Prevention

Definition and Concept : Prevention:

Actions which is aimed at eradicating, eliminating or minimizing the impact of disease and disability, or if none of these are possible, retarding the progress of the disease and disability is considered as prevention .

The concept of prevention: is defined in the context of primary , secondary and tertiary prevention. A fourth level, called primordial prevention, was later added.

- **Traditionally, there have been Four approaches to disease prevention:**

1 . Primordial Prevention: Elimination or modification of **risk factors** of diseases .

by mode of intervention : -

mass education and **lifestyle modification.**

2. Primary prevention :- to prevent emergency of disease (infection) and accomplished .

by measures and intervention of **Health promotion** and **specific protection.**

- (a) **Health promotion**: Health education
- Environmental modification – environmental protection from harm .
- Nutritional interventions – good food
- lifestyle and behaviour change
- Personal hygiene , hand wash

- b) **Specific protection**: Immunization and sero- prophylaxis, chemo-prophylaxis, specific nutrients and supplements, protection against occupational hazards, safety of drugs and foods, control of environmental hazards, avoidance of taking up smoking, the use of seat belts and other.

3 .Secondary prevention:

detection of disease in symptomatic period treating with appropriate remedy **before it progress**.

(Agent showing its pathogenic action in host / pathogenic phase) .

(to prevent progress of disease) .

Mode of intervention :-

- **Diagnosis - widal test , schick test , malaria parasite test (M P TEST)**

- **Treatment – paracetamol in fever , rosuvastatin in cholesterol**

4 .Tertiary prevention:- -attempts **to reduce complications** by **operation (surgery)** and **rehabilitation**, **Disability**

limitation which are carried out chiefly by the existing health care system. Mainly concerned with disability

- **Natural History Of Disease**

- Natural history **of disease signifies** the way in which a **disease evolves** over a time from **the earliest stage** to its **termination** as **recovery, disability or death**, in the absence of treatment or prevention .

- Natural history of disease is best established by **cohort studies/longitudinal study**

- **Consists of two phases-**

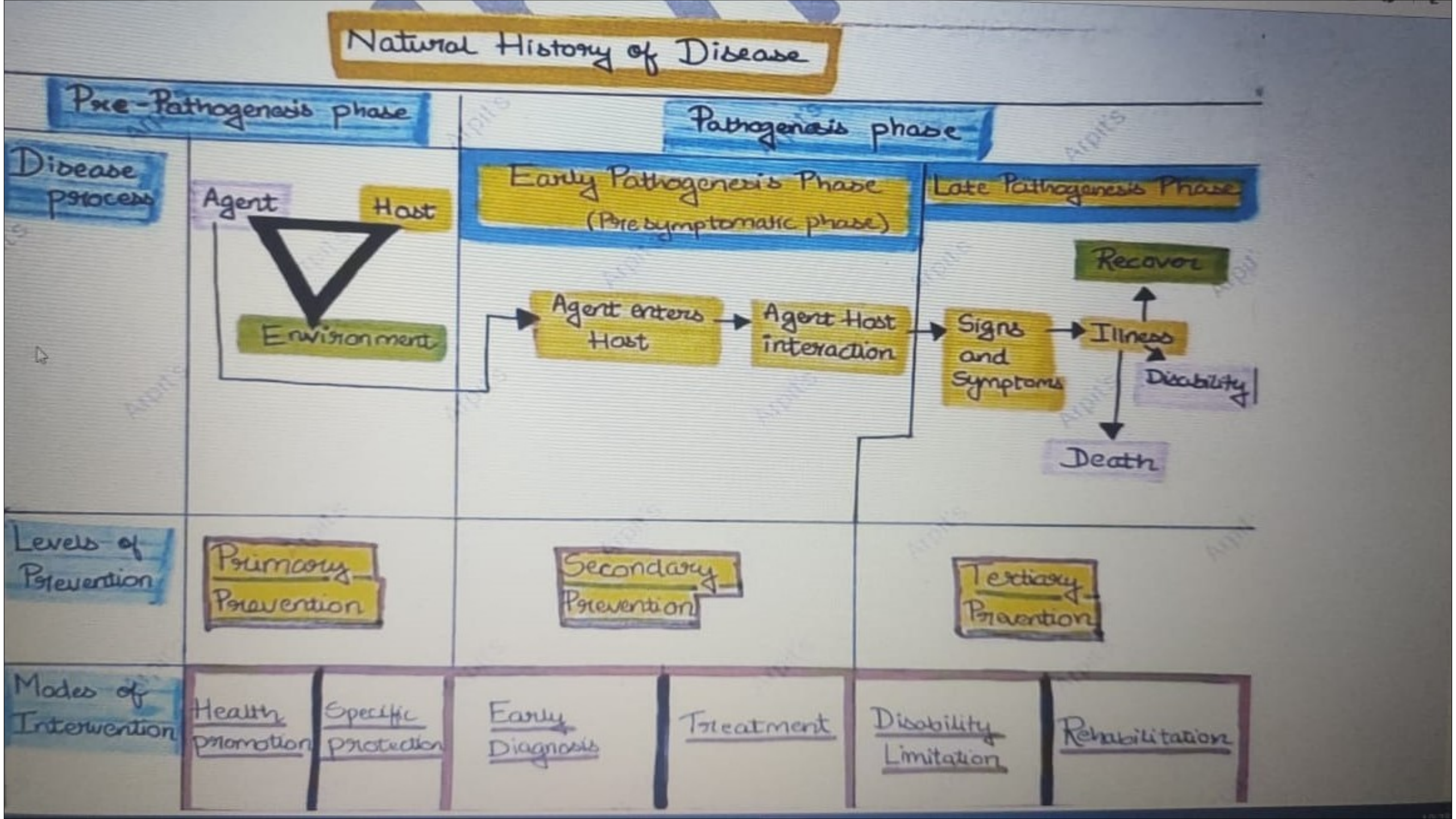
1. Pre pathogenesis (Le. , the process in environment)

