Pharmacy 4th Year Lecture 1 Public Health

Concepts in Public Health and Preventive Medicine

Over the past few decades, the science and practice of public health has evolved and its mandate has been enlarged. Rather than being strictly confined to limited role in disease prevention, public health has progressively become a central feature of the health sector through its involvement in policy-making, management and evaluation at every level of the health services.

Some used the term 'preventive medicine'; others preferred 'social medicine', 'community medicine', or 'community health'.

In a modern interpretation of Winslow's definition,

Beaglehole and Bonita (1997) identified the following essential **elements of modern public health:**

- Collective responsibility;
- Prime role of the state in protecting and promoting the public's health;
- Partnership with the population served;
- Emphasis on prevention;
- Recognizing underlying socio-economic determinants of health and disease;

Winslow's definition of public health

'… the science and art of preventing disease, prolonging life, and promoting physical health and efficiency, through organized community efforts, for the sanitation of the environment, the control of community infections, the education of the individual in the principles of personal hygiene, the organization of medical and nursing service for the early detection and preventive treatment of disease, and the development of the social machinery which will ensure to every individual in the community a standard of living adequate for the maintenance of health.'

THE DIMENSIONS OF PUBLIC HEALTH

It would be useful to explore the concepts contained in the four terms that are commonly used to describe different aspects of public health (Fig. 1.1):

1. **Preventive medicine**
2. **Social medicine**
3. **Community health**
4. **Community medicine**

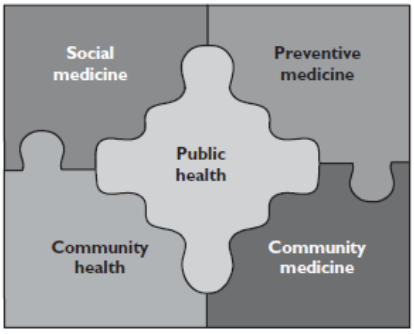

Figure 1.1: The dimensions of public health.

PREVENTIVE MEDICINE

Prevention is better than cure is one of the prime messages of public health. It differentiates public health from the clinical disciplines that are primarily involved with the care of the sick, whilst public health emphasizes the avoidance of illness. Prevention was initially construed narrowly in terms of protective measures like vaccination and improved nutrition that target only healthy people with the aim of preventing the onset of disease. This concept was extended to cover the early diagnosis and treatment of sick persons with the aim of preventing advanced diseases and in the case of communicable diseases, in preventing the spread within the community. A further extension of the definition covers the treatment of sick individuals aimed at reversing damage and restoring function. This concept led to the classification of prevention into three levels later to be differentiated into five stages (Table 1.1).

Three levels of prevention	Five stages of prevention
PRIMARY ■ *Target population*: entire population with special attention to healthy individuals ■ *Objective*: prevent onset of illness ■ *Methods*: education, immunization, nutrition, sanitation, etc.	**1 *General health promotion*** ■ *Target population*: entire population with special attention to healthy individuals ■ *Objective*: prevent onset of illness ■ *Methods*: education, nutrition, sanitation, life style changes, etc. **2 *Specific prophylaxis*** ■ *Target population*: entire population with special attention to healthy individuals ■ *Objective*: prevent onset of specific diseases ■ *Methods*: education, immunization, nutritional supplement (vitamin A, iodine), chemoprophylaxis (e.g. against malaria)
SECONDARY ■ *Target population*: sick individuals ■ *Objective*: early diagnosis and treatment to prevent further damage to the individual and in cases of infectious diseases, spread to the community ■ *Methods*: screening of high risk groups e.g. Pap smears, sputum examination for TB; monitoring of vulnerable groups – children, pregnant women	**3 *Early diagnosis and treatment*** ■ *Target population*: sick individuals ■ *Objective*: early diagnosis and treatment to prevent further damage to the individual and in cases of infectious diseases, spread to the community ■ *Methods*: screening of high risk groups e.g. Pap smears, sputum examination for TB, blood test for HIV; monitoring of vulnerable groups – children, pregnant women
TERTIARY ■ *Target population*: sick patients ■ *Objective*: reduce damage from disease and restore function ■ *Method*: clinical care and rehabilitation	**4 *Limiting damage*** ■ *Target population*: sick patients ■ *Objective*: limit damage from disease ■ *Methods*: skilled clinical care and social support to limit physical and social damage from the disease **5 *Rehabilitation*** ■ *Target population*: convalescent patients ■ *Objective*: restore function and capability ■ *Methods*: physical and social rehabilitation

SOCIAL MEDICINE

The rise of social medicine coincided with increasing realization of the links between social status and the health of individuals and communities. The objective of social medicine is to identify the social determinants of health and disease in the community and to devise mechanisms for alleviating suffering and ill health through social policies and actions. Social medicine is based on certain fundamental assumptions:

■ ***Health as a birthright.*** Everyone has the right to enjoy the highest possible level of health.

■ ***The responsibility of the state.*** It is the duty of governments to ensure that the people have the basic elements that would enable families and individuals to maintain good health and that they have access to good quality health care.

■ ***Development and health are inter-related***. Good health promotes development, and development promotes health.

■ ***Education promotes health.*** The strong association between health and level of education is particularly marked with regard to women's education. It affects their health status and behavior as well as that of their children.

■ ***Social factors have a profound influence on health***. Culture, behaviour, social organization, allocation of family resources, healthcare seeking behaviour, etc.

■ ***Health begins at home.*** Many of the interventions required for promoting health in developing countries begin at home through changes in individual behaviour and lifestyle, in families and in households.

■ ***Poverty*** is a major underlying cause of ill health

The overall goal is to achieve equity in health. As noted in the Declaration at Alma Ata: The existing gross inequality in the health status of the people particularly between developed and developing countries as well as within countries is politically, socially and economically unacceptable and is, therefore, of common concern to all countries'.

COMMUNITY HEALTH

Community health deals with the services that aim at protecting the health of the community. The interventions vary from environmental sanitation including vector control to personal health care, immunization, health education and such like. It includes an important diagnostic element – 'community diagnosis' – aimed at surveying and monitoring community health needs and assessing the impact of interventions.

COMMUNITY MEDICINE

This usually refers to services that are provided at the community level and is now often covered in the new term primary care. Community physicians, nurses and other health-care personnel are involved in providing care at clinics, health centers and in people's homes.

KEY PUBLIC HEALTH FUNCTIONS

Public health services perform a wide range of **functions**, which can be classified as **four key elements** (Fig. 1.2):

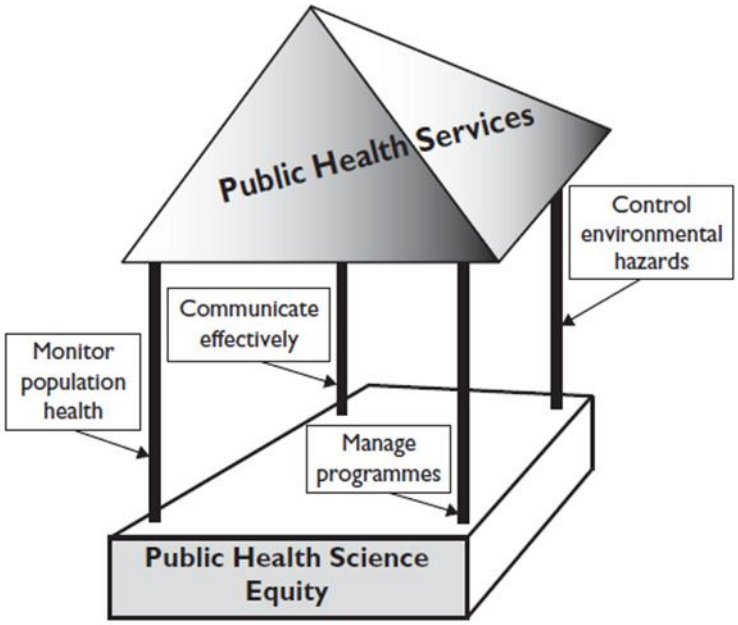

Figure 1.2: Graphic representation of the role of public health.

1. **Assessing and monitoring of the health of the population**; (The objective is to identify and deal with health problems of the population. The activities range from the investigation of an acute epidemic outbreak to longer-term definition of the priority health problems and their determinants).
2. **Planning, implementing and evaluating public health programs**; (Public health practitioners are also concerned with the design and management of public health programs at district, regional and national levels).
3. **Identifying and dealing with environmental hazards;** (Protection of the population against environmental hazards including accidents is a prime function of public health. As the provision of safe water, the disposal of wastes, control of vectors and modern hazards from toxic wastes and radioactive chemicals).
4. **Communicating with people and organizations to promote public health**; (Effective communication is an important tool that public health workers use to bring about change in the behavior of individuals and communities as well as in advising organizations within and outside the public sector).

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Infections through the gastro-intestinal tract

Infective Agents

The pathogens include viruses, bacteria, protozoa and helminthes

Transmission:

'Faeco-oral' or 'intestino-oral' transmission.

Faeco-oral transmission occurs mostly through unapparent fecal contamination of food, water and hands – the three main items that regularly make contact with the mouth.

- Directly by feces
- Indirectly (polluted water, dirty hands, contaminated soil and filth flies)

Epidemic patterns in relation to the mode of transmission:

- **A water-borne epidemic** is typically explosive: it may affect people over a wide area who have no other traceable connection but the use of the same water supply.
- **Food-borne outbreaks** may be more localized, affecting persons from the same household or boarding institution, those who feed communally at a hotel, restaurant

Host Factors

Certain non-specific factors in the host pay some part in preventing infection through the gastro-intestinal tract.

- The high acid content and the antibacterial lysozyme in the stomach
- The digestive juices in the upper part of the intestinal tract destroy potentially infective organisms.
- Specific immunity which can be derived from previous infections or from artificial immunization.
- Intestinal mucosa may acquire resistance to certain pathogens such as cholera or poliomyelitis, through a fraction of immunoglobins (IgA) which are secreted by the mucosa.

Control of The Infections Acquired Through The Gastro-Intestinal Tract

The most effective method of controlling these diseases can best be determined from a knowledge of the epidemiology of the infection with particular reference to the local community. Control can operate on each of the three components of infection:

1 The infective agent:

■sanitary disposal of feces؛

■elimination of human and animal reservoirs.

2 The route of transmission:

■provision of safe water supply؛

■protection of food from contamination؛

■control of flies؛

■improvement of personal hygiene.

3 The host:

■specific immunization؛

■chemoprophylaxis؛

■ specific treatment.

DIARRHOEAL DISEASES:

Diarrhoeal diseases, as a group, remain a major cause of death in developing countries, especially in preschool children. Children under 3 years of age may experience as many as 10 episodes of diarrhoea per year. The main agents are:

■Enteroviruses, e.g. rotavirus؛

■ Escherichia coli

■ *Campylobacter spp.;*

■ *Shigella*;

■ *Vibrio cholerae* 01 and 0139;

■ *Salmonella* (non-typhoid);

■ *Entamoeba histolytica*;

■ *Giardia lamblia*;

■ *Cryptosporidium*

ACUTE DIARRHOEA

Most episodes of diarrhoea last less than 7 days and can be effectively treated with oral rehydration, combined with an appropriate diet.

Children with diarrhoea but no dehydration should receive extra fluids at home. If the child is being breast-fed, more frequent and longer breast-feeding is advocated; supplemented with oral rehydration solution (ORS) or clean water. For non-exclusively breast-fed children give ORS, rice water, or clean water.

