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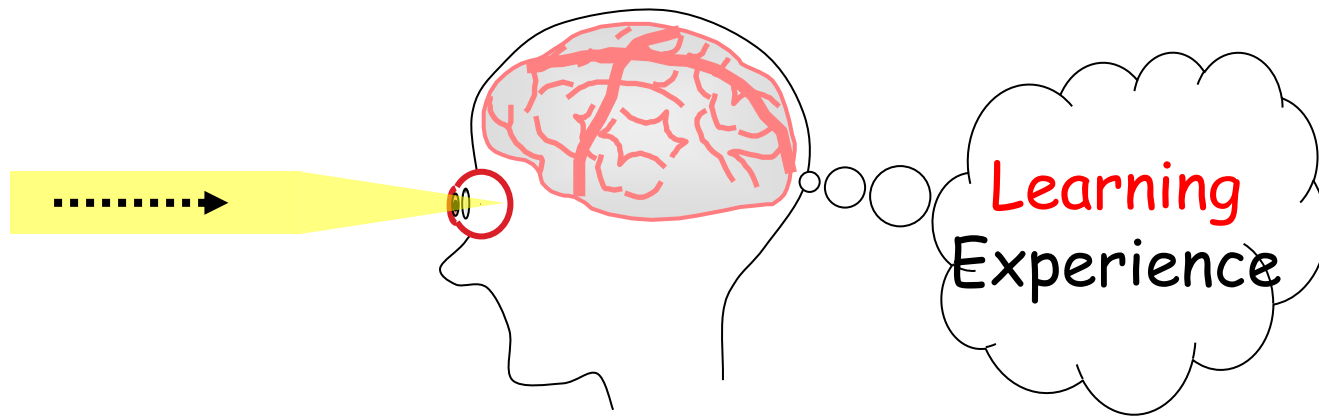
L'Université canadienne
Canada's university

PREVENTING AND FIGHTING DISEASE, RISKS AND RESPONSIBILITIES

A look at Chronic Conditions

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Lecture Objectives



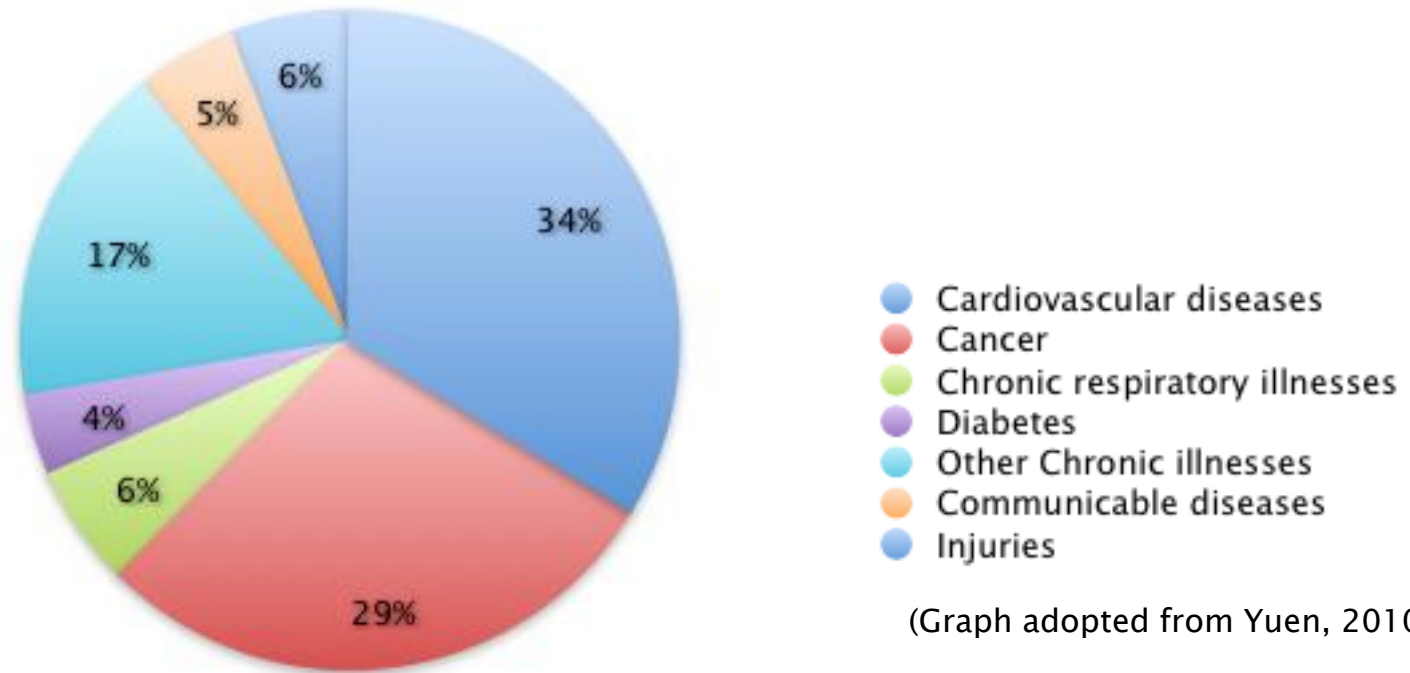
- ▶ Chronic diseases and its prevalence
- ▶ Anatomy and physiology of the heart and circulatory system
- ▶ Common types of chronic diseases
- ▶ Types of heart disease and the risks factors for developing them
- ▶ The symptoms, causes, and risk factors of diabetes
- ▶ Types of cancer and the risks factors for developing it
- ▶ Prevention of chronic disease

Chronic Disease

- ▶ **Definition:** “Illnesses that are prolonged, do not resolve spontaneously and are rarely cured completely.” (Marks, 2003)
- ▶ Often referred as non-communicable disease (NCD)
- ▶ Chronic diseases account for 63% of deaths worldwide (WHO, 2012)

J.S.Marks The burden of chronic disease and future of public health. National Center for Chronic Disease Prevention & Health Promotion, January 13, 2003.

