

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

COMMUNITY DENTISTRY

THIRD CLASS

ECOLOGY OF HEALTH

3RD LECTURE

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M.B.Ch.B MSc

Community Medicine

Definition

Ecology of health is the study of all factors in the environment that affects the health of man. Any given state of health is a product of interaction large number of factors.

Host

Agent

Environment

These factors are grouped into:

1. Factors related to host

such as age, sex, race, occupation, education, genetics, habits and other personal characteristics. Smoking for example is an important cause of lung cancer and ischemic heart diseases. Many diseases are genetically determined such as sickle cell disease and thalassaemia.

2. Factors related to disease agent

the disease agent is a substance, living or nonliving or a force, tangible or intangible, the excessive presence or lack of which may initiate or perpetuate a disease process.

1. Living agents
2. Non- living agents

Living agent:

(bacteria, viruses, parasites, fungi etc.) . Show following properties

- A. Infectivity : ability of the agent to enter and multiply in the host. This depend on the dose of inoculum. Measles is a disease with high infectivity

- B. Pathogenicity** : is the ability of the agents to produce illness in the host. This is influenced by various host and environmental factors in addition to dose , route and source of agent. Leprosy is a diseases of high infectivity and low pathogenicity.
- C. Virulence** : is the ability of an agent to produce sever clinical manifestation including death (case fatality rate is a simple measure of virulence.
- D. Susceptibility**: is the ability of the agent to survive in the host or in free state.
- E. Immunogenicity** : is the ability of the agent to induce immune response in the host (cellular, humoral or mixed type)

Nonliving agent:

This could be :

1. **Physical:** heat , cold, pressure ,radiation
2. **Chemical :** poisons , fumes , allergens , insecticides, endogenous waste (urea, uric acid , ketone)
3. **Mechanical:** vehicles , instruments , mechanical force.
4. **Nutritive :** excess or deficiency of various food or elements(like fluoride lead to dental caries or fluorosis).
5. **Social :** illiteracy , poverty , addiction.

