وزارة التعليم العالي والبحث العلمي

الجامعة التقنية الجنوبية

المعهد التقني /ألعماره

قسم التمريض

خدمات صحة المجتمع

لطلبة التمريض – المرحلة الثانية

المعهد الطبي التقني/ألعماره

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ماجستير اختصاص تقنيات صحة المجتمع

الأسبوع (1-3)

What is Community Health Services:

Community health services cover a wide range of services and provide care for people from birth to the end of their life. Community health teams play a vital role in supporting people with complex health and care needs to live independently in their own home for as long as possible.

Health: The state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

Community: It's a collection of people who share some important feature of their lives, its social group determined by geographical boundaries and common values or interest and living under certain laws and regulation

Community health: Is the identification of needs and the protection and improvement of collective health within a geographically defined area.

Community Health Nurse: One who has been educationally prepared to participates in a variety of setting with individuals, family, groups and community as whole.

Primary healthcare center (PHC) : is the basic structural and functional unit of the public health services in developing countries. PHCs were established to provide accessible, affordable and available primary health care to people.

Goal of Community Health Programs:

1. To improve the levels of health of the community.

2. To identify potential and existing community health problems.

Community health services are classified into categories including:

1- **Preventive health services** such as treatment of diabetes and hypertension.

2- **Promotive health services** such as health education, family planning, vaccination and nutritional supplementation.
3- **Curative health services** such as treatment of Malaria and Pneumonia.
4- **Rehabilitative health services** such as provision of prosthetics, physical therapy, counseling and mental health services.

Levels of Primary Health Care

Primary health care

- The "first" level of contact between the individual and the health system..
- Provided by the primary health centers.
- Aim to reduce risk factors and increase health promotion and prevention.

Secondary health care

- Comprises therapeutic services
- Provided by the district hospitals
- The 1st referral level

Tertiary health care

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

Primary Health Care Center Units :

- Administrative Unit : 1 administrator per 20,000 people

- Medical Unit : 2 doctors per 10,000 people
- Pharmacy Unit: 1 pharmacist per 20,000 people , 2 pharmacist assistants per 10,000 .
- Dental Unit: 1 dentist per 10,000 people , 1 dental assistant per 10,000 .
- Laboratory Unit : 4 lab assistant per 10,000 people
- Mother and Child Care Unit : 1 female doctor per 10,000 people ,2 nurse per unit
- School Health Unit: 1 health worker per 25 schools.
- Nursing Unit: 1 nurse per 10,000 people , 1 female nurse per 10,000.
- Monitoring of drinking water : 2 medical assistant per 50-100 shops
- Immunization Unit : Health or nursing worker
- Statistics Unit : 1 for (PHCc).
- Health Promotion Unit : Health worker
- Communicable Diseases Unit: Health worker
- Non-Communicable Diseases Unit: Health worker
- Nutrition Unit: Health worker

Services of primary health care centers:

Primary health care centers must implement all elements of primary health care for the community within the specified area.

These elements are:

1. Medical services
2. Mother health services
3. Child health services
4. Immunization services
5. Health education services
6. Family planning services.
7. School health services

8. Drinking water safety services
9. Prevention of diarrheal diseases
10. Prevention of respiratory diseases
11. Epidemiological surveillance of communicable diseases
12. Chronic disease management
13. Detection of non-communicable diseases
14. Early detection of breast cancer
15. Mental health services
16. Nursing services
17. Dental health services
18. Radiology services
19. Nutrition services
20. Laboratory services.
21. Occupational health and safety services.
22. Emergency services.

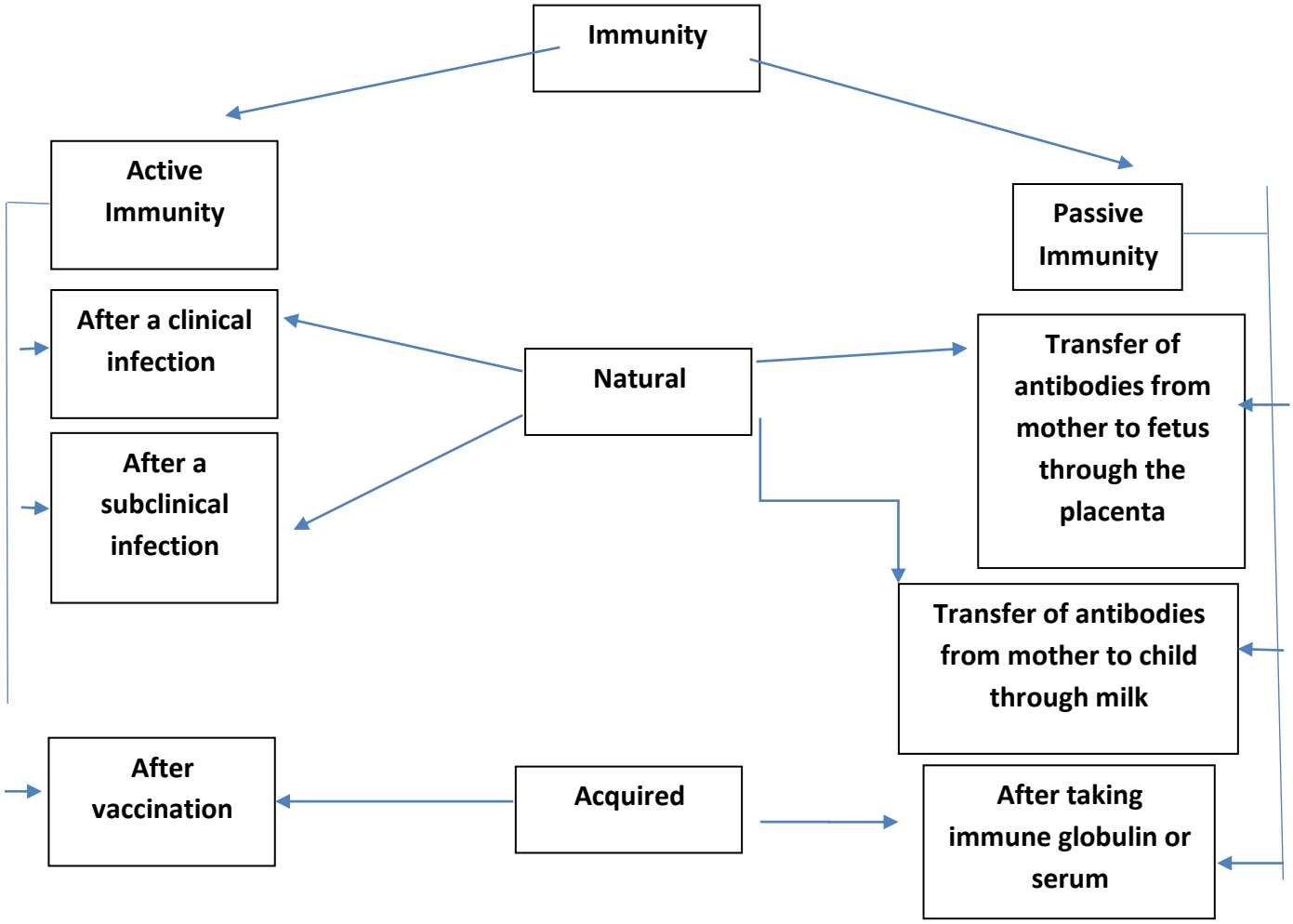
IMMUNIZATION

Immunization against diseases

There are six important and highly dangerous diseases that may kill many children or cause them permanent disability. There are children who may be infected with these diseases and survive and gain permanent immunity to them. Among these diseases are:

1. Tuberculosis (pulmonary tuberculosis).
2. Polio.
3. Diphtheria (diphtheria).
4. Whooping cough.
5. Tetanus (tetanus).
6 .Measles.

Immunity: Is the state of being insusceptible or resistant to a harmful agent or process, especially a pathogen or infectious disease.



Immunization: is the process by which an individual's immune system becomes fortified against an infectious agent such as bacteria, viruses, fungi and preventing them from harming his organs and cells.

Antiserum: It is a human or non-human blood serum that contains antibodies that is used to give passive immunity against many diseases.

Vaccine: is a biological preparation that provides active acquired immunity to a particular infectious or malignant disease.

Types of vaccines:

1- Attenuated (live) like measles. 2- Inactivated (killed) like IPV.

3- Toxoid like tetanus 4- A cellular or Subunit like hepatitis.

5- Conjugate (polysaccharide outer coat like Haemophilus influenza type B).

6- Genetic vaccine (DNA or RNA vaccines like COVID vaccines)

1- BCG Vaccine:

(Bacillus-Calmette-Guirine)vaccine it is a live attenuated microbe that protects against tuberculosis. Its a dried powder vaccine that is dissolved with the solution included with it. The BCG vaccine is easily damaged if it is exposed to sunlight, and the remaining vaccine is destroyed after the end of the vaccination session or after six hours of thawing (whichever comes first).