Leading Causes of Death in Canada, 2005



- ▶ Five major chronic diseases in Canada
 - Cardiovascular Diseases
 - Cancers
 - Diabetes
 - Respiratory Disease
 - Mental Illness (e.g. depression)

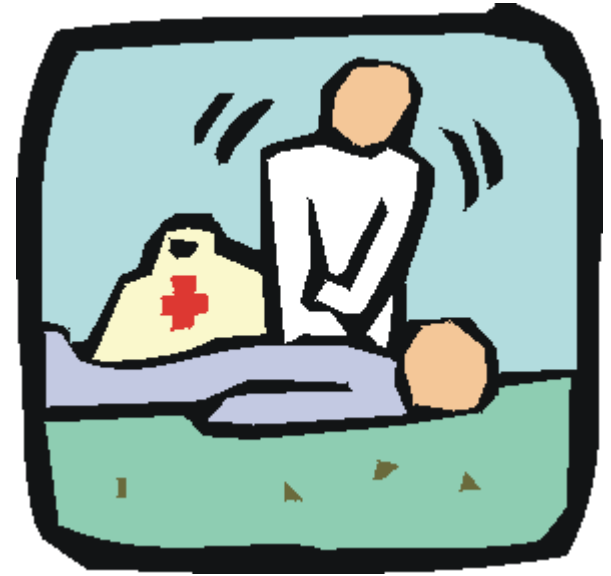
Cardiovascular Diseases (CVD)

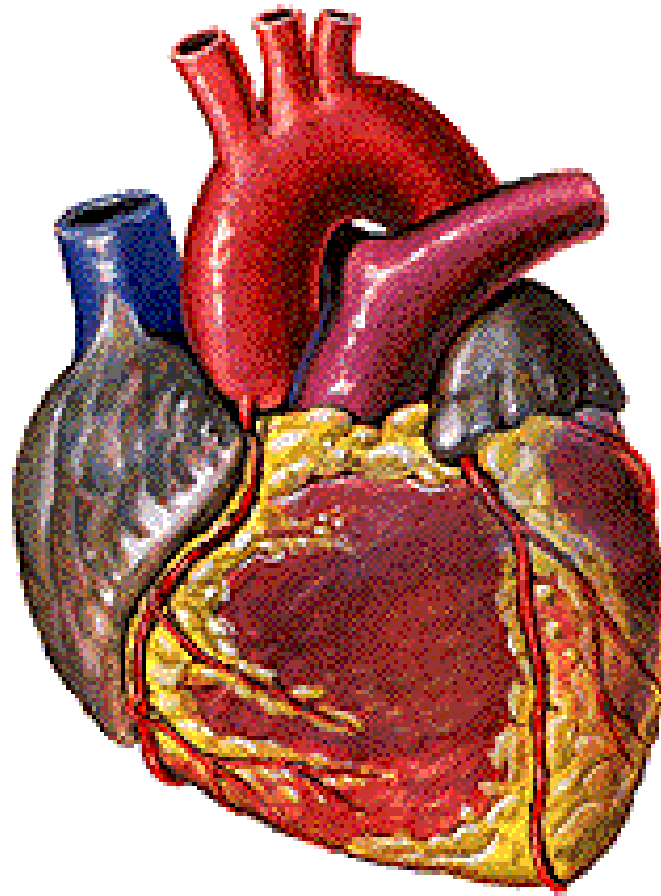
- ▶ **Definition:** A class of diseases of heart and blood vessels
- ▶ Leading cause of death worldwide.
- ▶ In Canada, CVD account for more than 32 percent of all deaths

CVD (cont.)

▶ Death rates from CVD are declining as the following reasons

- advances in medical techniques
- earlier and better diagnostic procedures and treatments
- better emergency medical assistance programs
- better training of people in cardiopulmonary resuscitation (CPR)