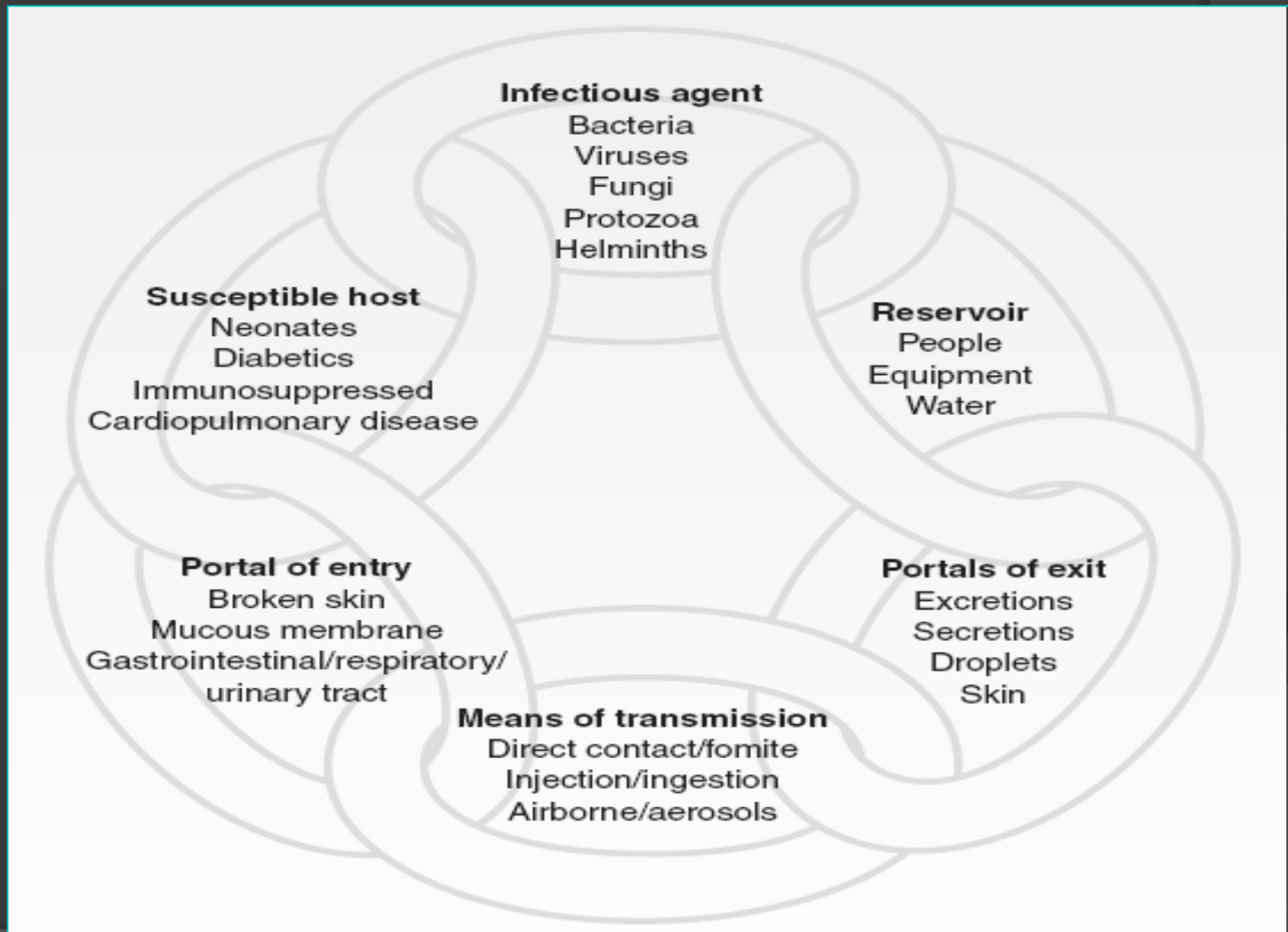
3. Factors related to environment in its physical, chemical, biological and social dimensions.

Environment:

1. assists the *survival* of disease agent.
2. facilitates the *transmission* of disease agent from the source to a new host and
3. affects the *immunity* of the host.

DISEASE TRANSMISSION

Chain of Disease transmission for C D s



Means of of transmission

Direct

- Skin-skin (Herpes type 1)
- Mucous-mucous (STI)
- Across placenta (toxoplasmosis)
- Through breast milk (HIV)
- Sneeze-cough(Influenza COVID 19)

Indirect

- Food-borne (Salmonella)
- Water-borne (Hepatitis A)
- Vector-borne (Malaria)
- Air-borne (Chickenpox)

Exposure

A relevant contact – depends on the agent Skin, sexual intercourse, water contact, etc

THE CONCEPT OF PREVENTIVE MEDICINE AND PREVENTION

Prevention

Is to make the occurrence of some anticipated thing like disease, accident, impossible. This can be achieved at four levels (levels of prevention):

Preventive Medicine

It the science that promotes, protects, restores and rehabilitate health of people through the effective use of scientific knowledge and skills.

preventive dentistry

is the area of dentistry that focuses on those procedures and life practices that help people to prevent the beginning or progression of oral disease. It includes at-home dental care performed by patients, as well as dental care and education by professional dental staff in the office or clinic.

Preventive medicine is applied

- A. At individual level like hand washing**
- B. At population or group level like immunization**

THE NATURAL HISTORY OF DISEASE

The natural history of disease refers to all the stages of disease from start till termination regardless of treatment. It consist of two main phases:

A. Pre-pathogenic phase:

The period of interaction of potential host, disease agent and environmental factors.