If some dehydration is present – restlessness, instability, thirsty – take child to nearest clinic if possible.

If the child is severely dehydrated – lethargy, swollen eyes, drinking poorly – take child to nearest hospital.

PERSISTENT DIARRHOEA

Persistence of an acute diarrhoeal episode for at least 14 days occurs in 3–20% of cases. The main goal in the clinical management of persistent diarrhoea is to maintain the child's hydration and nutritional status while the intestinal damage is being investigated and treated.

VIRAL INFECTIONS

The most common viral infections transmitted through the gastro-intestinal tract are:

- Rotaviruses;
- Poliomyelitis;
- Viral hepatitis a.

ROTAVIRUSES

Rotaviruses are the most common cause of diarrhea worldwide, accounting for 134 million episodes yearly. Virtually all children have been infected by the age of 4 years. The incubation period is short – 24–48 hours – with vomiting, fever and a watery diarrhoea the presenting clinical features

Occurrence: Worldwide

Organisms: Rotaviruses groups A and B

Reservoir: Humans

Transmission: Faeco-oral, person to person, water.

Control: High level of personal sanitary practices and Improved environmental hygiene.

POLIOMYELITIS

The incubation period varies from 3 to 21 days, with an average of about 10 days. Poliomyelitis is a notifiable disease. It is characterized by fever and a flaccid asymmetrical paralysis.

Occurrence: Indian subcontinent; Africa

Organisms: Poliovirus I, II, III

Reservoir: Humans (The poliovirusis excreted in the stools of infected cases, convalescent patients and health carriers).

Transmission: Person to person by faeco-oral, pharyngeal spread, rarely by foodstuffs contaminated by feces.

Control: Notification, Isolation, Safe disposal of feces, Hygiene, Immunization and Surveillance of acute flaccid paralysis (AFP).

Immunization

Immunization provides the most reliable method for the prevention of poliomyelitis and for controlling rapid spread during an epidemic. Two types of poliomyelitis vaccines are currently available: killed 'Salk' vaccine (IPV), which is given by injection, and the attenuated 'Sabin' vaccine, which is given by mouth (OPV).

VIRAL HEPATITIS

There are six types of viral hepatitis – A and E, which are transmitted by the faeco-oral route, and B, C, D and G, which are blood-borne infections.

Viral hepatitis A (HAV)

The disease is characterized by loss of appetite, jaundice, enlargement of the liver and raised levels of liver enzymes. The incubation period varies from 15 to 40 days with an average of around 20 days. The diagnosis is confirmed by the demonstration of IgM antibodies to the virus

Occurrence: Worldwide

Organism: Hepatitis A virus (HAV)

Reservoir: Humans

Transmission: Faeco-oral route, person to person, water, food

Control: Personal hygiene , Adequate disposal of feces, Safe drinking water and Immunization (Inactivated HAV vaccine is now available. A double-dose vaccine has been licensed which, if followed by a booster dose 6–12 months later).

Recovery from a clinical attack creates a lifelong active immunity.

Viral hepatitis E (HEV)

Like HAV, HEV causes malaise, anorexia, jaundice and liver enzyme serum elevation. The incubation period is around 40 days. Control As for HAV**.**

Hepatitis B (HBV)

Hepatitis B is not transmitted by the faeco-oral route but is a blood-borne agent, transmitted by inoculation. It is only included here for convenience.

Occurrence: Worldwide

Organism: Hepatitis B virus (HBV)

Reservoir: Humans

Transmission: Blood and blood products, accidental inoculation, insect bites, perinatally ,from a carrier mother, sexual intercourse – hetero- and homosexual, serous exudates of skin ulcers, injury-associated sports or jobs.

Control: Counseling, Hygiene, Blood screening, Vaccination (Three doses (at 0, 1 and 6 months) are required for complete protection).

Hepatitis C (HCV)

Like HBV. The incubation period from exposure to liver function abnormalities is usually 8 weeks. No vaccine is currently available.

Hepatitis delta (HDV)

Exist only in the presence of HBV. It gives rise to a more severe form of hepatitis.

Like HBV, HDV is a blood-borne pathogen.

Control: HBV vaccination also protects against HDV, Screening of blood has reduced the risk of infection.

Hepatitis G (HGV) HGV has a similar role to HCV.

BACTERIAL INFECTIONS

The most important bacterial infections that gain entry through the gastro-intestinal tract are:

- Enteric fevers; *Salmonella typhi*, *S. paratyphi* A, B
- Bacillary dysenteries;
- Cholera;
- Brucellosis;
- Food-poisoning bacteria.

ENTERIC FEVERS (Typhoid fever and Paratyphoid fevers)

Typhoid fever

Bacteriology: *S. typhi* is a Gram-negative, aerobic, non-sporing, rod-like organism. It can survive in water for 7 days, in sewage for 14 days and in ice-cream for 1 month.

Epidemiology: The enteric fevers have a worldwide distribution although they are endemic in communities. Typhoid fever presents one of the classical examples of a water-borne infection.

Reservoir: Humans are the only reservoir of infection. About 2-4% of typhoid patients become chronic carriers (in the gall bladder) of the infection. The majority are fecal carriers. Urinary carriers also occur.

Transmission: Water, food, flies and milk

Laboratory diagnosis:

- *S. typhi* is isolated from blood or ‘clot culture in the first week of disease, from feces in the second and following weeks and from urine in the 3rd and 4th weeks.
- Polymerase chain reaction (PCR)
- Widal test (0 and H agglutinations)

Control: Isolation, notification, search for source of infection. Supervision of carriers. Sanitary disposal of excreta, purification of water, control of flies, food hygiene and Immunization (Two vaccines are available - an injectable Vi vaccine, a single dose of which protects for 3 years, or an oral live attenuated vaccine, three doses of which must be taken at intervals of 2 days between doses and which effects protection for 1 year.).

BACILLARY DYSENTERY (shigellosis):

Bacillary dysentery is characterized by diarrhea (containing blood, mucus and pus), fever and a sudden onset of abdominal pain. The incubation period is 1-7 days.

classified into four main subgroups:

■ *Sh. dysenteriae* (10 serotypes);

■ *Sh. flexneri* (8 serotypes);

■ *Sh. boydii* (15 serotypes);

■ *Sh. sonnei* (15 colicen types).

Occurrence: Worldwide

Organisms: *Shigella* spp.

Source of infection: Sick patient, convalescent, carrier (e.g. food handler)

Transmission: Faecal contamination of food, water or fomites; flies

Control: Adequate treatment of the Patient (Severe forms of shigellosis require appropriate antibiotic therapy with ampicillin, trimethoprim- sulphamethozale, nalidixic acid or ciprofloxacin), Sanitary disposal of feces, Pure water supply, Food hygiene, Control of flies.

CHOLERA:

This is a disease of rapid onset characterized by vomiting; profuse dehydrating diarrhoea with ‘rice water stools’ and marked toxaemia. Muscular cramps,

suppression of urine and shock occur later. The incubation period is 1‑7 days. Cholera is a notifiable disease.

Occurrence: India/ Pakistan subcontinent, South East Asia, the Near East, Africa, Southern and Central Europe

Organisms: *Vibrio cholerae* (classical, El Tor biotypes, 0139 Bengal)

Reservoir: Humans (sick person, a convalescent patient or a carrier).

Transmission: Water, food, flies (A definite diagnosis of cholera can be made only after isolation of *V. cholerae* from the faeces or rectalswabs of patients).

Control: Diagnosis, isolation, notification and antibiotics which reduces the diarrhoeal period, Search for source of infection, Concurrent and terminal disinfection, environmental sanitation, health education; personal hygiene, international co-operation (The vaccines available at present are not helpful in the control of cholera, Two oral vaccines are available: Wc/rBs and CVD 103-HgR. They give 80‑90% protection in persons under 2 years).

BRUCELLOSIS:

Brucellosis is one of the most important zoonoses ‑ infections of animals which can affect man. The human disease is characterized by fever, heavy night sweats, splenomegaly and weakness. The incubation period varies from 6 days to as long as 3 months.

Occurrence: Worldwide

Organisms: *Brucella abortus, Br. melitensis, Br. suis*

Reservoir: Animals (e.g. cattle, goats, sheep, camels, swine)

Transmission: Ingestion, contact, inhalation, inoculation

Laboratory diagnosis: Numerous serological tests are available: standard tube-agglutination test (SAT) Rising titresof 640 or more are usually indicative of acute bucellosis; the rose Bengal test; ELISA; 2-mercaptoethanol agglutination test; complement fixation test; Coombs antiglobulin test; radioimmunoassay; Western blotting and PCR.

Control: Pasteurization of milk, Vaccination of herds (Living attenuated vaccines of *Br. melitensis* and *Br. Abortus* have been widely and successfully used). The antibiotics of choice for the specific treatment of brucellosis are tetracycline plus streptomycin or rifampicin with doxycycline.

BACTERIAL FOOD POISONING

Food poisoning in the tropics is commonly due to three species of bacteria: *Salmonella* spp. (the most important), *Staphylococcus aureus* and *Clostridium perfringens.*

Food-borne bacterial gastro-enteritis may be of three types: (i) infectious type (e.g. salmonella or *Vibrio parahaemolyticus*), when bacteria infected with food multiply in the individual; (ii) toxin type (e.g. *Staphylococcus aureus*) when food is ingested that already contains a toxin; and (iii) intermediate type (e.g. *Clostridium perfringens*, which releases a toxin in the bowel).

Salmonella food poisoning: typically presents with diarrhoea, vomiting and fever. The incubation period is usually 12‑24 hours.

Occurrence: Worldwide

Organism: *Salmonella* spp.

Reservoir: Animals (cattle, poultry, pigs, dogs, cats, rats and mice).

Transmission: Meat, meat products, milk and milk products and eggs.

Laboratory diagnosis: Serological agglutination methods

Control: Personal and food hygiene, Inspection of abattoirs, Health education of caterers and food handlers

Staphylococcus food poisoning: characterized by an abrupt onset with nausea and vomiting sometimes accompanied by diarrhoea and shock. The incubation period is from 1 to 6 hours. Seven serologically distinct enterotoxins A, B, C, D, E, G and H are recognized. Enterotoxin A is most often responsible in outbreaks of food poisoning.

Occurrence: Worldwide

Organisms: Enterotoxin-producing staphylococci

Reservoir: Humans

Transmission: Semi-preserved foods

Control: Personal hygiene of food handlers Food hygiene and refrigeration

Clostridium perfringens food poisoning: presents with diarrhoea and abdominal pain; vomiting is not very common. The incubation period is 12‑24 hours.

Occurrence: Worldwide, New Guinea (‘pigbel’)

Organism: *Clostridium perfringens*

Reservoir: Humans, animals or fly feces, and the spores of *Cl. perfringens* survive for long periods in soil, dust, clothes and in the environment generally.

Transmission: Ingestion of meat

Laboratory diagnosis:Cl. perfringens can be isolated from the stools of individuals suffering from the disease and from food remnants.

Control: Cooking and storage of meat, Vaccination (clostridial toxoid prepared from C cultures).

***Vibrio parahaemolyticus* food poisoning:** is characterized by acute diarrhoea, abdominal pain and nausea. The incubation period is 4-96 hours (usually 12-24 hours).

