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Lecture № 6

PREVENTION AND HEALTH PROMOTION

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- The goals of medicine are to promote health, to preserve health, to restore health when it is impaired, and to minimize suffering and distress.
- These goals are embodied in the word "prevention"

PREVENTION: DEFINITION AND CONCEPT

- Actions aimed at eradicating, eliminating or minimizing the impact of disease and disability, or if none of these are feasible, retarding the progress of the disease and disability.
- The concept of prevention is best defined in the context of levels, traditionally called primary, secondary and tertiary prevention. A fourth level, called primordial prevention, was later added.

DETERMINANTS OF PREVENTION

- **Successful prevention depends upon:**
 - a knowledge of causation,
 - dynamics of transmission,
 - identification of risk factors and risk groups,
 - availability of prophylactic or early detection and treatment measures,
 - an organization for applying these measures to appropriate persons or groups, and
 - continuous evaluation of and development of procedures applied

Preventable Causes of Disease

BEINGS

- **B**iological factors and **B**ehavioral Factors
- **E**nvironmental factors
- **I**mmunologic factors
- **N**utritional factors
- **G**enetic factors
- **S**ervices, **S**ocial factors, and **S**piritual factors

HEALTH PROMOTION

RISK FACTORS

LATENT DISEASE

SYMPTOMATIC DISEASE

IMPAIRMENT DISABILITY

PRIMARY PREVENTION

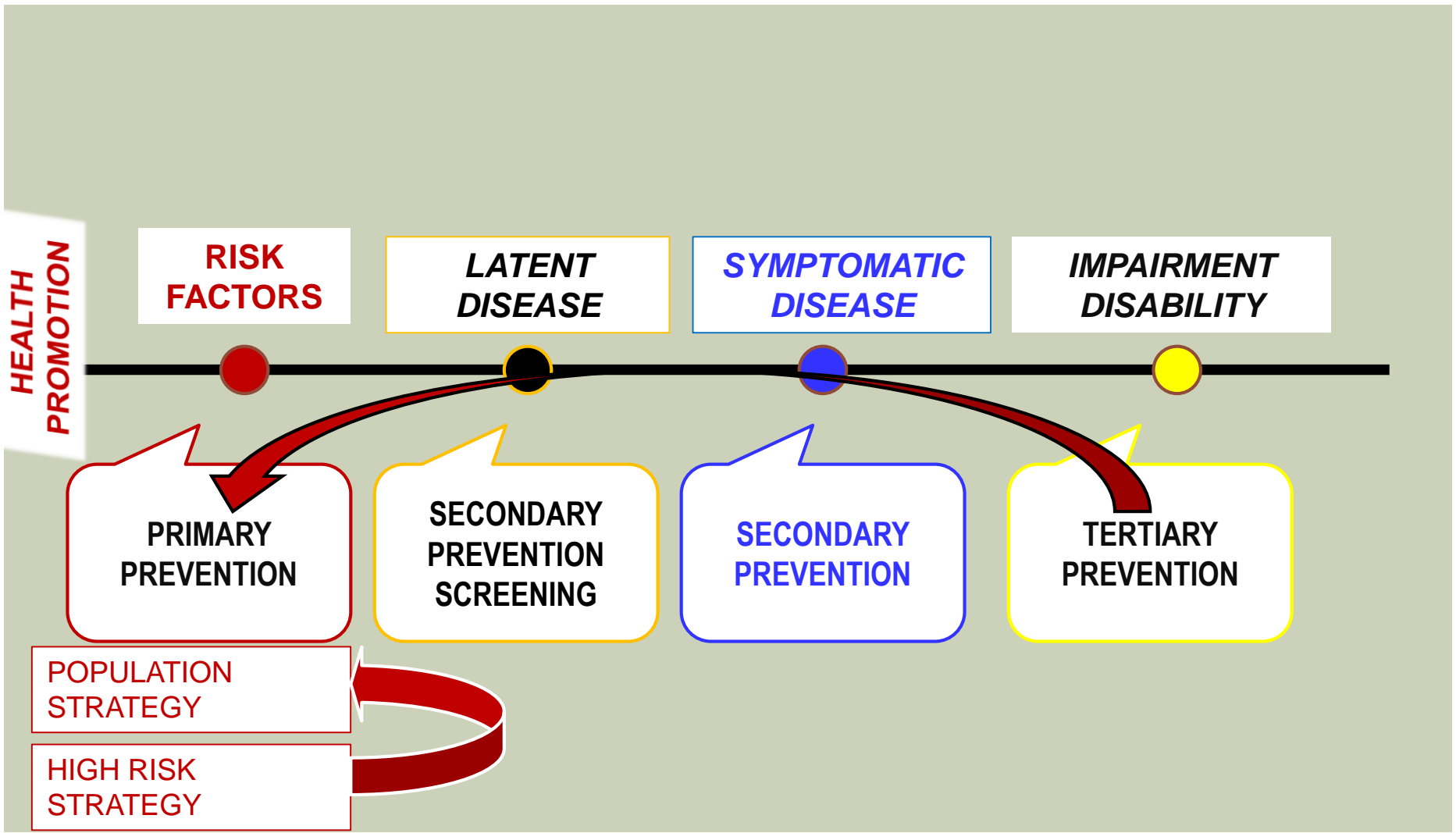
SECONDARY PREVENTION SCREENING

SECONDARY PREVENTION

TERTIARY PREVENTION

POPULATION STRATEGY

HIGH RISK STRATEGY



LEVELS OF PREVENTION

**PRIMORDIAL
PREVENTION**

**Before appearance
of risk factors**

**Total population
Selected groups**

**PRIMARY
PREVENTION**

Risk factors

**Total population
Selected groups**

**SECONDARY
PREVENTION**

Early stage of disease

Patients

**TERTIARY
PREVENTION**

**Late stage of disease
(treatment, rehabilitation)**

Patients

LEVELS OF PREVENTION

Stage of disease	Level of prevention	Type of response
Pre-disease	Primary Prevention	Health promotion and Specific protection