Heart beat

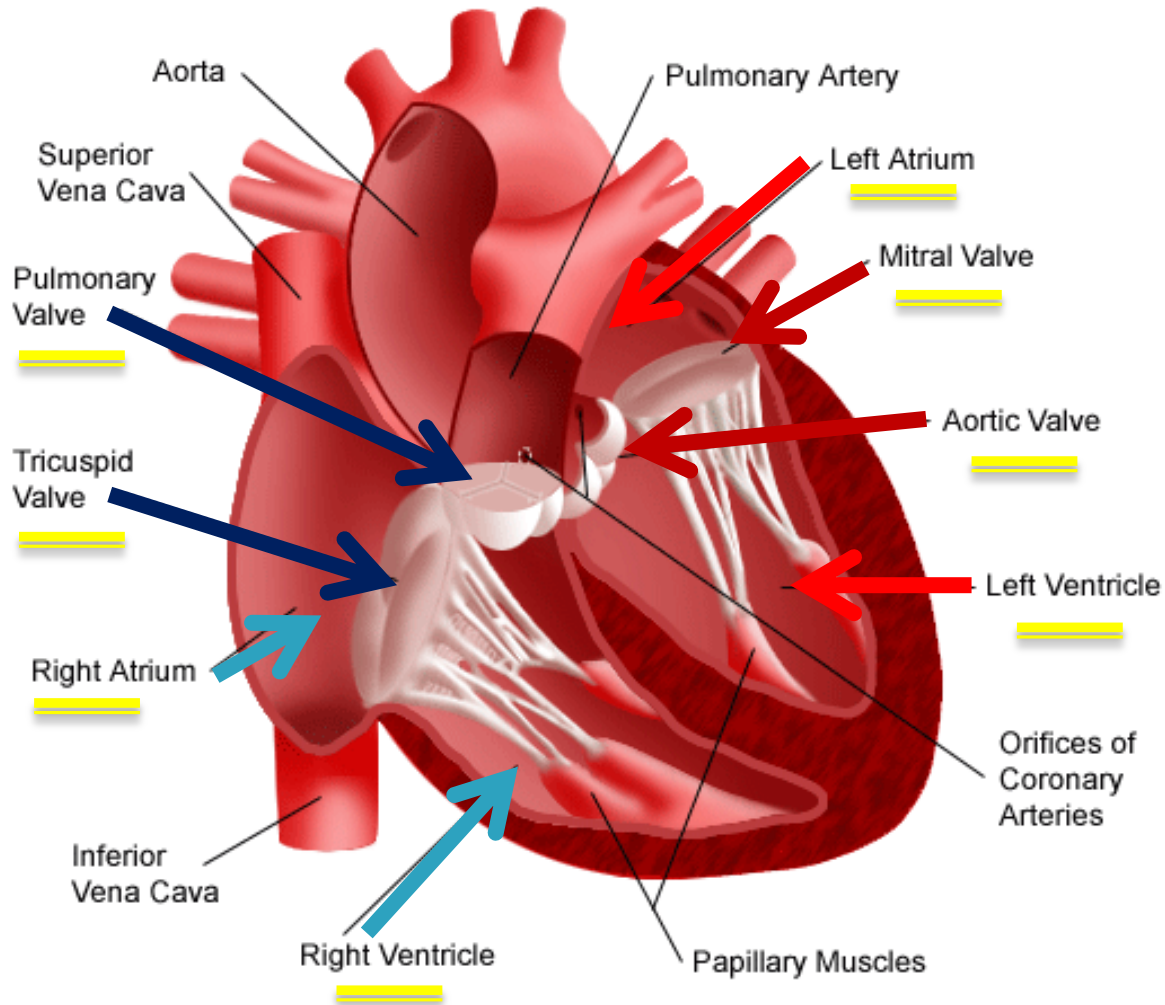
Cardiovascular System



- ▶ System comprising heart, lungs, and blood vessels
- ▶ Transports nutrients, oxygen, hormones, enzymes throughout the body
- ▶ Regulates temperature, water levels of cells, and acidity levels of body components