PROTOZOAL INFECTIONS

The most important protozoal infections transmitted by the faeco-oral route are:

- amoebiasis;
- the flagellate infestations;
- balantidiasis;
- toxoplasmosis;
- cryptosporidiosis.

Amoebiasis is caused by the protozoan *Entamoeba histolytica.* The parasite lives in the large intestine causing ulceration of the mucosa with consequent diarrhoea. *E. dispar* is morphologically similar but non-pathogenic.

Occurrence: Worldwide

Organism: *Entamoeba histolytica/E. dispar*

Reservoir: Humans (Amoebiasis in childhood is not uncommon).

Transmission: Contaminated hands (direct), food(indirect).

Control: Personal hygiene, Sanitary disposal of feces.

Flagellate infestations: A number of flagellate protozoa commonly parasitize the human intestine and genito-urinary tract;

- *Trichomonas hominis;*
- *Chilomastix mesnili;*
- *Trichomonas vaginalis;*
- *Giardia lamblia.*

Giardiasis; Heavy infection with *Giardia lamblia* is often accompanied by diarrhoea or steatorrhoea. The trophozoite lives in the upper part of the small intestine particularly the duodenum and jejunum.

Occurrence: Worldwide

Organism: *Giardia lamblia*

Transmission: by the direct ingestion of cysts of contaminated food or water.

Reservoir: Humans and animals

Control: Personal hygiene and Sanitary disposal of feces and can be treated with nitromidazole.

Balantidiasis; caused by infection with the ciliate protozoon, *Balantidium coli* which is a common parasite of the pig. Infection can cause severe diarrhoea.

Occurrence: Worldwide

Reservoir: Humans and animals, especially pigs

Transmission: Contaminated hands, food and flies

Laboratory diagnosis: Examination of feces reveals the typical large ovoid cysts

Control: Individuals infected can be treated with tetracycline. Personal hygiene

Sanitary disposal of feces.

Toxoplasmosis is caused by the intracellular sporozoon

Toxoplasma gondii. The infection may be congenital or acquired. Clinically, there are four types of acquired toxoplasmosis:

■ asymptomatic;

■ acute glandular;

■ ocular;

■ cerebral.

Occurrence: Worldwide

Organism: *Toxoplasma gondii*

Reservoirs: Humans are the main reservoir of human infection, person to person is unknown except in congenital infections. other mammals (cats, dogs and rabbits)

Transmission: Raw beef and pork

Laboratory diagnosis: A number of serological tests have been described for the detection of antibodies to *T. gondii.* The cytoplasm-modifying test of Sabin-Feldman (dyetest) is the one most widely used. Other serological tests in common use are the

complement-fixation test, direct agglutination test, haemagglutination test and fluorescent antibody test. PCR has been successfully used.

Control: Personal hygiene, Thorough cooking of meat. The most effective treatment for both humans and animals is a combination of pyrimethamine and sulphonamides.

Cryptosporidium:

It causes intractable, profuse, watery diarrhoea in immunosuppressed and immunocompromised individuals. It is probably a more important cause of diarrhoea in children in the tropics than has hitherto been realized.

Occurrence: Worldwide

Organism: *Cryptosporidium* spp. particularly

C. parvum

Reservoir: Animals, especially calves

Transmission: Faeco-oral

Control: Avoid contact with animals, Personal hygiene

HELMINTHIC INFECTIONS

Classification of important helminthic diseases transmitted through the gastro-intestinal tract;

Roundworms (Nematodes)	Tapeworms (Cestodes)	Flukes (Trematodes)
Ascariasis	Taeniasis	Paragonimiasis(lung)
Trichuriasis	Diphyllobothriasis	Chlonorchiasis
Enterobiasis	Hydatid disease	Opistorchiasis(liver)
Toxocariasis	Hymenolepsiasis	Fascioliasis (liver)
Trichinosis		Fasciolopsiasis (intestine)
Dracontiasis (filarial worm)		

The WHO recommended drugs for the treatment of intestinal nematodes are albendazole, levamisole, mebendazole and pyartel.

Nematode (Roundworm) Infections

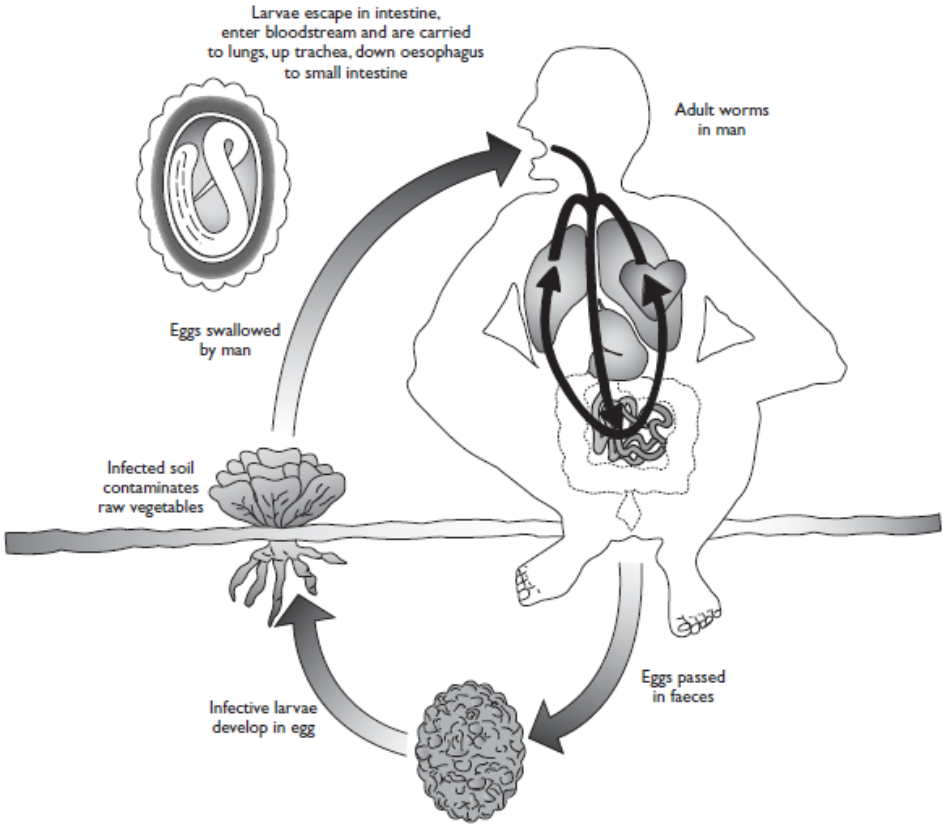
Ascariasis: This disease, due to the large intestinal roundworm, *Ascaris lumbricoides,* is often symptomless and infection is discovered incidentally; occasionally it causes intestinal obstruction in children.

Occurrence: Hot humid climates of the world

Organism: *Ascaris lumbricoides*

Reservoir: Humans

Transmission: spread by fecal pollution of the soil (The eggs are swallowed), Contaminated hands, food, drink



Laboratory diagnosis: The microscopical diagnosis of ascariasis can be confirmed by examination of feces samples.

Control: Personal hygiene, Sanitary disposal of feces, Chemotherapy

CESTODE (TAPEWORM) INFECTIONS

Taeniasis: occurs in all countries where beef or pork are eaten. The larval stage of *T. solium* produces cysticercosis. Clinical features are often absent, the patients only becoming aware of the worm infection when segments are passed in the stool.

Occurrence: Worldwide

Organisms: Taenia solium, T. saginata, Cysticercus cellulosae

Reservoir: Humans

Transmission: Uncooked meat, Auto-human infection (cysticercosis)

Control: Personal hygiene

Individual specific treatment (praziquantel), Sanitary disposal of feces, Thorough cooking of meat.

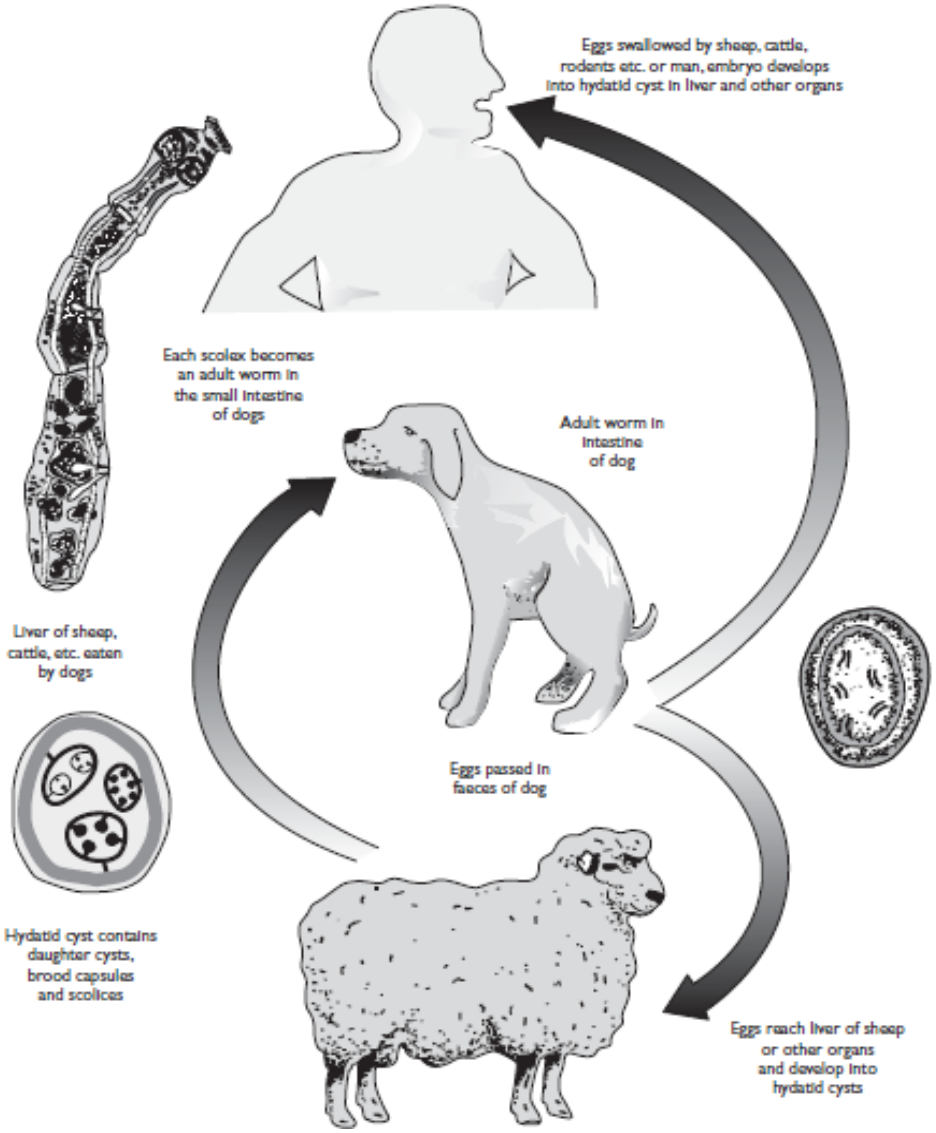
Hydatid disease: This disease can be caused by any one of three species of the genus *Echinococcus: E. granulosus, E. multilocularis* and *E. oligaettas.*

Occurrence: Worldwide

Organism: *Echinococcus* spp.