Dosage and method of administration:

A healthy child is vaccinated with the BCG vaccine immediately after birth intra dermaly in the upper third of the left shoulder, and the dose is (0.05 cc).

Side effects

The vaccine will cause a small red swelling that may appear days after vaccination, then it turns into a purulent swelling and then explodes after a while, leaving a clear scar above the muscle of the left arm. This scar is considered evidence of the success of the vaccination process.

If the red swelling does not appear within a period of (8-12) weeks after vaccination, then the vaccination is repeated with the same dose and for one time only.

2- DPT (Diphtheria, Pertussis, Tetanus) vaccine:

It contains a vaccine against diphtheria (detoxifying toxins), whooping cough (killed bacteria), and tetanus (detoxifying toxins). The vaccine is given intramuscularly in the left thigh at a dose of (0.5 cc).

Side effects of the triple vaccine are fever, loss of appetite for food, and the child also suffers from pain, redness, and swelling in the site of the vaccination for a period of (3-4 days).

Note: The triple (DPT) vaccine is not given to children over the age of five, but they can be given the double vaccine (tetanus and diphtheria).

3- Polio vaccine:

There are two types currently available:

A- Injectable Polio Vaccine (IPV):

It also called (Salk vaccine) after the scientist who discovered it, this vaccine contains polio virus with its three types. The virus is killed by a chemical method, and the vaccine is given intramuscularly or subcutaneously at a dose of (0.5 cc).

B- Oral polio vaccine (OPV):

It was discovered by the scientist (Sabin), also its contains the three types of polio virus. It is live attenuated vaccine given orally in six doses with two drops and no side effects usually.

4- Measles:

It is a live attenuated measles virus, found in a powder that has been freeze-dried and dissolved with its solvent and injected (0.5 cc) subcutaneously in the left arm.

Side effects of the measles vaccine: The child may develop a fever that lasts between one and three days, approximately 6-10 days after vaccination. They also sometimes develop a mild skin rash that resembles a measles rash. The vaccine is sensitive to heat and light and is given to the child at the age of 9 months. The effectiveness of the vaccine at this age is 85%, meaning that for every 100 children vaccinated with a single measles vaccine at the age of 9 months, there is a possibility that 15 children will not develop immunity, so the measles vaccine is re-administered through (MMR) vaccine to ensure that the effectiveness of the vaccine reaches more than (95%).

5- MMR vaccine:

Its mixed live attenuated (weakened) virus which contains the isolated Measles, Mumps, and Rubella viruses, is given as a (0.5 cc) of the vaccine after dissolving the powder with its solvent subcutaneously in the left arm. The number of doses for MMR vaccine is two doses. The first was at the age of (12 months) and the second was at the age of (18 months).

Side effects of the mixed measles vaccine: The mother is recommended to monitor her child after vaccination for a period of (5-12) days due to the possibility of some cases occurring, such as the child developing a high fever and the appearance of a skin rash, with the possibility of convulsions or swelling of the lymph nodes in the vaccination area (cervical and cranial lymph nodes). allergy, joint pain.

Schedule of routine vaccinations for children in Iraq 2019

The pentavalent vaccine consists of (Diphtheria, Tetanus, Pertussis, viral Hepatitis-B, and Haemophilusinfluenzae type B "Hib") vaccines.

Vaccination schedule for pregnant women and women of reproductive age with the tetanus toxoid vaccine:

Age	**Vaccines**
1day - 1weak	OPV(0 dose) + BCG + Hep-B
2 months	OPV (1^{st} dose) + Rotavirus v (1st dose) + PCV13 (1^{st} dose) + Penta v (1^{st} dose)
4 months	OPV (2^{nd} dose) + Rotavirus v (2^{nd} dose) + PCV13 (2^{nd} dose) + Penta v (2^{nd} dose) + IPV (1^{st} dose)
6months	OPV (3^{rd} dose) +PCV13 (3^{rd} dose) + IPV (2^{nd} dose) + Penta v (3^{rd} dose)+ Rotavirus v (3^{rd} dose)
9months	Measles vaccine+ Vitamin A (100,000 IU)
12months	MMR (1^{st} dose)
18months	OPV (1^{st} booster dose) + Vitamin A (200,000 IU) + MMR(2^{nd} dose) + DPT (1^{st} dose)
4-6 years	OPV (2^{nd} booster dose) + Vitamin A (200,000 IU) + DPT (2^{nd} dose)

Dosage number	Time	Duration of protection
First	at the first visit for health center after age of 15 years or the fourth month of pregnancy	does not provide any protection
Second	one month after the first dose	3 years
Third	after (6) months of the second dose	5 years
Fourth	one year after the third dose	10 years
Fifth	one year after the fourth dose	for life

Typhoid, Paratyphoid A&B (TAB) vaccine:

The typhoid vaccine consists of three types of Salmonella bacteria, (Salmonella typhi and Salmonella paratyphi A and B).

This vaccine contains killed microbes, which are destroyed by freezing or when exposed to sunlight. Vaccination with it is given to people who are exposed to the disease through their profession, such as doctors, nurses, workers in water and sewerage projects, workers in preparing and serving food, swimming pool participants, and travelers to an endemic area, as well as those in contact with infected patients.

Dosage and method of administration: Typhoid vaccine is given subcutaneously in the upper arm, in three doses, 4 weeks apart from each dose, and one booster dose is given every year.

Side effects of the typhoid vaccine: Pain, redness, and swelling in the injection area usually occur between (2-3 hours) after vaccination, malaise, high temperature, and nausea within 24 hours of vaccination. These can be treated by giving analgesic and antipyretic medications like paracetamol.

It is prohibited to give this vaccine to patients with tuberculosis, heart disease, kidney disease, and mothers during pregnancy.

Note: The typhoid vaccine is not given with the polio vaccine, and it is preferable to stop taking it two weeks before and after vaccination with the polio vaccine.

The role of the nurse in immunization against diseases:

1- Preserving vaccines from spoilage.

2- Keep vaccines at the correct temperature inside the health center.

3- Vaccines must be carried to the vaccination room in a (vaccine carrier) with ice.

4- Giving vaccines in the correct manner and in the required dose.

5- After completing the vaccination, the type of vaccine, the dose date, the name and signature of the nurse should be recorded.

6- Telling the mother why the vaccine was given to her child, and confirm the date of the next dose.

8- Informing the mother about the side effects that occur to the child as a result of taking the vaccine and what measures we take to treat the child.

9- The remaining vaccines must be disposed of after completing vaccination using sanitary methods.

Cold Chain System

All vaccines are considered biological materials that can lose their effectiveness against diseases over time. the rate of this loss increases when vaccines are exposed

to high temperatures (or low, depending on the type of vaccine), and that effectiveness cannot be restored by correcting the storage method.

Definition: Cold chain system is (the system that ensures that vaccines are kept safe and effective from the moment of manufacture until the vaccine is used).

Cold chain components:

1. Vaccination workers.

2. Refrigeration devices, including:

A- Walk-In Cold Rooms and Walk-In Freezer Rooms: The temperature must be between (+2°C to +8°C) for Walk-In Cold rooms and (-15°C to -25°C) for Walk-In freezer rooms.

B-Ice Lined Refrigerator and Deep Freezers: Spaces must be provided between vaccines when it is paved inside to allow air circulation between them.

C- Cold Boxes: An insulated box in which frozen ice packs can be arranged for the purpose of keeping and transferring vaccines at the appropriate temperature.

D- Vaccine carriers: A heat-insulated container in which ice packs are placed along the walls for the purpose of keeping the vaccine cold. Vaccine carriers is usually smaller than a cold box and is very easy to carry so it's used during vaccination campaigns that vaccination teamsconducted outside the health center.

C-Ice Packs: It is a regular plastic container filled with water and is available it is available in two basic sizes:

0.4 * liters and is used in the vaccine carriers.

0.6 * liters and is used in cooling boxes.

These containers are used for cooling, and for best use they must:

- Fill it with (relatively) cold water, provided that it does not exceed 75% of its capacity.

- Close it tightly.

- Ensure that there is no scratch on it.

- Freeze the it completely.

Stages of vaccine distribution:

Cold chain takes place in several stages. In all cases, vaccine must be protected from damage. The stages that the vaccine goes through from its production until it reaches the mother and child are:

1. The factory (the place where the vaccine is produced).

2. Airport.

3. Regional Store.

4. Central Store.

5. Governorate Store.

6. District Store.

7. Health center.

8. Vaccinated and then to the mother and child.

Caring for vaccines in the health center refrigerator:

1 - The door must be kept closed, and when an opening is needed, the work required must first be determined previously then the door will be closed quickly after that.