Anatomy of Heart

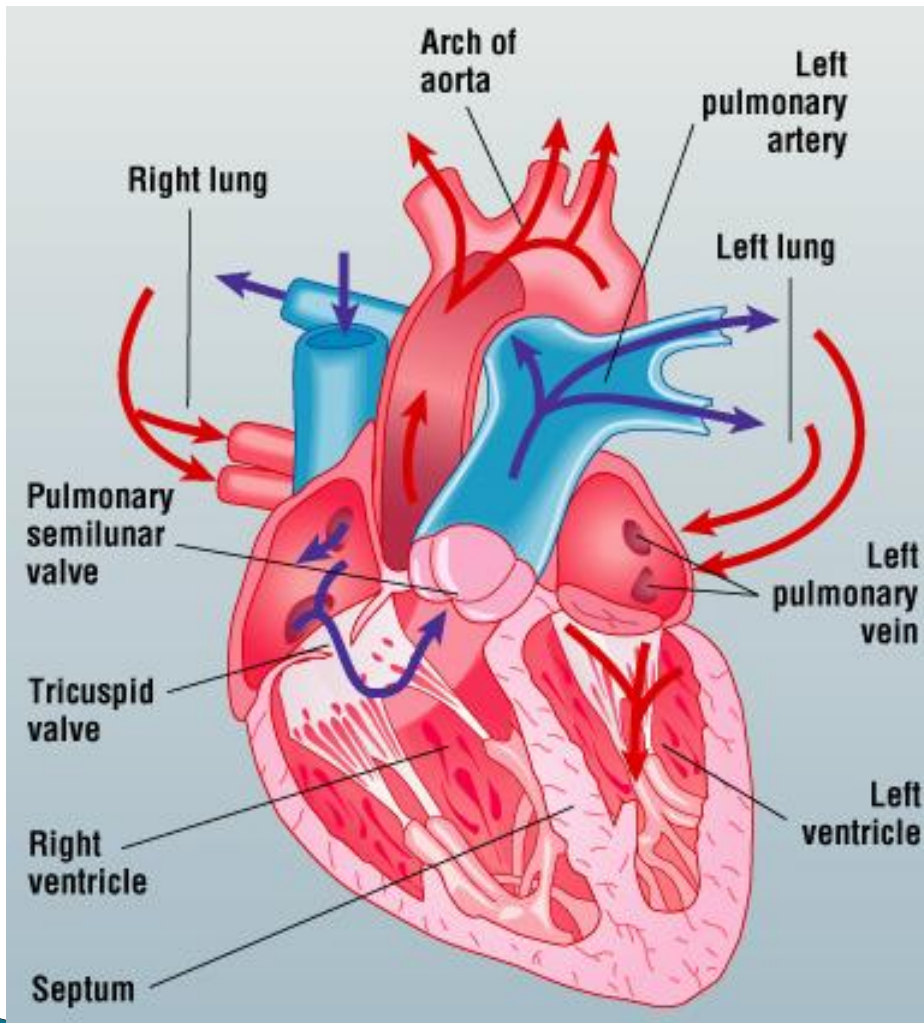
Interior View of the Heart



- ▶ 4 chambers
- ▶ 4 Valves
- ▶ Average heart beats 70 – 80 times/ minute

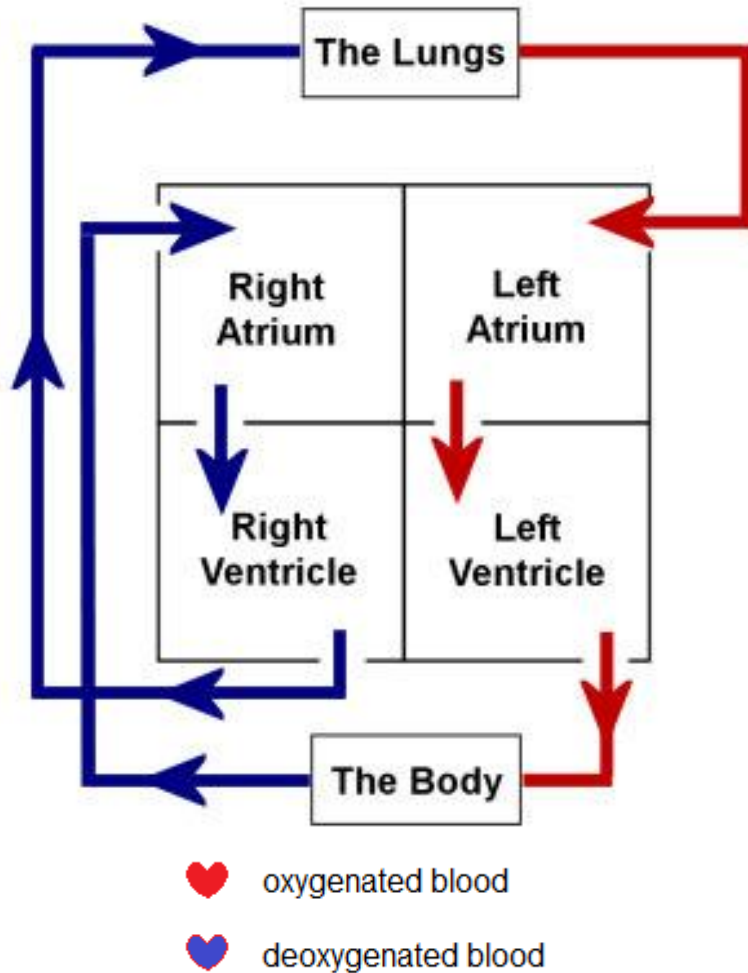


Blood Circulation



- ▶ Pulmonary circulation
- ▶ Systemic circulation
- ▶ Coronary circulation

Blood Circulation (Cont.)



- ▶ Deoxygenated blood enters right atrium
- ▶ Travels to right ventricle
- ▶ Through pulmonary artery to the lungs (receives oxygen)
- ▶ From lungs to left atrium of heart
- ▶ Forced into left ventricle
- ▶ From left ventricle through aorta to all body parts

Types of CVD

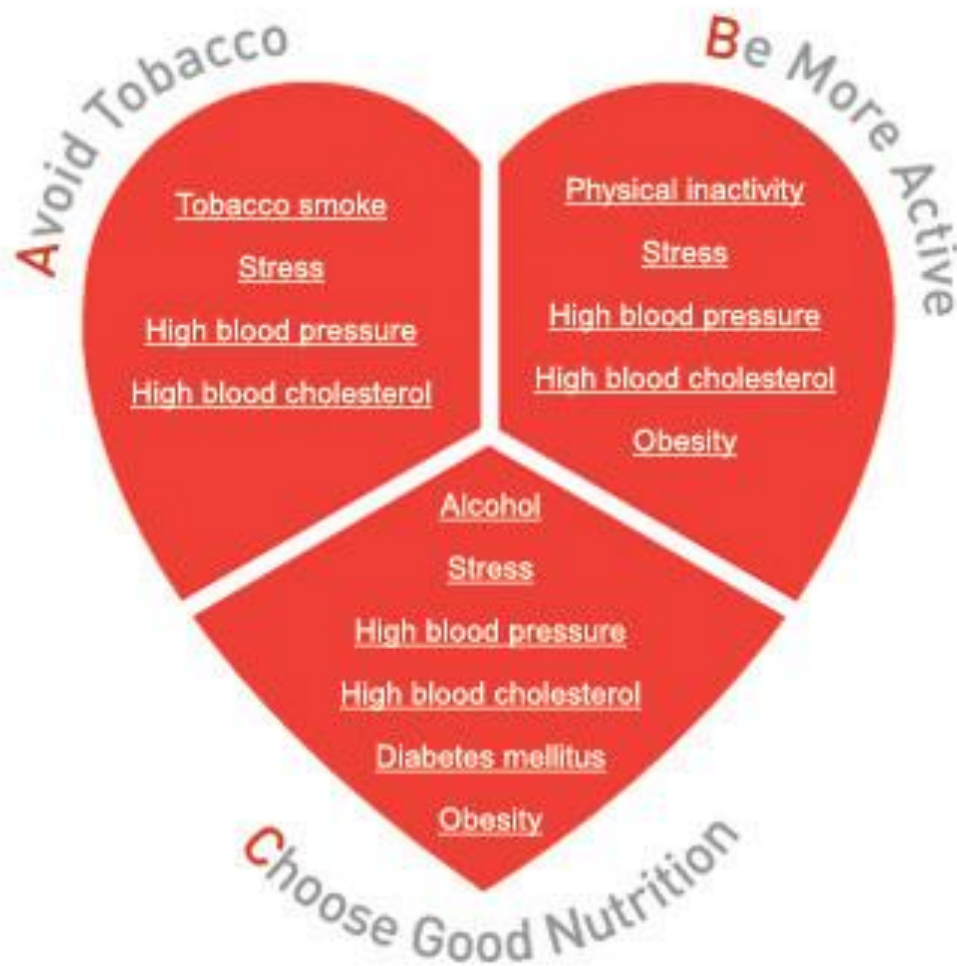
- ▶ Atherosclerosis: a type of arteriosclerosis, general term referring to narrowing and hardening of the arteries
- ▶ Coronary heart disease: Plaque causes a blockage in one or more coronary arteries that impedes blood flow
- ▶ Stroke: Blood supply to brain is severely reduced or cut off
- ▶ Hypertension: Chronic high blood pressure (140/80 mmHg or higher)
- ▶ Arrhythmia, Congestive Heart Failure, and Congenital and Rheumatic Heart Disease