Reservoir: Dogs

Transmission: Ingestion of infective ova



Laboratory diagnosis: Ultrasound technology, MR and CT scanning are often used in diagnosis.

Control: Personal hygiene, Albendazole, deworming of dogs (praziquantel) and abattoir hygiene

Family Health: Family planning include Maternal Infections, vaccination

FAMILY PLANNING

The objective of this service is to encourage couples to take responsible decisions about pregnancy and enable them to achieve their wishes with regard to:

- preventing unwanted pregnancies;
- securing desired pregnancies;
- spacing of pregnancies;
- limiting the size of the family.

The principal health outcomes of family planning can be summarized under the following headings.

(a) WOMEN'S HEALTH : The health impact of family planning occurs primarily through :

(i) The avoidance of unwanted pregnancies; An unwanted pregnancy may lead to an induced abortion. From the point of view of health, abortion outside the medical setting (criminal abortion) is one of the most dangerous consequence of unwanted pregnancy.

(ii) limiting the number of births and proper spacing; Repeated pregnancies increase the risk of maternal mortality and morbidity. These risks rise with each pregnancy beyond the third, and increase significantly with each pregnancy beyond the fifth. The incidence **of rupture of the uterus** and uterine atony increases with parity. **Anaemia** is a common problem in mothers with many children and the rate of **stillbirths** tends to increase significantly with high parity. The somatic consequences of repeated pregnancies may also be exemplified in the clear association between the incidence of **cancer of the cervix** and high parity.

(iii) timing the births; particularly the first and last, in relation to the age of the mother. Generally mothers face greater risk of dying below the age of 20 and above the age of 30-35.

(b) FOETAL HEALTH : A number of **congenital anomalies** (e.g., Down's syndrome) are associated with advancing maternal age. Such congenital anomalies can be avoided by timing the births in relation to the mother's age. Further, the **"quality" of population** can be improved only by avoiding completely unwanted births.

(c) CHILD HEALTH : It would seem that **family size and birth spacing**, if practiced by all, will yield substantial child health benefits. These are :

(a) *Child mortality :* It is well known that child mortality increases when pregnancies occur in rapid succession. A birth interval of 2 to 3 years is considered desirable to reduce child mortality.

(b) *Child growth, development and nutrition* : The child is likely to receive his full share of love and care, including nutrition he needs, when the family size is small and births are properly spaced. Family planning, in other words, is effective prevention against malnutrition.

(c) *Infectious diseases :* Children living in large-sized families have an increase in infection, especially infectious gastroenteritis, respiratory and skin infections.

Currently, the main health problems affecting the health of the mother and the child in developing countries, revolve round the triad of *malnutrition*, *infection* and the consequences of *unregulated fertility*.

MATERNAL INFECTIONS

Maternal infections may cause a variety of adverse effects such as **fetal growth retardation, low birth weight, embryopathy, abortion and puerperal sepsis.** In industrial societies, the risk of the mother acquiring **infections** during pregnancy is relatively low, but in underdeveloped areas, the mother is exposed to significantly higher risks. Many women are infected with HIV, hepatitis B, cytomegalo viruses, herpes simplex virus or toxoplasma during pregnancy. Furthermore, as many as 25 per cent of the women in rural areas suffer at least one bout of urinary infection. It is now widely recognized that children in developing areas need to be immunized against six infections - tuberculosis, diphtheria, whooping cough, tetanus, measles and polio. Tetanus toxoid application during pregnancy has also been taken up. Education of mothers in medical measures such as oral rehydration in diarrhea and febrile diseases is being tried. In addition, a good knowledge and practice of personal hygiene and appropriate sanitation measures, particularly in and around the home, are essential pre-requisites for the control of the most common infections and parasitic diseases.

IMMUNIZATION

Each child should be immunized against the common communicable diseases for which vaccines are available. Immunization is routinely offered against tuberculosis (BCG), tetanus, whooping cough, diphtheria, poliomyelitis and measles.

National immunization schedules for infants

Age	Vaccine	Hepatitis B vaccine* (two alternative schemes)	
		Alternative A	Alternative B
Birth	BCG, OPV-0	HB-1	
6 weeks	DPT-1, OPV-1	HB-2	HB-1
10 weeks	DPT-2, OPV-2		HB-2
14 weeks	DPT-3, OPV-3	HB-3	HB-3
9 months	Measles		

OPV, oral polio vaccine; DPT, diphtheria, pertussis, tetanus triple vaccine; HB, hepatitis B vaccine; BCG, vaccine against tuberculosis.

SEXUALLY TRANSMITTED DISEASES

The sexually transmitted diseases (STD) are a group of communicable diseases that are transmitted predominantly by sexual contact and caused by a wide range of bacterial, viral, protozoal and fungal agents and ectoparasites.

Most Common STDs

STDs can be divided into two general categories, those that can be cured and those that currently cannot. Syphilis, chancroid, gonorrhea, chlamydial infection, and trichomoniasis are the most common curable STDs. All are bacterial, except for trichomoniasis. All incurable STDs are viral. The most dangerous viral STD is human immunodeficiency virus (HIV), which leads to AIDS. Other incurable viral STDs

include human papilloma virus (HPV), hepatitis B and genital herpes. In this presentation, genital herpes will be referred to as herpes.

While viral STDs cannot currently be cured, treatment can relieve some of their symptoms and reduce the severity of some of their consequences

Clinical Spectrum

Gonococcal Infection*:* Gonococcal infection (Gonorrhea) causes inflammation of the genital tract involving the urethra in men and women, the cervix and rectum in women, and the rectum in men who have sex with men. Other sites are the throat (pharyngitis) and the eyes. The antibiotics of choice are ciprofloxacin, ceftriaxone, cefixime or spectinomycin.

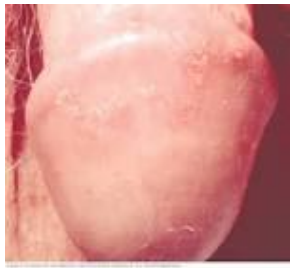
Syphilis : Syphilis causes ulceration of the uro-genital tract, mouth or rectum. Other signs of this infection, occurring in later stages, range from skin eruptions to complications of the cardiovascular and nervous system. Congenital syphilis is an important cause of stillbirth. The antibiotics used to treat syphilis are penicillin, doxycycline and erythromycin.

Chlamydial Infection : It is caused by bacteria called Chlamydia trachomatis. A high percentage of individuals have no obvious clinical manifestations of this infection. If symptoms occur they are similar to those caused by gonorrhea. Complications, can result in sterility in women or vertical transmission during childbirth, leading to conjunctivitis or eye inflammation in the newborn. In men it can cause urethritis with possible epididymitis. The antibiotics used are doxycycline or azithromycin. The alternatives are amoxicillin, ofloxacin, erythromycin or tetracycline.

Trichomoniasis : This parasitic infection leads to vaginitis and vaginal discharge in women. In most men there are no symptoms but it may cause urethritis. There is increasing evidence that T. *Vaginalis* may cause adverse outcomes in pregnancy, e.g. low birth weight and premature rupture of the membranes. The treatment option is metronidazole or tinidazole.

Chancroid : After infection a small papule develops at the site of inoculation, normally within 2-3 days. The lesion then erodes into a deep ulcer that is extremely painful. In about 25 per cent of patients there is a painful swelling of one or the other inguinal lymph nodes (bubo). The antibiotics used are ciprofloxacin, erythromycin, ciftriaxone and azithromycin.


Genital Herpes : Herpes simplex virus type 2 (HSV-2) is the primary cause of genital herpes. Classical genital herpes can be recognized by the presence of typical papular lesions that progress to multiple blisters and ulcers. HSV-2 infection is life-long and recurrent ulcerative episodes occur. Asymptomatic or subclinical infection does occur, as do subclinical recurrences, accompanied by viral shedding without a visible ulcer. There is no cure for HSV-2 infection. However, oral antiviral medications such as acyclovir, valaciclovir and famciclovir are all effective in reducing the severity and duration of first episode genital herpes. Topical creams are less effective.

Human Papilloma Virus : Human papilloma virus (HPV) causes **ano-genital warts**, which vary from the common soft, exuberant (cauliflower like) to papular flat warts on drier areas (e.g. shaft of penis). They can be seen anywhere in the genitalia. The other commonly recognized manifestation of genital HPV infection is **cervical cancer**, caused by some subtypes of HPV. Treatment is generally reserved for large lesions because sub-clinical infection tend to resolve on their own.



AIDS (Acquired Immune-Deficiency Syndrome)

AIDS, the acquired immune-deficiency syndrome (sometimes called "slim disease") is a fatal illness caused by a retrovirus known as the human immuno-deficiency virus (HIV) which breaks down the body's immune system, leaving the victim vulnerable to a host of life-threatening opportunistic infections, neurological disorders, or unusual

malignancies. Among the special features of HIV infection are that once infected, it is probable that a person will be infected for life. Strictly speaking, the term AIDS refers only to the last stage of the HIV infection.

Mode of transmission

Sexual transmission; Blood contact; Maternal-fetal transmission (mother-to child transmission); There is no evidence that HIV is transmitted through mosquitoes or any other insect, casual social contact with infected persons including within households, or by food or water. There is no evidence of spread to health care workers in their professional contact with people with AIDS.

Incubation period is uncertain, (from a few months to 10 years or even more).

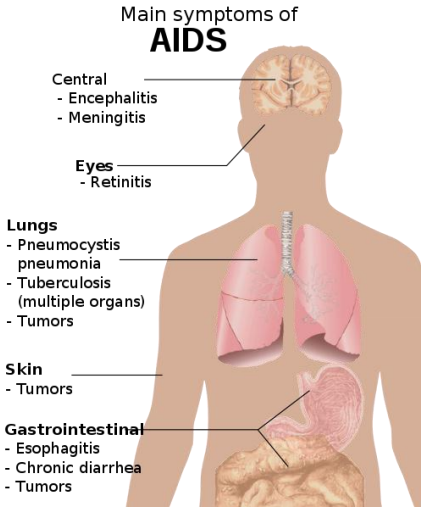
Clinical manifestations

The clinical features of HIV infection have been classified into four broad categories***:***

I. Initial infection; Except for a generally mild illness (fever, sore throat and rash), most HIV - infected people have no symptoms for the first five years or so. HIV antibodies usually take between 2 to 12 weeks to appear in the blood-stream.

II. Asymptomatic carrier state; Infected people have antibodies, but no overt signs of disease, except persistent generalized lymphadenopathy.

III. AIDS-related complex (ARC); A person with ARC has illnesses caused by damage to the immune system, but without the opportunistic infections and cancers associated with AIDS.



Opportunistic infection	Mean CD4 count (micro/L)
Tuberculosis	188
Oral candidiasis	161
LRTI	180
Tubercular meningitis	179
Chronic diarrhea	186
Tubercular pericarditis	156

IV. AIDS; AIDS is the end-stage of HIV infection. A number of opportunist infections and/or cancers that occur in people with otherwise unexplained defects in immunity.

Laboratory Diagnosis: At first a sensitive test **(ELISA)** is used to detect the HIV-antibodies, while a second **confirmatory test (Western Blot)** is used to weed out any false positive results. **Absolute CD4 lymphocyte count** (predictor of HIV progression) with CD4 < 200 cells/fxL. **CD4 lymphocyte Percentage** < 14%.

