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Concepts of Disease

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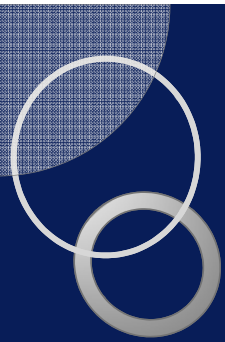


- Several theories are being proposed on the disease concept and got evolved over various time periods.
- Majority of the theories are overlapping one another in the current scenario
- Their interplay formed the basis of current Practice of Medicine.



CONCEPT OF DISEASE

- ➔ A condition of the body or some part or organ of the body in which its functions are deranged.
- ➔ It is a mal-adjustment of human organism to the environment.
- ➔ It is deviation from normal function.



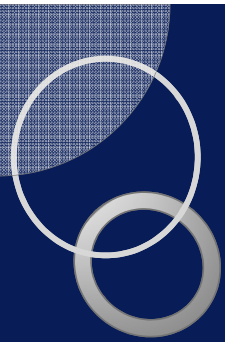
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CONCEPT OF CAUSATION

- ➔ **DEMONISTIC THEORY**
- ➔ **DEVILISITIC THEORY**
- ➔ **TRIDOSHAS THEORY**
- ➔ **FOUR HUMOURS THEORY**
- ➔ **YANG and YIN Principles**
- ➔ **GERM THEORY - Louis Pasteur, Robert Koch**
- ➔ **EPIDEMIOLOGICAL TRIAD**
- ➔ **MULTI FACTORIAL THORY – Web of disease causation, Wheel of causation**



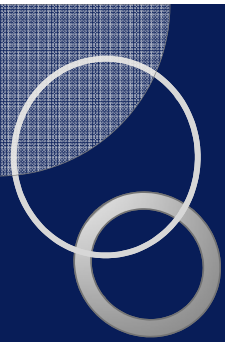
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Henle-Koch's Postulates

- 1. The agent should be present in every case of the disease under appropriate condition**
- 2. The agent should not be present in any other disease as a fortuitous and Non-Pathogenic agent**
- 3. The agent must be isolated from the body of the individual in pure culture**
- 4. It should induce disease in a new susceptible experiment animal**



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DYNAMICS OF DISEASE AND DISEASE TRANSMISSION



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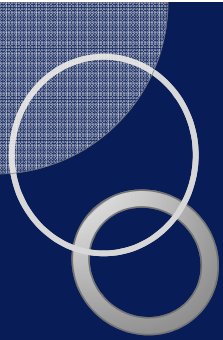
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NATURAL HISTORY OF DISEASE

- ➔ **IT IS THE WAY IN WHICH A DISEASE EVOLVES OVER TIME FROM THE EARLIEST STAGE OF ITS PREPATHOGENESIS PHASE TO ITS TERMINATION AS RECOVERY, DISABILITY OR DEATH, IN THE ABSENCE OF TREATMENT OR PREVENTION**

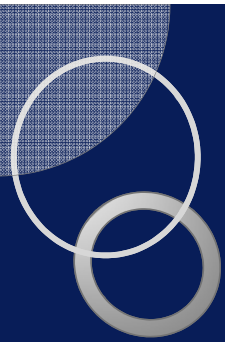


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NATURAL HISTORY OF DISEASE

- **PRE-PATHOGENIC PHASE OR SUSCEPTIBILITY STAGE**
- **PATHOGENIC PHASE**
 - 1. INCUBATION PERIOD**
 - 2. PRODROMAL STAGE**
 - 3. STAGE OF OVERT DISEASE**
 - 4. STAGE OF DEFERVESCENCE**
 - 5. STAGE OF CONVALESCENCE**



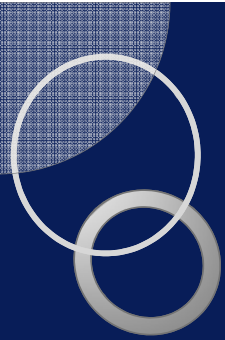
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FACTORS AFFECTING THE GRADIENT OF INFECTION

