

# Introduction to Community Medicine

## Community: (Population)

### Definition:

Community refers to a usually small, social unit of any size that shares common values.

Or is a group of people who have things in common & who recognize and aware of that commonality.

Examples:

- Geographic communities
- Health center catchment's area, a district, a province, or a country.
- A specific population group.

## Community Medicine:

Is the art & science of *preventing diseases, promoting health & prolonging life through the* organized efforts of society.

- It deals with the health of the whole population.
- Looks at the community (population) itself as a patient.
- Deals with the community as a social system and with the structure, function & dysfunction of such system.

Community Medicine is a new branch of medicine. It is often considered synonymous with **Preventive and Social Medicine, Public Health,** and **Community Health.** All these share common ground, i.e., prevention of disease and promotion of health.

These terms are often used interchangeably.

**The Aims of Preventive (Community) Medicine** are to promote and preserve health in individuals and community by adoption of healthy life style and health education; prevent and limit diseases; enhance quality of health care system and assure that all populations have access to appropriate and cost effective care; and to use epidemiology to assess and monitor the health of communities and populations at high risk to identify health problems.

**Prevention:** Is the anticipatory action taken to reduce the possibility of an event or condition occurring or developing, or to minimize the damage that may result from the event or condition if it does occur.

**Prevention** may take place at any point along the spectrum of the disease, from the prevention of the disease or injury to the prevention of impairment, disability or dependency.

### **Levels of prevention:**

**1- Primordial prevention:** (Acting on risk factor) 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.

**2- Primary prevention:** (Acting before disease occurrence) Activities designed to prevent onset of disease. We act before the development of the sign and symptoms of the disease. Ex: Immunization, ban on smoking, speed limit, seat belts.

**3- Secondary prevention:** (Acting after disease occurrence) Early identification of health problems to reduce the risk of progression or transmission. Ex: Early diagnosis of HT, DM, cervical CA, breast CA, STD.

**4- Tertiary prevention:** (Acting after complications occurrence) Focused on rehabilitation to reduce the impairment. Ex: Learning to walk after stroke, adjusting diet and life style after MI, learning to live with DM.

So, prevention is any intervention that seeks to reduce or eliminate diagnosable conditions and may be applied at individual level, as in immunization, or the community level, as in the chlorination of the water supply.

### **History of public health & community medicine:**

The value of primary prevention was known to mankind for many centuries. Early in human civilization, it was recognized that polluted water and lack of proper waste disposal may spread vector-borne disease. By Roman times, it was well understood that proper diversion of human waste was a necessary tenet of public health in urban area.

The practice of vaccination did not become prevalent until the 1820s, following the work of Edward Jenner. The science of epidemiology was founded by John Snow's identification of polluted public water as the cause of an 1854 cholera outbreak in London. Microorganisms were first identified in 1880s by the germ theory of Robert Koch and Louis Pasteur and the production of artificial vaccines revolutionized the study of infectious diseases and introduced the modern era of public health.

Public Health has become an important specialty in developed countries in the early of 19<sup>th</sup> century. The development of public health policies and

programs required intersectoral collaboration to understand the cause and prevention of diseases.

Medicine is one of the most ancient professions that evolved over time and developed further by different civilization. Until the 18<sup>th</sup> century all the doctors were general medical practitioners who treat all people from all diseases. The 20<sup>th</sup> century has witnessed a real revolution of medicine and considered as the era of specialization in medicine.

The 4 major medical specialties of "curative medicine": General Medicine, General Surgery, Pediatrics, and gynecology & Obstetrics have paved the way for more and more specialties later on. The Preventive (Community) Medicine has stand hand by hand with other specialties concentrating more on preventive aspects and act as bridge between practice of medicine and Public Health.

**Family Medicine** as specialty was recognized in Europe and America in the 1950s. Although it is new and modern specialty, some may see it as the father of all medical specialties as it resembles the general medical practitioner. The benefits of incorporating prevention into medical practice have become increasingly apparent over the past 30-40 years, as many serious diseases have decline in incidence following the introduction of effective clinical preventive services: Ex: Poliomyelitis which occur in regular epidemic waves (over 18300 cases in 1954), have become rare in the USA as well as many other countries as a results of childhood vaccination. Other Ex: Rubella epidemics occurred regularly in the USA every 6-9 years (in 1964 caused 12 million rubella infections, 11000 fetal losses and about 20000 infants born with congenital rubella syndrome. But now rubella is very rare since 1969 when the vaccine first became available.

**Evidence Based Medicine (EBM)** was first described in 1992. It was hailed as a new approach to teaching medicine and was once describe as "revolution" in the medical practice. **EBM** is defined as the conscientious, explicit, and judicious use of current best available evidence in making decision about the care of the patients. The practice of EBM calls for the integration of individual clinical expertise with the best available external evidence from systemic researches.

**Preventive Medicine sciences:** Include a set of biological, epidemiological, statistical, social, and economical sciences and practices intended to measure, protect, and promote health on a population level. It provides an exciting opportunity for physicians who are interesting in developing skills in clinical and preventive health services to promote

health and reduce the risks of disease, disability, and death in individual and population.

### **Public Health Problems:**

#### **1. In Developing Countries:**

- Infectious diseases e.g. TB, malaria....etc.
- Malnutrition.
- Poor health education.
- Limit access to health services.

*((Problems associated with poverty and overcrowding))*

#### **2. In Developed Countries:**

- Chronic diseases e.g. IHD, HT, DM...etc.
- Over nutrition and obesity.
- Violence and drug addiction.
- Environmental pollution e.g. air pollution, ozone layer depletion...etc.

*((Problems associated with industrialization, affluence, aging, violence, and medical intervention))*

### **Scope of Community Medicine:**

- Medical statistics (Biostatistics)
- Nutritional health and Nutritional disorders.
- General epidemiology
- Primary Health Care: Includes:
  - Maternal and child health care including family planning.
  - Health education.
  - Mental health.
  - Geriatric Health
- Epidemiology of communicable diseases
- Epidemiology of non communicable diseases (chronic diseases)
- Occupational Health
- Environmental Health
- Health Care Administration

## Primary Health Care

### Basic Definitions:

#### 1. Health:

*The World Health Organization (WHO)* defined health as **a state of complete physical, mental and social well being and not merely the absence of disease or infirmity.**

Today health is not merely an absence of disease; it is related to quality of life instead. Health is considered a means of productivity. Thus health development is essential to socio-economic development as a whole.

*Another definition* of health is that “ **health is a successful adaptation of the human body to stresses and stimuli (in the environment) to which it is exposed, such that it expresses adequate functioning under given genetic and environmental conditions.** The successful adaptation may be very optimal, and the attributes of optimal health are:

1. Anatomical integrity to ensure the physical aspect of health.
2. Ability to do normal duties at personal, family and community level.
3. Ability to deal with stress whether this stress is physical, mental or social.
4. Feeling of well being. This is the mental or psychological dimension of health.
5. Freedom from disease and premature death.
6. Spiritual and moral stability.

#### **Health has many dimensions:**

1. Physical dimension.
2. Mental dimension
3. Social dimension.
4. Spiritual (including religion) and ethical dimension.
5. Emotional dimension.
6. Vocational dimension
7. Other dimensions, philosophical, socioeconomic, medical, environmental

Thus, health may be seen as extending over a spectrum. At one end of the spectrum is the optimal health and at the other end is the end of any health or death.

**Optimal health**—————**Death**

2. **Disease (Dis-ease):** Failure of the adaptive mechanism of an organism to counteract the stimuli and stresses to which it is exposed, resulting in abnormal structure and function of one or more parts of the body.
3. **Health care services:** All services performed by individuals or institutions for promoting, maintaining or restoring health.
4. **Health care:** the product of health care services delivered through various types of health services. It implies a comprehensive care (promotive, protective, curative and rehabilitative).
5. **Medical care:** A term used to emphasize the delivery of curative care. It is a subset of health care.

#### **Levels of Care:**

- 1-Primary health care
- 2-Secondary health care
- 3-Tertiary health care

#### **Primary health care**

- The “first” level of contact between the individual and the health system.
- Essential health care (PHC) is provided.
- A majority of prevailing health problems can be satisfactorily managed.
- The closest to the people.
- Provided by the primary health centers.

#### **Secondary health care**

- More complex problems are dealt with.
- Comprises curative services
- Provided by the district hospitals
- The 1st referral level

#### **Tertiary health care:**

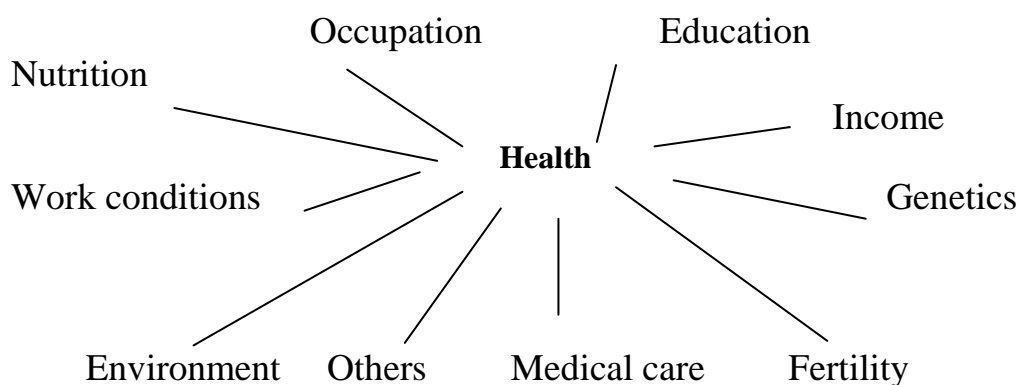
- Offers super-specialist care
- Provided by regional/central level institution.
- Provide training programs

## Differences between medical and health care:

	Medical care	Health care
The concept	old	New
The prevalence	In developing countries	In developed countries
The consumers	Sick individuals	All individuals ( healthy & sick)
The aspects	Diagnostic & curative	Comprehensive (Preventive, curative, rehabilitative & promotive)
The concern with determinants of diseases	absent	present

### Characteristics of medical care (hospital-based, curative –oriented care):

1. Usually it is based on high technology or sophisticated technology which is costly to do and costly to maintain.
2. It is limited to people who visited hospitals usually complaining of advanced disease.
3. It does not interfere in any means in the process of disease genesis outside the walls of hospitals
4. Although hospital care relieves pain in most cases, it does not always cure disease. Sometimes it adds disease to the those admitted (nosocomial infection, iatrogenic diseases, provider mistakes)
5. The coverage by hospital care is usually limited to much-selected catchment's population. **Adding to that, factors determining health are many; some of these factors are illustrated below:**



Medical care (curative care) is only one factor affecting the health status of people and perhaps, it is not the most important determinant of health of neither individuals nor population groups.

It is clear that the classical hospital – based cure oriented medical care is not the solution for the ever increasing health needs of the general population. A new approach was proposed and then practiced. That was the **primary health care (PHC)**. The PHC strategy was adopted by the WHO and member states in 1978.

**Primary Health Care is based on following principles:**

- 1-accessibility and equity;
- 2- relevance to the needs of the population;
- 3-cost effective appropriate use of technology and health services;
- 4-integration between primary care and secondary and tertiary care;
- 5 -encouragement of self care and community involvement in health service planning and provision;
- 6-collaboration between health and other sectors to address underlying causes of ill health;
- 7-redistribution of resources to primary care, areas of need, to rural areas, and to disadvantaged groups.

**Definition of primary health care (PHC):**

Primary health care is essential health care made universally accessible to individuals and families in the community by means acceptable to them, through their full participation and at an affordable cost. It forms an integral part both of the country's health care system of which PHC is the nucleus and of the overall social and economic development of the community.

Primary health care stresses the provision of **promotive, preventive, curative and rehabilitative care**. In other words, it stresses the provision of comprehensive, continuing, practical and high quality care. It is not a second hand care and in no way it is intended to make the cost of care a burden on consumers.

