PRINCIPLE OF HEALTH
By; Dr. Irniza Rasdi

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Course Synopsis
• This course covers the concept and definition of health, wellness, disease processes, basic principles and strategies for disease prevention.

• The influence of environmental factors, risk factors, causative agents, lifestyles and behavioural factor; pathophysiology, impact, treatment, prevention and healthcare strategies are discussed by giving examples of infectious diseases, non-infectious diseases, cancer, injury and mental disorders.

Overview of Titles
1. Medicine and Public Health
2. Health and Illnesses.
3. Communicable Diseases
4. Non-communicable Diseases
5. Global trends in Diseases and Illnesses
6. Principal of Prevention and Control
7. Health Indicators
8. Social Determinants of Health
9. Mental Health
10. Malaysian Health Care System

Assessments

<table>
<thead>
<tr>
<th>Assessments</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-term examination (Chapter 1-5)</td>
<td>20</td>
</tr>
<tr>
<td>Continuous Assessments A (Assignment I)</td>
<td>15</td>
</tr>
<tr>
<td>Continuous Assessments B (Assignment II)</td>
<td>15</td>
</tr>
<tr>
<td>Continuous Assessments B (Assignment III)</td>
<td>10</td>
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<tr>
<td>Final Examination (Chapter 6-10)</td>
<td>40</td>
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<td>Total</td>
<td>100</td>
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Overview of lectures

1. Medicine and Public Health
2. Health and Illnesses.
3. Communicable Diseases
4. Non-communicable Diseases
5. Global trends in Diseases and Illnesses

Medicine

- The word MEDICINE is derived from the Latinars medicina, meaning - THE ART OF HEALING.
- Medicine has been evolving since thousands of years ago which is believed to be started with ancient Egyptian Medicine (2500 B.C) to modern medicine (1600s)

Modern medicine characteristics

- Clinical practice - doctors personally assess patients in order to diagnose, treat, and prevent disease using clinical judgement
- Conducted in health care system
- Delivered through primary, secondary, and tertiary care by physicians, physician assistants, nurse practitioners

Public Health

- PUBLIC HEALTH is the science and art of promoting health, preventing disease, and prolonging life, through organized efforts
- Core function of public health
  - Diagnostic Function: Monitor population Health Status / Investigate & Diagnose Health Problem
  - Policy Development: For improving and protecting people’s health; health information, education / community empowerment, partnership / Quality of health care
  - Law and regulation enforcement: Assuring appropriate and adequate health services

Difference between public health and medicine

<table>
<thead>
<tr>
<th></th>
<th>Public Health</th>
<th>Medicine</th>
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</thead>
<tbody>
<tr>
<td>Patients</td>
<td>Entire population</td>
<td>Individual</td>
</tr>
<tr>
<td>Intervention</td>
<td>Monitor, investigate &amp; Diagnose Health Problem</td>
<td>Medical, Surgical treatment</td>
</tr>
<tr>
<td></td>
<td>Policy development</td>
<td></td>
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<tr>
<td></td>
<td>Law Enforcement</td>
<td></td>
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<tr>
<td></td>
<td>Appropriate Health Services</td>
<td></td>
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<tr>
<td></td>
<td>Health Services</td>
<td></td>
</tr>
<tr>
<td>Process</td>
<td>System management</td>
<td>Patient management</td>
</tr>
<tr>
<td></td>
<td>Service management</td>
<td></td>
</tr>
<tr>
<td>Outcome</td>
<td>HEALTHY COMMUNITY</td>
<td>HEALING</td>
</tr>
</tbody>
</table>

Definition of Health

- Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.
- Determinants of health
Wellness

• The conscious and deliberate process by which people are actively involved in enhancing their well-being: intellectual, physical, social, emotional, occupational and spiritual”.

Diseases and illness

DISEASES

• An abnormal condition affecting an organism. This abnormal condition could be due to infection, degeneration of tissue, injury/trauma, toxic exposure, development of cancer, etc. This is what needs to be ‘cured’, especially if it’s life-threatening.

ILLNESS

• The feelings that might come with having a disease. Feelings like pain, fatigue, weakness, discomfort, distress, confusion, dysfunction, etc. – the reasons people seek healthcare – and usually the way people measure their success with treatment.

Illness-wellness Continuum

Diseases

Non-Communicable

• A medical condition or disease which is non-infectious and non-transmissible between persons

• Heart disease, hypertension, diabetes, cancer, stroke and arthritis

Communicable

• Diseases that have a potential of transmission from one person or species to another

• Tuberculosis, dengue, malaria, measles, mumps, diphtheria

Web of causation model

• The web causation model represents the complex group of subjects and relationships that can contribute to occurrences and spread of a disease

Epidemiologic Triangle Model

• Agent - An entity that causes the injury or disease

• A host is the human or organism that is susceptible to the agent

• The environment are not part of the host or the agent but influence their interaction
Natural History of Diseases

- Definition: The progression of a disease process in an individual over time, in the absence of treatment.

<table>
<thead>
<tr>
<th>Stage of pathologic onset</th>
<th>Pre-symptomatic stage</th>
<th>Clinically manifest disease</th>
<th>Progress to a fatal termination</th>
<th>Remission and relapses</th>
<th>Regress spontaneously, leading to recovery</th>
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</thead>
</table>

Epidemiology

- The study of the distribution and determinants of health-related states and events in specified populations and the application of this study to the control of health problems.