- Infectivity
- Pathogenicity
- Virulence
- Antigenicity



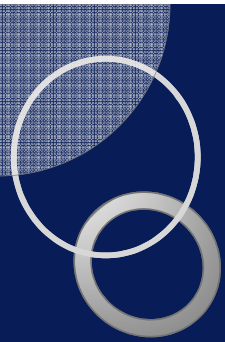
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TYPE OF INFECTION

- Latent infection
- Sub-clinical infection or inapparent or occult
- Atypical infection
- Severe clinical infection



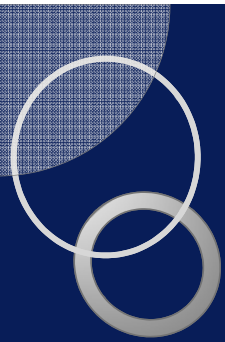
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Factors for development or spread of infectious disease

- An etiological agent responsible for the disease should be present
- There should be a reservoir or carrier for the etiological agent to survive
- The infecting agent should be able to escape from the reservoir of infection through the portal of exit
- There should be a possible source of entry to transmit the agent to a new susceptible host
- The agent should be able to invade the new host
- The host should be susceptible



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MODES OF TRANSMISSION

- **DIRECT TRANSMISSION**
- **DIRECT CONTACT**
- **DROPLET INFECTION**
- **CONTACT WITH SOIL**
- **INOCULATION INTO SKIN OR MUCOSA**
- **TRANSPLACENTAL**
- **INDIRECT TRANSMISSION**
- **VEHICLE BORNE**
- **VECTOR BORNE**
- **A) mechanical**
- **B) biological**
- **AIR-BORNE**
- **FOMITE BORNE**
- **UNCLEAN HANDS AND FINGERS**



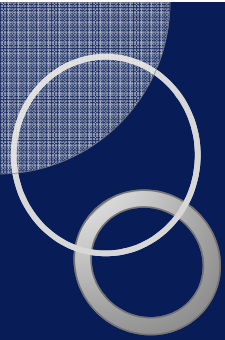
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BIOLOGICAL TRANSMISSION

- ➔ Propagative
- ➔ Cyclo-Propagative
- ➔ Cyclo-developmental
- ➔ Transovarial transmission
- ➔ Trans-stadial transmission



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SOURCE OF INFECTION



➔ **It is defined as the person, animal, object or substance from which an infectious agent passes or is disseminated to the host**



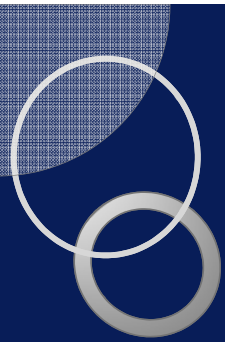
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RESERVOIR

- ➔ It is defined as “any person, animal, arthropod, plant, soil, or substance “(or combination of these in which an infectious agent lives and multiplies, on which it depends primarily for survival, and where it reproduces itself in such manner that it can be transmitted to a susceptible host”



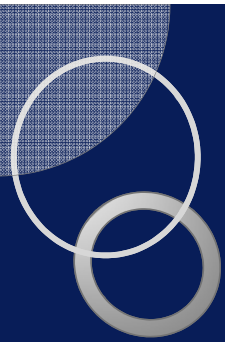
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CARRIERS

- ➔ A Carrier is defined as an infected person or animal that harbours a specific infectious agent in the absence of discernible clinical disease and serves as a potential source of infection for others



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CARRIERS

↘ TYPE

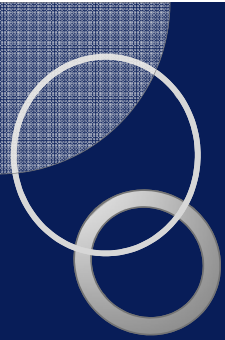
- A) Incubatory
- B) Convalescent
- C) Healthy