2- Do not put any food items in the vaccine refrigerator.

3- Do not put vaccines in the refrigerator door.

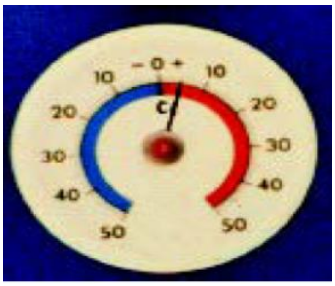
4- The refrigerator freezer should be designated only for preparing ice bags and not for vaccines.

5- Do not use any expired vaccine.

H - The temperature of the refrigerator must be checked twice a day, in the morning and in the evening, and the temperature must be between (0 - 8+ degrees Celsius).

6 - Recording the temperature on a board placed outside the refrigerator, and only the responsible person records the information on it.

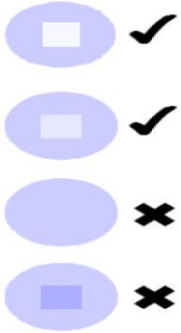
Types of thermometers used to measure the temperature of vaccines.



1- Circular metal thermometer:

A thermometer indicates temperatures above and below zero (-50°C to +50°C). It has a clip for hanging inside the refrigerator and freezer.

2- Vaccine Vial Monitor (V.V.M):



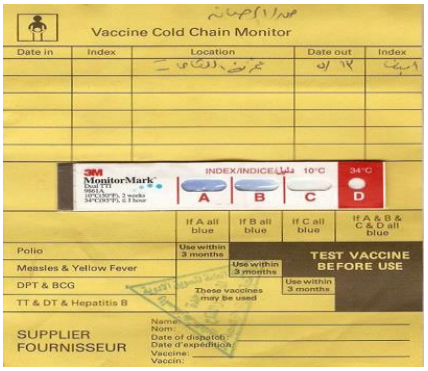
It is a dot made of a sensitive material, it is currently installed on each polio vaccine vial to indicate the cumulative exposure of the vaccine vial to heat over time. As a result of time and temperature, the color of the indicator changes from white to dark blue in a gradual and irreversible manner.

3- Freeze-tag:

A (freezing temperature gauge) is placed in the refrigerator to monitor the temperature of vaccines. It indicates (OK) sign if the temperature does not reach freezing, and indicates (Alarm) sign if the temperature reaches freezing which is harmful to

vaccines, because some vaccines are damaged by low temperature.

4- Cold Chain Monitor (C.C.M):



It is a time- and temperature-sensitive thermometer. It contains a tape with windows(A,B,C) and the last window is in the shape of a round disk (D) as indicator. This tape contains a heat-sensitive material that changes its color from white to blue when exposed to heat and this substance spreads through the window over time. It's must Putting with every (3000) vaccine doses and its existence is considered one of the basic international conditions for marketing the vaccine by manufacturers.

5- Electronic thermometer:

This thermometer has been used to monitor temperatures in all primary health care centers since 2013, as an alternative to the circular thermometer, as it records temperatures for the last 30 days ago and indicates any increase or decrease in the temperature required to store vaccines which is (+2c to +8c).

WHO Recommended Vaccine Storage Condition According To :

1- Vaccines Sensitive to Freezing:

IPV , Hep -B , Penta , PCV , DPT , TT , Dt ,Td , Influenza , Typhoid.

2- Vaccines Sensitive to Heat:

OPV , BCG , Measles , MMR , Rota virus

The role of the nurse in the cold chain: -

1- Estimating the health center's vaccine needs.

2- Take the oldest vaccines, i.e. those that have been in the refrigerator for a long time.

3- Check the refrigerator temperature and recording it on the paper stuck on the refrigerator.

4- Supervising the method of administering the vaccine to the mother and child.

5- Supervising the method of transporting the vaccine.

6- Submit a weekly or monthly report on the quantity of vaccines used.

7- Training workers in preparing, dispensing and administering the vaccine and conducting ongoing seminars.

Vaccination registration:

There should be three vaccine record lists:

1. A list of children born in the local community containing their names, dates of birth, addresses, and types of vaccine they received.
2. A list of pregnant women containing their names, expected dates of birth, and dates of previous vaccinations.
3. A list of children over one-year-old who have not completed their vaccinations.

الأسبوع (4-5)

School health services

School health services: Is the various actions that are taken by the health team in conjunction with the school authorities, teachers and parents to promote the highest possible level of health for school children throughout their years of study.

School health services in Iraq started in 1936 as. "dispensary " of students health under supervision of Ministry of education . In 1952, it became under the administration of the Ministry of health. In 1970 the name was changed to school health centre . In Iraq health services in general and school health services and

maternal and child health services in particular gained special attention and care from the ministry of health. This appears in public health law number 89 in 1981.

Objectives of school health:

1- Examination of 100% of the students enrolled in kindergarten, students of first and secondary schools. The disabled students in institutes and nursing homes and religious schools for the purpose of early detection of cases and their treatment.
2- Reducing the spread of all communicable diseases schools.
3- Diagnosis of all environmental deficiencies and follow-up their treatment by the relevant authorities.
4- Healthy and environmental awareness to all students and educational workers in schools.
5- Provide of school health care for all members of the school community.
6- Contribute to the support and development of school feeding programs.
7- Determine the size and prevalence of health problems in the school community.
8- Contribute to the support and development of psychological health in the school community.
9- Activating cooperation between the school and the family and the community to promote the health of students.

Importance of the School Health Services: The importance of school health services include:

1- The school health services is needed because we know that the children in the school form a large proportion of the population and are targets for malnutrition, and some other diseases. If their health is taken care of therefore, a large percentage of the population will be covered.

2- School children at this age undergo several physical, emotional and developmental changes.
3- These changes may create problem for the school so the school authorities should recognize these problems and give adequate solution
4- School age child comes to school and faces many risks e.g. accidents, emotional stress, and also communicable diseases. The school therefore is a centre of risk and so the school authority should take action to solve the problem.
5- The school should care for the health of the child because teaching about health in school is usually more effective than teaching elsewhere e.g. in the mass media .

The Functions and Duties of School Health Nurse:

1- To participate in the preparation of the annual plan and periodic meetings of the health unit.
2- Work in clinics and nursing including: (Take the basic data of the patient, Taking biometrics and his recorded accurately (temperature, pulse, respiration)
3- Participation with the doctor in the emergency cases in the unit and accompany the patient assigned when needed.
4- Responsible for the acts of sterilizing of medical devices and instruments .
5- Health education activities within the unit and school.
6- Participation in field program the following: (Infectious disease control program and epidemiological survey, Medical programs, School environmental program and the vaccination program).
7- In the field of vaccines: (Ensuring the safety of the cold chain, Give vaccinations under the supervision of a doctor .
8- To participate in the program of activities of continuing medical education and self-development of its information.

School health services which provided by the school health unit inside and outside the health center:-

1- Medical examination for new pupils enrolled in the school.

2- Health Visits for school by school health team and their duties are:

A- Medical examination for students and referring of those who are ill.

B- Follow-up of the school environment.

C- Health inspection of restaurants and food stores in schools.

D- Follow-up of preventive measures against infectious disease.

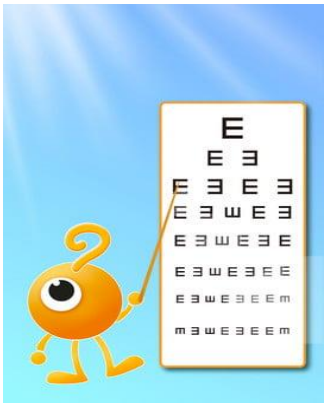
3- Immunization of pupils against common communicable diseases e.g. rubella vaccine which is given to sixth glass girls.

4- Health education: this include training programmes for teachers about of primary health care such as (How to prevent and control infectious disease, First aides ,Prevention of accidents at school, homes, streets, Smoking & its harmful effects).

5- Assessment of nutritional state of pupils by measuring weight and height . Giving prophylactic dose (200000 I.U) of vitamin A for students in the first primary schools .

6- Dental health: A periodic checking of the teeth of the school pupils. Dental care (curative and preventive) for all kindergartens and 60% of primary schools .

7- Mental health: Coordination between school health unit and the mental health department at the teaching hospital to refer any student suffering from psychological problems.



8. Vision screening tests: Vision screening tests should be conducted annually by a nurse, teacher or medical technician. The Snellen Chart or other screening device approved by the Ministry of Health.

9. **Hearing screening tests:** An individual pure tone audiometer or other screening equipment approved by the Ministry of Health.

10- A good surveillance system for communicable disease to preventive their spread in schools and include:-

A- Early discovery of disease.

B- Early treatment.

C- Examination of contact student with the case and adequate measures will be taken.