Latent Disease	Secondary prevention	Pre-symptomatic Diagnosis and treatment
Symptomatic Disease	Tertiary prevention	<ul style="list-style-type: none">•Disability limitation for early symptomatic disease•Rehabilitation for late Symptomatic disease

PRIMORDIAL PREVENTION

- Primordial prevention consists of actions and measures that **inhibit the emergence of risk factors** in the form of environmental, economic, social, and behavioral conditions and cultural patterns of living etc.
- Primordial prevention consists of actions to **minimize future hazards to health**. It addresses broad health determinants rather than preventing personal exposure to risk factors, which is the goal of primary prevention.

PRIMORDIAL PREVENTION (CONT.)

- It is the prevention of the emergence or development of risk factors in countries or population groups in which they have not yet appeared.
- For example, many adult health problems (e.g., obesity, hypertension) have their early origins in childhood, because this is the time when lifestyles are formed (for example, smoking, eating patterns, physical exercise).

PRIMORDIAL PREVENTION (CONT.)

- In primordial prevention, efforts are directed towards discouraging children from adopting harmful lifestyles.
- The main intervention in primordial prevention is through individual and mass education \approx health promotion

PRIMARY PREVENTION

- Primary prevention can be defined as the action taken prior to the onset of disease, which removes the possibility that the disease will ever occur.
- It signifies intervention in the pre-pathogenesis phase of a disease or health problem.
- Primary prevention may be accomplished by measures of “Health promotion” and “specific protection”.

PRIMARY PREVENTION (CONT.)

- It includes the concept of "**positive health**", a concept that encourages achievement and maintenance of "an acceptable level of health that will enable every individual to lead a socially and economically productive life".
- Primary prevention may be accomplished by measures designed to promote general health and well-being, and quality of life of people or by specific protective measures.