↘ PORTAL OF EXIT

- A) Urinary
- B) Intestinal
- C) Respiratory

↘ DURATION

- A) Temporary
- B) Chronic



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FEATURES OF CARRIER

- 1. Presence of specific microbes in the body**
- 2. Absence of apparent symptoms and signs**
- 3. Shedding of micro-organisms in the discharges or excretions**
- 4. As a source of infection to others**



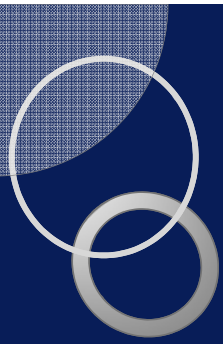
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INCUPATION PERIOD

➔ **THE TIME INTERVAL BETWEEN
INVASION BY AN INFECTIOUS
AGENT AND APPEARANCE OF THE
FIRST SIGN OR SYMPTOM OF THE
DISEASE IN QUESTION**



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FACTORS AFFECTING THE INCUPATION PERIOD

- DOSE OF INOCULUM
- SITE OF MULTIFICATION
- RATE OF MULTIFICATION
- HOST DEFENCE MECHANISM



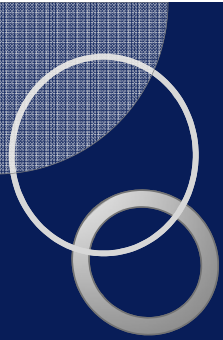
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FACTORS TO DETERMINE THE INCUBATION PERIOD

- ➔ **GENERATION TIME**
- ➔ **INFECTIVE DOSE**
- ➔ **PORTAL OF ENTRY**
- ➔ **INDIVIDUAL SUCEPTIBILITY**



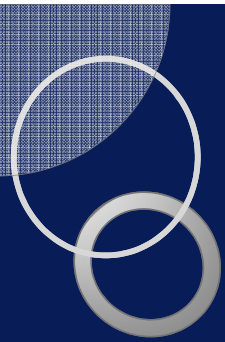
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IMPORTANCE OF INCUBATION PERIOD

- ➔ **Tracing the source of infection and contact**
- ➔ **Period of surveillance**
- ➔ **Immunization**
- ➔ **Identification of point source or propagated epidemics**
- ➔ **Prognosis**



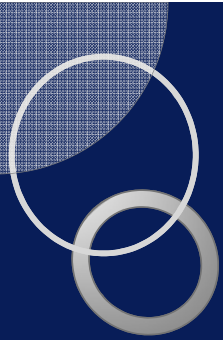
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MEDIAN INCUBATION PERIOD

➔ **IT IS DEFINED AS THE TIME REQUIRED FOR 50% OF THE CASES TO OCCUR FOLLOWING EXPOSURE**



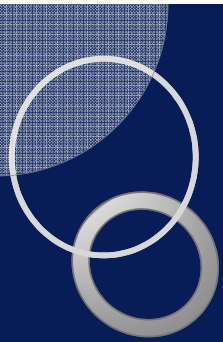
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LATENT PERIOD

➔ IT HAS BEEN DEFINED AS
THE PERIOD FROM DISEASE
INITIATION TO DISEASE
DETECTION



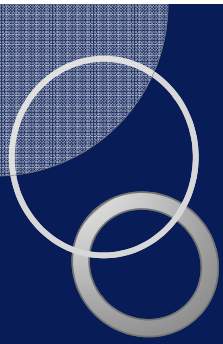
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GENERATION TIME

➔ **IT IS DEFINED AS THE INTERVAL OF TIME BETWEEN RECEIPT OF INFECTION BY A HOST AND MAXIMAL INFECTIVITY OF THAT HOST**



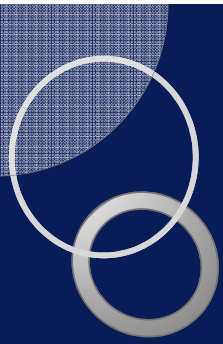
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SERIAL INTERVAL