Antiretroviral treatment (ART):

Pharmacy 4th Year Lecture 2 Public Health

General items & ICD-10

ICD-10 is the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD), a medical classification list by the World Health Organization. It contains codes for diseases, signs and symptoms, abnormal findings, complaints, social circumstances, and external causes of injury of diseases. The code set allows more than 14,000 different codes and permits the tracking of many new diagnoses.

The ICD is important because it provides a common language for reporting and monitoring diseases. This allows the world to compare and share data in a consistent and standard way – between hospitals, regions and countries and over periods of time.

Components of ICD-10 and Their Usage

ICD-10 is basically an update of ICD-9. Many of the features of ICD-9 appear in ICD-10.

There are two main classifications used worldwide:

1. ICD-10-CM (Clinical Modification) – Diagnostic codes
2. ICD-10-PCS (Procedure Coding System) – Procedure Codes (for inpatients)

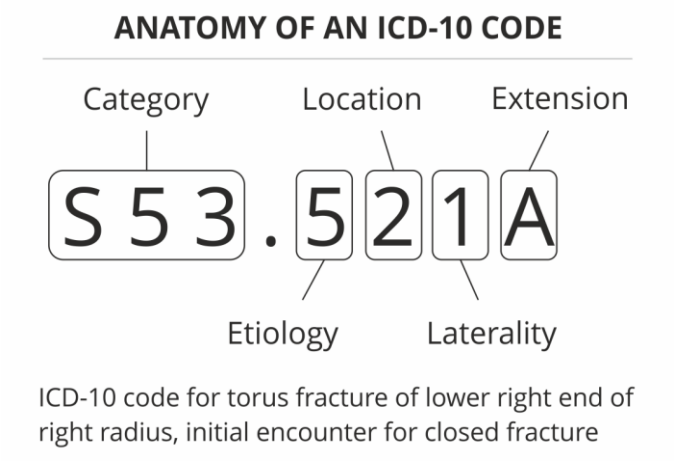
Both have an Alphabetic Index to Disease and a Tabular List of Diseases, which are used in a similar manner.

The ICD-10-CM (International Classification of Diseases, 10th Revision, Clinical Modification) is a system used by physicians and other healthcare providers to classify and code all diagnoses, symptoms and procedures recorded in conjunction with hospital care in the United States. It provides a level of detail that is necessary for diagnostic specificity and morbidity classification in the U.S, ICD-10-CM is used in clinical and outpatient settings in the U.S

ICD-10-PCS (International Classification of Diseases 10th Revision Procedure Coding System) is a procedure classification published by the United States for classifying procedures performed in hospital inpatient health care settings.

The ICD-10 is arranged in 21→22 major chapters.

ICD-10-CM Diagnoses Codes are 3-7 character codes. Character 1 is alphabetic, character 2 is numeric and characters 3–7 are alphabetic or numeric, with a decimal after 3rd digit.



FORMAT OF ICD-10 DIAGNOSIS CODE								
In this example, S52 is the category. The 4th and 5th characters of "5" and "2" provide additional clinical detail and anatomic site. The 6th character indicates laterality, i.e., right radius. The 7th character, "A", is an extension that provides additional information, which means "initial encounter"	CATEGORY				ETIOLOGY, ANATOMIC SITE, SEVERITY, OR OTHR CLINICAL			EXTENSION
Characters	1st	2nd	3rd		4th	5th	6th	7th
Fracture of forearm	S	5	3					
Fracture of lower end of radius	S	5	3	.	5			
Torus fracture of lower end of radius	S	5	3	.	5	2		
Torus fracture of lower end of right radius	S	5	3	.	5	2	1	
Torus fracture of lower end of right radius, initial encounter for closed fracture	S	5	3	.	5	2	1	A

2022 ICD-10-CM Codes

A00-B99 Certain infectious and parasitic diseases

C00-D49 Neoplasms

D50-D89 Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism

E00-E89 Endocrine, nutritional and metabolic diseases

F01-F99 Mental, Behavioral and Neurodevelopmental disorders

G00-G99 Diseases of the nervous system

H00-H59 Diseases of the eye and adnexa

H60-H95 Diseases of the ear and mastoid process

I00-I99 Diseases of the circulatory system

J00-J99 Diseases of the respiratory system

K00-K95 Diseases of the digestive system

L00-L99 Diseases of the skin and subcutaneous tissue

M00-M99 Diseases of the musculoskeletal system and connective tissue

N00-N99 Diseases of the genitourinary system

O00-O9A Pregnancy, childbirth and the puerperium

P00-P96 Certain conditions originating in the perinatal period

Q00-Q99 Congenital malformations, deformations and chromosomal abnormalities

R00-R99 Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified

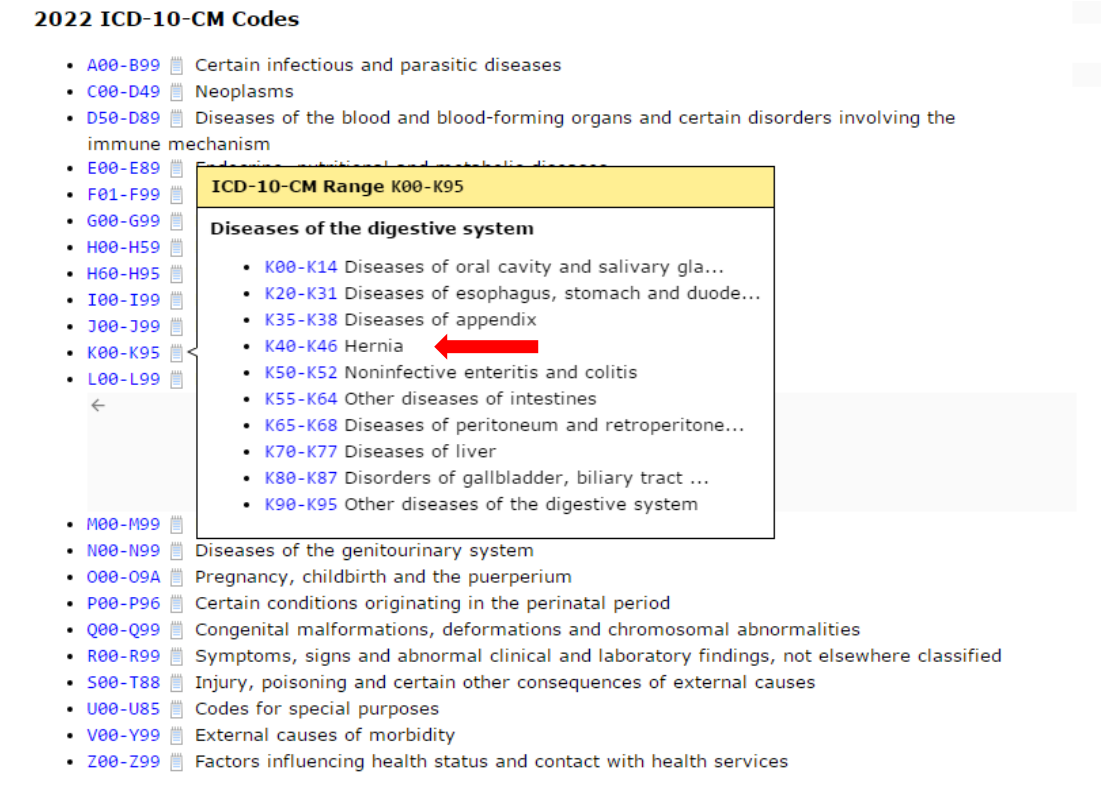
S00-T88 Injury, poisoning and certain other consequences of external causes

U00-U85 Codes for special purposes

V00-Y99 External causes of morbidity

Z00-Z99 Factors influencing health status and contact with health services

The ultimate purpose of ICD is to contribute to a uniform classification that can be used throughout the world to make accurate comparisons of morbidity and mortality data for decision-making in prevention, in management of health care and in facilitating research on particular health problems.



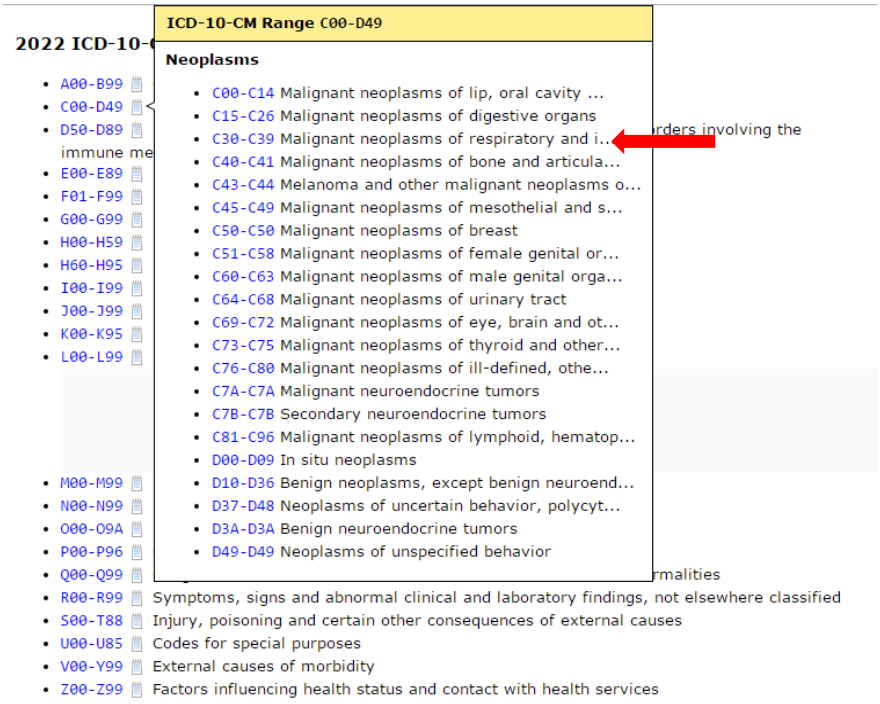
ICD-10-CM Codes › K00-K95 Hernia › Hernia K40-K46

Hernia K40-K46

Note
- Hernia with both gangrene and obstruction is classified to hernia with gangrene.