Class Brain 1

- ▶ What is the non-controllable risk factor for CVD in the following?
 - A. High blood pressure
 - B. Cholesterol levels
 - C. Individual response to stress
 - D. Age
 - E. None of Above



Risk Factors for CVD



Controllable:

- ▶ High blood pressure
- ▶ Cholesterol levels
- ▶ Cigarette smoking
- ▶ Physical inactivity
- ▶ Obesity
- ▶ Diabetes
- ▶ Individual response to stress

Non-Controllable:

- ▶ Heredity
- ▶ Sex
- ▶ Age
- ▶ Ethnicity

Risk Factors in Woman for CVD

Premenopausal

- ▶ diabetes
- ▶ high blood pressure
- ▶ kidney disease
- ▶ genetic predisposition to high cholesterol
- ▶ family history
- ▶ oral contraceptive use
- ▶ smoking

Postmenopausal

- ▶ Estrogens production ↓
- ▶ high cholesterol
- ▶ depression
- ▶ Marital status
- ▶ Income
- ▶ High blood pressure
- ▶ BMI
- ▶ diabetes
- ▶ Alcohol consumption
- ▶ Leisure-time physical activity
- ▶ Use of hormone replacement therapy
- ▶ smoking

Signs of Heart Diseases in Postmenopausal Women

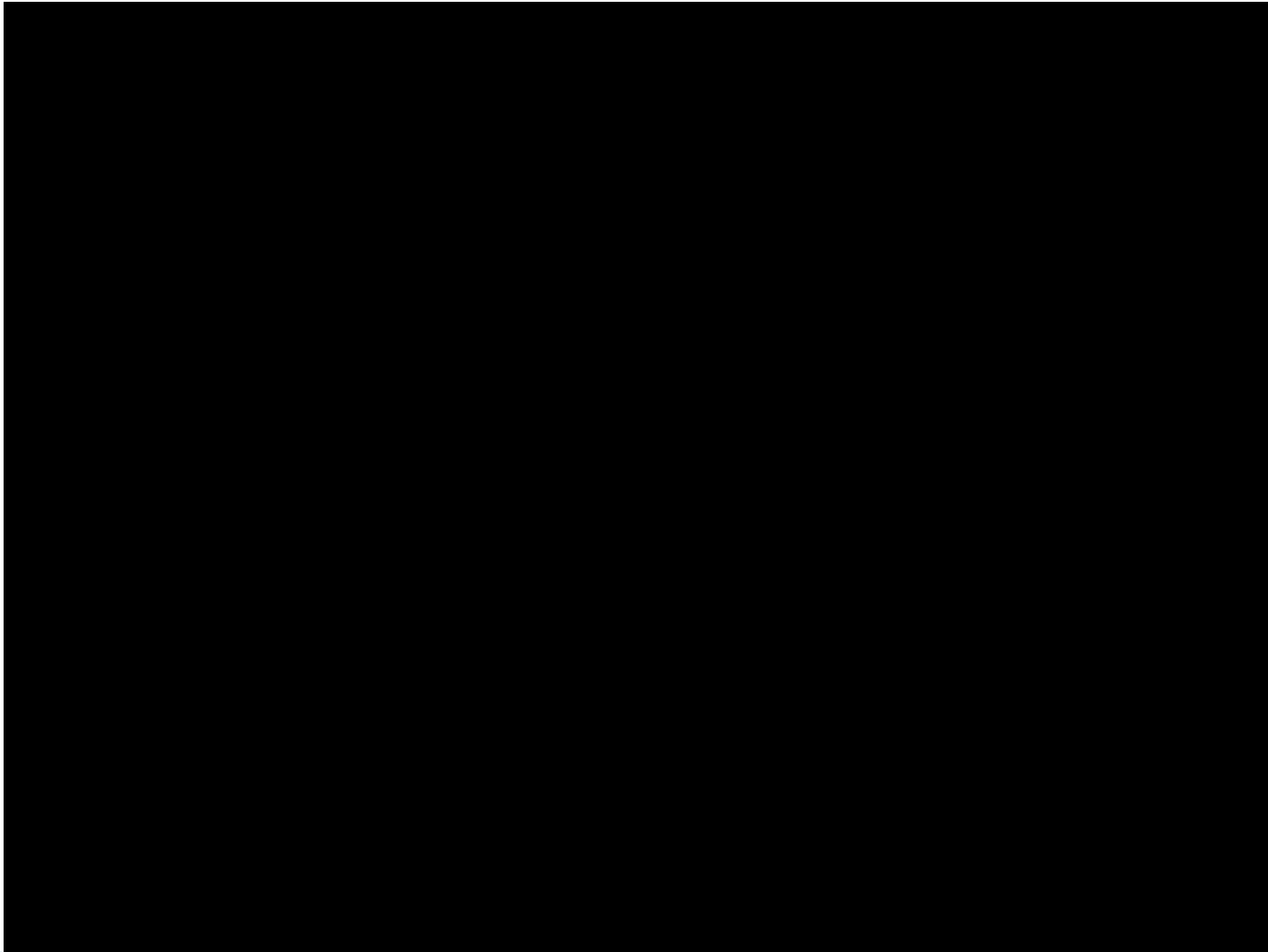
- ▶ Women's symptoms often differ from men's
- ▶ First sign is chest discomfort rather than pain and may be treated too casually by physicians
- ▶ Heart attack symptoms in women:
 - pain in neck, jaw, or arms
 - heaviness in shoulders, back, pit of stomach
 - feeling out of breath, tired, sweating, nausea