Features:

- 1. Disease has not occurred**
- 2. Interaction between epidemiological triad.**
- 3. Agent has not affected man.**
- 4. Risk factor are operating at this stage**

Importance During this phase primary prevention may be applied successfully.

B. Pathogenic phase:

The course of disease in man from the early changes in body structure and function until termination. In this stage man might develop subclinical infection or he might become carrier .

In this stage agent enters the host and start multiplying. This is the infectivity of the organism . If the immune response is good, host develops immunity to the disease.

Its end with

complete recovery, partial recovery , defect or death.

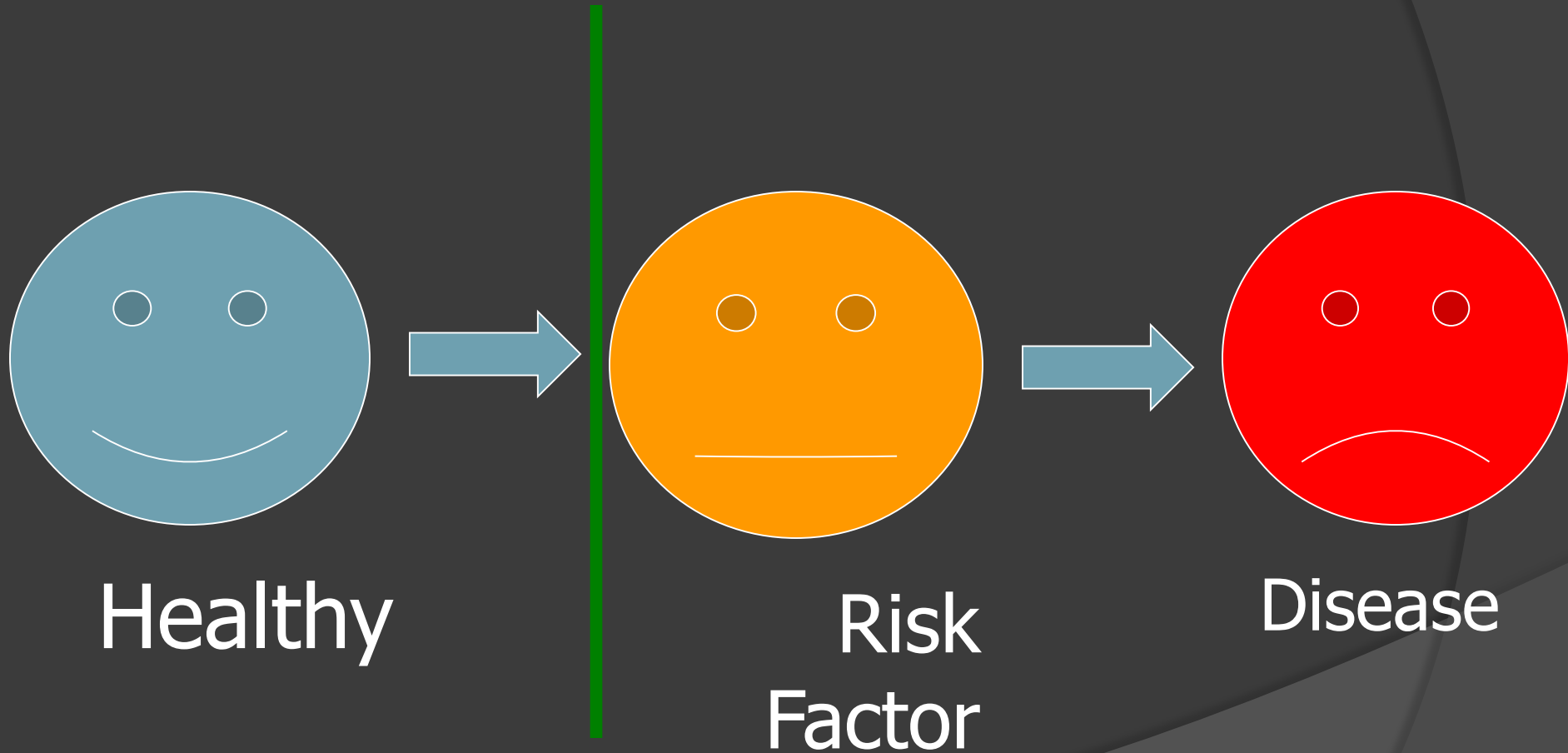
Levels of Prevention

- Primordial prevention
- Primary prevention
- Secondary prevention
- Tertiary prevention

