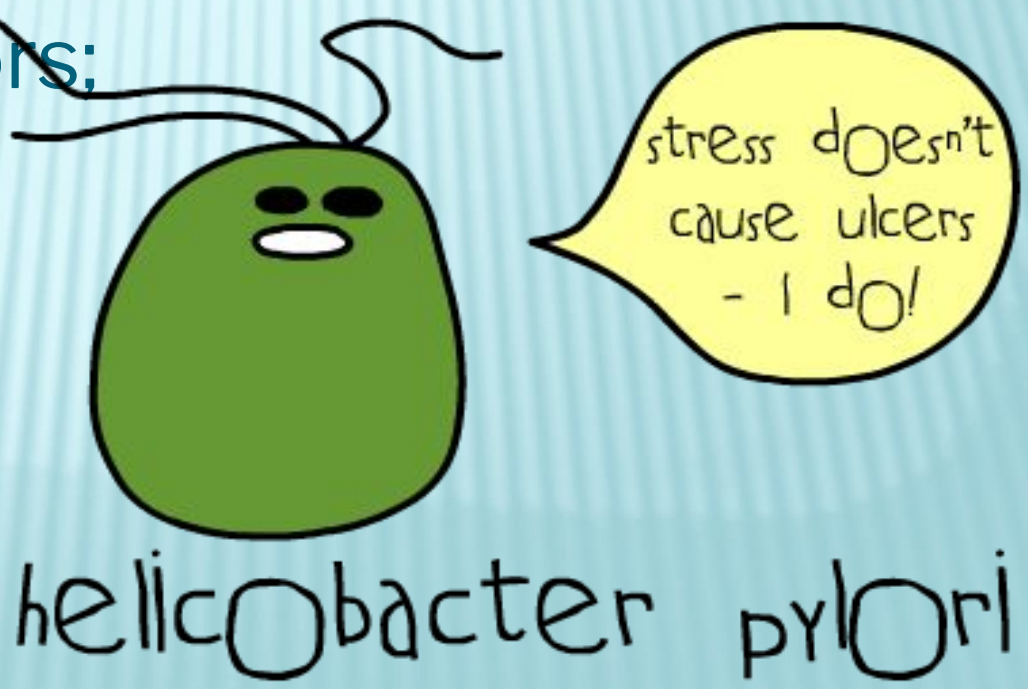
- **External risk factors** - long term smoking, industrial and household emissions, respiratory infections, low socioeconomic status, use of certain drugs, allergens;

INTERNAL RISK FACTORS

Genetic, bronchial hyperresponsiveness, atopy, the incomplete development of the lungs, obesity

RISK FACTORS FOR DISEASES OF THE DIGESTIVE SYSTEM

- Nutritional factor;
- Neuropsychiatric factors;
- Unhealthy habits;
- Chronic intoxication process;
- Occupational factors;
- Genetic factor;
- H. Pylori;



RISK FACTORS FOR DISEASES OF URINARY SYSTEM

- Catarrhal diseases, hypothermia;
- abnormalities, genetic factor;
- trauma and injury, physical strain;
- infectious diseases (otolaryngology);
- poisons, drugs, intoxication;
- heart disease and blood vessels and other internal organs;
- pregnancy, cancer, constipation, etc.

PCRM Dietary Guidelines for Alzheimer Disease Prevention

1. Minimize saturated fats and trans fats
2. Primary staples are vegetables, legumes, fruits, and whole grains
3. One ounce of nuts or seeds daily provides a healthful source of vitamin E
4. Diet should include a reliable source of vitamin B_{12} (at least 2.4 µg/day for adults)
5. Choose multivitamins without iron and copper; iron supplements only when directed by your physician
6. Avoid the use of cookware, antacids, baking powder, or other products that contribute dietary aluminum
7. Engage in aerobic exercise equivalent to 40 minutes of brisk walking 3 times per week


Let's get
healthy