Diabetes Mellitus



- ▶ **Definition:** is a metabolic disorder characterized by the presence of hyperglycemia due to defective insulin secretion, defective insulin action or both (Ur, 2008).

An Overview of Diabetes



<http://www.youtube.com/watch?v=sTgBvJsHcCk>



Diabetes Incidence and Mortality

- ▶ Serious, widespread, costly disease
- ▶ Estimated that 4.9% of Canadians have diabetes
- ▶ Males are more likely to develop diabetes than females
- ▶ Diagnosis increase with age, 14.6% in proportion of all individuals over age of 65
- ▶ mortality rate for diabetes in Canada is 16.8 per 100000 population (Public Health Agency of Canada, PHAC, 1996)

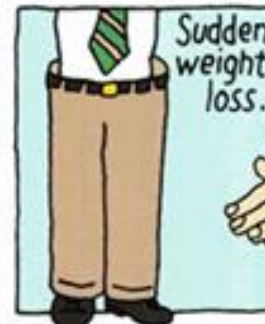
Types of Diabetes

- ▶ Type 1: autoimmune disease that destroys the cells that make insulin
- ▶ Type 2: insulin production is deficient or the body is unable to utilize all the available insulin
 - 90–95% of all diabetes cases
 - linked to obesity and physical inactivity
- ▶ Gestational: develops during pregnancy but may predispose to later type 2 diabetes

Diabetes Symptoms

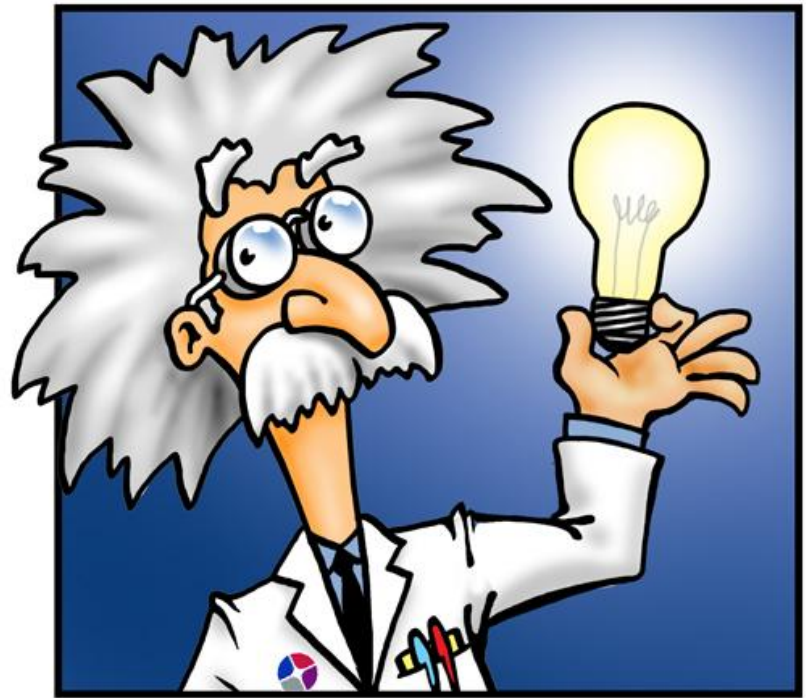


SYMPTOMS OF DIABETES



Class Brain 2

- ▶ What are the primary risk factors for developing type 2 diabetes?
 - A. Obesity or being overweight
 - B. consumption of alcohol
 - C. Insulin resistance