**The Basic Requirements for Sound PHC:**

- Appropriateness
- Availability
- Adequacy
- Accessibility
- Acceptability



- Affordability
- Assessability
- Accountability
- Completeness
- Comprehensiveness
- Continuity

**Appropriateness:**

Whether the service is needed at all in relation to essential human needs, priorities and policies. The service has to be properly selected and carried out by trained personnel in the proper way.

**Availability:**

Availability of medical care means that care can be obtained whenever people need it.

**Adequacy:**

The service proportionate to requirement.  
Sufficient volume of care to meet the need and demand of a community.

**Accessibility:**

Reachable, convenient services, Geographic, economic, cultural accessibility . This means: Care can be used when and where people needs arise. Distance, cost and administrative arrangements should not act as barriers to the use of health care services.

**Acceptability:**

Acceptability of care depends on a variety of factors, including satisfactory communication between health care providers and the patients, whether the patients trust this care, and whether the patients believe in the confidentiality and privacy of information shared with the providers. *A female doctor is certainly more acceptable to provide antenatal care from the sociocultural point of view.*

**Affordability:**

The cost should be within the means and resources of the individual and the country.

**Assessability:**

Assessebility means that medical care can be readily assessed and evaluated.

**Accountability**

Accountability implies the feasibility of regular review of financial records by certified public accountants.

**Completeness:**

Completeness of care requires adequate attention to all aspects of a medical problem, including prevention, early detection, diagnosis, treatment, follow up measures, and rehabilitation.

**Comprehensiveness:**

Comprehensiveness of care means that care is provided for all types of health problems.

**Continuity**

Continuity of care requires that the management of a patient's care over time be coordinated among providers.

**Elements of Primary Health Care:**

**1. Education for Health**

Is one of the potent methodologies for information dissemination. It promotes the partnership of both the family members and health workers in the promotion of health as well as prevention of illness.

**2. Locally Endemic Disease Control**

The control of endemic disease focuses on the prevention of its occurrence to reduce morbidity rate.

**3. Expanded Program on Immunization**

This program exists to control the occurrence of preventable illnesses especially of children below 5 years. Immunizations on poliomyelitis, measles, tetanus, diphtheria and other preventable disease are given for free by the government.

**4. Maternal and Child Health and Family Planning**

The mother and child are the most delicate members of the community. So the protection of the mother and child to illness and other risks would ensure good health for the community. The goal of Family Planning includes spacing of children and responsible parenthood.

**5. Environmental Sanitation and Promotion of Safe Water Supply**

Environmental Sanitation is defined as the study of all factors in the man's environment, which exercise deleterious effect on his well-being and survival. Water is a basic need for life and one factor in man's environment. Water is necessary for the maintenance of healthy lifestyle. Safe Water and Sanitation is necessary for basic promotion of health.

**6. Nutrition and Promotion of Adequate Food Supply**

One basic need of the family is food. Malnutrition is one of the problems that we have in the country.

**7. Treatment of Communicable Diseases and Common Illness**

The diseases spread through direct contact pose a great risk to those who can be infected. Tuberculosis is one of the communicable diseases continuously occupies the top ten causes of death. Most communicable

diseases are also preventable. The Government focuses on the prevention, control and treatment of these illnesses.

### **8. Supply of Essential Drugs.**

- Other elements can be added, according to the health needs of the community. Examples are: promotion of mental health, school health services and oral health services. Whatever the components are, health education is central to all PHC programs in any community.

### **Skills of the doctor working in PHC setting:**

A doctor working in a primary health care setting is described as “*the five star doctor*” who is expected to be:

- a. **Care provider**, who considers a patient as an integral of a family and the community and provides high quality care.
- b. **Decision-maker**. The work of doctors is a series of decision making; starting from the decision on kinds of questions asked in history, steps in physical examination, laboratory tests to be done, label of diagnosis, type and duration of treatment, when to stop or change treatment, indicators of prognosis, ...etc.
- c. **Communicator**, who is able to promote healthy lifestyles by effective explanation and advocacy and careful and effective listening to people.
- d. **Community leader**, This needs the winning of the trust of people first, then a doctor can reconcile individual and community health requirements and initiate action on behalf of the community.
- e. **Team member**, who can work in harmony with other individuals and organizations to facilitate the work of his team and institution.

# **PRIMARY HEALTH CARE IN IRAQ**

Primary health care as a strategy has been adopted in Iraq since Al-Ma-Ata declaration in 1978. To meet the basic needs of the population and to fulfill the requirements for primary health care, an extensive network of health care institutions was established.

## **Sources of health care**

- Mobile units for remote areas and in campaigns.
- Primary health centres.
- District hospitals.
- General multispeciality hospitals.
- Specialized referral hospitals.
- Private clinics and hospitals.
- Cooperative clinics.

The list of the essential services adopted in Iraq is not different from the list recommended by the World Health Organization (WHO). They are clearly defined in the Iraqi Public Health Law No. 89 for 1981. A number of programmes, however, received special attention and a good deal of effort and resources has been devoted to execute them on national level. They received international, national and local support.

## **The principal objectives of primary health care programmes:**

1. To reduce morbidity and mortality levels in population.
2. To reduce morbidity and mortality levels in children aged under five years and women in the reproductive age.
3. Specifically to reduce infant and childhood mortality which result from specific targeted diseases.
4. To improve peoples awareness and practices regarding health behaviour and child care.
5. To encourage people participation in caring for their health and supporting health programmes.
6. Other specific objectives for each programme.

## **The major primary health care programmes:**

1. Expanded programme on immunization (EPI).
2. Control of diarrhoeal disease programme (CDD).

3. Control of acute respiratory infection (ARI).
4. Maternal and child health (MCH).
5. Promotion of breast feeding.
6. Training of traditional birth attendant [TBAs].

### **Supportive programmes of PHC:**

- a. Health information system.
- b. Guide- lines, supervision and follow- up.
- c. Continuing education.
- d. In- service training.
- e. Effective referral system.

### **Expanded programme on Immunization (EPI)**

Immunization services are provided through variety of health care institutions as routine activities supported frequently by national immunization days to improve coverage rates.

Immunization services in Iraq have been offered to children since 1967 but EPI was launched since 1978. An intensive acceleration is being adopted since 1985, when the first national immunization campaign was launched and succeeded in bridging tangible gap in the coverage rate. The coverage rates since the end of the 2000 ranged between 80-100%. It is evident that the targeted diseases showed massive reduction in incidence and mortality. Poliomyelitis is under eradication action and success is remarkable in this aspect.

#### **The main objectives of EPI are:**

1. To cover 90-100% of eligible children by immunization against targeted diseases.
2. To reduce infant mortality and childhood mortality from the targeted diseases by 25% of the level in the preceding year and to reach a level as low as 20/1000 live births.
3. To encourage people to immunize their children at proper age and ensure adequate immunization doses for each and every eligible child in the target population.

This programme (EPI) is perhaps, the most successful one among all primary health care programmes in Iraq, both in terms of popularity and accessibility and in its evident success in reducing the extent of targeted diseases.

## **Control of diarrhoeal diseases (CDD):**

Diarrhoeal diseases of childhood represent one of the major causes of morbidity and mortality among under five children in developing countries. Dehydration is the important preventable and correctable complication of diarrhoea.

### **The main objectives of CDD are:**

1. To reduce infant mortality rate due to diarrhea.
2. To educate people regarding recognition of severe cases and home management of disease.

The main measure to control diarrhoeal disease is oral rehydration therapy (ORT). Oral rehydration units exist in almost every health care institution concerned with primary health care.

## **Control of acute respiratory infection (ARI):**

Acute respiratory infections, together with malnutrition and diarrhoeal disease represent the three major causes of illness and death among children in developing countries. In Iraq, the situation is more or less similar to the above description. This led to put acute respiratory infection among the top priorities of primary health care activities.

### **The main objectives are:**

- To reduce mortality associated with severe ARI cases.
- To improve case management at PHC level.
- To rationalize the use of antibiotics.
- To educate parents about recognition of severe cases and about some home practices to deal with diseased children.

The ARI control strategy includes the following components:

1. Immunization.
2. Case management.
3. Health education.

## **Mother and child health care (MCH):**

This programme emphasizes the provision of comprehensive care to mothers and children through primary health care strategy. Services provided include:

- a. Pre-marital.
- b. Antenatal.
- c. Natal.
- d. Post natal.
- e. child health.
- f. School health.

### **Promotion of breast feeding:**

This programme is intended to encourage breast feeding. Evidence from a number of studies indicated a tangible achievement in this field. In one study, it was reported that the percentage of women who breast-fed their infants increased from 50-60% to 85%.

### **Training of TBAs:**

This programme is intended to improve the conduct of traditional birth attendants . Many of such women are being exposed to training courses and provided with basic package of sterile delivery.

# Family Health

## The new strategy for the delivery of PHC:

Is the Implementation of the Family Health Model .

It is comprehensive continuous health care for the family as one unit.

- It yields better results than care that is fragmented among unrelated and uncontrolled specialists.
- The family physician is the health care provider whom the family members contact first.
- The family physician treats all members of the family considering all the factors that influencing them.

### The steps to implement the Family Health Model:

1) Establish fully equipped and efficient Family Health Units and Centers.

- health centers in both rural (one/500- 3000 population) and in urban area (one /5000-10000 population). A group of such centers is linked with district hospital, which in turn is linked with general and specialized hospital.

This step includes listing the numbers of population within a specific geographic area served by the family health unit. The aim of this step is to:

- registration of all the family members within the catchment area
- obtaining information ( environmental, demographic, and health) ,
- identification of the vulnerable groups.

This data is recorded in the Family Health Folder

#### **The family health Folder:**

1. It includes all the health and illness events of each member of the family from birth to death to be useful for the family physician.
2. These data is useful for the family physician as it shows all preventive, curative services and investigations carried for each family member.
3. It is the tool for evaluating the health services.

2) Determination of the catchment area , housing enumeration and family registration.

3) Training to orient the health personnel regarding the Family Health Model approach.



4) Involving the community through a health committee.

Health committee is formed in every health center consisting of religious workers, school teachers, and a representative of the government. The committee should be informed about the role of the Family team in order to take appropriate actions to explore social, cultural and environmental problems related to health and diseases.

5) Organization of out-reach activities.

Out-reach activities are organized to those in need of these services (risk groups), to trace defaulters and to initiate immunization.

6) Orient the people to accept the Family Health Model as a tool for providing comprehensive health care rather than outpatient clinic.

7) Integration of preventive and curative services: integration of the existing health offices, MCH centers and other units to function as one unit in the name of PHC.

8) Coordination with teaching institutions for introduction of Family Health Model in the medical curriculum to orient the future health manpower about the concept of the Family Medicine, in addition to continued training of the health personnel.

### **Referral system:**

Referral is the process in which the family physician at the family health unit or center who has inadequate skills due to his qualification and/ or lesser facilities at his level to manage a clinical condition, seeks the assistance of a better equipped and qualified specialist, with better resources at the higher level to guide him in managing a clinical condition.

Referral does not mean transferring responsibility; it is sharing responsibility in patient care.

Doctors should know:

- When** a client should be referred to the secondary level,
- How** the client will get to the referral site,
- Who** the client should contact at the referral site,
- What** document carried by the client to be directed from the primary level to the referral site.

## **The Benefits of referral System:**

### **For the Client:**

- Early detection of diseases.
- Avoid loss from one hospital to another.
- Save time and effort.
- Draw the attention of the specialist.

### **For the family physician:**

- learning and training process.
- Gaining self confidence.
- Help in organizing follow-up services.
- Increase communication between the health personnel.

### **For the Consultant:**

- Save time and effort so relief hospitals from the burden.
- Can gather data about the patient leading to improve the quality of the patient's management.

# **Maternal and Child Health Care**

## **Maternal and Child Health (MCH):**

It is one of the essential components of PHC which is concerned with the special needs and problems of mothers and children and more precisely the needs and problems arising from the process of human reproduction, growth and development.