Includes
- acquired hernia
- congenital [except diaphragmatic or hiatus] hernia
- recurrent hernia

Codes
- K40 Inguinal hernia
- K41 Femoral hernia
- K42 Umbilical hernia
- K43 Ventral hernia
- K44 Diaphragmatic hernia
- K45 Other abdominal hernia
- K46 Unspecified abdominal hernia



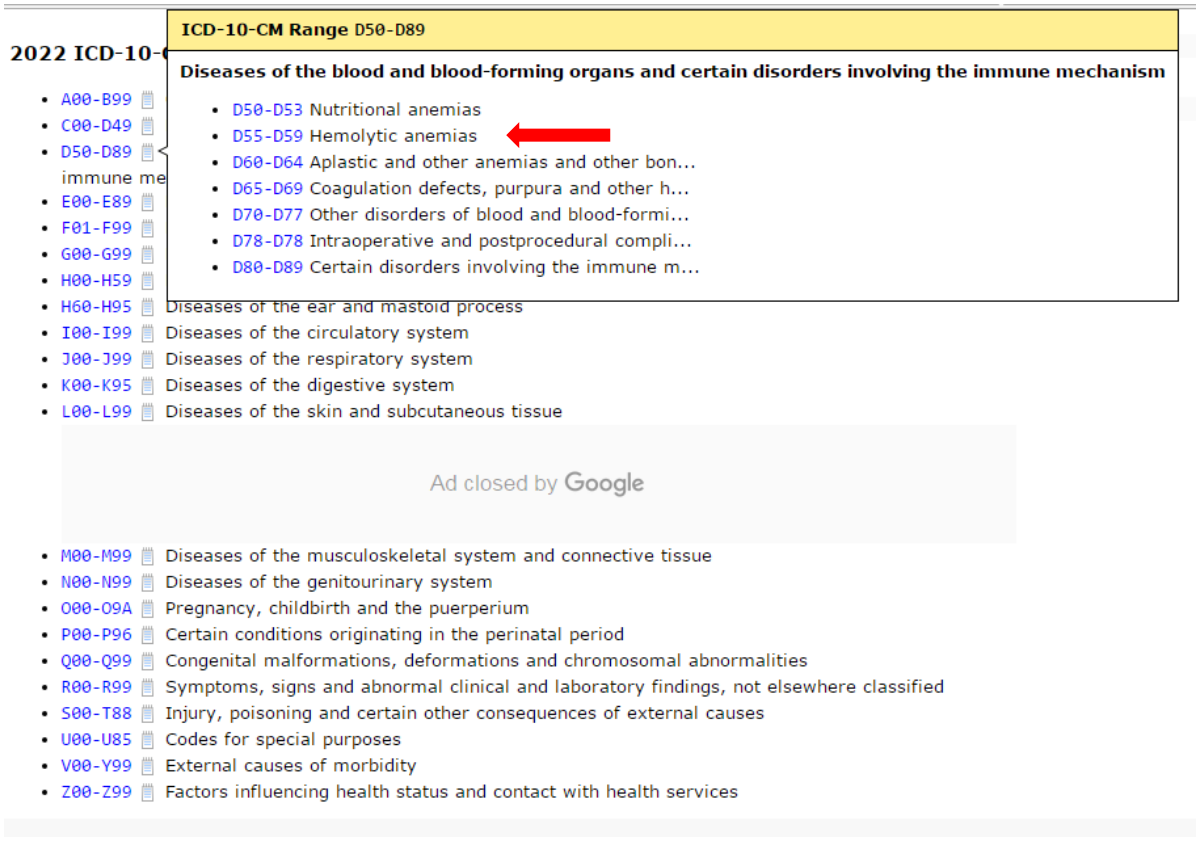
ICD-10-CM Codes › C00-D49 Malignant neoplasms of respiratory and intrathoracic organs › Malignant neoplasms of respiratory and intrathoracic organs C30-C39

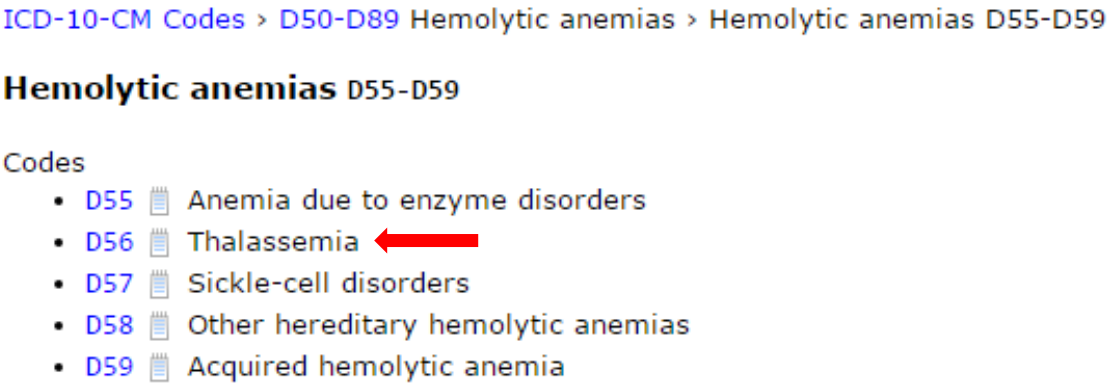
Malignant neoplasms of respiratory and intrathoracic organs C30-C39

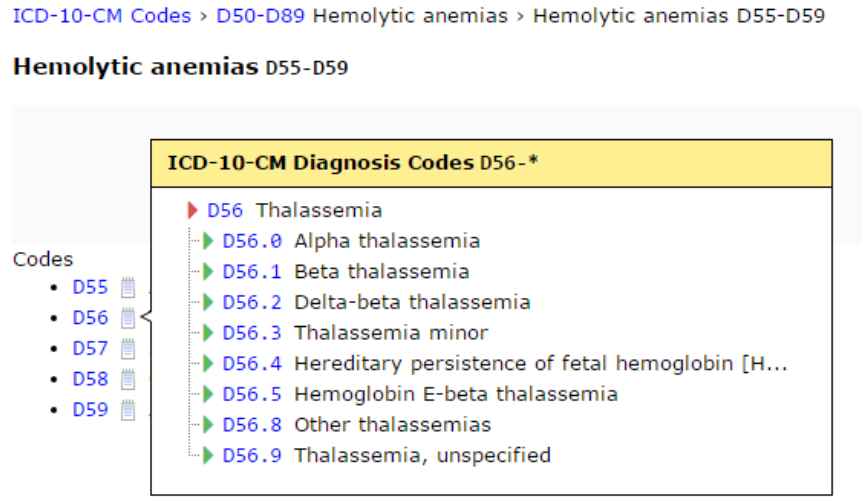
Type 1 Excludes
- mesothelioma (C45.-)

Includes
- malignant neoplasm of middle ear

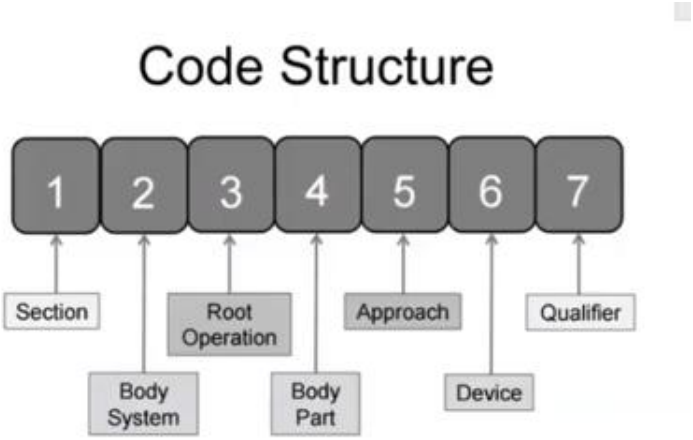
Codes
- C30 Malignant neoplasm of nasal cavity and middle ear
- C31 Malignant neoplasm of accessory sinuses
- C32 Malignant neoplasm of larynx
- C33 Malignant neoplasm of trachea
- C34 Malignant neoplasm of bronchus and lung
- C37 Malignant neoplasm of thymus
- C38 Malignant neoplasm of heart, mediastinum and pleura
- C39 Malignant neoplasm of other and ill-defined sites in the respiratory system and intrathoracic organs


2022 ICD-10-
A00-B99
C00-D49
D50-D89
immune me
E00-E89
F01-F99
G00-G99
H00-H59
H60-H95 Diseases of the ear and mastoid process
I00-I99 Diseases of the circulatory system
J00-J99 Diseases of the respiratory system
K00-K95 Diseases of the digestive system
L00-L99 Diseases of the skin and subcutaneous tissue
ICD-10-CM Range D50-D89
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism
D50-D53 Nutritional anemias
D55-D59 Hemolytic anemias
D60-D64 Aplastic and other anemias and other bon...
D65-D69 Coagulation defects, purpura and other h...
D70-D77 Other disorders of blood and blood-formi...
D78-D78 Intraoperative and postprocedural compli...
D80-D89 Certain disorders involving the immune m...
Ad closed by Google
M00-M99 Diseases of the musculoskeletal system and connective tissue
N00-N99 Diseases of the genitourinary system
O00-O9A Pregnancy, childbirth and the puerperium
P00-P96 Certain conditions originating in the perinatal period
Q00-Q99 Congenital malformations, deformations and chromosomal abnormalities
R00-R99 Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified
S00-T88 Injury, poisoning and certain other consequences of external causes
U00-U85 Codes for special purposes
V00-Y99 External causes of morbidity
Z00-Z99 Factors influencing health status and contact with health services


ICD-10-CM Codes › D50-D89 Hemolytic anemias › Hemolytic anemias D55-D59
Hemolytic anemias D55-D59
Codes
D55 Anemia due to enzyme disorders
D56 Thalassemia
D57 Sickle-cell disorders
D58 Other hereditary hemolytic anemias
D59 Acquired hemolytic anemia


ICD-10-CM Codes › D50-D89 Hemolytic anemias › Hemolytic anemias D55-D59
Hemolytic anemias D55-D59
Codes
D55
D56
D57
D58
D59
ICD-10-CM Diagnosis Codes D56-*
D56 Thalassemia
D56.0 Alpha thalassemia
D56.1 Beta thalassemia
D56.2 Delta-beta thalassemia
D56.3 Thalassemia minor
D56.4 Hereditary persistence of fetal hemoglobin [H...
D56.5 Hemoglobin E-beta thalassemia
D56.8 Other thalassemias
D56.9 Thalassemia, unspecified

The structure of the ICD-10 PCS system is designed in a way that has the potential to drive powerful analytic insights. Each character can be one of any 34 possible values (numbers 0-9, and letters A-Z, excluding letters O and I to avoid confusion with numbers zero and one). Additionally, characters have a hierarchical relationship and the same character placed in a different position has a different meaning



2022 ICD-10-PCS Codes

ICD-10-PCS is a procedure classification published by the United States for classifying procedures performed in hospital inpatient health care settings.

- 0 Medical and Surgical
- 1 Obstetrics
- 2 Placement
- 3 Administration
- 4 Measurement and Monitoring
- 5 Extracorporeal or Systemic Assistance and Performance
- 6 Extracorporeal or Systemic Therapies
- 7 Osteopathic
- 8 Other Procedures
- 9 Chiropractic
- B Imaging
- C Nuclear Medicine
- D Radiation Therapy
- F Physical Rehabilitation and Diagnostic Audiology
- G Mental Health
- H Substance Abuse Treatment
- X New Technology

ICD-10-PCS › 1 › Pregnancy

Pregnancy

- 102 Change
- 109 Drainage
- 10A Abortion
- 10D Extraction
- 10E Delivery
- 10H Insertion
- 10J Inspection
- 10P Removal
- 10Q Repair
- 10S Reposition
- 10T Resection
- 10Y Transplantation

ICD-10-PCS › 1 › Abortion › 0 › Abortion

Abortion

- 10A0 Products of Conception

ICD-10-PCS › 1 › 0 › A › Products of Conception

Products of Conception

- 10A0 Products of Conception
  - 10A00 Open
    - 10A00Z No Device
      - 10A00ZZ Abortion of Products of Conception, Open Approach
  - 10A03 Percutaneous
    - 10A03Z No Device
      - 10A03ZZ Abortion of Products of Conception, Percutaneous Approach
  - 10A04 Percutaneous Endoscopic
    - 10A04Z No Device
      - 10A04ZZ Abortion of Products of Conception, Percutaneous Endoscopic Approach
  - 10A07 Via Natural or Artificial Opening
    - 10A07Z No Device
      - 10A07Z6 Abortion of Products of Conception, Vacuum, Via Natural or Artificial Opening
      - 10A07ZW Abortion of Products of Conception, Laminaria, Via Natural or Artificial Opening
      - 10A07ZX Abortion of Products of Conception, Abortifacient, Via Natural or Artificial Opening
      - 10A07ZZ Abortion of Products of Conception, Via Natural or Artificial Opening
  - 10A08 Via Natural or Artificial Opening Endoscopic
    - 10A08Z No Device
      - 10A08ZZ Abortion of Products of Conception, Via Natural or Artificial Opening Endoscopic

Non-communicable disease: health in transition

CHRONIC DISEASES; Non-infectious diseases take an enormous toll in lives and health worldwide. Nearly 60% of deaths globally are now due to heart disease, stroke, cancer and lung diseases. The growing problem of chronic diseases can be illustrated by a brief review of the rising trend in the prevalence of diabetes and by an examination of the tobacco problem as an important risk factor.