D- Compulsory leave will be given for students and the duration of that leave will depend on the communicability period of the disease.

Compulsory leave for students affected with communicable diseases .

N	Disease	Period of compulsory leave
1-	Poliomyelitis	4 weeks after the onset of the disease
2-	Cholera	5 days.
3-	Tuberculosis (TB)	2 month
4-	Meningitis	According to the decision of the specialist doctor.
5-	Viral Hepatitis (Type A,B and C)	2 weeks
6-	German measles	5 days after the onset of rash
7-	Measles	7 days of the start of symptoms
8-	Chickenpox	15 days from the onset of symptoms
9	Whooping Cough	2 weeks
10-	Mumps	10 days from the onset of the swelling.
11-	Typhoid fever and Para typhoid	2 weeks.
12-	Diphtheria	2 weeks
13-	influenza without complications	5 days

Standards and indicators that must be available in the school environment:-

Monitoring the school environment from priority of school health services to diagnose environmental deficiencies.

1. School Building: Should be in a place easily accessible, in a quiet area away from the noise and pollution sources from factories and railways.

2- The direction of the building: To be according to the exposure to the sun and the wind direction.

3 - The School Fence: Should be 1.8-2 meters high.

4- School space :should be allocates (10-15) square meters per student and include space buildings, stadiums, parks.

5 - Health Facilities in the School: - Including: (**Source of drinking water , Water Tank , Water Closet).**

6- School Shop:- Requires opening a shop in the school to prevent the phenomenon of street vendors in front of schools and educate students about the harmful effects of eating and drinking from street vendors**.**

7- Classroom : - Each student in the class must be allocated an area ranging between (1 - 1.5) square meters, and the appropriate distance for the room is (6 m) for the width of the room, (8 m) for the length of the room, and (4 m) for its height.

8- School furniture:

A - Blackboard: should be (un shiny dark black color, placed in the middle of the front wall , to leave between them and the first row of seats Lesson (1.5-2) m.

B - Seats of school: -

1- Should be height and width of seat are appropriate to student.

2- Separates between two rows of seats 1/2 half a meter.

3- Leaves between the lateral row of desks and wall 3/4 meters.

4- Leaves between the last row and the back wall 1m.

الأسبوع (6-7-8)

Prevention from *Communicable* disease

Infectious or communicable diseases are those diseases that are transmitted from the carrier to the healthy person, directly or indirectly, causing the disease itself to occur. Diseases do not arise on their own, but rather for their occurrence, they must be present in the presence of germs that are transmitted from the patient to others, such as viruses and parasitic diseases.

Disease: It is defined as a deviation in the natural state of the body, which leads to a disturbance in the functional work of the organs. The disease occurs either in the form of an epidemic, or it may be endemic or appear in the form of sporadic cases.

Epidemic Disease: It is the sudden appearance of a specific disease among a large group of people in a short period in a specific area or community that had not previously been infected with this disease, or the disease was endemic and then its infection rate increased significantly and suddenly.

Endemic disease: It is the continuous presence of a disease in a specific community, but in a non-epidemic form, as is the case with typhoid fever, measles, malaria, and schistosomiasis.

Sporadic disease: It is the occurrence of isolated disease cases from time to time in society.

Process of infection:

For any infectious disease to occur, there are six factors that must be present in order for the infection process to take place. If any of these six elements are missing, infection cannot take place. These factors are:

1. The presence of causative agent.
2. The presence of a source or reservoir of infection.
3. Having a portal of exit.
4. Having a mode of transmission.
5. Having a portal of entry.
6. Host presence.

1- Causative Agent:

The Pathogenic organisms are the ones that cause infectious diseases and exist in many types, including:

A- Animal cause:

They include single-celled parasites (Protozoa) such as amoeba and malaria, and multicellular parasites such as Schistosoma worms, intestinal worms, and insects with jointed legs (Vectors).

B- Plant cause:

These include fungi, pathogenic viruses, pathogenic bacteria, and Rickettsia.

2- Source:

It is the place where pathogens live, grow, and reproduce. such as humans, animals, plants, soil, and others.

3- Portal of Exit:

Pathogens can exit from the source into the environment either through the respiratory system, the digestive system, or the urinary system, or through the skin and mucous membranes, where the infection emerges from the openings of wounds and blisters, as well as through mechanical exits, where the infection emerges by mechanical action, as in The case of the bite of a mosquito carrying the malaria parasite or through blood transfusions, as in cases of hepatitis.

4- Mode of Transmission:

This means the method by which the infection (pathogen) is transmitted from the source to the new host. The infection is transmitted in two ways:

A- Direct method:

In this case, the infection is transmitted to human without an intermediary, meaning that the human being is the only host, and the infection spreads from one person to another through coughing, kissing, sexual intercourse, or through the placenta, and from diseases that are transmitted from mother to fetus, such as hereditary syphilis and German measles.

B- Indirect method:

In this case, the pathogen comes out of the infected person's body and is transmitted by the mediator to the healthy person through insects such as mosquitoes, flies, fleas, or through the presence of an intermediary such as contaminated drink, food, soil, or personal items such as clothing.

5- Portal of Entry:

It means the places through which the pathogen enters the body of the healthy host. Pathogens usually enter through one of the following entrances:

A- Respiratory system.

B- The digestive system.

T- Contact with skin and mucous membranes.

D - Penetrating the skin by pricking the skin with medical injections or surgical instruments or by an insect vector such as a mosquito to transmit malaria.

6- Host:

The host is a person or animal that is susceptible to contracting the disease when the pathogen (microbe) enters its body. Some bodies have a defensive force against diseases, so they overcome the microbe and eliminate it. This depends on multiple factors, the virulence of the microbe (its ability to cause pathological changes), the body's resistance and degree of immunity, age, gender, race, and unhealthy social customs and traditions.

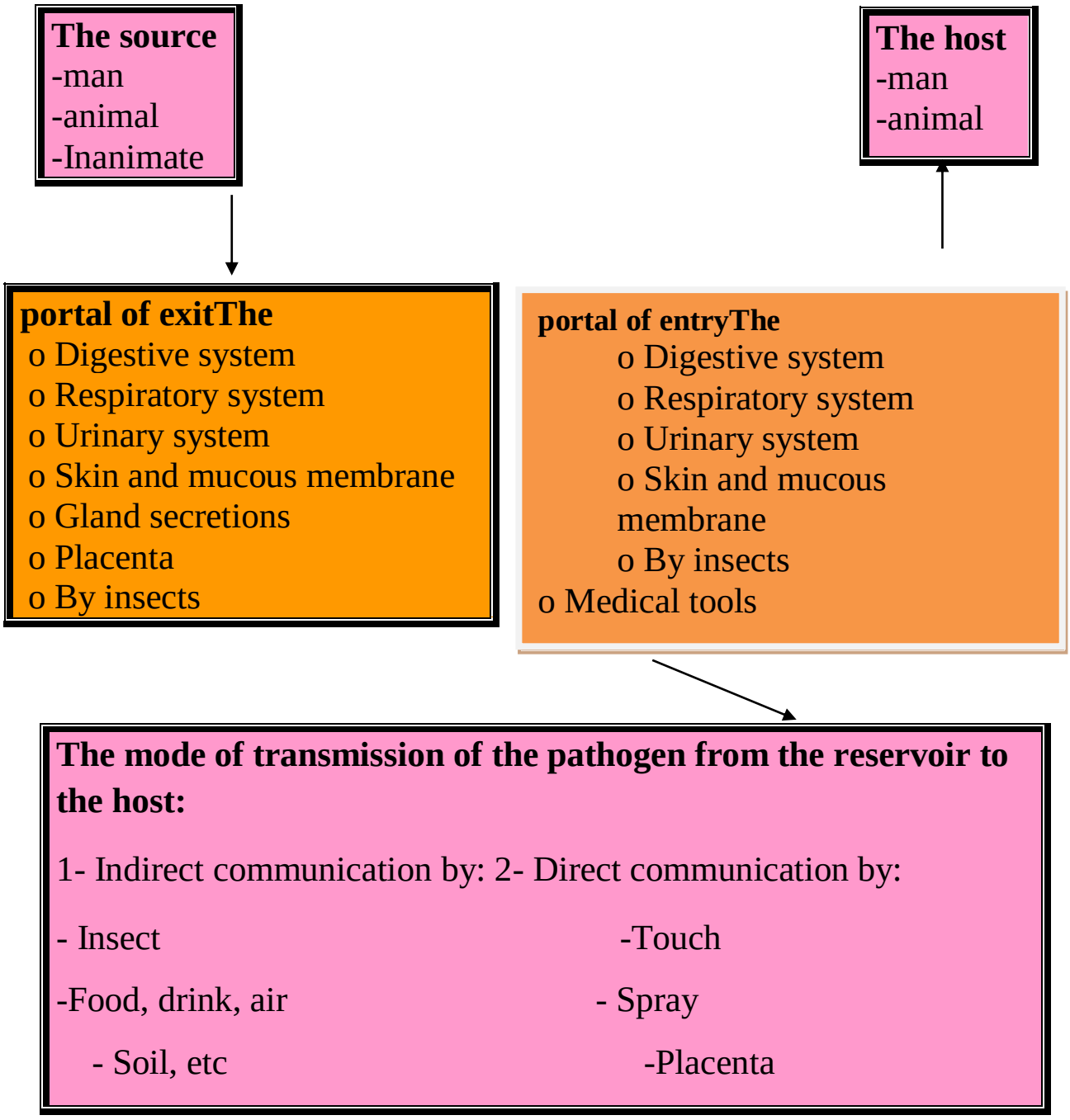


Figure (1): Chain of events in the Process of infection, and the most important factors.