## **MCH Services:**

Are the services concerned with the well-fare of mother, infants and pre-school children. These services are designed for the care of mothers from the time of conception to ensure that they have a normal pregnancy, normal delivery and proper care in the postnatal period. They also include the protection and supervision of the health of children from the time of conception to the time they enter school.

## **MCH Services have special priorities in the developing countries for the following Reasons :**

- 1-Mothers and children form the majority of population.
- 2-They are particularly vulnerable to diseases & death .
- 3-Most of the diseases are preventable.
- 4-Child illnesses and malnutrition reduce cognitive development and intellectual performance, school enrolment and attendance, which impair final educational achievement.
- 5-Intrauterine growth retardation and malnutrition during early childhood have long term effects on body size and strength with implications for productivity in adulthood.
- 6-Preventive services of mothers & children decrease childhood and mother disability & the resulting social burden.
- 7-Good health of mothers & children is an investment in social development & productivity of a nation.

## **In addition:**

- Annually, > 200 million women become pregnant all over the world. If the needs of these women are neither recognized nor acknowledged, many of these pregnancies may end in disability or death of the mother, the infant or both.
  - At least 15% of all pregnant women need skilled obstetric care some time during pregnancy, delivery or the puerperium.
- For 580,000 women, complications of pregnancy, child birth or the puerperium are fatal.

-Of the infants born alive, nearly 8.1 million die during the first year of their lives.

-One half of those (4 million) die during the first month of their lives.

Of those 2.8 million die during the first week of their lives.

An equal number to the above die in utero and are stillborn

### **Aims of MCH Services:**

1- Every pregnant women maintains good health, goes through a normal and safe delivery, and bears a healthy child.

2- Every child grows up in healthy environment, receives proper nourishment, and adequate protection from diseases

3- Communicable diseases are controlled.

4- Diseases are detected and treated before they become serious & chronic.

5- Statistical data is maintained.

### **Objectives:**

1-Health promotion of children

2- Prevention and control of health hazards to children

3- Treatment of common childhood diseases

4-Rehabilitation of handicapped children

5-Ensuring a favourable outcome of pregnancy and puerperium and dealing with factors leading to unfavourable outcomes (risk factors).

6-Ensuring secure relationships between parents themselves and parents and their children.

### **Phases of Maternity Care:**

#### **1. Premarital Care:**

Is the health care given to girls and boys before they get married and is an essential part of adolescent health care. Basically it includes promotive health services such as education regarding proper nutrition, life style, STDs, and in some countries on contraception. It also includes preventive services such as immunization.

#### **Aims of premarital care:**

1-To assess woman general health & wellbeing.

2-Health education and risk assessment can be directed towards the planned pregnancy.

3-To optimize nutritional status of girls in prepration for pregnancy and lactation. Nutritional education, folate supplementation to reduce the risk of subsequent neural tube defect.

4-Promote & provide family planning methods .

- 5-Educate adolescents on reproduction & child care . .
- 6-Immunization (boostor doses of TT, rubella, hepatitis, and HIV status when indicated.)
- 7-For a woman with diabetes mellitus, abnormal blood glucose should be controlled.

**Premarital care includes the following services for the couple:**

- 1-History taking regarding past medical history especially on hereditary diseases.
- 2- Medical examination including the evaluation of the nutritional status of the female.
- 3-Investigations including blood group (ABO and Rh), serological tests for identifying STD like syphilis & AIDS, blood examination for early detection of haemoglobinopathies, and CXR for TB.
- 4-Health education.
- 5-Counseling on family planning, if requested by the couple.

Couples are, then provided with certificate for their fitness and suitability for marriage.

**2. Prenatal (Antenatal) Care:**

It is defined as the complete health supervision of the pregnant woman in order to maintain, protect and promote the health and well-being of the mother, the fetus and the newborn infant.

**Aims of ANC:**

- 1-Assessment & management of maternal risk & symptoms
- 2- Assessment and management of fetus risk.
- 3- Diagnosis and management of prenatal complications.
- 4- Prenatal diagnosis and management of fetal abnormality
- 5- Decision regarding timing and mode of delivery
- 6- Parental educating regarding pregnancy and childbirth.
- 7- Parental education regarding child-rearing.

**Components of ANC:**

- 1-Monitoring health through antenatal examinations.
- 2-Risk screening & assessment.
- 3-Provision of special supplements &immunization.
- 4-Health education.

In order to make antenatal care (ANC) services effective, they must be delivered adequately. **Adequacy** should be in quantity (the

first antenatal visit should be made during the first trimester, and at least seven visits well distributed over the pregnancy period should be made), as well as in quality (content of the visits should be up to the internationally accepted standard). Adequate ANC will lead to a reduction of maternal and perinatal morbidity and mortality.

### **Standards of ANC:**

The most important AN visit is the first visit. During this visit we will have to make sure that the lady is actually pregnant. This can be done through a pregnancy test done on a urine sample for the detection of Human Chorionic Gonadotrophin (HCG) during the first 13 weeks. If gestational age is beyond 13 weeks, the gravid uterus can be felt by abdominal examination or visualized with a sonogram.

When the pregnancy is confirmed, a file is opened for the pregnant mother in the AN clinic. It should contain information like name, age, address, employment status, educational level and similar information about the husband.

**History:** History in ANC consists of 5 components:

- a. General: Past history of hypertension, diabetes mellitus, thyroid disease, viral diseases, heart diseases, blood transfusion, surgical interventions, etc.
- b. Menstrual: Age at menarche, regularity of the cycle, length of the cycle, duration, dysmenorrhea, etc.
- c. Obstetrical: Gravidity, parity, abortions, stillbirths, low birth weight, preterm delivery, difficult labour, Caesarean sections, etc.
- d. Current pregnancy: Date of the last menstrual period (to determine present gestational age and the expected date of delivery), bleeding, vaginal discharge, nausea, vomiting, dysuria, etc.
- e. Family: History of hypertension, diabetes mellitus, twin and thalassaemia.

**Physical Examination:** Weight, height, blood pressure, sclera, tongue, neck for goitre and enlarged lymph nodes, heart, lungs, breasts, abdominal organomegaly, fundal height (do not forget to compare it with the calculated gestational age by using the date of the LMP), foetal heart, leg oedema and varicose veins. Teeth should be examined by the dentist in the centre.

### **Investigations: -**

- Urine analysis: for sugar, albumin and pus cells. If suspicion of UTI, send for microscopy, culture & sensitivity.
- Blood for haemoglobin and PCV, blood group (ABO and Rh).
- Rubella Ab titer : base line level is needed in certain circumstances.

- Cervical swab for culture when indicated.
- Prenatal Hbs Ag screening is recommended in special indications:
  - any woman with history of acute or chronic liver disease in the past.
  - blood transfusion on repeated occasion.
  - history of working or treatment in haemodialysis unit.
  - certain occupations with frequent exposure or handling of blood such as medical or surgical setting.
  - household contact with hepatitis B carrier or patient.
  - multiple episodes of STD.
  - history of being rejected as blood donor.
  
- Women who may carry Aids virus should be offered confidential HIV Ab studies .

**Instructions:** About nutrition, rest, sleep, exercise, clothing, oral health, and the date and frequency of subsequent visits (every 4 weeks until 28 weeks of gestation, every 2 weeks between 28-36 weeks of gestation and once weekly until delivery).

### **Other Tests & Procedures if indicated:**

1-Amniocentesis :

Carried out at 15-18 weeks gestation . for woman over 35 years, or family history of congenital anomaly, chromosomal abnormality, errors of metabolism or neural tube defects, and for spontaneous abortion.

2-Alfa-feto-protein (AFP ) determination in blood:

At 16 -18 weeks gestation, for woman with D.M or in neural tube defects.

3-Oral glucose tolerance Test :

24 -28 weeks gestation .for those with suspected gestational D.M

4-Ultrasound examination:

for determination of pregnancy duration, presentation, of fetus & placenta, missed abortion, suspected IUGR or congenital abnormalities.

**In the subsequent visits** only the followings are done: Weight, blood pressure, general condition, fundal height, legs, and foetal heart. Any complaint should also be dealt with.

**Repeat:** GUE and HB during the second and third trimesters.

Determine Rh antibody titre for Rh negative mothers.

**Avoid:** X-Ray and unnecessary medications.

**Give:** haematinic supplementations and tetanus toxoid.

**Counsel:** on the place where delivery will take place.

**Provide:** a card with full information on the pregnancy addressed to the maternity hospital at which delivery will take place.

### **High Risk Pregnancy:**

Is one in which the fetus and/or the mother has a significantly increased chance of morbidity or mortality.

Pregnant women at such risk must be identified during ANC, according to the presence of certain risk factors which may arise:

- a. Before pregnancy begins: age (<18, >35 years), weight (<40 Kg), height (<145 cm), > 5 previous births, previous infertility, short spacing (<2 years since that last delivery), bad obstetrical history, other diseases).
- b. During pregnancy: failure to gain weight (<6 Kg), anaemia, oedema of the arms or face) Rh iso-immunization, bleeding, bacteruria, drug or hormonal therapy.

Identification of risky pregnancy can also be classified according to:

1- conditions from history:

- Age <18 year or >35.
- Medical history of hypertension, D.M, heart disease, ect...
- Bad obstetrical history.
- Bad previous delivery history.
- History of congenital abnormality.
- Too long or too short birth interval.
- Multiparty >5.
- Heavy cigarette smoking.

2- Conditions from physical examinations:

- Weight <40 kg or >90 kg.
- Height < 145 cm.
- Minimum weight gain during pregnancy.
- Obstetrical complications.
- Abnormal presentations.
- Intrauterine growth retardation.
- Post maturity.



**Selective supplements** during pregnancy include giving iron, folic acid, vitamins, and proteins in the form of nutritional supply (e.g high protein biscuits).

**Immunization during pregnancy:** Tetanus Toxoid vaccine in five doses:

- First dose: at the end of first trimester.
- Second dose: one month after the first dose.
- Third dose: six months after second month.
- Fourth dose: one year after third dose.
- Fifth dose: one year after fourth dose.

**Health education:**

- 1- Nutrition: extra 200-300 kcal/day, additional protein (30 gm/day)
- 2- Advice should be stressed to stop smoking.
- 3- Advice to avoid alcohol.
- 4- Take no medication unless prescribed by a doctor.
- 5- Avoid exposure to x-ray.
- 6- Get adequate daily rest and avoid exhausty work
- 7- Should not work when there are chemical or radiation hazards.
- 8- Perform mild to moderate exercise.

**Approaches to health education:**

- 1- Individual health education.
- 2- Group teaching, lectures, demonstrations.
- 3- Illustrated leaflets and posters.
- 4- Use of various mass media.
- 5- Home visits.

**3-Natal (Delivery) Care:**

This phase is characterized not only by its short duration (hours), but also by being a dangerous phase for both mother and infant. If not properly handled, it leads to morbidity or mortality of either or both of them. The mother might develop complications such as bleeding, may be exposed to surgical interventions, or subjected to infections and to trauma. The infant may be exposed to asphyxia, trauma, hypothermia or

infections. Good natal care will reduce the number of deaths and disabilities resulting from such conditions.

**Delivery** may take place in maternity hospitals, centres and institutions. Home delivery may be appropriate for a normal delivery, provided that the person attending the delivery is suitably trained and equipped, and that referral to a higher level of care is available in case of complications. Since the situation can alter dramatically in the course of delivery, emergency services providing skilled intervention should always be available.

### **Skilled birth attendants:**

A skilled attendant is a doctor, midwife or a nurse who has learnt the skills necessary to manage normal deliveries and diagnose or refer obstetric complications. The skilled birth attendant must be able to:

- 1- Manage normal labour and delivery
- 2- Recognize the onset of complications
- 3- Perform essential interventions
- 4- Start treatment
- 5- Supervise the referral of the mother and baby for interventions that are beyond their competence.