DIABETES: The prevalence of diabetes showed a wide range between countries. Typically, variation within countries shows a higher prevalence in urban communities compared with relatively low frequency in rural communities, a pointer to modern lifestyles as risk factors for diabetes. The long-term complications are steadily increasing the burden of disease in some communities. For example, diabetes is now the commonest cause of new cases of irreversible blindness. Apart from the direct complications of diabetes, the disease is a risk factor for cardiovascular diseases.

Control of diabetes

The explosive increase in the prevalence of diabetes has been in the adult form of the disease, the non-insulin-dependent diabetes mellitus (NIDDM). There is strong epidemiological evidence that this epidemic is related to the changing lifestyle: refined foods have replaced natural whole grain, high-fiber diets; and there is a lack of physical exercise. By adopting a healthier diet and increasing exercise, persons with impaired glucose tolerance can reduce the risk of progressing to frank diabetes.

TOBACCO – A MAJOR CAUSE OF AVOIDABLE BURDEN OF DISEASE

Over the past 50 years, sound scientific evidence has accumulated to show that prolonged smoking is an important cause of premature mortality and disability worldwide**.**

The toll from tobacco smoking In populations where cigarette smoking has been common for several decades, it accounts for:

- 90% of lung cancer;
- 15‑20% of other cancers;
- 75% of chronic bronchitis and emphysema;
- 25% of deaths from cardiovascular disease at ages 35‑69 years;
- 16% of the total annual incidence of cancer cases;
- 30% of cancer deaths in developed countries, and 10% in developing countries;
- 12% of all tuberculosis deaths ‑

Secondary smoking (i.e. exposure to other peoples smoking) is associated with a somewhat higher risk of lung cancer, and with several other important health ailments in children such as sudden infant death syndrome, low birth weight, intrauterine growth retardation and children's respiratory disease.

Control of smoking

WHO recommends a four-pronged strategy:

1 Ban advertising and expand public health information:

■ Forbid all forms of advertising and promotional distribution of tobacco products and sponsorship of sporting events, etc.

■ Disseminate public health information – with special attention to youths, provide credible information about the health and other ill effects of smoking.

2 Use taxes and regulations to reduce consumption:

■ Increased taxation – this usually reduces demand for tobacco products.

■ Regulation to reduce public and workplace smoking – these bans reinforce the message that smoking is an undesirable activity.

3 Encourage cessation of tobacco use:

■ Promote the production and sale of less harmful and less expensive ways of delivering nicotine through patches, tablets, inhalers or other means.

■ Expand free and/or subsidized smoking cessation services and products.

■ Deregulate nicotine replacement products and increase access to smoking substitute products in developing countries.

4 Build anti-tobacco coalitions:

■ Use public revenues derived from tobacco taxes to fund groups and activities that support tobacco control.

■ Fund transition to other employment for tobacco farmers and others who would lose income as a result of tobacco control.

■ Mobilize civil society and other groups to promote the message: 'Tobacco or Health'.

MENTAL HEALTH

Throughout the world there is an increasing awareness of mental disorder as a significant cause of morbidity. This awareness has increased with the steady decline of morbidity due to nutritional disorders, communicable diseases and other forms of physical illness. There is also a better understanding of certain behavioral and social problems which had previously not been properly recognized as manifestations of mental disorder. The role of the community both in the prevention of mental disorder and the care of the mentally handicapped has now been widely acknowledged and is regarded as the only appropriate basis for the development of mental health programs.

Promotion of mental health

The positive aspect of the mental health program involves the design and creation of social and environmental situations in which mental health will grow and flourish. The factors that promote mental health are both physical and socio-cultural. The physical aspect includes the promotion of the general fitness of the individual and the control of environmental stresses such as excessive noise. The socio-cultural factors include the consolidation of family life, the control of economic stresses, and the resolution of conflicts within the society.

Preventive Measures

The mental health problems of the community are stratified in terms of age and other social features. The mental health program would include measures to prevent mental disorder which are appropriate at each age group:

Prenatal

Good antenatal care and delivery services should:

■ ensure normal fetal development;

■ prevent congenital infections (e.g. syphilis);

■ avoid intrapartum trauma.

Infancy

■ Provide emotional security within the family circle.

■ Care for abandoned children and children without families.

■ Prevent malnutrition, communicable and other diseases.

School-age

■ Provide a balanced program of work and play to avoid excessive fatigue (physical and mental).

■ Encourage positive use of leisure hours.

■ Establish satisfactory social adjustment inside and outside the family.

Adolescence

■ Prevent, identify and deal with emotional problems at puberty by health education (including sex education).

Young adult

■ Assist adjustment to working life, especially where rural/urban, agrarian/industrial transfers are involved.

Adult

■ Provide counselling service for family life and for resolving conflicts in relation to self, family and community.

Old age

■ Provide substitute systems of care where traditional extended family systems are breaking down.

OCCUPATION: HEALTH AND DISEASE

World Health Organization/International Labour Organization committee offered a definition of the aim of occupational health which was accepted by the World Community: the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention among workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological equipment and, to summarize: the adaptation of work to man and of each man to his job.

Occupational diseases: Occupational diseases are usually classified according to the target organ systems: respiratory, cardiovascular, skin, genitourinary, nervous, liver, haemopoietic and endocrine.

Occupational lung disorders

The lungs are the major route of entry of noxious gases and dust. The resulting disorders can be grouped into five categories:

■ acute inflammation;

■ asthma;

■ extrinsic allergic alveolitis;

■ pneumoconiosis;

■ cancers.

Occupational skin diseases

The major industries prone to cause occupationally related dermatoses are:

■ agriculture and horticulture;

■ building and construction;

■ leather manufacture;

■ catering and food processing;

■ boat building and repair;

■ hair dressing;

■ wood working;

■ chemical and electrical industries.

Occupational cancer

Generally, cancers of occupational origin are not distinguishable by their clinical presentation from other cancers. Those agents that have been reported to have a high incidence of or mortality from cancer include:

■ aromatic amines(aniline, benzidine, l-naphthylamine and 2-naphthylamine); ‑ high risk of cancer of the bladder

■ asbestos ‑increase in risk for cancer of lung, larynx, gastro-intestinal tract;

■ benzene ‑ acute myelogenous leukaemia;

■ beryllium ‑ increased risk of lung cancer;

■ cadmium ‑ increased risk of lung cancer;

■ chromium ‑ increased risk of nasal and respiratory cancer;

■ nickel ‑ increased risk of nasal cancer;

General principles for preventing and controlling occupational hazards

Measures	Examples and comment
Educate the workers	Inform the workers of the hazards in the working environment and how they can protect themselves and other workers
Replace hazardous chemical	Use alternative safer compound
Modify the process	e.g. wet drilling to reduce dust in mining
Eliminate toxic process at source	e.g. use exhaust fans to remove dust at the point of drilling
Limit the number of workers	Confine the hazardous process to a restricted area; avoid unnecessary exposure of clerical workers. The use of remote action and in the most advanced processes, the use of robots may further reduce human exposure
Protect workers	Workers should use protective gowns, gloves, goggles and other protective equipment as required. Management should monitor the compliance of workers and if necessary impose sanctions on workers who fail to use prescribed protective gear
Monitor the environment	e.g. dust level, will indicate risks and impact of control measures
Monitor exposure of workers	e.g. using film and thermoluminescent dosimeters (usually worn as badges) to measure individual exposure of radiographers and radiologists to ionizing radiation
Monitor the health of workers	should be monitored to look for early signs of adverse effects, e.g. blood tests in workers exposed to lead
Establish emergency and first aid services	Workers and health staff should be trained to deal with emergencies. Appropriate first aid equipment should be easily accessible, e.g. emergency showers

GENETICS AND HEALTH

Clinical Significance of Genetics

Human genetics is one of the elements that can be used in the planning of co-ordinated attacks on disease, since it can sometimes differentiate those groups or individuals who are susceptible from those who are not.

Genetic counseling

Population genetic studies are a recent important expansion of the field of genetics and the knowledge thus acquired can be of practical value in preventive medicine, in the form commonly referred to as genetic counseling.

Genetic counseling is essentially a process of communication and **involves** far more than the mere discussion of genetic risks. **First**, the nature of the disease has to be

described, its prognosis given and the nature and efficacy of any treatment discussed. Feelings of guilt and recrimination may have to be dealt with. **Second**, the various options open to a couple will have to be considered: family limitation, sterilization, adoption, artificial insemination and prenatal diagnosis with elective abortion.

HEAT DISORDERS

These heat disorders can be grouped into minor and major disorders. The minor comprise heat oedema, heat fatigue and heat exhaustion unspecified. The major, other than heat syncope, are often grouped in three clinical syndromes resulting from exposure to heat: namely heat cramps, heat exhaustion and heat stroke.

Table : Features of the major heat disorders

Disorder	Susceptible groups (water/salt intake)	Characteristic clinical features	Treatment and prevention
Heat cramps	Acclimatized, active (↑water/↓salt)	*Sweating*: profuse *Muscle cramps*: at the end of the working day	Increase sodium intake
Heat exhaustion			
Water-depletion	Those unable to indicate thirst, e.g. elderly, infirm, unconscious, infants (↓water) Active workers: in hot industries or in outdoor employment in a hot environment (↓water)	*Sweating*: present *Thirst*: present *Urine*: ↓ output, ↑ osmolarity *Serum Na*: ↑ *Temperature*: up to 38.9°C	Water replacement (oral or i.v.) Encourage drinking and rest periods
Salt-depletion	Large losses of thermal sweat, especially in those unacclimatized (adequate water, ↓salt)	*Sweating*: profuse *Muscle cramps*: may be present *Thirst*: classically absent *Urine*: normal output, ↓ Na *Serum Na*: ↓ *Temperature*: normal or ↓ *Vascular*: hypotension, tachycardia	i.v. normal saline or isotonic glucose Encourage adequate water and salt intake
Heat stroke	Classic: elderly Exertion-induced: active, young	*Sweating*: often absent *CNS disturbance* Temperture: >40°C	Anticipation Prompt recognition Rapid cooling

Pharmacy 4th Year Lecture 4 Public Health

Infections Through Skin and Mucous Membranes

Infections transmitted through skin and mucous membranes may be divided into two groups:

■ Transmission requires human contact either direct (person to person) or indirect (through fomites). These are often called ‘contagious’ diseases.

■ Infection is acquired from various non-human sources: (i) infected soil (hookworm); (ii) water (schistosomiasis, leptospirosis); (iii) animal bites (rabies); or (iv) through wounds (tetanus).