Control of Communicable Disease

These are the measures taken to control infectious diseases, to limit transmission to the maximum possible degree. Reducing the spread of the disease, its occurrence, or the occurrence of complications. The basic general principles for control infectious diseases include:

1. Measures taken against the disease source (causative).
2. Measures taken towards those in contact with those susceptible to infection.
3. Measures taken towards the environment.

First: Measures taken against the disease source (causative).

1- Eliminate the source:

Eliminating the source of infection is only applied in diseases in which the infection is transmitted from animals to humans, where the animal is eliminated and disposed of. As for humans, the infection itself is eliminated by giving appropriate treatment, or performing a surgical operation such as removing the infected part of the body, such as removing the tonsils in a carrier of the diphtheria microbe.

2- Reducing infection perued:

In order for the pathogen to be transmitted from an infected person or animal to a healthy person, it needs a certain period called (the infection period).

Each infectious disease has an infection period that differs from the other disease, and this period can be reduced as follows:

A- Early detection of pathological conditions.

B - Reporting disease cases and suspicious cases to take rapid measures to prevent the spread of the disease.

C - Isolation of the infected: This is the separation of the infected person or animal from others to prevent the pathogen from reaching them. He is usually isolated during the period of infection, either at home or in the hospital, depending on the type of disease he is infected with and according to health instructions in the country:

Diseases that must be isolated in a hospital:	**Diseases that can be isolated at home:**
Diphtheria - epidemic polio - meningitis - viral hepatitis - typhoid and paratyphoid fever - cholera - anthrax - relapsing fever - scarlet fever - tetanus - plague - smallpox.	Measles - Rubella - mumps - whooping cough – chickenpox - amoebic dysentery -bacillarydysentery -pulmonary tuberculosis - influenza.

D- Treating medical conditions: by giving them the necessary antibiotics according to the patient's health condition, providing the necessary nursing care, providing the necessary foods, and preventing complications.

3- Disinfection. It is of two types:

A- Concurrent disinfection:

It is a continuous process in which all contaminated tools and secretions are disinfected, such as sputum, pus, feces, urine, as well as clothes, food utensils, and tools in contact with the patient, and it is part of nursing care.

B- Terminal disinfection:

This type of disinfection is carried out when the patient recovers, moves from one place to another, or dies. It includes disinfecting the place and all the patient's needs that he used.

4- Early detection of Carriers:

They are people who carry the microbe and do not show any symptoms and do not feel their condition, which makes them a great danger to society. Controlling all these people is considered difficult, but countries try as much as possible to follow them up and take the necessary measures according to the disease condition.

Second: Measures taken towards those in contact.

Contacts: They are the people who were in direct contact with the person infected with a contagious disease during the incubation period. the contacts were either at home, school, nursery, laboratory, or training camps.

The measures that must be taken towards contacts are:

1. Taking their information such as (name, age, address, etc.).

2. Quarantine for contacts: This means limiting the freedom of movement of healthy people who have been exposed to a contagious disease for a period equal to the incubation period of the disease.

3. Conduct a daily medical examination to determine their general health condition and place them under medical observation.

4. Conduct the necessary laboratory tests according to the type of the disease.

5. Giving vaccines.

6. Giving chemoprophylaxis.

7. Giving all necessary health instructions and advice about the infectious disease.

Third: Measures taken towards the environment in order to protect it:

The reason for the disappearance of some infectious diseases in most developed countries is attributed to the health measures taken to provide safe drinking water, dispose of waste in healthy ways, and eliminate harmful insects and animals that transmit diseases.

Among the measures taken to protect society and the environment are:

1. Supervising stores, slaughterhouses, markets, and food-producing institutions, detecting disease carriers, and adding chlorine to water - all of this helps in controlling the environment.

2. Providing immediate emergency care.

3. Isolation of infected people and rapid quarantine of those in contact.

4. Giving vaccines and preventive medications.

5. Health education about the nature of the disease, its spread, and mood of transmission.

6. Conduct an epidemiological investigation to discover the source of infection and the means of transmission.

The measures for Prevention of communicable diseases:

1. Providing protection for the body against pathogens by:
A- Giving preventive medications that provide passive immunity for short-term protection.
B- Giving the necessary vaccines.

2. Health education. For creating health awareness that helps people improve their health by improving environmental conditions.

3. Improving the health of individuals and society by providing healthy housing, necessary food for all ages and sanitary conditions for workplaces.

4. Providing a healthy environment by providing safe drinking water and disposing of waste in the correct ways

5. International preventive measures ,in case of an epidemic.

- Restricting the movement of citizens within the affected area.
- Closing public stores, such as cinemas, cafes, restaurants, hotels,etc.
- Isolating, monitoring, confiscation and preventing the transportation of animals and goods.
- Issuing instructions of the measures that must be taken to combat communicable diseases.
- The health authority has the right to enter residential homes and public stores for health inspection with the approval of the Minister.
- When any person is suspected of being a carrier of a disease- the health authority has the right to take necessary measures to monitor, isolate or quarantine him for the purpose of examining him.

الأسبوع(9- 11-10)

Environmental Health

Caring for the environment has become a focus of concern for countries due to the increasing negative impacts on the biological, physical and chemical environment resulting from the continuous increase in industrial projects and the abundance of their waste, means of transportation, with intensifying use of chemicals for multiple purposes which causing the occurrence and spread of many diseases, including infectious diseases.

Environment: It is the placein which a person is born, lives and grows up, and includes all the natural, social and economic factors that surround him and everything

that affects this person directly or indirectly (World Health Organization). **The environment Include**:

1- **Physical environment**: Like air, water, housing, food, waste, garbage, sound, light, heat, humidity, home, school, laboratory, means of transportation, and entertainment places.
2- **Biological environment**: includes all living. Animal, plant organisms and the factors that help these organisms live.
3- **Social environment**: includes the relationships between humans and other members of society, their customs and traditions.

World Health Organization has identified **the factors that must be paid attention to in order to provide a healthy environment** free of everything that affects human health and development.

1. Combating air pollution from all harmful factors to human life.
2. Protecting water sources from pollution.
3. Preparing a healthy residence that meets all the necessary health conditions.
4. Finding appropriate sanitary means to dispose of human waste.
5. Control all insects and rodents.
6. Follow healthy methods in food preparation, storage, and distribution.
7. Spreading health awareness among citizens and urging them to adhere to the rules of public health and personal hygiene.
8. Monitoring public stores, schools, factories, roads, and streets to ensure that they are free of health damage.

Environmental Health: It is a person's adaptation to his environment or the balance that must exist between a person and his environment in order to secure a healthy life for himself.

The most important components of environmental health:

1. Healthy housing.

2. Water health.

3. Atmospheric health.

4. Food hygiene.

5. Disposal of various types of waste.

6. Control of insects and rodents.

7. Eliminate animals that are considered a reservoir of infection.

First: Healthy housing:

The World Health Organization defined healthy housing as (A healthy place where a person and his family live and enjoy comfort, tranquility, physical and mental safety, and in which he can perform the physiological functions of the body and in which health conditions are met, thus avoiding the infectious diseases and accidents of various causes.

Conditions for healthy housing:

1. It must be in a quiet location away from noise.

2. It must have a strong and solid structure, with a smooth floor and a moisture-proof roof.

3. The number and width of the rooms must be appropriate to the number of family members.

4. Have with a hygienic kitchen for storing and cooking food.

5. Provide a hygienic bathroom.

6. Providing safe drinking water.

7. Providing good lighting, ventilation, and access of the sun inside.

8. Provide good hygienic heating and cooling system.

9. It must have sanitary means for waste disposal.

10. Protecting the residence from insects and mice.

Second: Water hygiene

Water makes up about 70% of the structure of the human body. A person needs about (3 liters) of water daily, he consumes part of it in his drink and the rest through the

foods he eats. However, water needs vary depending on the climate and activity, as well as from one region to another. The person in the cities may need about (160 liters) perday, and in the village the person needs per day is (25 litres).