### **Traditional birth attendants (TBAs):**

They are people, usually women, who have acquired their skills in delivering women by working with other traditional birth attendants and from their own experience.

Primary health care programmes have been devised for training of these TBAs and for incorporating them within the health services.

The training programme is designed to promote safer birth practices, to avoid harmful practices, to improve their technique with regards to hygiene and cleanliness, to recognize abnormalities which indicate the need for referral for more skilled management, and to know their limitations thus do not attempt to deal with problems beyond their skills.

They are also supplied with simple kits which include hygienic dressings and basic equipments.

### **Emergency obstetric care (EmOC):**

Studies have shown the crucial role of the EmOC in preventing maternal deaths.

It is provided at the first referral level for obstetric services. This facility is required for dealing with the complications that occur in the course of

pregnancy and delivery and that require skilled intervention to save the life of the mother and her baby. It is estimated that at least 5% of pregnancies require some form of skilled obstetric intervention.

EmOC at the first referral level are:

- Surgery (e.g. Caesarean section)
- Anaesthesia to support surgical procedures.
- Medical treatment of complications such as diabetes and hypertension.
- Blood replacement for severe anaemia or bleeding.
- Monitoring and management of women at risk.
- Neonatal special care.

Maternal deaths occur when women with life-threatening complications do not have timely access to EmOC. The delays may occur at one or more stages:

- Delay at home in deciding to seek emergency treatment.
- Delay in reaching an institution that can provide EmOC.
- Delay in providing effective EmOC at the referral institution.

#### **4-Postnatal Care:**

This period starts one hour after delivery of the placenta and continues for six weeks. During this period two medical examinations should be carried out with the aim of detecting and curing any problems resulting from birth. The first examination is carried out within two weeks after delivery and the second between 4 and 6 weeks after delivery.

##### **Objectives of postnatal examinations:**

- 1- Early diagnosis and treatment of complications of postnatal period.
- 2- To provide care for the rapid restoration of the mother to optimum health.
- 3- To check adequacy of breast feeding.
- 4- Provide family planning services.
- 5- Provide basic education.
- 6- Provide psychological support.

Examination should include checking the size and position of the uterus, cervix and perineum; and checking the blood pressure. The GUE and Hb testing should be repeated. We must teach pelvic floor exercise

and promote breast feeding. Home visits should be paid to women who are discharged early by a home visitor or a public health nurse.

### **Care of the newborn:**

Aims of newborn examination in the first 48 hours:

- 1- To detect any congenital abnormalities.
- 2- To ascertain that the baby has not suffer from injury during birth.
- 3- To look for signs and symptoms of diseases peculiar to the newborn infant.

The tasks for caring the newborn include:

Cord care, eye care, general examination and checking the weight, encourage exclusive breast feeding, and start immunization

The second examination should be carried out after 6 weeks with the aim of following up the progress of the infant and detecting any abnormality.

## **Maternal Nutrition during Pregnancy and Lactation**

There is a general association between diets of poor nutritive values and conditions like low birth weight (LBW) and high fetal and infant mortality rates. We can conclude that under-nutrition among mothers,

especially in developing countries contributes to impaired maternal, fetal and infant health and vitality.

### **Nutrition in Pregnancy**

Fetal development is accompanied by extensive changes in the composition of the maternal body, as well as its metabolism. Many of these changes begin very early in pregnancy. They include changes in the followings:

- Increase in the general metabolism (BMR), leading to an anabolic state.
- Changes in the GI tract (nausea, vomiting, constipation and impaired absorption of some nutrients such as iron).
- Changes in renal function ( $\uparrow$  GFR leading to loss of sugar and amino acids in the urine).
- Changes in the blood volume ( $\uparrow$  plasma volume by 50% and red cell mass by 20%) leading to haemo-dilution and a reduction of Hb concentration in the peripheral blood by 2 g/dl which is called “relative anaemia of pregnancy” .
- Changes in water metabolism, where the amount of water in the maternal body is increased by about 7 litres most of which is in the extra-cellular compartment.

### **Some Possible Outcomes of Maternal Under-Nutrition:**

1. Low Birth Weight and Prematurity: They are more common among lower social classes and in developing countries.
2. Fetal and Neonatal Morbidity and Mortality: The under-nourished fetus and neonate usually show a general depression of vitality and

have an increased chance of death during the neonatal period.

Congenital malformations have been produced in pregnant animals maintained on deficient diets.

3. Toxemia of pregnancy: Is more common in lower socio-economic groups and in developing countries. It may be related to certain nutritional deficiencies.
4. Anaemia: During pregnancy plasma volume increases by 50% and the red cell mass increases by 20% leading to relative anaemia of pregnancy. The causes of anaemia during pregnancy are:
  - a. Increased iron requirements due to fetal growth.
  - b. Impairment of iron metabolism during pregnancy.
  - c. Short spacing.
  - d. Dietary iron deficiency (low iron content).
  - e. Blood loss due to parasites (anchoylostoma).

Anaemia may also be due to the deficiency of folic acid and/or vitamin B12. This is manifested by very low HB values of <7g/dl. In Iraq, low Hb levels not responding to iron supplements may indicate thalassaemia or sickle cell anaemia.

### **Weight Gain During Pregnancy**

Healthy pregnant women gain 10-12Kg throughout pregnancy. On the other hand, under-nourished women usually gain <7Kg, especially those performing heavy physical work. The sources of weight gain are:

1. Products of conception (fetus, placental, amniotic fluid and membranes).
2. Enlargement of the organs of reproduction (uterus and breasts).
3. Increase in the fat stores.
4. Expansion of the extracellular fluid compartment.

## **Lactation**

The daily milk flow of  $\approx 850$  ml/day means the loss of nearly 1000Kcal/day. If this amount is not balanced by energy intake, it will be subsidized from body stores. Well fed women lay down considerable quantities of body fat during the earlier part of pregnancy, which will be used for foetal growth during late pregnancy, or later to subsidize lactation.

In developing countries and poor communities, most women are in a continuous state of pregnancy and lactation and it seems doubtful that such reserves of fat can be accumulated. Unless energy requirements during lactation are balanced by food intake, such women must lose weight.

## **Low Birth Weight (LBW) and Prematurity**

The criterion which was used to define prematurity was birth weight less than 2500g. An additional criterion was later added which was length at birth, the cut-off point of which was 47cm (18.5 inches). Both weight below 2500g and length below 47cm were found to occur more frequently in infants born before completing 37 weeks of intra-uterine life.

### **Definitions:**

LBW infant: A live born infant weighing less than 2500g at birth.

Pre-term infant: An infant born before 37 completed weeks of gestation calculated from the first day of the last menstrual period.

Full-term infant: An infant born between 37-42 completed weeks of gestation calculated from the first day of the last menstrual period.

Post-term infant: An infant born after 42 completed weeks of gestation calculated from the first day of the last menstrual period.

### **Importance**

LBW and preterm infants have reduced chances of survival. These survival chances are directly proportional to birth weight and gestational age at birth.

About 2/3 of all neonatal mortalities occur in preterm infants. They die from infections, intracranial haemorrhages, or respiratory disorders. In some, no specific cause of death other than prematurity can be identified. It is estimated that 20 million LBW infants are born annually all over the world, of whom 95% are born in developing countries where there are no facilities to care for those neonates during the critical neonatal period.

### **Aetiology of LBW and Prematurity**

The same factors, in most instances, will cause intrauterine growth retardation or restriction (IUGR) causing LBW and shorten gestation (causing premature birth).

#### **I. Complications During Pregnancy:**

1. Hypertension: It can happen with or without proteinuria (pre-eclampsia or essential hypertension). It can be associated with or lead to placental abnormalities. These conditions may lead to both IUGR & pre-term delivery.
2. Diabetes Mellitus: sometimes pregnancy is terminated before 37 completed weeks of gestation, to protect the vitality of the infant. This will lead to the birth of a pre-term infant.



3. Heart Diseases: associated with pre-term delivery, which is sometimes induced.
4. Anaemia: associated with LBW and pre-term delivery.
5. Infections: during pregnancy are associated with fever, immunological reactions, and release of toxic substances. The damage caused is related to the infectious agent, the timing of the infection and the organs or tissues involved. These infections may be:
  - a. Viral: rubella, cytomegalovirus, and herpes.
  - b. Bacterial: can either be amniotic fluid infections (ascending antenatal bacterial infections, which are the most common, are associated with protein energy malnutrition and heavy physical work and lead to preterm delivery), trans-placental infections (TB or syphilis which cause placental insufficiency and preterm delivery), or urinary tract infections (UTIs which are associated with preterm delivery).
  - c. Parasitic: congenital malaria is very rare as the foetus is protected by trans-placentally transmitted antimalarial antibodies, and the LBW and preterm delivery are caused by the associated fever and severe anaemia; and toxoplasma (which is associated with pre-term delivery and congenital malformations rather than LBW).
6. Cervical incompetence: may be also associated with infections and lead to preterm delivery.
7. Uterine abnormalities: congenital malformations of the uterus and fibromyomas can lead to preterm delivery.
8. Polyhydramnios: is associated with preterm delivery.
9. Premature rupture of the membranes: is associated with preterm delivery.

10. Antepartum haemorrhage: is associated with foetal growth retardation and preterm delivery.
11. Placental factors: the small placenta and the diseased placenta (abruptio placentae and placental infarcts) are both associated with IUGR.
12. Amniocentesis: is associated with infections and preterm delivery.
13. Maternal surgery: abdominal surgery may lead to preterm delivery.
14. Trauma: may lead to preterm delivery.
15. Iatrogenic: incorrect estimation of the gestational age may lead to preterm induction of labour.

**II. Multiple Pregnancy:** BW and GA decrease with increasing number of foetuses, leading to a higher incidence of LBW and preterm delivery in a multiple pregnancy. There is also a high incidence of placental abnormalities in multiple pregnancies.

**Table (8): Percentage of LBW and Prematurity of All Births in Single and Multiple Pregnancies**

Abnormality	Single	Multiple
LBW (% of all births)	7%	54%
Prematurity (% of all births)	5%	26%

**III. Congenital malformations:** More LBW and preterm deliveries are found in newborns with congenital malformations. This is especially true in chromosomal abnormalities and serious congenital malformations (cardiac and cephalic).

**IV. Sex of the Infant:** LBW is higher in female infants, while preterm deliveries are higher in the male infant.

**V. Biological Factors:**

1. Maternal age: more LBW and preterm births happen before 20 years and after 35 years of age.
2. Maternal height: more LBW in shorter mothers.
3. Maternal weight: low pre-pregnancy weight, low weight gain during pregnancy and low quality diets are associated with LBW.
4. Parity: increased chance of LBW in first and after the 4<sup>th</sup> birth.
5. Short spacing: increased chance of LBW and preterm delivery.
6. Drugs and alcohol:
  - a. Medicinal drugs: some are teratogenic and may lead to IUGR.
  - b. Narcotics: decrease food intake leading to maternal under-nutrition and IUGR.
  - c. Alcohol: is teratogenic leading to LBW and foetal alcohol syndrome.
2. Poor antenatal care: increased chance of LBW and preterm delivery.
3. Previous LBW: increased chance of LBW and preterm delivery.
4. Residence: Increased LBW in rural areas and in higher altitudes.
5. Occupation and physical activity: occupations characterized by hard physical work are associated with a higher chance of LBW and preterm deliveries especially in developing countries.
6. Psychological stress: is associated with preterm labour.
7. Genetic factors: about 40% of the variation in birth weight is attributed to genetic factors (ethnic and familial).

**VI. Socioeconomic Factors:** Low social status, low family income, low educational level and some husband's occupations may lead to poor maternal nutrition which is associated with LBW.

**VII. Cigarette Smoking:** Smoking depresses appetite leading to under-nutrition, it has a direct toxic effect of the foetus, it decreases placental perfusion (vaso-constrictive effect of nicotine), and causes hypoxia due to the accumulation of CO in the maternal blood. This will lead to LBW, the degree of which is dose related. One should not forget the role of passive smoking on pregnant women and their foetuses.