➔ **THE GAP IN TIME BETWEEN
THE ONSET OF THE PRIMARY
CASE AND THE SECONDARY
CASE**



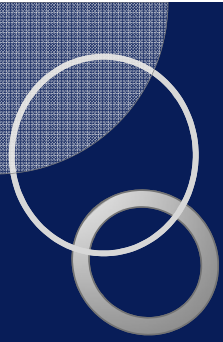
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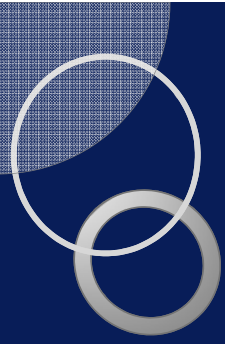
COMMUNICABLE PERIOD

- ➔ It is defined as the time during which an infectious agent may be transferred directly or indirectly from an infected person to another person, from an infected animal to man , or from an infected person to an animal, including arthropods



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SECONDARY ATTACK RATE

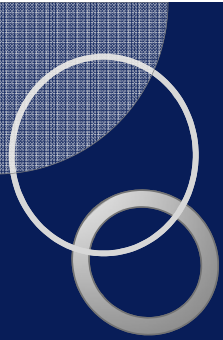


- ➔ It is defined as the number of exposed persons developing the disease within the range of the incubation period, following exposure to the primary case



HERD IMMUNITY

➔ **IT IS THE LEVEL OF RESISTENCE OF A COMMUNITY OR GROUP OF PEOPLE TO A PARTICULAR DISEASE**



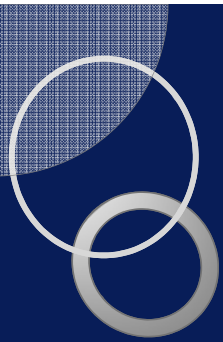
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BEHAVIOUR OF DISEASE IN THE COMMUNITY

1. EXOTIC
2. SPORADIC
3. ENDEMIC
4. EPIDEMIC
5. PANDEMIC
6. OUTBREAK



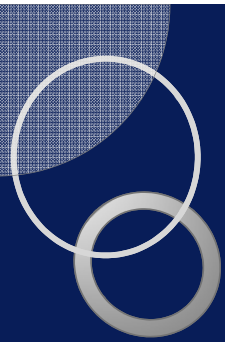
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EPIDEMIC

- ➔ It is the unusual occurrence in a community or region of cases of an illness, specific health-related behavior, or other health related events clearly in excess of normal expectancy (LAST, 1995)



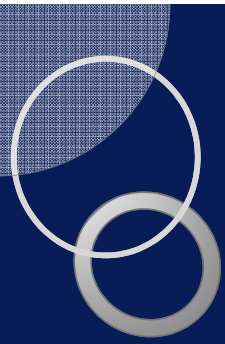
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OUT BREAK

➔ **TWO OR MORE RELATED CASES IN INFECTIONS, SUGGESTING THE POSSIBILITY OF A COMMON SOURCE OR TRANSMISSION BETWEEN CASES**



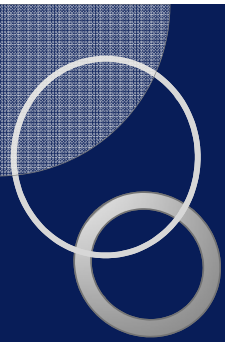
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EPIDEMIOLOGY OF DISEASE



- ➔ PLACE
- ➔ TIME
- ➔ DISTRIBUTION
- ➔ AGENT DETERMINANTS
- ➔ HOST DETERMINANTS
- ➔ ENVIRONMENTAL DETERMINANTS
- ➔ INCUBATION PERIOD
- ➔ MODE OF TRANSMISSION
- ➔ PORTAL OF ENTRY
- ➔ NATURAL HISTORY OF DISEASE
- ➔ SECONDARY ATTACK RATE



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