Primordial prevention

- In Primordial prevention we prevent emergence of risk factors
- It can be started in early childhood , by discouraging children from unhealthy life styles
- Most useful in preventing **CHRONIC DISEASES** e.g. Diabetes Mellitus & Hypertension
- Risk factors like Smoking, Obesity, Sedentary life style etc. are prevented

Primordial prevention



Methods of Primordial prevention

◎ Health education

- Individual
- Mass (Group)

Primary prevention

All measures taken prior to the onset of disease (prepathogenic phase), it is carried out on health population, through health promotion and specific protection. Examples are good housing, regular exercise, immunization, personal hygiene, the use of safety belt.(risk factor present)

the use of a topical fluoride gel to prevent dental caries is an example of primary prevention in dental practice.

Primary prevention



Healthy



Disease

Methods of Primary prevention

Population (mass) strategy

We do the intervention to the entire population

High risk strategy

We do intervention only to people at high risk

Methods of Primary prevention

⦿ Population strategy

- Rubella vaccination to all children
- Hepatitis B vaccination to everybody

⦿ High risk strategy

- Rubella vaccination to only girls
- Hepatitis B vaccination to doctors, dental students ,laboratory workers etc.

Secondary prevention

This is applied after the onset of disease (pathogenic phase)through early detection and prompt treatment of disease to prevent complications and further injury.

a dental restoration is an example of secondary prevention

Secondary prevention may reduce:

- **length of illness,**
- **the length of infectiousness,**
- **the risk of complications and**
- **the economic losses.**