- Identifying and understanding the distribution of a disease or a health event by;
  - Persons,
  - Place and
  - Time

The Iceberg Concept of epidemiology

For every apparent case of a disease there is a larger population who are at the pre or sub-clinical phase of that disease.

Communicable diseases

- A disease that can be spread to a person from another person, an animal or object. Eg: common cold, influenza, mononucleosis, etc.

Pathogen

- A pathogen is an infectious agent (“germ”) that causes disease or illness in a host.
- Definition of an agent ability:
  - Infectivity: ability of an agent to enter and grow in the host
  - Pathogenicity: capability of an agent to cause disease in a susceptible host
  - Virulence: ability to cause death

Types of pathogens

<table>
<thead>
<tr>
<th>Type of pathogen</th>
<th>Description</th>
<th>Human diseases caused by pathogens of that type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacteria</td>
<td>Single-celled organisms without a nucleus</td>
<td>Strep throat, ear infections, tuberculosis, food poisoning, typhoid</td>
</tr>
<tr>
<td>Viruses</td>
<td>Viruses are not cells. They are made of DNA or RNA.</td>
<td>Common cold, flu, genital herpes, cold sores, warts, AIDS, genital warts, shingles, polio</td>
</tr>
<tr>
<td>Fungi</td>
<td>Single-celled organisms, including yeasts and molds, that grow as single cells or thread like filaments</td>
<td>Ringworm, athlete’s foot, ringworm, candidiasis, thrush, penicillin, mushroom poisoning</td>
</tr>
<tr>
<td>Protozoa</td>
<td>Single-celled organism with a nucleus</td>
<td>Malaria, “traveler’s diarrhea” giardiasis, toxoplasmosis (“hunting sickness”)</td>
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</tbody>
</table>
Chain of infection

Mode of infection

Direct transmission
Immediate transfer of disease agent between infected and susceptible individuals

Indirect transmission
Microbes transferred through contaminated intermediate object/living things

Droplet Transmission
Respiratory droplets carrying infectious pathogens

Airborne Transmission
Dissemination of droplet nuclei containing infectious agents. Dispersed over long distances

Susceptible
Susceptible host

Dynamics of infectiousness
Latent period
Infectious period
Non-infectious

Timeline for Infection

Pattern of Diseases Occurrence

Increasing amount of disease
Pandemic
Epidemic
Endemic
Sporadic

Types of infectious diseases

Human body protection mechanism

Food and water-borne
Sexually transmitted diseases (STD)
Airborne
Vector-borne
Nosocomial

1st Line
Skin, mucous, saliva, tears and stomach acid

2nd Line
White blood cells

3rd Line
Antibodies
Immunity

Non-Communicable Diseases

- NCDs can refer to chronic diseases which last for long periods of time and progress slowly.

Cardiovascular diseases

- Cardiovascular disease is caused by disorders of the heart and blood vessels, and includes:
  - coronary heart disease (heart attacks),
  - cerebrovascular disease (stroke),
  - raised blood pressure (hypertension),
  - peripheral artery disease,
  - rheumatic heart disease,
  - congenital heart disease and heart failure.

Cancer

- Cancer is the uncontrolled growth and spread of cells that arises from a change in one single cell.
  - The change may be started by external agents and inherited genetic factors and can affect almost any part of the body.
  - The transformation from a normal cell into a tumour cell is a multistage process where growths often invade surrounding tissue and can metastasize to distant sites.

Diabetes

- Diabetes is a chronic disease that occurs when the pancreas does not produce enough insulin (a hormone that regulates blood sugar) or alternatively, when the body cannot effectively use the insulin it produces.

<table>
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<tr>
<td>Type I</td>
<td>Insulin-dependent diabetes mellitus (IDDM) or juvenile-onset diabetes.</td>
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<td>Develops when the body’s immune system destroys pancreatic beta cells, the only cells in the body that make the hormone insulin that regulates blood glucose.</td>
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<tr>
<td>Type II</td>
<td>Non-insulin-dependent diabetes mellitus (NIDDM) or adult-onset diabetes.</td>
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<td></td>
<td>Begins as insulin resistance, a disorder in which the cells do not use insulin properly. As the need for insulin rises, the pancreas gradually loses its ability to produce insulin.</td>
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<td>Gestational</td>
<td>A form of glucose intolerance that is diagnosed in some women during pregnancy.</td>
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<tr>
<td>diabetes</td>
<td>Result from specific genetic conditions (such as maturity-onset diabetes of youth), surgery, drugs, malnutrition, infections, and other illnesses.</td>
</tr>
<tr>
<td>Others</td>
<td></td>
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Chronic respiratory diseases (CRDs)

- Diseases of the airways and other structures of the lung.
  - Some of the most common are:
    - chronic obstructive pulmonary disease (COPD),
    - asthma,
    - occupational lung diseases and
    - pulmonary hypertension.
  - In addition to tobacco smoke, other risk factors include:
    - air pollution,
    - allergen
    - occupational chemicals and dusts, and
    - frequent lower respiratory infections during childhood.
Risk Factors

Global Trends in Diseases
What kills more people: infectious diseases or non-communicable diseases?

- Non-communicable diseases were responsible for 68% of all deaths globally in 2012.
- The 4 main NCDs are cardiovascular diseases, cancers, diabetes and chronic lung diseases.
- Communicable, maternal, neonatal and nutrition conditions collectively were responsible for 23% of global deaths.
- Injuries caused 9% of all deaths.