Primary prevention

Achieved by

Health promotion

- Health education
- Environmental modifications
- Nutritional interventions
- Life style and behavioral changes

Specific protection

- Immunization and seroprophylaxis
- Chemoprophylaxis
- Use of specific nutrients or supplementations
- Protection against occupational hazards
- Safety of drugs and foods
- Control of environmental hazards, e.g. air pollution

WHAT IS HEALTH PROMOTION ALL ABOUT?

- It is the **process of enabling people to increase control over and improve their health**. (Ottawa H.P. Charter).
- It is a process which **empowers** families and communities to **improve** their quality of life, and **achieve** and **maintain** health and wellness.
≠ primordial prevention
- It emphasizes **not only prevention of disease but the promotion of positive good health**.

WHAT IS HEALTH PROMOTION ALL ABOUT?

- It is a **positive concept** emphasizing personal, social, political and institutional resources, as well as physical capacities.
- Health promotion is any **combination** of health, education, economic, political, spiritual or organizational **initiatives** designed to bring about positive attitudinal, behavioral, social or environmental **changes** conducive to improving the health of populations.

WHAT IS HEALTH PROMOTION ALL ABOUT?

- Health promotion is directed towards action on the determinants or causes of health.
- Health promotion, therefore, requires a close co-operation of sectors beyond health services, reflecting the diversity of conditions which influence health.
- Government at both local and national levels has a unique responsibility to act appropriately and in a timely way to ensure that the 'total' environment, which is beyond the control of individuals and groups, is conducive to health.

DEFINITIONS OF HEALTH PROMOTION

- “Any combination of health education and related organizational, economic and political interventions designed to facilitate behavioral and environmental changes conducive to health”. (Green LW 1979)
- "Health promotion is the science and art of helping people change their lifestyle to move toward a state of **optimal health**. Optimal health is defined as a balance of physical, emotional, social, spiritual, and intellectual health. Lifestyle change can be facilitated through a combination of efforts to enhance awareness, change behavior and create environments that support good health practices. Of the three, supportive environments will probably have the greatest impact in producing lasting change". (*American Journal of Health Promotion*, 1989,3,3,5)

DEFINITIONS OF HEALTH PROMOTION (CONT.)

- ❑ Process enabling individually and collectively increase *control over determinants* of their health, and improve health status. (WHO, 1998)
- ❑ It does not mean only responsibility of the health care system, but also *individual responsibility* for health expressed via *life style*. (Kebza, 2005)

OTTAWA CHARTER (1986)

- Health promotion should be a part of **public policy**, documents and measures.
- Health promotion should be a part of a **community policy** and practice.
- **Environment** should enable and promote health.
- **People** should be able to gain information, knowledge and skills enabling development of health.
- **Health services** should more orient on health promotion and support.