Specifications of healthy water:

1. It is clear because it is free of suspended materials such as clay.
2. Acceptable taste.
3. Free of chemicals.
4. Uncontaminated and free of waterborne pathogens.

Water Pollution:

The most important types of pollution are:

A- Physical pollution.

In thistype of pollution there ischanging in natural properties of water likeits colour due to the presence of suspended materials, i.e. clay, etc., and its taste changes, making it unpalatable and its smell unpleasant.

B- Chemical pollution.

Water may be contaminated when toxic chemicals such as lead, arsenic, and pesticides are introduced into it, giving the water an unpleasant odor and taste, such as petroleum and its wastes. Also the water may be contaminated with radioactive materials

C- Microbial pollution.

It’s the most dangerous types of pollution, as water may be contaminated with pathogenic germs such as bacteria, viruses, and parasites, which cause various infectious diseases. The source of this type of pollution is humans or infected animals.

Water-borne diseases:

1. Diseases caused by bacteria, such as: typhoid, paratyphoid, cholera, bacillus dysentery, intestinal infections, and eye, ear, and skin infections.

2. Diseases caused by viruses, such as: polio, hepatitis, and some types of intestinal infections in children.

3. Diseases caused by parasites such as amoebic dysentery, schistosomiasis, and some intestinal worms such as Ascaris and Ancylostoma.

4. Diseases resulting from changes in chemical quantities in water:

- Enlargement of the thyroid gland due to lack of iodine in the water.
- Tooth decay due to a lack of fluoride in the water below the normal amount (0.5 mg per liter).
- Teeth staining due to an increase in fluoride in drinking water (more than 1.5 mg per liter).

5. Other diseases resulting from increased water hardness or poisoning by lead and other metals.

Diseases are transmitted to humans through water by:

1. Contaminated drinking water.
2. Bathing in polluted water, such as bathing in polluted rivers, and swimming pools.
3. Irrigating crops with contaminated water that can be eaten without cooking or washing them.
4. Put ice made from contaminated water in drinks to cool them.
5. Using contaminated water to wash utensils and prepare food.

Water Purification:

Most natural sources of water are not suitable for drinking, such as water from rivers, canals, and wells. They cannot be used for other purposes, such as preparing food, because they are exposed to pollution and the transmission of diseases. Water sources can be treated and made safe and drinkable through boiling, sterilization, filtration, and sedimentation.

Environmental Health

Third: The health of the atmosphere

Atmospheric health includes: The health of air, ventilation, heating, lighting, noise, and radiation.

***Air:**

Air is considered one of the most important requirements necessary to sustain life for humans, animals, and plants. Air is a mixture of several gases, the most important of which are oxygen, nitrogen, carbon dioxide, and a percentage of water vapor, in addition to some other elements and compounds that are present in very small percentages. Clean air is usually colorless and odorless. Healthy air suitable for humans is one that meets the following conditions:

1. It must be rich in oxygen and in sufficient quantity for humans.

2. Its temperature should be lower than the human body temperature in order to allow the body to lose its heat.

3. Its humidity level must be appropriate.

4. It must be free of microbes.

5. It must be free of dust, harmful gases, and odors.

6. It must be mobile.

Air pollution:

In general, the air or atmosphere is polluted from many sources, the most important of which are:

1. Pollution from homes.It includes types of fuel used for heating, or lighting, such as coal, wood, oil, gas, and gasoline.

2. Pollution from factories.It includes waste resulting from manufacturing processes such as dust, steam, cotton dust, and tobacco, in addition to radioactive contamination resulting from nuclear activities to generate energy.

3. Pollution from agricultural activities.It occurs as a result of the use of pesticides, and burning weeds.

4. Pollution from transportation.It occurs as a result of the emission of gases or steamfrom machines and devices that operate train, cars, airplanes and ships.

5. Pollution from fermentation of organic materials. It includes waste such as fecal matter, urine, and dead animal carcasses.

***Noise:**

It is the loud sound coming from various sources, such as the sounds of cars, planes, motorcycles, industrial equipment and the sounds of radio and television.

Noise effect: Noise causes many harms to humans, including:

1. It reduces production in quantity and quality.

2. Expose him to various accidents.

3. It causes him anxiety, fatigue and discomfort.

4. It leads to permanent headaches.

5. It causes tinnitus in the ear.

6. It causes sleep disturbance and high blood pressure.

7. Temporary or permanent deafness occurs.

Fourth: Food health

Food is those edible substances that enter the body and provide it with thermal energy, helping it grow properly, build tissues, replace damaged cells, and sustain

human life. The components of healthy food are proteins, carbohydrates, vitamins, fats, minerals, and salts. The calorie requirement for a woman is 2250 calories and for a man is 2750 calories. Pregnant and breastfeeding women also need more calories than other women.

Food contamination:

contaminated food may lead either to poisoning as a result of its decomposition by secretions of toxic germs, or to the transmission of infectious diseases. Food becomes contaminated in several ways, including:

1. Food becomes contaminated during transportation or improper storage.

2. Food becomes contaminated by workers preparing, preserving, and selling it, if the worker is sick or carrying pathogenic microbes.

3. Food becomes contaminated by using contaminated utensils, machines, and tools.

4. Food becomes contaminated when it grows in a polluted environment, such as when fish and shellfish grow in polluted water.

5. Food is contaminated by insects such as flies and animals that can reach it.

Diseases caused by food contamination:

A- Infectious diseases such as:

1- Typhoid and paratyphoid.
2- Non-pulmonary tuberculosis (such as tuberculosis of the intestines, bones, and glands).
3- Cholera. 4- Amoebic and bacillus dysentery.
5- Diarrhea for children. 6- Hydatid cyst.
7- Intestinal worms. 8- Scarlet fever.
9- Malta fever (Brucellosis). 10- Diphtheria.

B - Food poisoning, which occurs as a result of some germs secreting poison into food before eating it, such as Staphylococcus aureus.

Fifth: Wastedisposal

It’s among the most important public health problems for society, as its statistics indicate that the rate of what each individual throws away is estimated at (half a ton annually), with possibility of this rate increasing, and that only 15% of the rural population have healthy ways to dispose of waste, and about(1,350 million) of the world’s population still suffer from the problem of waste disposal and its effect to health.

Waste, in general, is divided into two parts:

1. Dry waste (garbage).

2. Liquid waste (sewage).

***Dry waste (garbage).**

1. Waste from homes, hotels, restaurants and markets.

2. Waste from factories and shopslike paper, pieces of glass, building materials, and empty cans.

3. Animals (decomposed dead animal bodies such as cats and dogs).

4. Animal waste (waste from stables and animal barns).

5. Street garbage, which contains dust, tree leaves and damaged car debris.

Garbage collection:

1. Garbage are collected inside metal or plastic containers, preferably cylindrical in shape so as not to leave some waste in their corners after emptying them. They should be easy to clean and have tight covers to prevent flies. It is preferable to open and close these covers with the foot instead of the hand.

2. A large garbage container is allocated in a suitable place in one of the corners of the road to collect garbage within 24 hours.

3. This garbage is transported in modern, private (automatic) cars with tight doors that prevent waste from leaking out while driving to the main centers.

Methods of garbage disposal:

1. Sanitary backfilling. 2. Throwing into the sea.

3. Burning. 4. Convert garbage into fertilizer.

5. Reduction.

***Liquid waste (sewage) includes:**

1- Faeces. 2- Urine. 3- Bathroom and kitchen water.

4- Waste water from factories. 5- Street washing water.6- Rain water.

Methods of liquid waste disposal:

A- Dry method.

This method is used in villages and cities that are not yet connected to public sewers. The most important types are (Pit toilet, Tank toilet, Pail toilet, Chemical toilet, Double tank toilet).

B- Water method.

This method is used in cities, where waste is carried by water from all residences to public sewers. These sewers are underground channels that extend outside the city until they reach the purification process place, where they are treated(like sedimentation and filtration)and disposed (such as used in Irrigating a farm or draining it into the sea) and others.

Diseases transmitted through human waste:

Diseases transmitted through waste are dangerous, the most important of which are typhoid, cholera, hepatitis, dysentery, intestinal worm diseases.

The role of the nurse in environmental health:

1. Providing health and nursing services in the best possible way to individuals, families, groups and society as a whole.

2. Participate in solving health problems such as preventing accidents, the effect of radiation on health, and in epidemiological examinations of infectious and non-communicable diseases.

3. Health education for society regarding the use of services wisely and the control or elimination of all environmental risks.