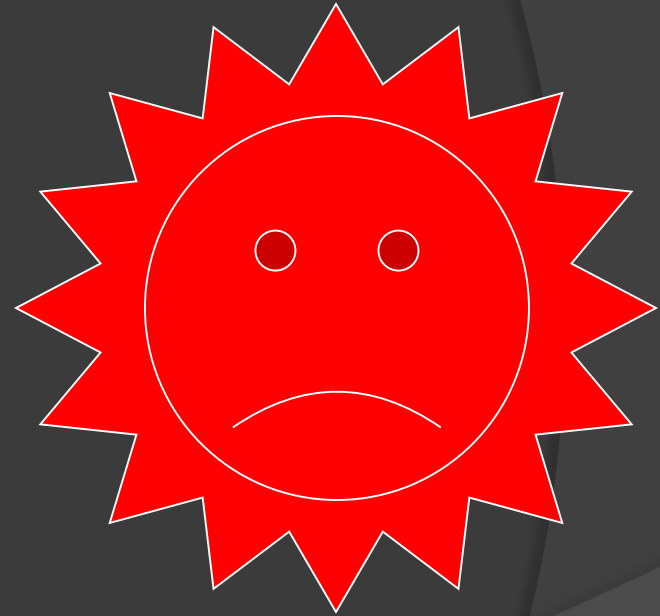
Secondary prevention



Healthy



Disease



Complications

Tertiary prevention

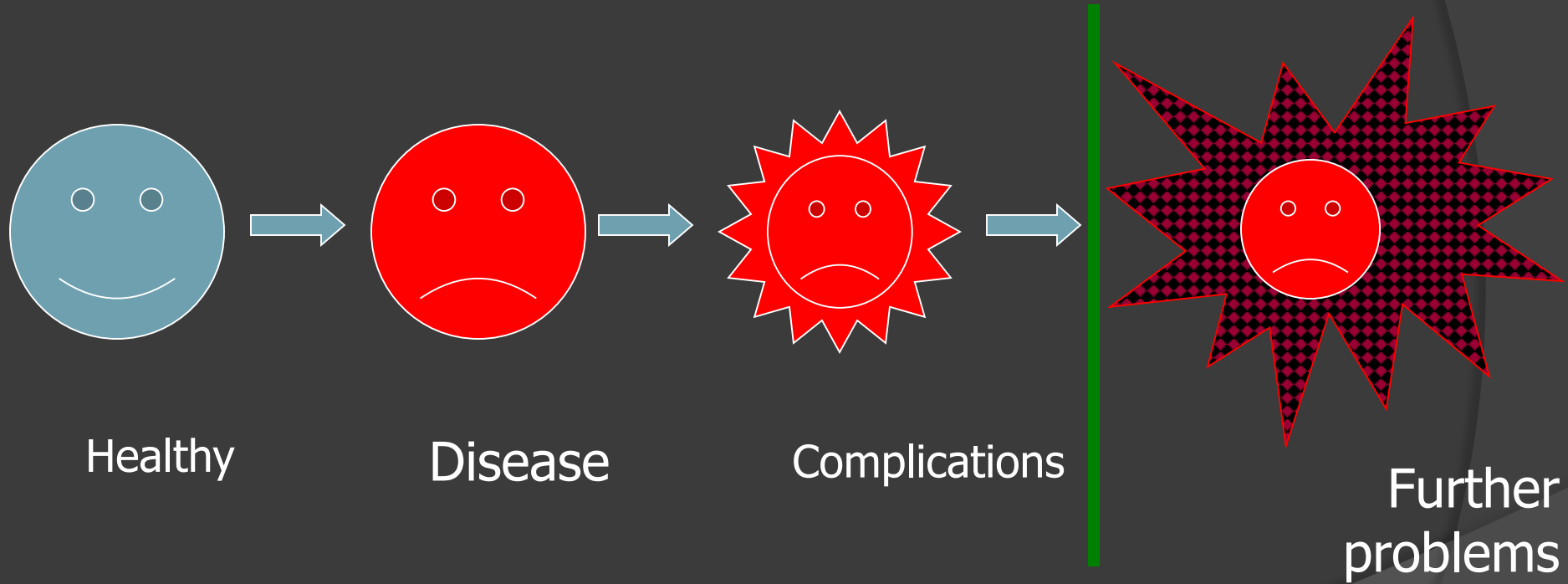
- Disease has already occurred and even complications but we try to prevent further consequences of disease

- Paralysis due to Poliomyelitis has occurred but we try to prevent further injury due paralyzed legs.