IMPORTANT AREAS FOR CONSIDERATION IN HEALTH PROMOTION

**PRINCIPLES OF HEALTH
PROMOTION**

**Building a
healthy public
policy**

**Creating supportive
environments**

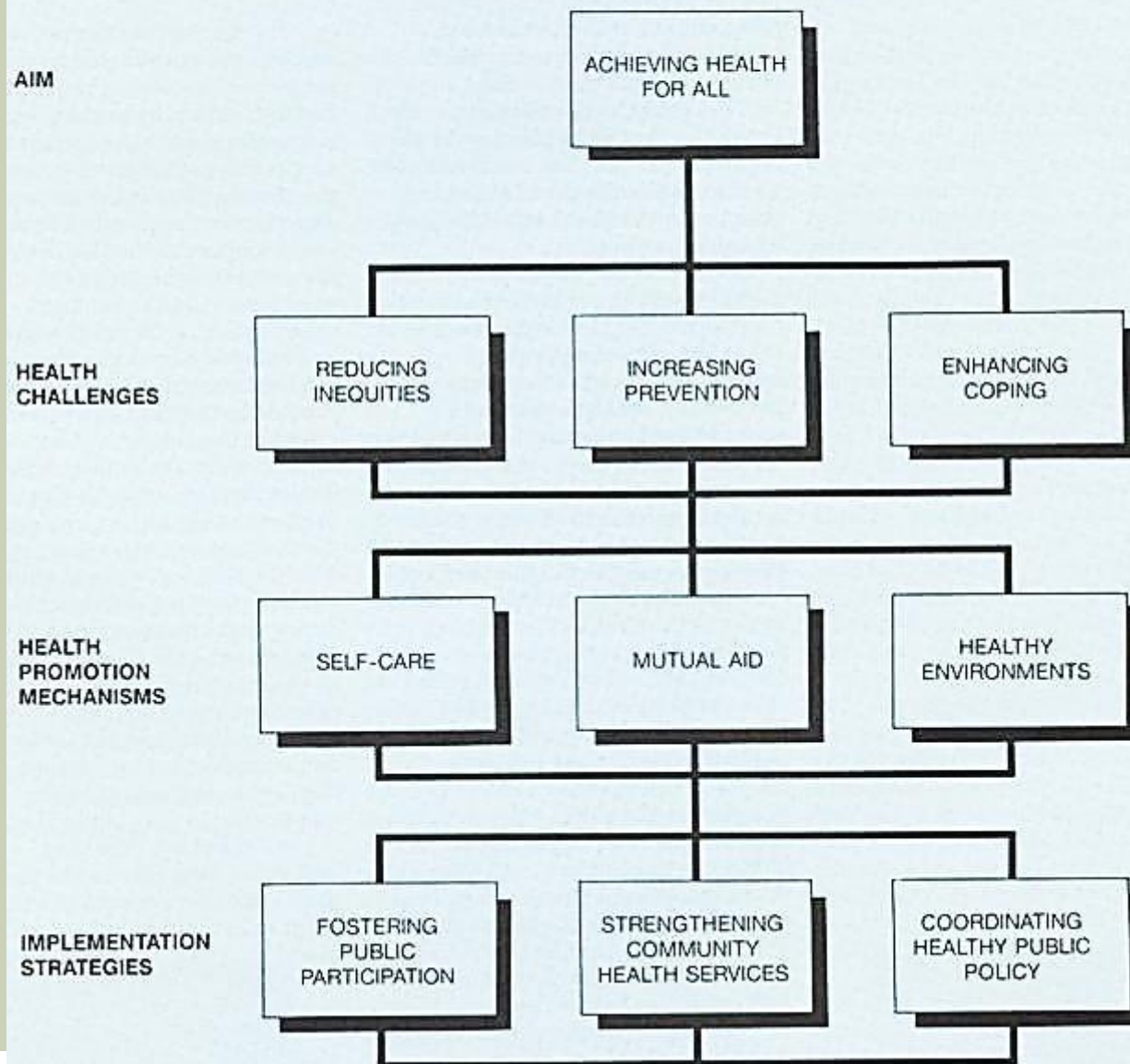
**Strengthening
community
action**

**Developing
personal skills**

**Reorientating
health services**

**PRINCIPLES OF HEALTH
PROMOTION**

A FRAMEWORK FOR HEALTH PROMOTION



WHO IS RESPONSIBLE FOR HEALTH PROMOTION

- Individuals
- Communities
- Non-government organizations
- Government
- International organizations

Individuals

What role do individuals play in health promotion?

- Individual's play a key role in promoting their health, because personal behaviour is the major determining factor of health status. For health promotion to be effective, individuals' need to be empowered. This refers to an individual's ability to make decisions about, or have personal control over their life. (
- Individuals working in health-related areas are able to assist people to gain control over their health eg general practitioners, counselors, dentists, health workers, community nurses. Other individuals who are involved in improving health also include health educators, social workers, community workers and environmental health officers.

COMMUNITY GROUPS AND SCHOOLS

- They are important settings for health promotion, after all these are the places where we live, work and play.
- Communities should be able to contribute to discussion and participate in the setting of health policies.

Non-government Organisations

- **Non-government Organisations** are non-profit making organisations that operate at local, national or international levels. They are funded from a variety of sources including government grants, public donations and fundraising.

Many organizations such as universities conduct health research into the prevention, detection, and treatment of disease. While other NGO's contribute in various ways, including raising funds for research, running educational and health promotion programmes, providing support services and coordinating voluntary care.