## **VIII. Idiopathic Pre-Term Labour**

### **Effects of LBW and Prematurity on the Foetus**

Of all those prematurely born foetus, and those born with a low weight, 50% will die during the first 24 hours, 15% will die during the second day. Fatality increases with decreasing gestational age at birth.

### **Causes of Morbidity and Mortality:**

- **Immediate:**
  1. Respiratory: asphyxia, apnoea and RDS.
  2. Neurological: intra-cranial haemorrhage.
  3. Cardiovascular: bradycardia and hypotension.
  4. Haematological: anaemia and bleeding tendency.
  5. Nutritional and gastro-intestinal: feeding problems.
  6. Metabolic: hypocalcaemia and hyperbilirubinaemia.
  7. Renal: Lower GFR.
  8. Temperature regulation: hypo and hyperthermia.
  9. Immunity: increased risk of infections.
  10. Ophthalmic: retrolental fibroplasia and blindness.

- **Long Term:**
  1. CNS dysfunction.
  2. Chronic lung diseases.
  3. Poor growth.

It is estimated that 22% of all infants in Iraq are born with LBW.

**Quiz**

**If you are a doctor working in PHC centre, what will you do to a 20 years old pregnant lady attending ANC for the first time?**

## **Child Health Care**

**Preventive services are needed for children for the following reasons:**

1- Many causes of morbidity and mortality are avoidable, such as malnutrition, accidents, as well as infectious disease which can be prevented by immunization, hygiene and sanitation.

2- Vulnerability of children and their parents during the earlier years of their life due to rapid growth.

Children under the age of 5 years are at particular risk of morbidity and mortality and should receive special care through programs specially designed to decrease morbidity and mortality rates in this age group.

These programs are: Growth Monitoring, Control of Diarrhoeal Diseases, Breast Feeding, Expanded Program on Immunization, Food Fortification and supplementation, Female Education and Control of Acute Respiratory Infections.

### **Growth Monitoring Programme**

Normal growth: is the progression of changes in height, weight, and head circumference that are compatible with established standards for a given population.

#### **Weight :**

Average newborn weight: 3.25 kg +/-0.5 at birth

**Neonates** may lose 5%-10% of birth weight in the first few days of life and regain their birth weight by (10 - 14 days)

**Infants** gain approximately :

30 g/day → 0 - 3 months

20 g/day → 3 - 6 months

10 g/day → 6 - 12 months

*((Infants “double” their birth weight by 4 months of age and “triple” their birth weight by 1 year)*

The average length at birth for a term infant is (50cm)+/-2cm

### **Height - length:**

Use term of height after 2 years.

Infants grow (25 cm)50% → 1st year of life(75cm) Toddlers grow

(10 cm) → (1st - 2nd ) ~88cm

3 years → 96 cm

*(( Children “double” their length by 4 years of age .))*

*Estimated weight after first year is :*

*AGE (YR) X 2 +8*

*Estimated height after first year is :*

*Age (years) X 6 +77*

### **Head circumference :**

The average at birth is (35 cm)+/-1.5cm.

-at 1year it reaches 47 cm, -at 2years it reaches 49cm .

### **Definition of Growth Monitoring**

It is a process of periodic measurements of the weight of children under the age of 5 years, in order to detect signs of malnutrition, (growth failure) as early as possible and to correct it.

This process should start soon after birth with the measurement of birth weight and the recording of weight on the growth chart.



Two routine medical examinations should be carried for every newborn baby. The first is the responsibility of the birth attendant (doctor or midwife) in charge of the birth. It is done to detect abnormalities which need immediate treatment, eg. disorders of respiration, muscle tone, birth injury and obvious congenital malformations. It also includes the measurement of birth weight and the estimation of Apgar score at the 1<sup>st</sup> and the 5<sup>th</sup> minute of after birth.

**Apgar's Score** measures 5 signs, each is given a score of 0, 1 or 2 depending on the state of the newborn.

#### **Apgar Score Measurement**

<b>Sign</b>	<b>Score</b>		
	<b>0</b>	<b>1</b>	<b>2</b>
Heart Rate	Absent	Slow (<100/minute)	>100/minute
Respiratory Effort	Absent	Slow irregular	Regular, crying
Muscle Tone	Limp	Some flexion of the extremities	Active movement
Response to Catheter in Nostril	No reaction	Grimace	Cough and Sneeze
Skin Colour	Pale or blue	Pink body, pale extremities	Pink all over

The range is between zero which means a dead infant to 10 which is very rare at the first minute. If the Apgar score is less than or equal to 3 at 5 minutes this means that the infant is at a higher risk of neonatal death, or of having respiratory and/or cerebral complications during the neonatal period. This neonate should be referred to the neonatal intensive care unit.

The second part of this examination should be done within the 1<sup>st</sup> 48 hours after birth by a paediatrician. It is much more detailed than the first and includes examination of all systems. All findings should be recorded.

Some countries have a program to screen newborn infants for inborn errors of metabolism called the heel prick test where a sample of blood is taken from the heel of the neonate. Some of these errors can be easily corrected, to prevent death and disability. Examples are congenital hypothyroidism and phenylketonurea which, if not treated, the child will be retarded.

Growth of infants and children <5 years of age should be monitored regularly. Ideally, this should be done every month. In Iraq, weight is measured when the child is brought to the centre for routine immunization. In the past, **standard growth charts** of a certain reference population were used to assess the growth of children. Weight and height for boys and girls are available now from age 0-18 years by WHO.

Birth weight is used as the 1<sup>st</sup> reading and weight is measured monthly, plotted on the chart and joined by a curve which is called the **growth curve**. In normal situation and if the child is gaining weight the curve is up going. A flat Curve means no weight gain. A down-going curve means weight loss. In both of the last situations, this is abnormal and action should taken.

Malnutrition is a very prevalent problem among under 5 children especially in the developing world. It is estimated that about 190,000,000 under five children are malnourished all over the world.

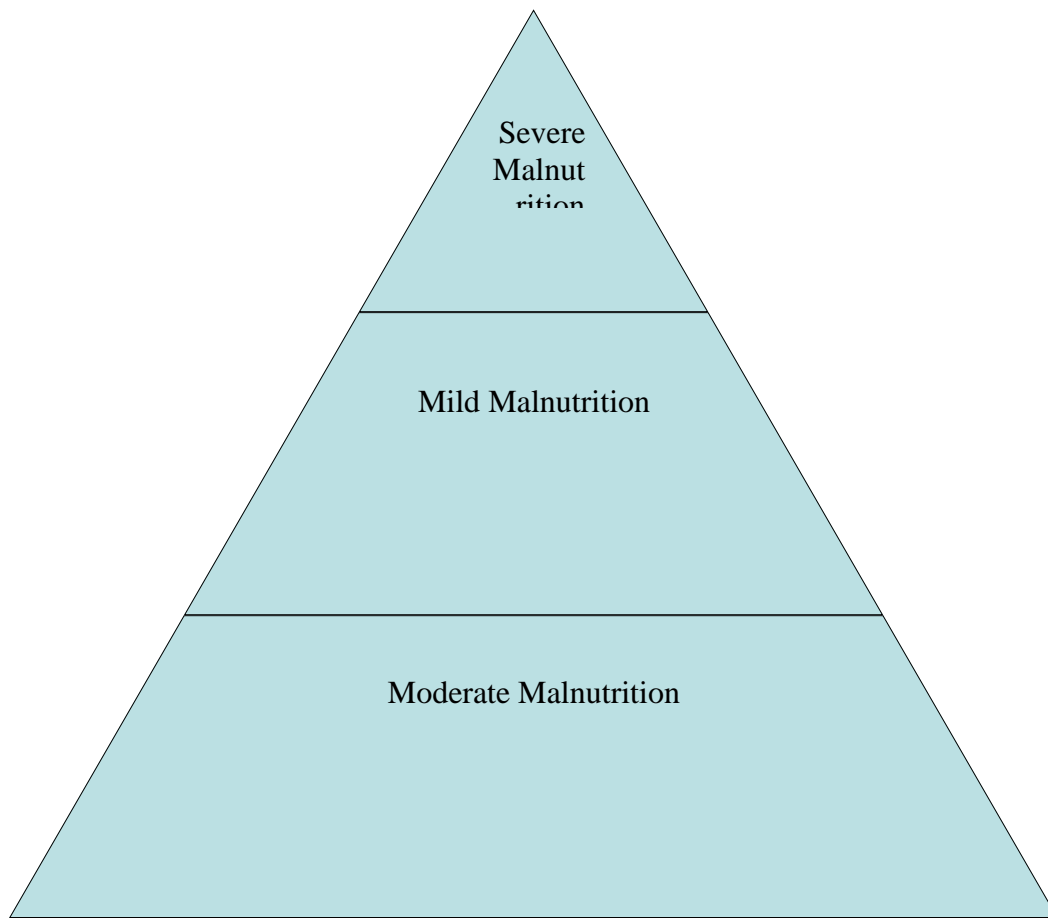
Most malnutrition is invisible, and most parents of malnourished children do not know that there is any thing wrong. Even health workers can't detect early malnutrition using the reference population weight for age charts. Only 1-2% of all malnourished children will show signs of clinical malnutrition in the form of marasmus and kwashiorkor which is

severe (third degree) malnutrition. This is what is called the **Iceberg Phenomenon**.

This type of malnutrition results from the deficiency of protein and energy, which is called protein-energy malnutrition (PEM). Many malnourished children live in homes where there is no absolute shortage of sufficient food or adequate diet. The majority of the cases of malnutrition are caused by:

1. Repeated infections such as diarrhoea where there is loss of appetite and vomiting.
2. Poor knowledge of mothers of the type of feeding needed by infants and children & incorrect feeding practices.

If the early signs of faltering growth can be made visible to the mother, and if at the same time, she can be made aware of the special nutritional needs of the infant and the young child, then it would be possible to prevent more than 50% of all child malnutrition in the developing world, even within existing family resources.



**The Iceberg Phenomenon**

## **Messages given to the mother to prevent malnutrition in their children:**

1. Breast feeding: Should be exclusive during the first 4-6 months of life. It should also be scheduled according to the demand of the infant and not on a time table, at least 8 times during the day, 2-3 of which should be given at night.
2. When the infant is between 4-6 months old, continue breast feeding and give complementary food such as fruit juice, cereals and vegetable soup 1-2 times/day and until the end of the 6<sup>th</sup> month of life.
3. Between 6-12 months, continue breast feeding and give complementary food as 5-6 small meals, give more variety and include white and red meat.
4. Between 12-24 months, continue breast feeding and give complementary food 5-6 small meals including family food.
5. Between 3-5 years of age, give three main meals from the family food and add 3 small meals.
6. Add fats and oils to the child's meal to increase energy intake.
7. Continue feeding during an illness.
8. Add one extra meal daily after the illness, until the growth curves returns to normal up going state.
9. Active feeding by an adult, from a separate dish not the family dish.

## **Control of Diarrhoeal diseases (CDD)**

**Diarrhea:** Passage of liquid or watery stool for at least 3 times during 24 hours. Consistency is more important than frequency.

Note that breast fed infants usually pass semi-solid, pasty and yellow stools. Sometimes, they pass stool after each breast feed. This is not diarrhoea. Unfortunately, many doctors misinterpret these stools as diarrhoea and they give the wrong advice to the mothers to stop breast feeding. This is incorrect practice.

Diarrhoea can be *Acute* which lasts for less than 14 days, or *Persistent* which lasts for 14 days or longer. There may be blood in the stool which is called *Dysentery*, which can be amoebic or bacillary.

Children under 5 y of age are the major victims of diarrhoea, which will lead to growth failure & complications. Annually, 3,000,000 children die from diarrhoea all over the world.

Diarrhoea is caused by viruses, bacteria, or protozoa. The contributing factors to diarrhoea are unclean water, dirty hands when preparing meals (mothers) or when feeding their children, or food spoiled by high temperature.