2. Pathogenesis (Le., the process in man) –

1.Early pathogenesis – pre symptomatic phase .

2. Late pathogenesis - symptomatic phase - disability ,recovery , death .

Natural History of Disease



- **THEORY OF DISEASE CAUSATION**

- **Web of Causation -**

Suggested by **Mac Mohan** & **Pugh**

[Makdi ke Web me Mohan ka Pug]

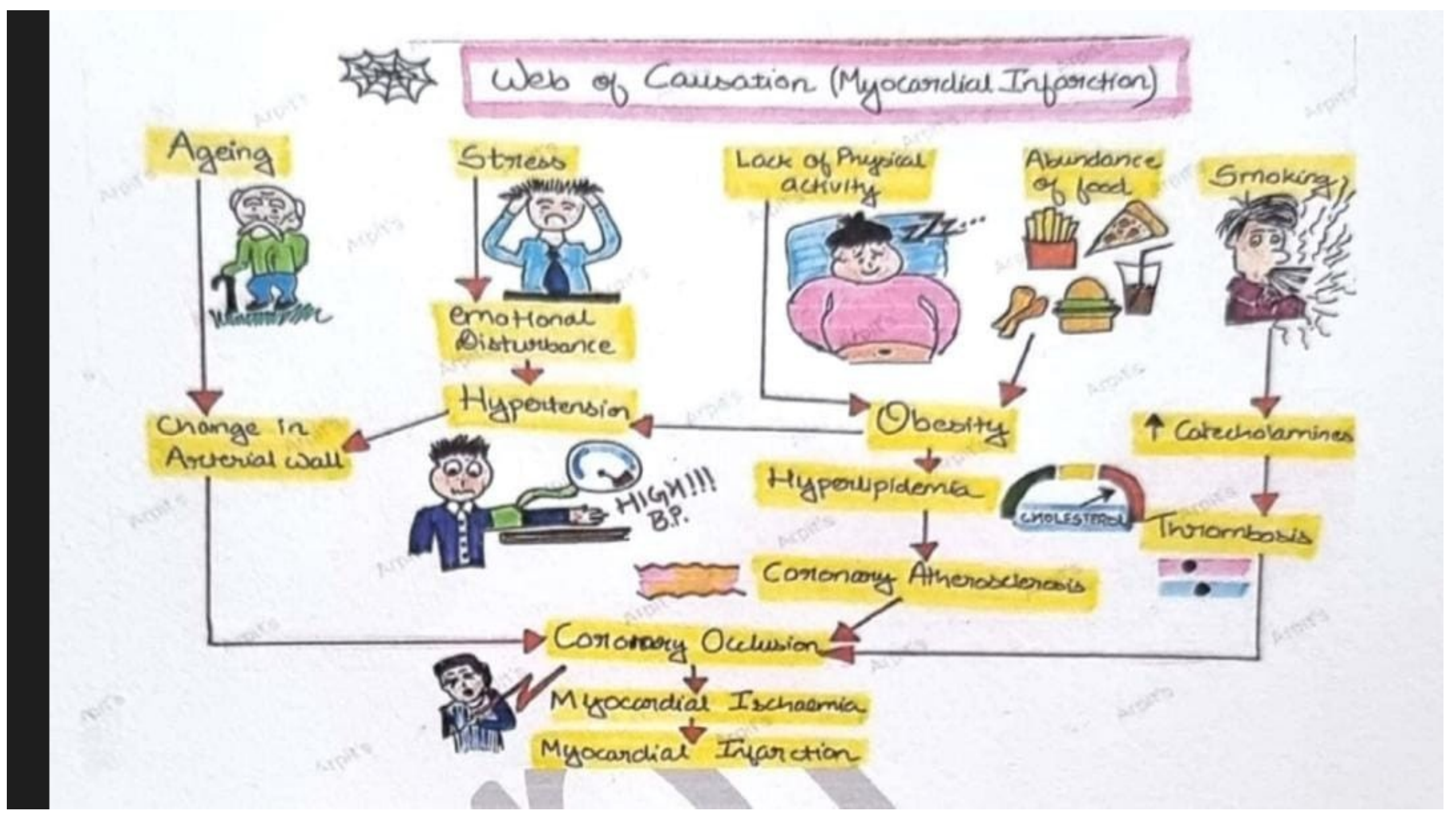
Ideally suited in the study **of chronic disease**, where **disease agent** is **often not known** & it's the **outcome of interaction between multiple factors** (Biological, Environmental, Immunological, Nutritional, Genetic, Social/Spiritual) [BEINGSS] .