International Organisations eg WHO.

- The World Health Organisation is a specialized agency of the United Nations that acts as the coordinating authority on international public health issues. It provides leadership on global health concerns, monitors disease outbreaks, assesses the performance of health systems around the world and promotes health research.

APPROACHES FOR PRIMARY PREVENTION

- The WHO has recommended the following approaches for the primary prevention of chronic diseases where the risk factors are established:
 - a. Population (mass) strategy
 - b. High -risk strategy

POPULATION (MASS) STRATEGY

- “Population strategy” is directed at the whole population irrespective of individual risk levels.
- For example, studies have shown that even a small reduction in the average blood pressure or serum cholesterol of a population would produce a large reduction in the incidence of cardiovascular disease
- The population approach is directed towards socio-economic, behavioral and lifestyle changes

HIGH -RISK STRATEGY

- The high-risk strategy aims to bring preventive care to individuals at special risk.
- This requires detection of individuals at high risk by the optimum use of clinical methods.

SECONDARY PREVENTION

- It is defined as “action which halts the progress of a disease at its incipient stage and prevents complications.”
- The specific interventions are: early diagnosis (e.g. screening tests, and case finding programs....) and adequate treatment.

SECONDARY PREVENTION (CONT.)

- Secondary prevention attempts to **arrest the disease process**, restore health by seeking out unrecognized disease and treating it **before irreversible pathological changes take place**, and reverse communicability of infectious diseases.
- It thus protects others from in the community from acquiring the infection and thus provide at once secondary prevention for the infected ones and primary prevention for their potential contacts.

SCREENING

Screening is the process in which we use a test to determine whether an individual likely has a particular health indicator or not or is likely to develop a particular health indicator or not.

Screening is not the same as diagnosis; screening tests give us information about whether the disease is likely to be present.

A **screening test** assesses the presence of an underlying marker that is associated with outcome of interest.

SCREENING, EXAMPLES

- Women receive regular screening tests beginning in young adulthood for cervical cancer (Pap smear)
- Physicians assess blood pressure and cholesterol as screening tools for the development of cardiovascular disease

WHEN TO SCREEN

We screen for disease when we have the opportunity to **reduce costs and risk** associated with diagnoses on large proportions of at-risk individuals

1. We screen for health indicators **that affect population health** principally, not for rare diseases (although there are exceptions for rare diseases screen in utero).
2. There should be **sufficient time** between biological onset of disease and appearance of signs and symptoms of the disease exist so that screening could detect the presence of the disease **earlier** than it would come to clinical attention.
3. There should be **available treatment** for the disease so that early detection improves the lives of affected.
4. Screening tests should **be cheaper and less invasive** than best available diagnostic tool.

SCREENING TEST EVALUATION

1. Sensitivity
2. Specificity
3. Positive predictive value
4. Negative predictive value

SCREENING TEST EVALUATION

	Diagnosis positive	Diagnosis negative	Screening parameter
Screen positive	True positive (TP)	False positive (FP)	$PPV = \frac{TP}{TP+FP}$
Screen negative	False negative (FN)	True negative (TN)	$NPV = \frac{TN}{TN + FN}$
Screening parameter	$Sensitivity = \frac{TP}{TP+FN}$	$Specificity = \frac{TN}{TN+FP}$	

SCREENING TEST EVALUATION

SENSITIVITY AND SPECIFICITY

- To assess the validity of a screening tool in establishing the presence of disease we compare with a gold standard
- **Sensitivity:** Whether individuals with disease are correctly identified by the screening test as having the disease
- **Specificity:** Whether individuals without the disease are correctly identified by the screening test as not having the disease

SCREENING TEST EVALUATION

SENSITIVITY AND SPECIFICITY TRADEOFFS

Test cut-off is very **sensitive**: All those who have the disease will be captured by the test

Test cut-off is very **specific**: Individuals who do not have the disease will not be screened positive

High sensitivity/low specificity tests are common in practice; i.e., we will not miss many individuals with disease but we also will screen positive those who do not have disease