Diarrhoea leads to malnutrition which is manifested by growth retardation & under weight, the degree of which directly correlates to the duration of the diarrhoea (25gm loss of weight for each day of diarrhoea). This growth deficit is multi-factorial.

### **Factors leading to growth deficit in a baby with diarrhoea:**

- 1- Reduced food intake: due to anorexia (loss of appetite) and withholding food from the child by the mother.
- 2- Reduced absorption of nutrients due to rapid gut transit time, and enteropathy leading to such malabsorption.
- 3- Catabolic losses through vomiting (loss of nutrients) and fever leading to energy expenditure.

This malnutrition will lead to reduced immunity leading to further episodes of diarrhoea. Those at particular risk are infants who are artificially fed and those who are at the weaning age (due to inadequate feeding, contaminated feeds and low resistance to infection).

### **Dehydration**

Is a deficit in water and electrolytes (Sodium, Potassium, Chloride and Bicarbonate) resulting from losses in stool, vomiting, urine, fever, sweat and breathing. When these losses are not adequately replaced, this deficit will develop.

#### **Assessment of Diarrhoea cases for dehydration**

<b>Sign</b>	<b>Classification</b>		
	<b>A</b>	<b>B</b>	<b>C</b>
General Condition	Well, Alert	Restless, Irritable	Lethargic, Unconscious
Eyes	Normal	Sunken	Sunken
Thirst	Drinks normally	Eager to drink	Unable to drink
Skin Pinch	Goes Back Quickly	Goes Back Slowly (1 sec)	Goes Back Very Slowly (2 or more sec)
Classification	No Dehydration	Some Dehydration	Severe Dehydration
Treatment	(home) Plan A	Plan B (PHC)	Plan C (Hospital)

## **Treatment plans:**

### **Plan A:**

The aim is to prevent dehydration from occurring. The steps are:

1. Give extra fluid: ORS (Oral Rehydration Solution) & home fluids.
2. Continue feeding of children (breast or other).
3. Teach the mother:
  - a. How to prepare and give ORS (1 litre of water) then we add the sachet & give by cup & spoon or by cup directly, to be used within 24 hr of preparation, “she must discard what remains after 24h i.e throw it away”, to give him 50-100 ml every time the child passes stool.
  - b. Signs of dehydration & the danger signs by showing her pictures of the main signs of dehydration & telling her to bring her child immediately to the health centre if such signs occur.

### **Plan B:**

**The aim is to correct dehydration. The steps are:**

1. Give ORS in the health centre: Child’s weight (kg) x 75 ml = volume given over a 4 hr period. Assess every hour.
2. Continue feeding or breast feeding.
3. Give 100-200 ml of clean water.
4. Teach mother to prepare & give ORS correctly (cup and spoon), as in plan A.
- 5.
6. Assess every hour.
7. If the child vomits the ORS, wait for 10 minutes and then restart giving him the solution slowly.
8. Reassess after four hours, classify according to the hydration status, and use the appropriate plan accordingly.



Note: Puffiness of the face & eyes is a sign of over hydration. In that case, give the fluid slowly.

### **Plan C:**

The aim is to correct dehydration urgently (immediately).

Route: Intra-Venous or Naso-Gastric tube (because we have to act quickly).

In IV: give Ringer's lactate solution. If it is not available, use normal saline. Calculate the amount of fluid using the following formula:

Weight (kg) x 100ml over a period of 3 hours for children over the age of one year, and over 6 hours for infants, according to the following table:

#### **Intravenous Rehydration by age and time**

Age (months)	Amount of IV fluid/unit time	
	30ml/Kg body weight	70ml/Kg body weight
<12	First hour	Following 5 hours
12+	First 30 minutes	Following 2.5 hours

The steps are:

1. Reassess every hour, if no improvement, give fluid more rapidly.
2. If the patient can drink, give ORS in 5ml/kg body weight/hr
3. Reassess after completion, classify according to the hydration status & choose the appropriate plan accordingly.

### **Oral Rehydration Solution**

Composition:

Na: 3.5 gm, NaHCO<sub>3</sub>: 2.5 gm, KCl: 1.5 gm, Glucose: 20 gm, In 1000ml (1litre) of water.

Some replace NaHCO<sub>3</sub> by 2 gm Tri-sodium Citrate Di-hydrate which lessens vomiting, is tastier and more stable in humid and hot areas.

Advantages of ORS: Cheap, effective and easy to give at home by the mother. This is why 95% of the cases are treated by ORS, as children will not develop dehydration, when they get diarrhoea.

Preparation of ORS: The water should be boiled and cooled before the powder is added to avoid the loss of bicarbonate, and changes of concentration. In winter, warm the solution to 40°C to increase acceptability, increase the rate of absorption, decrease vomiting & decrease the risk of a drop in the body temperature when large volumes are consumed.

If no ORS is available we use home prepared fluids or household food solutions, rice water, soups , fruit juices salt and sugar solution (one teaspoon of salt + one table spoon of sugar).

**Zinc supplements:** zinc supplements reduce the duration of a diarrhoea episode by 25% and are associated with a 30% reduction in stool volume.

### **Management of Chronic (Persistent) Diarrhoea**

If the child is under 6 months or is also dehydrated, refer to the hospital, where dehydration is corrected and the case is fully assessed.

If the child is over 6 months and not dehydrated, then the management is mainly dietary. Teach the mother to:

1. Dilute any animal milk given to the child with an equal volume of water or replace with fermented milk products such as yogurt.
2. Increase energy intake: 6 meals per day of thick cereals, added oils or fat, vegetables, pulses and fish or meat.

3. Reassess in 5 days. If diarrhoea persists refer to hospital. If diarrhoea has stopped, teach the mother to use the regular diet, resume the usual animal milk & give an extra meal every day for one month, use growth charts.

### **Management of Blood in Stool**

If bacillary dysentery (*Shigella*) is prevalent in the area, the clinical picture is severe, and there are no amoebic trophozoites in the general stool examination, give Co-trimoxazol which is the antibacterial of choice.

If amoebic dysentery is prevalent in the area, symptoms are less severe, and amoebic trophozoites are seen in the general stool examination, give metronidazole (Flagyl) .

### **Drugs not to be used for diarrhoea:**

1. Anti-bacterials: Most cases are viral. Antibacterials are only used when there is lab evidence of bacterial infections (mainly cholera and amoebic dysentery). They will eventually lead to secondary infection due to the inhibition of the growth of the normal flora.
2. Anti-protozoal: Used only when there is lab evidence of amoebic dysentery or giardiasis.
3. Mycostatin: *Monilia* is a normal inhabitant of the GIT. Mycostatin is only given when there is oral thrush or anal moniliasis.
4. Anti-motility agents and anti-spasmodics: As they may cause paralytic ileus in children.
5. Pectocaolines: Will coat the GIT, allow colonization of the GIT bacteria with bacteria and lead to persistent diarrhoea.
6. Anti-emetics: May cause CNS symptoms.

### **Key measures to prevent diarrhoea include:**

- access to safe drinking-water;
- use of improved sanitation;
- hand washing with soap;
- exclusive breastfeeding for the first six months of life;
- good personal and food hygiene;
- health education about how infections spread; and
- rotavirus vaccination.

## **Infant and Child Feeding**

### **Breast Feeding**

#### **Composition of milk**

The major constituent is water, so there is no need for any other fluid, if infant is exclusively breast fed. Water can act as a vehicle to transmit water-borne diseases, if not properly boiled. Water can make the baby feel full, and therefore will decrease suckling and inhibit milk production. Other constituents are fat, proteins, carbohydrates, vitamins and minerals. Some nutrients are present in higher concentrations in cow milk than breast milk but the type is not the appropriate one for absorption. Breast milk is very easily digested & absorbed & the child will pass a pasty, yellowish stool that should not be mistaken for diarrhoea. Breast milk is clean & sterile, while bottle milk is not sterile leading to diarrhoea & other complications.

## **Advantages of Breast Feeding**

- 1. Nutritional:** Breast milk contains all nutrients needed by the infant in the appropriate composition and quantity, especially during the 1<sup>st</sup> 4-6 months of life. *Proteins* are easily digested by the infant. Cow milk on the other hand is difficult to digest. *Lipids* in human milk are specific to the needs of the infant & contribute to brain development while in cow milk the lipids are designed to contribute to building of muscles and weight gain. *Lactose* is higher in human than in cow milk. *Vitamins, iron and minerals* are adequate in human milk. Iron in breast milk is low in quantity but adequate. Human milk contains *Lactoferrin* which is an iron binding protein that binds to the iron & accompanies it to the absorption sites & releases it there. Formula milk, on the other hand, contains extra iron and no lactoferrin, therefore, it will be free in the GIT and will promote the growth of pathogenic bacteria leading to gastro-enteritis. The amount of *water* is adequate. Breast milk also contains *lipase* for the digestion of fat.
- 2. Immunological Properties and Protection Against Infection:** Breast milk is sterile and clean, it contains antibodies specific to the organisms in the birth canal of the mother, leukocytes (4000cells/mm<sup>3</sup>). It promotes the growth of lactobacillus in the GIT and contains lactoferrin. Even when breast fed infants develop diarrhoea, it is usually mild, with a lower risk of hypernatraemia and metabolic acidosis. Breasts fed infants develop less allergic conditions, less asthma & less eczema because they are not exposed to substances strange to their bodies.
- 3. Psychological Bonding between Mother and Infant:** Breast feeding will lead to the establishment of a strong relationship between the mother and the infant.

- 4. Fertility Control:** Exclusive breast feeding which enhances the production of prolactin by the pituitary and the maintenance of its level in blood, will inhibit the pituitary-ovarian axis and therefore inhibit ovulation. This is the natural method of contraception known as the Lactational Amenorrhoea Method (LAM).
- 5. Decrease Post-partum Blood Loss:** The release of Oxytocin will help the uterus to contract and will therefore lead to decrease in blood loss. This will help in the decrease of the prevalence of anaemia after pregnancy.
- 6. Protection against Breast Cancer:** It was found that breast feeding protects the mother against breast cancer.
- 5. Convenience:** Breast Milk is convenient, always ready, in the correct composition and concentration, correct temperature and is not costly.

*Disadvantages of bottle feeding:*

1. Contamination resulting in diarrhoea and malnutrition.
2. Cost is high so the mother will over-dilute feeds which will lead to malnutrition.
3. Vitamin deficiency.
4. Iron deficiency leading to anaemia.
5. Hypernatraemia leading to acidosis especially in LBW infants leading to kidney disease. Bottle fed infants are more prone to develop hypernatraemic acidosis when they have diarrhoea because of the high sodium content of formula milk.
6. Hypercalcemia due to high content of Calcium in cow milk.
7. Higher content of saturated fatty acids in cow's milk but. Infants need unsaturated fatty acids for brain development. Cow milk is deficient in linolenic acid and cholesterol which are needed for brain growth &

formula milk is low in fat which means that it gives insufficient energy.

8. High casein content of cow milk leads to indigestion and curd formation leading to constipation.
9. Allergic conditions are more prevalent among bottle fed infants due to the presence of unfamiliar proteins in cow milk leading to antibody production.
10. Nipple confusion and refusal to breast feed because the mechanism of suckling the breast is different from that of sucking the bottle. The child will be confused & will abandon the suckling mechanism preferring the sucking which is easier.

**Contraindications of Breast Feeding:** Very rare & practically non-existent. Some of the conditions claimed to be contraindications are not absolute but relative. These are:

1. Breast Ca: Is one of the contraindications because of the hormonal effect on the tumour. If it is only a lump which was removed and the follow-up indicates no recurrence, the mother is allowed to breast feed if she chooses to.
2. Inborn errors of metabolism (PKU and galactosaemia). These are rare conditions. Specially prepared milk is needed to prevent brain damage and mental retardation.
3. Breast milk jaundice which is a very, very, very rare condition starting 2 weeks after birth. It must be differentiated from physiological jaundice which starts on the third day after birth.
4. Beta-Streptococcal infection of the throat of the infant because it can lead to severe bilateral mastitis in the mother. Breast milk should be expressed and given to the baby by cup and spoon.