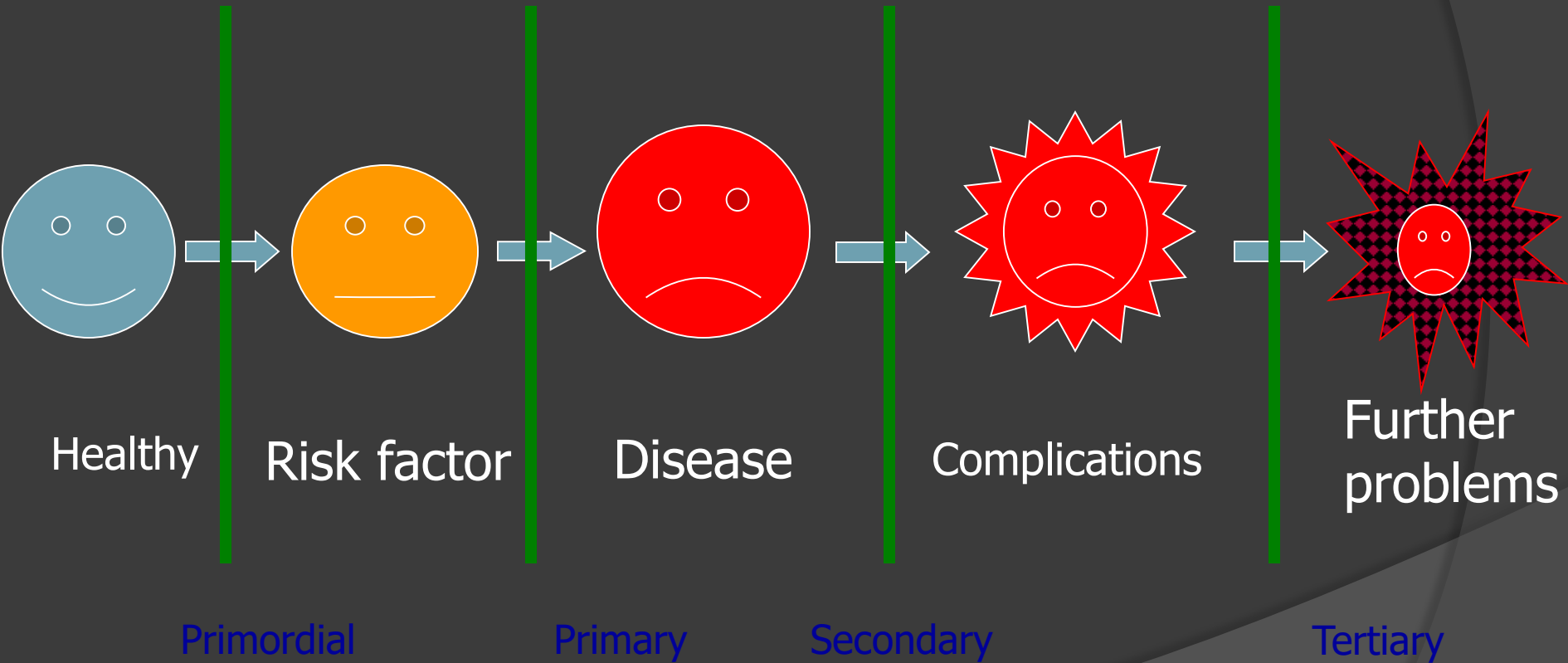
So aim to limitation of disability and rehabilitation. Rehabilitation may be physical, educational, social or vocational.

and a fixed bridge is an example of tertiary prevention in dental practice

Tertiary prevention



Levels of Prevention



Modes of Intervention



Modes/Methods of intervention

⦿ Primary

- Health promotion
- Specific protection

⦿ Secondary prevention

- Early diagnosis and treatment

⦿ Tertiary prevention

- Disability limitation
- Rehabilitation

Health promotion

It is a process of enabling people to increase control over and to improve health. Achieved by

1. Health education : plaque removal, tooth brushing
2. Environment modification: safe water
3. Nutritional intervention:
4. Lifestyle and behavioral changes: prevent smoking, do physical exercises

Specific protection

These are activities designed to protect against disease agents by decreasing the susceptibility of the host or by establishing barrier against agents in the environment.

- Immunization
- Chemoprophylaxis e.g. infective endocarditis
- Nutrient supplementation e.g. Folic acid, Iron, Vitamin A , fluoride application
- Application of pit and fissure sealants

Early diagnosis and treatment

- ④ Diagnose disease early and treat to prevent complications. The earlier the disease is diagnosed and treated the better its prognosis.
 - Screening for subclinical disease :for Diabetes Mellitus, Hypertension, oral cancer
 - Case finding
 - Promote treatment

Disability limitation and Rehabilitation

- In case of paralysis due to Poliomyelitis
- Providing crutches/calipers will prevent further injury to the leg
- It will also help the patient to walk, work
- **Fix bridge in dental practice**

Crutches and calipers for children with polio paralysis

Caliper

Crutches





Thank you