4. Writing reports to those responsible for public health conditions.

5. Visits to homes, factories, schools, and public stores and providing health awareness and guidance services.

الأسبوع (12-13)

Healthy nutrition

Healthy nutrition: It is complete and balanced food that contains sufficient amounts of nutrients such as carbohydrates, proteins, fats, vitamins, mineral, and water in the proportions necessary for the body's growth, health, vitality, activity, and reproduction.

Food has many benefits, the most important of which are:

1. Providing the body with energy for its activity.

2. Gives the body resistance agents infectious diseases.

3. Healing damaged tissues and renewing its cells.

4. Helping the child grow and develop.

5. Preventingnutritional deficiency diseases like anemia.

Factors affecting community nutrition:

1. Abundance of agriculture.

- The appropriate time for planting.

- Growing good crops.

- Good storage after harvest.

- Move crops to all parts of the country properly.

2. Economy.

- Allocating funds to support food.

- Supporting agriculture to improve the economy.

- Abundance of manpower.

3. Healthy environment.

- Providing safe drinking water.

- Controlling food-borne diseases.

4. Health education.

- Spreading health awareness about food through schools and public organizations.

- Changing unhealthy behavior and eating habits by developing educational programs.

5. The social status of the family.

- Family planning.

- Family financial income.

- Caring for children in families with social problems.

Nutritional education:

It is the process of providing educational experiences about healthyfood by promoting individual knowledge, healthyattitudes, and behavior based on scientific and educational foundations and according to the priorities of nutritional.

When starting to prepare any nutritional program, whether educational or therapeutic, an **assessment process** must be conducted to the nutritional status of the community. So when conducting a process to evaluate the nutritional status (Nutrition assessment) for any individual or society must answer two important questions:

-Is the individual malnourished?

- How many people suffer from malnutrition?

Nutritional status is assessed in two ways:

1- Measurement method.
2- Method of laboratory tests.

Measurement method: This method is usually used in children, especially children under five years of age, and is used to measure growth in children. This method is divided into two types according to whether the child's age is known or not.

- If the child's age is known, we use the method of measuring the child's weight and height.

- If the child's age is unknown - we use the method of measuring arm circumference or chest and head circumference.

Weightmeasurement:

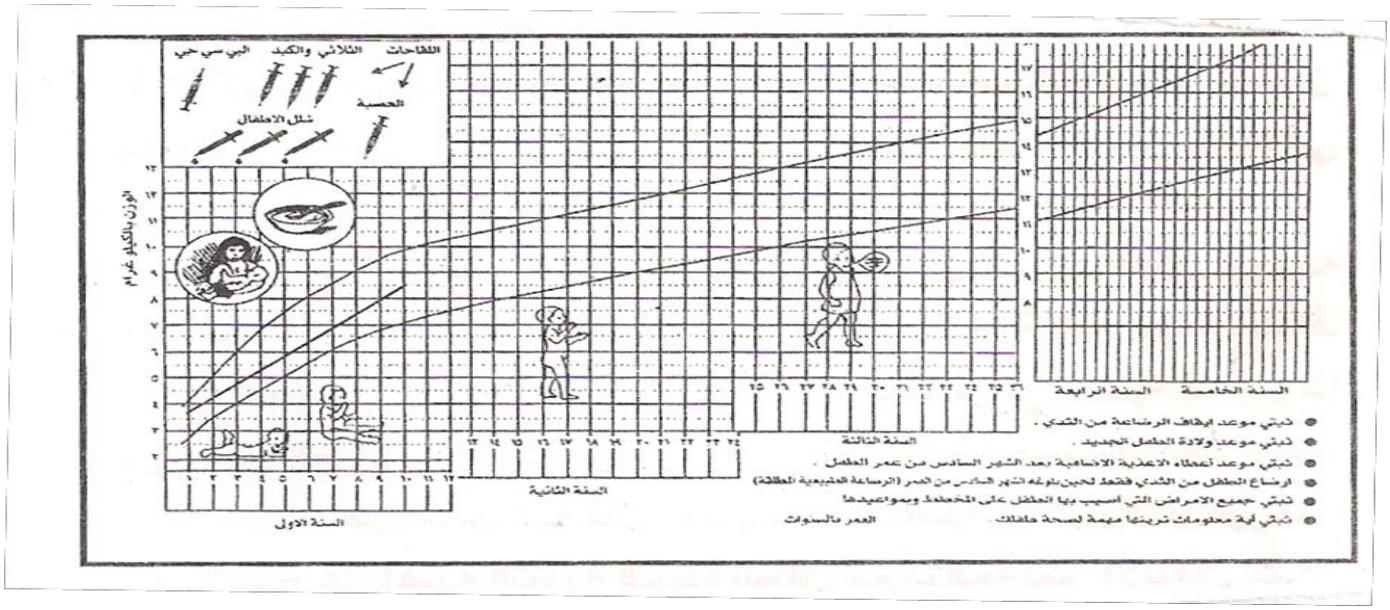
When we know the date of the child's birth, we can estimate the child's degree of growth by using the weight-age chart. The weight is recorded on the chart every month and we can determine the degree of growth from the chart.

- Weight between 80% - 100% of its age equivalent is considered normal.

- Weight between 60% - 80% is considered at risk for malnutrition.

- Weight less than 60% of normal, the child is considered malnourished, and most children need hospitalization.

The child's weight is determined on the chart in the form of a point, and a connection is made between one point and another when measuring the child's weight periodically. The growth line is supposed to be parallel to the curve, which represents the upper and lower limits of growth.



In case that there is a stopping in the child’s growth and there is no weight gain for several months, we notice that the growth curve follows a horizontal line, and this is a warning for the mother to take care of her child and find out the reasons before it develops into a health problem.

If negligence in the care and nutrition of the child persists for several months, we will notice that the growth curve is heading downward as a result of the decrease in the child’s weight as he grows older, and he needs urgent medical attention to save his life.

Height measurement:

Measuring height in relation to age is not important in determining a child's growth due to the intervention of genetic factors. Recording weight-height ratios can be used in nutritional surveys, especially in advanced stages of life, such as school-age children.

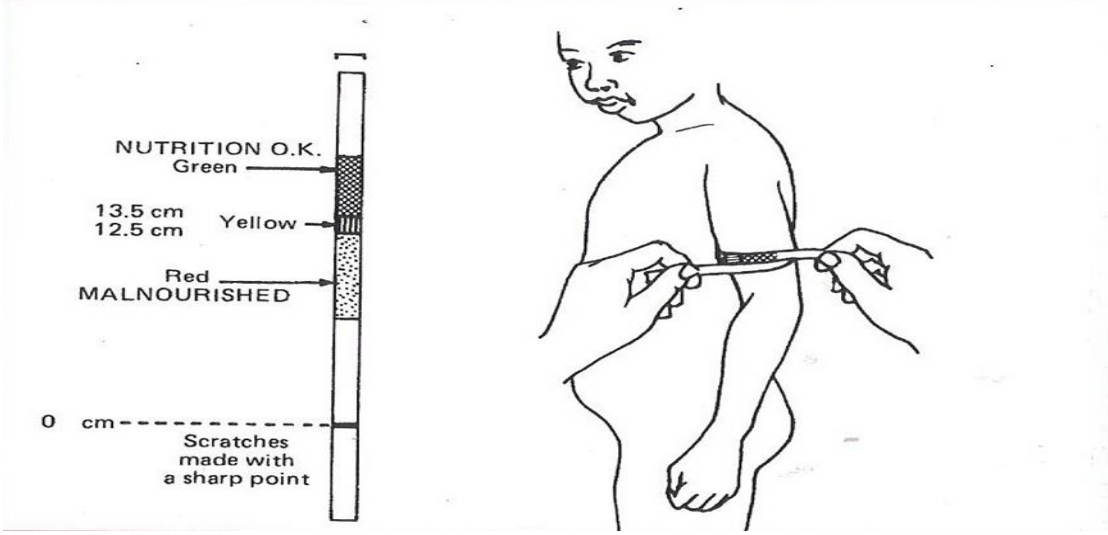
Arm circumference measurement:

This is an easy method and is used in:

A - When age is not known. (The child must be more than 1-year-old and less than 5 years old).

B- When a scale is not available to measure weight.

C- It is used in community nutritional surveys when making home visits



Nutritional educational program for the community:

The objectives of the nutritional educational program in the community are:

1. Diagnosing and measuring habits, behavior and nutritional problems in society.
2. Planning to solve food problems in the community in cooperation with it.
3. Coordination and cooperation with all institutions and organizations in solving food problems in society.

Stages of planning food programs:

1- Evaluating the nutritional status in the community.

2- Determine the priorities of nutritional problems.

3- Determine the nutritional behavior that must be changed.

4- Determine who will participate in the program.

5- Determine how to communicate with people anddesigningthe components of the message in a clear and specific way.

6- Specifying the place and time of giving the information.