5. Puerperal psychosis: In the past the mother used to be hospitalized and kept away from her baby so she can not harm him. Currently, the practice is to hospitalize the baby with the mother, but under strict observation. The point is that this will help in the recovery of the mother.
6. Radioactive therapy to the mother, where the baby should be kept away from her.

In the following conditions, breast feeding is **NOT** contraindicated:

1. Viral infection of the mother such as HBV, where the infant is immunized soon after birth and can also receive passive immunity. As for HIV/AIDS, there are different opinions. Some authorities say that breast feeding should be prevented as it may be a way of transmitting the disease from mother to infant. The other school say that particularly in developing countries, the chances of the infant dying from diarrhoea resulting from bottle feeding is much higher than that of dying from AIDS.
2. TB of the mother because the infant usually receives BCG and chemoprophylaxis, and the mother should receive anti TB drugs.
3. Neonatal jaundice is not a contraindication, and breast milk helps the infant to get rid of the excessive bilirubin.
4. Prematurity & low birth weight, where breast milk will supplement the nutrients which should be transmitted to foetus during the last weeks of pregnancy. If the infant is very premature and the suckling reflex is not well developed, milk can be expressed from the breast and given through a naso-gastric tube.
5. Pregnancy (a new pregnancy) is not a contraindication, as the well-nourished mother can breast feed and support a growing foetus.



6. Congenital malformation of the mouth as in cleft palate where breast milk can be expressed and given by cup & spoon.
7. Foetal distress & hypoxia where the mother should stop feeding temporarily (2-4 days), but should also express her milk in preparation for the resumption of breast feeding.
8. Multiple births, where the mother can breast feed twins successfully.

### **Problems of Breast Feeding**

1. Engorged & congested breast: Mainly due to the increase of fluid and blood in the breasts. Early initiation of breast feeding will prevent this condition. If the infant is put on the breast in the correct position, he will not be able to empty the breast. Milk expression manually or mechanically by a pump will alleviate the symptoms. Analgesics, massage & cold sponging can also be used.
2. Milk fever: This happens when the breast is filled with milk, the milk will be pumped back into the circulation leading to an immune reaction, which is self-limiting & resolves spontaneously.
3. Nipple pain & cracks: This happens when only the nipple is taken by the infant, and not the areola. This happens due to incorrect positioning & is treated by correcting the position of the child & not by using antibiotics or creams.
4. Refusal to suckle: This happens when the infant is sick or in a very premature or LBW infant (<1800gm) where the reflexes are not developed. Separation of the child from his mother for a few days (if the mother is hospitalized for example) may also cause this condition.
5. Mastitis and breast abscess: Due to blocked ducts superimposed by bacteria leading to mastitis, which may develop into abscess. If detected early (before pus accumulation) it can be managed by

massaging the breast, expressing milk, giving antibiotics, recommending bed rest & giving analgesics. If pus is detected drain the breast surgically and give antibiotics. Do not stop breast feeding in Mastitis & use the other healthy breast.

### **Complementary Feeding (Weaning Period)**

**Definition:** It is the transitional stage when a young child's diet *gradually* changes from one of milk alone, to a diet based on what the family eats.

Weaning begins when the child is introduced to food other than milk & is completed when the child is fully accustomed to the regular family diet. This period differs from one child to another. During weaning the child should continue to breast feed, since breast milk is an important nutritional supplement to the weaning food.

Weaning usually starts between 4-6 months of age where the child can swallow & digest semisolid food at this age. Weaning can be completed at any time between 12-24 months when the child can consume solid family food.

Early weaning increases the incidence of diarrhoea and allergic conditions. The foods given are not useful and they will not be absorbed by the GIT as it is not yet ready to digest and absorb these foods. Late weaning, after the age of six months, will make the child unable to deal with solid foods, and it may lead to malnutrition.

## The Expanded Program on Immunization (EPI)

Most of the vaccines used currently were introduced in the 1960s. However even during the late 1970s children under the age of five years were still dying due to vaccine preventable diseases, and vaccine coverage rates were low. The reason for this was that it was left to the parents to bring their children for vaccination. During the early 1980s the EPI was introduced in most countries.

### The National Immunization Schedule in Iraq

<b>Age/Population Group</b>	<b>Vaccine</b>
First week after birth	BCG, TOPV <sub>0</sub> , HBV <sub>1</sub>
End of the 2 <sup>nd</sup> month	DPT <sub>1</sub> , TOPV <sub>1</sub> , HBV <sub>2</sub>
End of the 4 <sup>th</sup> month	*DPT <sub>2</sub> , TOPV <sub>2</sub>
End of the 6 <sup>th</sup> month	DPT <sub>3</sub> , TOPV <sub>3</sub> , HBV <sub>3</sub>
End of the 9 <sup>th</sup> month	Measles
End of the 15 <sup>th</sup> month	MMR
<b>Boosters</b>	
End of the 18 <sup>th</sup> month	DPT + TOPV (1 <sup>st</sup> booster)
School entry age (4-6 years)	DPT + TOPV (2 <sup>nd</sup> booster)
Every 10 years	Td (full dose of tetanus toxoid and a reduced dose of diphtheria toxoid after the age of 6 years)
<b>Other Vaccines</b>	
12 year old girls	Rubella vaccine
Pregnant Women (Tetanus Toxoid)	1 <sup>st</sup> : 16 weeks of pregnancy (no protection)
	2 <sup>nd</sup> : 4-6weeks later (3year protection)
	3 <sup>rd</sup> : 6 months later (5 year protection)
	4 <sup>th</sup> : 1 year later (10 year protection)
	5 <sup>th</sup> : 1 year later (protection throughout the reproductive life)

\* If the infant develops a severe reaction to a prior dose, give DT not DPT, because the pertussis component is responsible for this severe reaction.

**Key:** TOPV (Trivalent Oral Poliomyelitis Vaccine), MMR (Mumps, Measles & Rubella), DPT (Diphtheria, Pertussis & Tetanus), Td (Tetanus & Diphtheria), HBV (Hepatitis B Virus vaccine), TT (Tetanus Toxoid).

### The up to date (2012) National Immunization Schedule in Iraq

Age/Population Group	Vaccine
First day after birth	BCG, TOPV <sub>0</sub> , HBV <sub>1</sub>
End of the 2 <sup>nd</sup> month	(DPT + Hib + HBV <sub>2</sub> ) <sub>1</sub> , TOPV <sub>1</sub> , Rota virus <sub>1</sub> خماسي جرعة اولى
End of the 4 <sup>th</sup> month	(DPT + Hib) <sub>1</sub> , TOPV <sub>2</sub> , Rota virus <sub>2</sub> رباعي جرعة اولى
End of the 6 <sup>th</sup> month	(DPT + Hib + HBV <sub>2</sub> ), TOPV <sub>3</sub> , Rota virus <sub>3</sub> خماسي جرعة ثانية
End of the 9 <sup>th</sup> month	Measles, vitamin A 100,000 I.U
End of the 15 <sup>th</sup> month	MMR <sub>1</sub> حصبة مختلطة جرعة اولى
<b>Boosters</b>	
End of the 18 <sup>th</sup> month	(DPT + Hib) <sub>2</sub> , TOPV(1 <sup>st</sup> booster), vitamin A 200.000 I.U رباعي جرعة ثانية
School entry age (4-6 years)	DPT, TOPV (2 <sup>nd</sup> booster), MMR <sub>2</sub> ثلاثي منشطة

Hib: haemophilus influenza vaccine

If we attain 90-95% vaccine coverage of children against a certain disease we are virtually attaining a 100% protection of children, & this is the concept of “**Herd immunity**” which means that those who are vaccinated will protect those who are not through cutting the cycle of transmission.

### Basic Data on EPI Vaccines:

Vaccine against	Nature	Form	Dose	Route	Heat Stability	Type of Immunity
Diphtheria	Toxoid	Fluid	0.5ml	i.m. *	High	IgG
Tetanus	Toxoid	Fluid	0.5ml	i.m. *	High	IgG
Hepatitis B	HBs AG**	Fluid	0.5ml	i.m.	High	IgG
Pertusis	Whole killed Bacteria	Fluid	0.5ml	i.m.*	Medium	IgG ,A,M
Measles	Attenuated live Virus	Freeze Dried	0.5ml	s.c.	High for Dried Low for Reconstituted.	IgG ,A,M
T.B.	Attenuated live BCG	Freeze Dried	0.1ml	i.d.	Medium for Dried Low for reconstituted	T-cell Mediated
Polio-myelitis	Attenuated live Virus	Fluid	3 drops	Oral	Low	IgG, A,M Intestinal + circulating
	Killed virus	Fluid		i.m.	Medium	Same, only circulating
Rubella	Attenuated live Virus	Freeze Dried	0.5ml	s.c.	High/low	IgG ,A,M

\*i.m or deep s.c. in other countries according to the policy of that country.

\*\*Either from the plasma of infected people after inactivating it which is expensive or by the DNA recombinant method which is a lot cheaper.

### **Contraindications to Killed Vaccines & Toxoids:**

- Diphtheria: full dose to children over 6 years of age
- Pertusis
  - Any abnormality of the CNS e.g. Spina bifida
  - Acute febrile illness
  - Severe local or general reaction to a previous dose (give DT)
  - History of convulsions in a child
  - Family history of convulsions (controversial)

### **Contraindications to Live Vaccines:**

- **General**
  - Within 3 weeks of another live vaccine (not absolute)
  - Pregnancy
  - Acute febrile illness
  - Immunological dysfunction e.g. hypo-gamma-globulinaemia
  - Malignant disease, e.g. Leukaemia, Hodgkin's disease
  - Steroid therapy, immuno-suppressants & radiotherapy
- **Specific**
  - Oral Poliomyelitis: diarrhoea & vomiting
  - Measles: Active TB, allergy to polymyxin & neomycin, family history of convulsions.
  - BCG: Local septic condition, premature & LBW baby, chronic skin disease
  - Rubella: pregnancy, allergy to neomycin & polymyxin, thrombocytopenia.

### **The Cold Chain:**

Vaccines are effective only if maintained at the recommended temperatures throughout their journey from the manufacturer to the consumer. Exposure to high temperatures will lead to the damage of

these vaccines. To keep them cold we need equipment (freezer, refrigerator, cool boxes, vaccine carriers, thermometers & cold rooms) & people who know how to keep the vaccines at the recommended temperature.

### **Eradication of Polio Virus:**

Global eradication of poliomyelitis is possible because the virus can only survive in humans. The principle for eradication is that we need 3 years to pass by from the last case registration in order to announce eradication. The last case reported in Iraq was on the 28<sup>th</sup> of January 2000.

### **Strategies**

1. Routine Immunization: We must have a coverage rate of at least 90% at both national & district level.
2. Polio National Immunization Days (NIDs): Two round of vaccination (one month apart) are done nationwide during the low transmission season (spring and autumn)
3. The aim is to interrupt the circulation of poliovirus by immunizing every child. A child can take up to 15 doses of OPV without side effects. These campaigns can be implemented at the same time in neighbouring countries (cross-border), so that virus transmission is cut between countries.
4. 4. Acute Flaccid Paralysis (AFP) Surveillance: Any case with Acute & Flaccid paralysis in children under the age of 15 years must be reported & checked by taking two stool samples to detect the presence of the wild polio virus in the stool. The case is followed up for 60 days (if the child dies, lost for follow up or remains paralyzed for more than 60 days then this is assumed to be a case of Poliomyelitis). There should be at least one case detected per 100,000 children under the age of 15 years to ensure good and reliable surveillance.