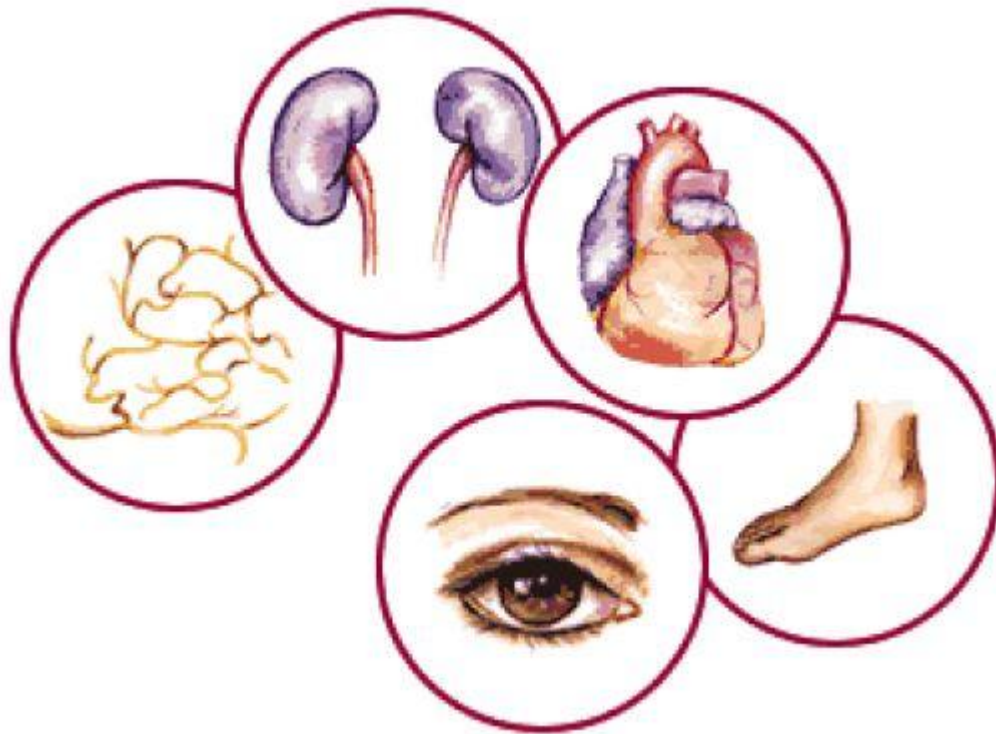
Risk Factors for Diabetes



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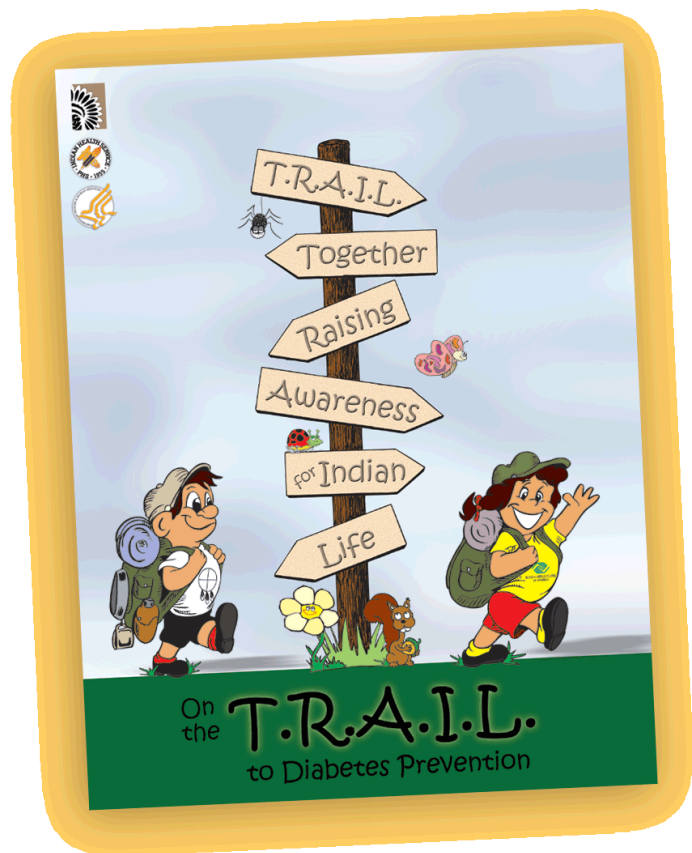


Complications of Diabetes



- ▶ CVD
- ▶ Eye disease and blindness
- ▶ Kidney disease
- ▶ Amputations
- ▶ Stroke
- ▶ Flu- and pneumonia-related deaths

Diabetes Control and Prevention



Regular Monitoring

Medicine

Diet

Exercise



Cancer



- ▶ **Definition:** Cancer is a term used for diseases in which abnormal cells divide without control and are able to invade other tissues. Cancer cells can spread to other parts of the body through the blood and lymph systems (National Cancer Institute, NCI, US).
 - Neoplasms
 - malignant and benign tumors:
 - biopsy
 - metastasis

Aetiology of Cancer

- ▶ Internal
 - Cell reproduction errors
 - Ontogenes
 - Proto-ontogenes
- ▶ External
 - Radiation
 - chemicals
 - hormone drugs
 - immunosuppressant drugs

Classifications of Cancer

- ▶ Carcinomas – epithelial tissues (e.g., breast, lung, intestines, skin, mouth)
- ▶ Sarcomas – mesodermal (middle) layer tissues (e.g., bones, muscles, connective tissue)
- ▶ Lymphomas – lymphatic system
- ▶ Leukemia – blood-forming parts