➢ Web of causation considers all the **predisposing factors** & their interrelationship with each other .

➢ Helps to suggest ways to **interrupt** the risk **of transmission .**

➢ Sometimes **removal** of just one link may be **sufficient to control disease .**

Web of Causation (Myocardial Infarction)



- **INVESTIGATION OF AN EPIDEMIC**

1. **Verification of diagnosis** - Verification of diagnosis is the first step in an epidemic investigation .

- 2**. Confirmation of the existence of an epidemic -** The next step is to confirm if epidemic exists.

- 3. **Defining the population at risk -**
- **Make a map of the area:**
- **Counting the population:** The denominator may be related to the entire population or sub-groups of a population.

- **4 . Rapid search for all cases and their characteristics -**

(a) Medical survey

(b) Epidemiological case sheet

- **5 . Data analysis –**
- The data collected should be analysed on going basis, using the classical epidemiological parameters time, place and person**.**

6 . Formulation of hypotheses - On the basis of (a) possible, source (b) causative agent (c) possible modes of spread, and (d) the environmental factors which enabled it to occur.

7 . **Testing of hypotheses –** done by compare .

8 . Evaluation of ecological factors

9 . Further investigation of population at risk

10. Writing the report -The report should be complete and convincing. Information to be included in the final report on an epidemic .

- **Modes of intervention**

1. Health promotion
2. Specific protection
3. Early diagnosis and treatment
4. Disability limitation
5. Rehabilitation

1 . **Health promotion**: Health education , Environmental modification , Nutritional interventions and lifestyle and behavioural changes.

b) **Specific protection**: Immunization and sero-prophylaxis, chemo-prophylaxis, specific nutrients and supplements, protection against occupational hazards, safety of drugs and foods. control of environmental hazards, avoidance of taking up smoking, the use of seat belts and other.

Immunizing agents are classified as.

1. Vaccines
2. Immunoglobulins
3. Antisera

1. Vaccines:

2. Vaccine is an **immuno-biological substance** (or) **antigenic substance** when administered **stimulates specific antibody** & protects individual against particular **diseases,** they are used for **active immunization**.

3. Types of Vaccines:

1 . Live Vaccine

2 . Killed Vaccine

3 . Toxoid

1 . **Live Vaccine** :

- Organisms (Antigens) in the preparation are living but attenuated.

- Usually given **in single dose**.

- They are **safe, effective, more potent & long lasting** .

- **Cold chain** is needed to retain the potency .

- **Live vaccines** should not be given to a person **with Immuno-deficiency** conditions **like AIDS, Cancer, TB, Steroid therapy .**

- **Pregnancy** (relative contraindication) - do not take it .

- Example: **BCG , OPV, MMR , COVISHIELD**

2**. Killed Vaccine** :

- Organisms (antigens) **are inactivated** (or**) killed by heat** (or) **chemicals** like a **phenol** .
- Usuallly given in multi dose (Booster Dose)
- **Less safe, less effective, less potent with short immunity**
- Examples: **Cholera, plague, rabies, influenza , COVAXINE** etc.

3. **Toxoids**:

- The **toxins** of the organisms **are modified** (**Detoxified**) to maintain **antigenicity** & not the **pathogenicity .**
- Usually required on **multiple doses** .
- **Safe and effective**
- Examples**: Diphtheria toxoid, tetanus toxoid** .

2 **. Immunoglobulins** : They are ready made antibody preparations obtained from human beings.

- Produce immediate immunity
- they are used for passive immunization .
- **Types of immunoglobulin : -**

1 . IgA – all secretion of your body like breast milk , saliva Nasal mucus

2 .**IgG** - cross placenta

3. **IgM** - resistance against infection

4 . **Ig E** - for allergy {eosinophil}

5 . **IgD** - Immunity

3 . Antisera :

These are **specific immunoglobulins prepared** from the **plasma** of **immunized animals live horse** .
Cheaper & less effective Immunity lasts for **2 to 3 weeks only** .

Examples : **Anti tetanus serum (ATS)**

Anti diphtheria Serum (ADS)

What are the host defenses ?

Host defenses that protect the body against infection include .

1 .**Natural barriers** (e .g , skin, mucous membranes) .

2 . **Nonspecific (innate) immune responses** (e .g , phagocytic cells [neutrophils, macrophages] and their products) .

3 . **Specific (adaptive) immune responses** (e .g, antibodies, B and T lymphocytes) .