## **Control of Acute Respiratory Infections (ARI) Programs:**

ARIs form a main cause of morbidity & mortality among children in developing countries. ARIs contribute to 30-60% of all children attending outpatient department of health facilities, 70% of which are upper ARIs. Although the overall incidence of ARIs among children in developing & developed countries is within the same range, the annual incidence of **pneumonia** is 3-4 % in children <5 years of age in developed countries compared to 10-20% in developing countries. This shows that the majority of these infections are mild & can be treated at home **without the use of antibiotics**. Therefore, one of the objectives of ARI control program is to be able to identify the few serious cases of ARI, and to follow the standard case management guidelines for ARI cases. The primary agents are usually viruses, which are responsible for a high proportion of the primary infections, while bacteria may be primary or secondary agents. Streptococcus pneumonia & Haemophilus influenzae are the most frequent causes of pneumonia & account to 2-4% of cases in developed countries and 20% of cases in developing countries.

### **The Standard Case Management of ARI Cases includes:**

Assessment, Classification & Management.

#### **Assessment:**

Ask the mother if the child has cough, fever, convulsion; look for chest indrawing & listen for wheeze; count the number of breaths in one minute; See if the child is drowsy; Feel for fever; Check for severe under-nutrition.



**Classification:** Is done according to age group.

**1. Two months up to 5 years:** After the assessment is completed, one of the following four classifications is reached:

**a. Very Severe Disease:** is made when any of the following danger signs is detected:

- Not able to drink
- Convulsions
- Abnormally sleepy or difficult to wake
- Stridor in a calm child
- Severe undernutrition

This child is at high risk of dying, so we should act urgently.

**b. Severe Pneumonia:** A child with chest indrawing, who may also have nasal flaring, grunting or cyanosis. This child is also at high risk of dying, so we should act urgently.

**c. Pneumonia:** No chest indrawing, but the child has fast breathing: 50+/minute (2-12 months) and 40+/minute (12 months-5 years).

**d. No Pneumonia (cough or cold):** No chest indrawing & no fast breathing.

**2. Less than 2 months:** Young infants become sick and die very quickly. They frequently have non-specific signs and symptoms such as poor feeding or low body temperature and may normally have mild chest indrawing because of their soft chest wall. After the assessment is completed, one of the following three classifications is reached:

**a. Very Severe Disease:** is made when any of the following danger signs is detected:

- Abnormally sleepy or difficult to wake
- Convulsions
- Stridor in a calm child
- Stopped feeding well
- Wheeze
- Fever (38°C) or low body temperature < 35.5°C
- Grunting
- Cyanosis

**b. Severe Pneumonia:** Fast breathing (60+/minute) or severe chest indrawing.

**c. No Pneumonia:** No fast breathing, no chest indrawing and no danger signs.

## **Management**

**Very Severe Disease or Severe Pneumonia:** The management of children with these two classifications the lines of management are the same for all age groups. It is as follows:

1. Give the first (Pre-referral) dose of paranteral antibiotics.
2. Refer urgently to hospital.
3. Treat fever, if present.

**Pneumonia:** This diagnosis is peculiar to children between 2 months and 5 years. The child is treated at home with antibiotics. One of the following drugs is given for five days: Cotrimoxazole, amoxicillin (syrup or tablets) or Procaine Penicillin (daily i.m. injections). The rules are:

- Give the first dose in the health centre
- Teach the mother how to give the dose, how much, how many doses per day and for how many days.
- Advise on home care.
- Reassess in two days.

**No Pneumonia (Cough or cold):** Advice home care.

**Two months-5 years:**

- No antibiotics
- Advise mother to give home care (clear the nose, feed the child during the illness, and increase feeding after the illness; give extra fluids to drink and breast feed; soothe the throat and relieve cough with a safe remedy; return quickly if any of the following develops- breathing becomes difficult- breathing becomes fast- the child is not able to drink- the child becomes sicker)
- Treat fever, if present
- Treat wheezing, if present

**< Two months:**

- No antibiotics
- Advise home care: keep warm, breast feed frequently, clear nose, watch for danger signs, return immediately if: breathing becomes difficult, breathing becomes fast, feeding becomes a problem, the infant becomes sicker or has high fever).

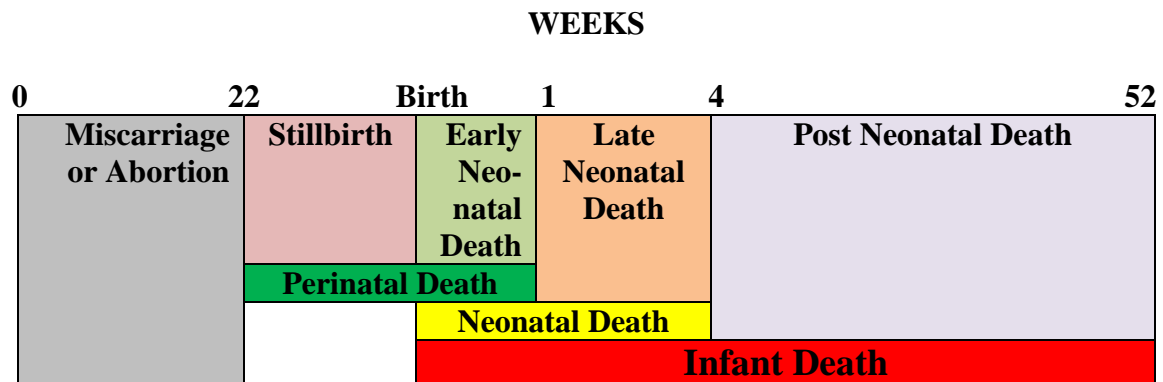
## MCH Indicators

### Infant Mortality Rate:

Infancy is the first year of life, thus infant mortality rate (IMR) in a given period of time (usually a year) is the number of deaths among infants per 1000 live births in the same period.

Deaths occurring during different periods of infancy reflect different groups of causal factors.

#### Sub-divisions of Deaths in Infancy



### Causes of infant mortality :

#### A- Neonatal Mortality:

These deaths reflect conditions related to pregnancy and labour, so called endogenous causes, they include:

- 1-Low birth weight and prematurity.
- 2-Birth injury
- 3- Congenital abnormalities
- 4- Neonatal sepsis
- 5 - Neonatal tetanus still a cause in some developing countries.

## **B- Post Neonatal Mortality:**

These deaths are predominantly a reflection of social and environmental factors, as indicated by higher rates in lower socio-economic groups (exogenous causes), and the causes of these deaths include (gastro-enteritis, respiratory infections, accidents, and under-nutrition). Another cause is congenital malformations, which does not show socio-economic differentials.

There is a wide variation in IMR ranging from 6/1000 in developed countries to 104/1000 in least developed countries. The marked decrease of IMR in the developed countries was mainly due to controlling the exogenous causes (improved environmental conditions, better nutritional standard, immunization, better education and improved medical care). While the higher rates, still existing in most developing countries, are due to uncontrolled environmental conditions, poor nutrition, poor education and low socioeconomic state.

## **Prevention of infant mortality rate:**

- 1-Adequate antenatal care, risk identification and management.
- 2-Encourage hospital deliveries and training of traditional birth attendants.
- 3-Improving obstetric and neonatal care.
- 4- Early initiation of breast feeding, and continue exclusive breast feeding for 6 months.
- 5-Early detection and treatment of childhood diseases.
- 6-Early detection and correction of malnutrition
- 7-Improving environmental sanitation and standard of living.
- 8-Improving maternal education.
- 9-Family planning measures.
- 10-Health education.

## **Perinatal Mortality Rate:**

This rate groups together stillbirths and deaths occurring during the first week of life. The reasons for calculating this rate are:

- 1-It is a sensitive indicator of antenatal, intranatal and postnatal maternal services.
- 2-This rate compares variations between different localities (hospitals, towns, cities, and countries) with respect to health care provision.

## **Causes of perinatal mortality:**

- 1- Antenatal causes: systemic diseases such as (hypertension, diabetes, heart diseases, Rh iso-immunization), pelvic causes (endocrine tumors, ovarian tumors), intra-uterine growth restriction, anatomical defects of genital tract, endocrine causes, others.
- 2-Intranatal causes: birth injury, birth asphyxia, prolonged labour.
- 3-Postnatal causes: respiratory distress syndrome, hypothermia, sepsis.
- 4-Other causes: lack of family planning, high maternal age, lack of spacing, poor obstetric history, malnutrition, severe anemia, cultural factors, multiple pregnancies, and maternal smoking.

Whereas other factors related to the health services may also play a role, which are:

1. Inadequate antenatal care
2. Inappropriate management during delivery
3. Lack of neonatal care

## **Prevention of perinatal mortality:**

Some important steps towards reducing perinatal mortality that can be implemented at various stages are:

- Antenatal period: antenatal registration, efficient care, immunization, good nutrition, referral.
- Intranatal period: efficient obstetric care, aseptic delivery practice, trained birth attendants.
- Postnatal period: efficient new born care, resuscitation, family planning, adequate spacing.

## **Childhood Mortality:**

Mortality rates during childhood are measured in relation to the population in the same age group.

**Age Specific Death rate**= the number of deaths among persons of a given age group in a year / the average (midyear) population in the specified age group in the same year per 10,000 population.

Leading causes of childhood mortality:

- Diarrheal diseases.
- Acute respiratory infections
- Malnutrition
- Accidents
- injuries

The reduction is due to the decrease in the incidence and fatality of infectious diseases (better socio-environmental factors, nutrition, housing, sanitation, immunization and advances in therapy). As a result, other causes of death have emerged and became targets for prevention such as

accidents and childhood cancers (leukaemias). There are still inequalities between countries and between social classes within the same country.

## **Maternal Mortality:**

### **Definitions:**

**Maternal Death (MD):** The death of a woman while pregnant or within 42 days of termination of pregnancy from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.

**Direct MD:** Deaths resulting from obstetrical complications of the pregnancy, labour, or puerperium, and from interventions, omissions, incorrect treatment, or a chain of events resulting from the above.

**Indirect MD:** Deaths resulting from previous existing disease or a disease that developed during pregnancy, labour or puerperium and aggravated by the maternal physiological adaptation to pregnancy.

### **Main Causes of Maternal Deaths:**

#### *A- Direct causes:*

The main killers in developing countries are: haemorrhage (antepartum and postpartum), infection (sepsis), hypertensive diseases of pregnancy, obstructed labour leading to rupture of the uterus and unsafe criminal abortion may also lead to death due to haemorrhage and sepsis. Ectopic pregnancies, unsafe operative procedures and pulmonary embolisms are other causes.

#### *B: indirect causes:*



About 20% of maternal deaths results from previously existing diseases aggravated by pregnancy such as anemia, hepatitis, pneumonia, heart diseases, ....

**C- *other factors related to the health services*** may also play a role, which are:

- Unavailability of blood transfusion facilities.
- Deficient medical treatment of complications.
- Lack of essential supplies and trained personnel.
- Lack of, or poor referral services.
- Inadequate antenatal care.
- Lack of facilities for emergency transport.
- Lack of access to maternity services.
- Inappropriate management during delivery
- Lack of postnatal care

**D- *Reproductive factors:***

The main ***maternal characteristics*** for being at risk of having a maternal death are:

- Very young or very old mothers
- First birth and Fifth birth or over
- Cigarette smoking
- Small stature
- Hypertension

**E- *Social factors:***

- Low social class
- Malnutrition
- Poverty

- Poor environmental conditions.

Maternal deaths are tragic events and they cause social and economic losses. Those women are usually young and are responsible for the health and well being of the family.

Pregnancy is not a disease, and pregnancy related morbidity and mortality are preventable or avoidable.

***Avoidable Maternal deaths:*** Are deaths which can probably be prevented, if the patient had received ideal care under ideal conditions.

### **Prevention of Maternal Deaths:**

1. Establish maternal mortality committees
2. Improve standards of health facilities (hospitals and PHC centres)
3. Proper training of health professionals (obstetricians, GPs, midwives and TBAs)
4. Community education to encourage mothers to have ANC
5. Identification and management of high risk groups
6. Research