Types of Cancer



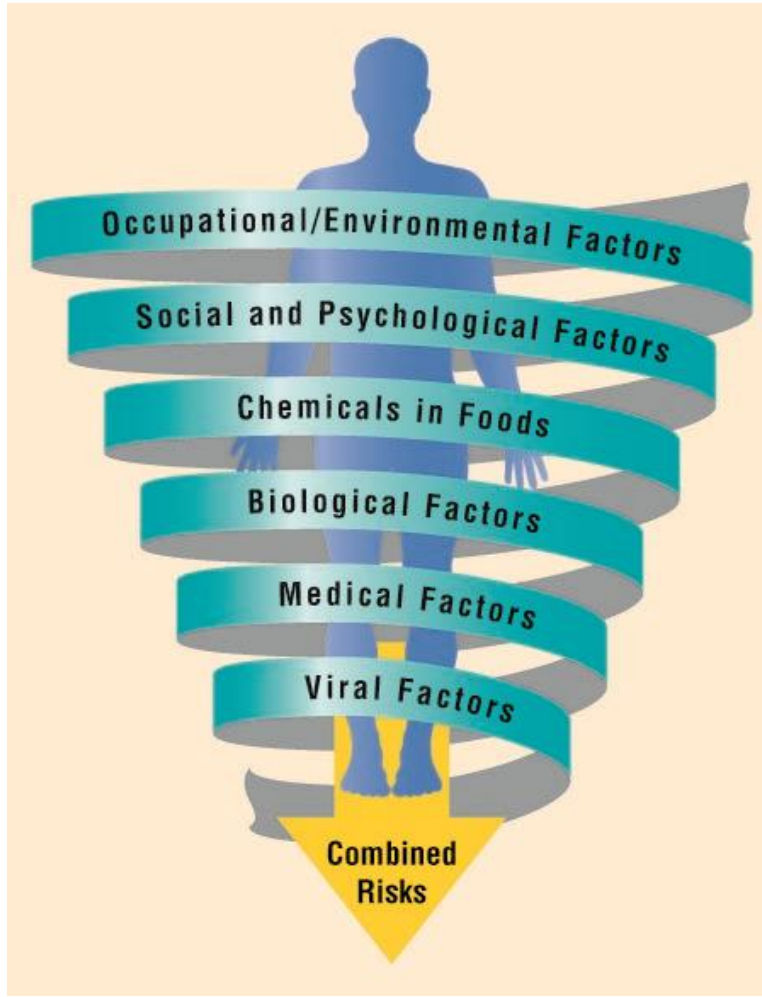
- ▶ Lung Cancer
- ▶ Breast Cancer
- ▶ Colorectal (colon and rectal) Cancers
- ▶ Prostate Cancer
- ▶ Skin Cancer
- ▶ Testicular Cancer
- ▶ Ovarian Cancer
- ▶ Uterine Cancer
- ▶ Leukemia
- ▶ Oral Cancer

Class Brain 3

- ▶ Name one risk factor for cancer



Risks for Cancer



- ▶ Occupational/Environmental factors (radiation, chemicals)
- ▶ Social and psychological factors (lifestyle—obesity, smoking, diet)
- ▶ Chemicals in Foods (diet)
- ▶ Biological factors (genetic)
- ▶ Medical factors (estrogen replacement therapy and chemotherapy)
- ▶ Viral factors and infectious diseases (HBV, HCV, and Liver Cancer; HPV and Cervical Cancer)

Cancer Detection

Cancer's Seven Warning Signals

- 1 Changes in bowel or bladder habits.
- 2 A sore that does not heal.
- 3 Unusual bleeding or discharge.
- 4 Thickening or lump in breast or elsewhere.
- 5 Indigestion or difficulty in swallowing.
- 6 Obvious change in a wart or mole.
- 7 Nagging cough or hoarseness.

If you have a warning signal,
see your doctor.

- ▶ Magnetic Resonance Imaging (MRI)
- ▶ Computerized Axial Tomography scanning (CAT scan)
- ▶ Self-exam and check-ups
- ▶ Assess risk factors and try to avoid them, when possible

Cancer Prevention



- ▶ Lung cancer: quit smoking and avoid second hand smoking
- ▶ Breast Cancer: physical activity; regular self examination & mammography
- ▶ Skin Cancer: limit sunlight exposure
- ▶ Testicular Cancer: self examination
- ▶ Ovarian Cancer: annual pelvic exams (Pap tests); diets lower in saturated fat
- ▶ Oral Cancer: reduce tobacco use
- ▶ Most cancers shows warning signs

Cancer Treatment



- ▶ Surgery to remove tumor
- ▶ Radiotherapy
- ▶ Chemotherapy
- ▶ Attention to the psychological needs of patients and families

Class Brain 4

Margaret Alexander I was born in 1957 in Utah, of European ancestry. Several members of my family have had cancer: My older sister had breast cancer at age 36, my mother had ovarian cancer at age 49, my mother's sister had breast cancer at age 47, and my mother's mother had breast cancer at age 54.

- ▶ 0–19 years My childhood was uneventful. I met my future husband my first semester in college and was married at age 19. A few months after my wedding, I was pregnant.
- ▶ 20–39 years My first child was born when I was just 20, and two more followed at ages 24 and 27. I breastfed each baby for about six months. Despite the children, I finished my nursing degree and got a job as a nurse in a local hospital. Aware of the history of cancer in my family, I regularly practiced breast self-examination. I was not referred for a mammogram because I was considered too young. At age 32, I agreed to participate in a research study. In 1996, as part of that study, I learned that I carry an altered gene that increases my risk for breast and ovarian cancer. On the strength of this new information, I was able to get mammograms at regular intervals.
- ▶ 40–59 years At age 42, my mammogram showed some suspicious calcifications. A biopsy revealed breast cancer. I had a partial mastectomy with 12 lymph nodes removed. Because 3 of the 12 nodes showed cancer, I had both radiation and chemotherapy and was put on Tamoxifen (a drug that reduces the chances of breast cancer developing) for five years.
- ▶ 60+ years I feel great these days and am grateful that the research study led to my cancer being detected early. I continue my practice of regular self-examination and see my doctor twice a year. I have had no recurrences of the breast cancer and feel confident of the future. Because the altered gene I carry also predisposes me to increased risk of ovarian cancer, I considered having my ovaries removed, but finally decided not to take that step. But, I will have regular check-ups!

▶ Section 1: Cancer History

Complete the table by writing in the number of people in this case who were diagnosed with cancer during each period of life. Then list the type of cancer each person developed. If no one was diagnosed with cancer, leave the section blank.

Team's Cancer History Type of Information	Period of Life			
	0–19 years	20–39 years	40–59 years	60+ years
number of people diagnosed with cancer				
type of cancer				

▶ Section 2: Possible Risk Factors

Go back through your slides and identify possible risk factors associated with the development of cancer in the people in this case. And what prevents the cancer from developing?