RAMIFICATIONS OF FALSE POSITIVES VS. FALSE NEGATIVES

Low rate of false negatives preferred

- Infectious diseases critical to maintain low rate of false negative
- When disease can be readily remediated if caught early but devastating if not

Low rate of false positivity preferred

- When subsequent diagnostic test is invasive and expensive procedures
- Screening is done routinely on low burden diseases

TERTIARY PREVENTION

- It is used when the disease process has advanced beyond its early stages.
- It is defined as “**all the measures available to reduce or limit impairments and disabilities, and to promote the patients’ adjustment to irremediable conditions.**”
- Once a disease has developed and has been treated in its acute clinical phase, tertiary prevention seeks to soften the impact caused by the disease on the patient’s function, longevity, and quality of life.
- Intervention that should be accomplished in the stage of tertiary prevention are disability limitation, and rehabilitation.

IMPAIRMENT

- Impairment is “any loss or abnormality of psychological, physiological or anatomical structure or function.”

DISABILITY

- Disability is “any restriction or lack of ability to perform an activity in the manner or within the range considered normal for the human being.”

HANDICAP

- Handicap is termed as “a disadvantage for a given individual, resulting from an impairment or disability, that limits or prevents the fulfillment of a role in the community that is normal (depending on age, sex, and social and cultural factors) for that individual.”

REHABILITATION

- Rehabilitation is “the combined and coordinated use of medical, social, educational, and vocational measures for training and retraining the individual to the highest possible level of functional ability.”

Disease	Intervention level	Primary	Secondary	Tertiary
Colorectal cancer	Individual	Counselling on healthy lifestyles: dietary counselling for people at risk of colorectal cancer, etc.	Hemoccult stool testing to detect colorectal cancer early	Follow-up exams to identify recurrence or metastatic disease: physical examination, liver enzyme tests, chest x-rays, etc.
	Population	Publicity campaigns alerting the public to the benefits of lifestyle changes in preventing colorectal cancers; promotion of high fibre diets; subsidies to help people access exercise programmes; anti-smoking campaigns	Organized colonoscopy screening programs	Implementation of health services organizational models that improve access to high-quality care

Metabolic syndrome	Individual	Nutrition and exercise counselling	Screening for diabetes	Referral to cardiac rehabilitation clinics
	Population	Built environment favourable for active transport (walking, bicycling rather than using a car)	Community level weight loss and exercise programs to control metabolic syndrome	Implementation of multidisciplinary clinics

EXAMPLE: SUICIDE IN THE RIVER

- **Tertiary prevention** would imply downstream efforts at resuscitation at the scene and in hospital.
- **Secondary prevention** activities include attempts to identify suicidal people before they make an attempt, perhaps via screening for depression in primary care practices using a brief screen for depressive symptoms. Those who give indications of depression could be more fully evaluated, perhaps by referral to a psychologist.
- **Primary prevention** might include social programs for high-risk youth in areas of high suicide rates, or putting up safety nets to prevent the act of suicide.
- **Primordial prevention** would likely focus on the social ecology of suicide, seeking to identify underlying determinants that explain why people in that area are throwing themselves into the river. Is there, for example, a connection between the world economic downturn, local unemployment, debt and feelings of despair? Do such problems occur more commonly in small, one-industry towns? Primordial prevention involve a wide range of government agencies and focus on developing healthy public policies and altering underlying determinants of health.

TO SUMMARIZE

- The goals of medicine are to promote health, to preserve health, to restore health when it is impaired, and to minimize suffering and distress.
- These goals are embodied in the word "prevention".
- Successful prevention depends upon a knowledge of causation, dynamics of transmission, identification of risk factors and risk groups, availability of prophylactic or early detection and treatment measures, an organization for applying these measures to appropriate persons or groups, and continuous evaluation of and development of procedures applied.
- The objective of preventive medicine is to intercept or oppose the "cause" and thereby the disease process. This epidemiological concept permits the inclusion of treatment as one of the modes of intervention.