7- Using appropriateeducational aides to the community.

8- Program evaluation.

School nutritional education program: The goal of this program is:

1- Implementing nutritional education programs regarding healthy eating habits.

2- Identifying food-related diseases.

3- Measuring the degrees of growth and development at this stage.

4-Helpin developing skills about how to produce, store, select and prepare foods for correct diet.

5- Creating acceptance towards some nutritious foods among students.

Eating habits at school: The student must learn and practice the following:

1. Drink enough fluids according to age and weather conditions.
2. Eat different types of food according to the student's age.
3. Include cellulose in the diet to prevent constipation.
4. To eat appropriate meals on a regular basis.
5. Do not eat a lot of sweets, especially between meals.
6. Calm eating and chewing food well.
7. Keep food hygienically away from flies and dust.
8. Wash vegetables well before eating.

Responsibilities and duties of the food guide:

1- Conveying nutritional awareness to the community according to priorities of health and nutritional problems.

2- Choosing the appropriate method and topic for food awareness.

3- Evaluation of nutritional education.

4 - Coordination and cooperation with all official and semi-official activities, organizations, and institutions in order to achieve food awareness programs.

5- Conducting survey research.

6- Publishing nutrition topics in all media.

الأسبوع (14-15)

Occupational health

Both the International Labor Organization and the World Health Organization have defined **Occupational health as:** It is a science and art that its implementation leads to sustaining life and improving the physical and mental health and social well-being of all workers in all professions and it is not merely the prevention of diseases, risks, and disabilities.

Occupational health nursing can be defined as follows (The process of implementing all basic nursing procedures and principles in order to improve workers' health and reach the highest level of health in the workplace.

Occupational health goals:

1. Ensure that the nature of the work performed by the worker is compatible with his physical, psychological and mental ability and capacity.

2. Protecting workers from diseases caused by working conditions, by taking preventive measures in the work environment to preserve the worker's health.

3. Early detection and immediate treatment of illnesses and diseases that affect the worker while performing his work and providing adequate care.

4. Providing adequate care and treatment for diseases not caused by the work environment.

If these goals mentioned above were achieved**, the result would lead us to a number of benefits and advantages for the worker**, the most important of which are:

1. It protects the worker's health and life.

2. It preserves the worker's ability to earn and produce.

3. Reduces the rate of absence and interruption from work.

4. Increases production.

5. It maintains skilled workers and helps them develop their production skills.

6. It increases the worker's ability to rely on himself and not be a heavy burden on others.

Occupational factors that affect the health of workers in laboratories:

1. Physical factors:

A- Heat.

High temperature– workers in some factories, such as iron, steel, and glass factories, are exposed to it. High temperature, causing loss of a large amount of salts and water. Which causes contractions in the body's muscles and intestines, and the body also loses its ability to regulate temperature.

Low temperature–the workers in cold places are exposed to it, such as refrigerators in meat and foods preservation factories. This may lead to freezing of the limbs, ears, and nose. And due to decrease of blood supply for them, tissue death and gangrene

may have occurred. As for partial cold, it causes the locally pain and numbness in the area of exposure, with cracks and peeling of the skin also occur.

B- Difference in atmospheric pressure.

Low atmospheric pressure - those who work at high altitudes on mountain peaks, for example, are exposed to it, causing (altitude sickness), which in most cases is called lack of oxygen.

High atmospheric pressure- those who work in low-lying areas, such as divers and miners, are exposed to it, and it leads the worker to contract a serious disease that arises as a result of the rapid transition from high pressure to low pressure, as this leads to the release of nitrogen gas bubbles in the body's tissues and fluids. This gas clogs the capillaries, cutting off blood to different parts of the body.

C- Noise: Loud noise is present in some factories, such as printing presses. The noise affects the workers, causing a feeling of distress, in addition to the gradual loss of hearing that may lead to complete deafness.

D – Vibrations: Workers mayhave exposed to vibrations like in rock drilling operations and drilling machines in streets. Vibrations may lead to stiffening of the arteries and veins in the proximal part of the machine, or sometimes paralysis in this part.

C- Lighting.

High lighting - such as workers in welding and fusion factories, results in a clouding of the eye lens.

Poor lighting - strong darkness, as happens in mines results in various accidents such as stumbling, collisions, etc., in addition to its direct impact on the eye, causing fatigue in it.

H- Radiation: Radiology department workers in hospitals, atomic medicine institutes, and other institutions that deal with radiation are exposed to it. Some of this radiation may be extremely dangerous after exposure to it for a short period, such as (X) rays and (gamma) rays, while others, such as ultraviolet rays can cause severe irritation and burns after exposure for a moderate period.

2. Chemical factors:

A- Dust: They are solid particles resulting from mechanical industrial processes such as grinding, hammering, screening, and others.Like rock dust, sand, fertilizers, pesticides, sugar, flour, wood, cotton and coal. Among the occupational diseases arising from them are pulmonary dust diseases, general poisoning, allergies (asthma) and cancer.

B- Smokes: Which have a direct effect on the respiratory system, nervous system,eyesand other organsespecially if they are toxic substances resulting from some chemical reactions, as they can cause damage to the respiratory systems as a result of prolonged inhalation, or act as a suffocating effect, or sometimes have a toxic effect.

C- Steams: Its rise and spread from industries. mercuryand solvent materials steams are considered one of the greatest occupational hazards due to their toxic effect.

D- Gases: Industrially dangerous gases include carbon monoxide, hydrogen cyanide, nitrogen oxides and ozone, and their effect on health is irritation of the respiratory systems and they also have a suffocating and poisoning effect.

C- Fog: Like chromic acid fog resulting from the painting process, acid-alkaline fog resulting from the tanning process.

3. biological factors:

It includes all pathogens that a worker may be exposed to in his work environment like bacteria, parasites, fungi, and viruses. An example of this is what workers in slaughterhouses, poultry, farms, laboratories, restaurants and hospital workers.

4. Mechanical factors:

It depends onthe specifications of machines, devices and equipment used by workers in the work place, they have many influences that affect the health of the worker so there are two basic conditions that must be met in this regard:

A - The safety of the machine from damage or defect, and that the work is safe and comfortable for the worker to avoid many accidents that may lead to death.

B - Full knowledge of using the machine, and the worker is fully trained and qualified before starting work, with an initial medical examination is conducted on him, and thus the appropriate worker is placed in the appropriate place.

5. Social and administrative factors:

This includes the relationship between workers with each other, as well as the relationship (between the boss and the workers). An example of this, is the work system in the factory, entry and exit times, guards, rest periods, meal system, salaries, and other entertainment supplies.

6. Personal and psychological factors:

It relates to the way the worker performs his work (his standing, movement, and relationship with the machine and its operation) and the extent to which he bears the responsibilities assigned to him, as well as his personal capabilities, his convictions and satisfactionabout the work he performs.

Characteristics and conditions of a healthy environment in the factory:

1- The factory must be far from residential areas, schools, and main roads.

2- The factory must be equipped with potable water sources and dispose of waste in a healthy manner.

3- Attention must be paid to all occupational factors that are dangerous to the health of workers, like temperature, humidity, ventilation and lighting inside the factory, as well as complete cleanliness.

4- The factory building, machinery and equipment must be designed in a way that preserves the health of the worker.

5 - Noise and harmful radiation must be prevented or reduced as much as possible, by isolating the machine, or using protective clothing and devices.

6 - Dust, gases, fumes, and other chemicals resulting from the production process, etc., must be prevented or reduced to permissible limits, by isolating the machine and using protective clothing and devices, such as special masks, goggles, helmets, shoes, gloves, and work suits.

7- Toxic materials must be placed and kept in special places out of the reach of workers.

8 - Fire-fighting devices and emergency devices must be provided throughout the factory, and entry and exit ports must be provided for all workers when a fire breaks out.

Health care for workers:

1. Initial medical examination (examination before starting work): The purpose of this examination is to verify the worker's physical and mental health and his fitness to do the type of work assigned to him. This does not mean that the disabled worker will be fired from work, but rather he will be appointed to a job suitable for his physical and mental ability and capabilities.

2. Periodic medical examination: These examinations are conducted at scheduled periodic intervals for workers whose work may affect some of the body's systems and organs as a result of their exposure to some occupational hazards.

3. Providing emergency procedures and first aid to workers: This type is done in the vicinity of an accident or emergency illness for some workers in the vicinity of their work, while searching for the cause to prepare the occasion and to prevent the accident from recurring to another worker.

4. Treating sick workers, whether their illness is occupational or non-occupational.

5. Vaccinating workers against infectious diseases.

6. Providing proper healthy nutrition for workers.

7. Worker health education: So that workers can know the health problems they face inside and outside their factories. As well as helping them to become fully familiar with the use of devices and machines.