The agents include viruses, bacteria, fungi and arthropods

Viral infections	**Fungal infections**
Chickenpox (varicella-zoster virus)	Superficial fungal infections
Viral haemorrhagic fevers (Lassa fever virus,	(*Epidermophyton* spp.,
Marburg virus, Ebola virus)	*Trichophyton* spp., *Microsporon* spp.,
Acquired immune deficiency syndrome	*Mallassezia furfur*)
(Human immunodeficiency viruses)*	Candidiasis (*Candida albicans*)
Protozoal infections	**Arthropod infections**
Trichomoniasis (*Trichomonas vaginalis*)*	Scabies (*Sarcoptes scabei*)
Bacterial infections	OTHER SOURCES
Lymphogranuloma venereum	**Viral infection**
(*Chlamydia trachomatis*, serotypes L1-3)*	**Rabies** (rabies virus)
Soft chancre (*Haemophilus ducrei*)*	**Bacterial infections**
Granuloma inguinale*	Tetanus (*Clostridium tetani*)
(*Calymmatobacterium granulomatis*)	Buruli ulcer (*Mycobacterium ulcerans*)
Gonorrhoea (*Neisseria gonorrhoeae*)*	Leptospirosis (*Leptospira* spp.)
Sexually transmitted syphilis*	Anthrax (*Bacillus anthracis*)
(*Treponema pallidum*)	**Helminthic infections**
Yaws (*Treponema pertenue*)	Hookworm (*Ankylostoma duodenale,
Pinta (*Treponema carateum*)	*Necator americanus*)
Endemic syphilis (*Treponema pallidum*)	Strongyloidiasis (*Strongyloides stercoralis*)
Trachoma (*Chlamydia trachomatis,*	Schistosomiasis (*Schistosoma* spp.)
serotypes A–C)	
Inclusion conjunctivitis (*Chlamydia*	
*trachomatis,*serotypes D–K)	
Leprosy (*Mycobacterium leprae*)	

Control of Contact Infections

1 The infective agent

■ elimination of the reservoir by case finding, selective or mass treatment.

2 The route of transmission

■ improvement of personal hygiene; ■ elimination of overcrowding; ■ avoidance of sexual promiscuity.

3 The host

■ specific immunization, e.g. tetanus; ■ chemotherapy and chemoprophylaxis, e.g. yaws.

VIRAL INFECTIONS

Chickenpox

***Organism*:** Varicella-zoster virus (VZV)

***Reservoir*:** Humans

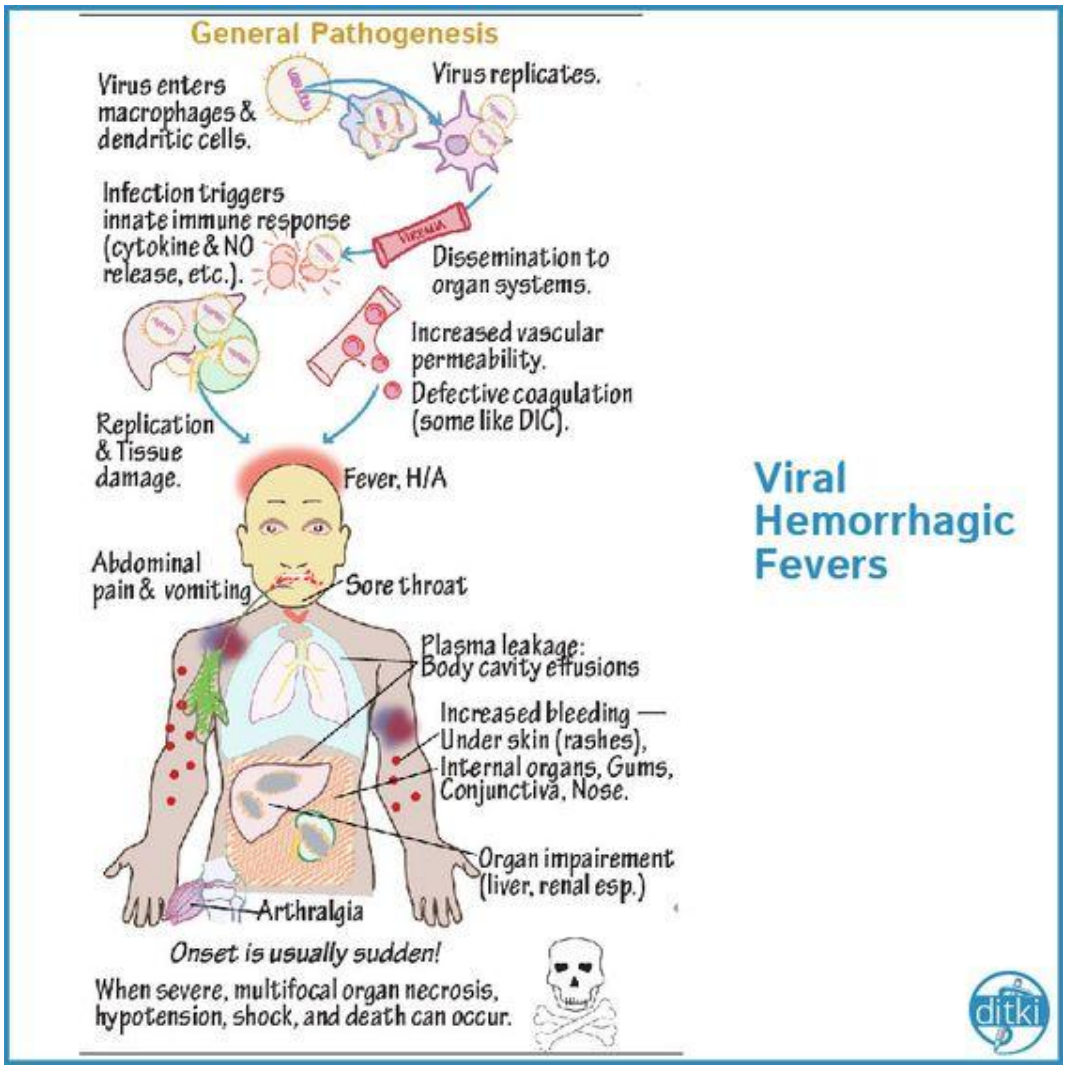
***Transmission*:** Contact, droplets, fomites. The patient remains infectious 1‑2 days before the rash appears and until all blisters have formed scabs.

***Host factors*:** It tends to be more severe in adults than in children. One attack of chickenpox usually confers lifelong immunity, the patient may subsequently exhibit a recrudescence of infection in the form of herpes zoster from latent infection.

***Control*:** Immunization of high-risk groups (a live attenuated varicella virus given at12 months to 12 years) , Notification.

Viral haemorrhagic fevers

Several viral haemorrhagic fevers that affect humans. This section deals with with Lassa fever, Marburg virus disease and Ebola virus disease. A common feature of these infections is that transmission requires intimate exposure to the patient or contact with blood or other bodily secretions, have common features: they affect many organs, they damage the blood vessels, and they affect the body's ability to regulate itself.



Risk factors for nosocomial or person to person spread are:

■ care of an infected individual;

■ contact with infected needles;

■ contact with blood or secretions;

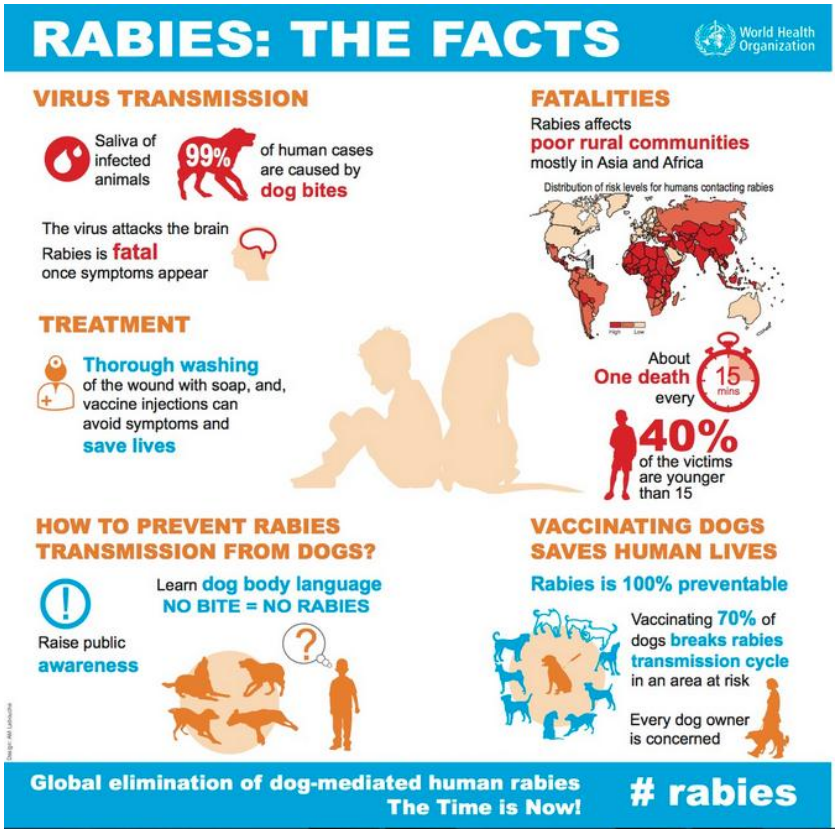
■ preparation of a body for burial;

■ sexual contact.

Patient management by barrier nursing techniques should be adopted rigorously to prevent nosocomial transmission. Ideally, patients should be managed at the hospital where they are first admitted.

Rabies

Rabies is a viral infection which produces fatal encephalitis in man. The clinical features include convulsions, dysphagia, nervousness and anxiety, muscular paralysis and a progressive coma.



***Occurrence*:** Endemic in most parts of the world except Great Britain, Australia, New Zealand, Scandinavia, parts of the West Indies and the Pacific Islands

***Organism*:** Rabies virus

***Reservoir*:** Wild animals, strays and pets

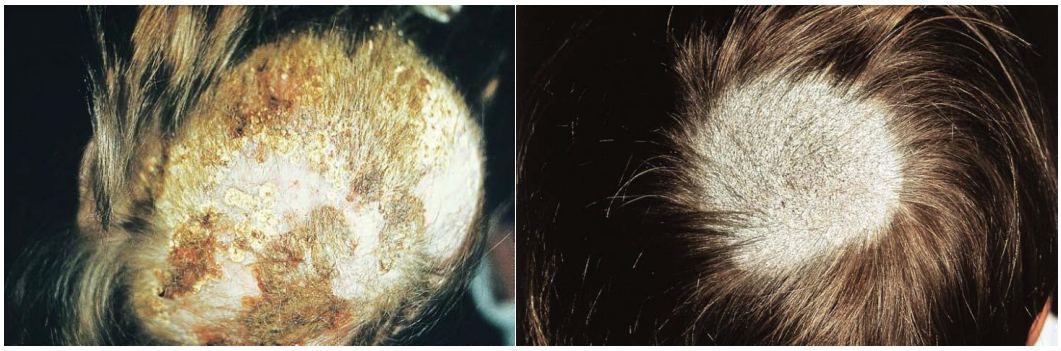
***Transmission*:** Bite of infected animals. Air-borne in restricted circumstances

***Control*:** Immunization of pet dogs, control of stray dogs. Passive and active immunization after exposure. Prophylactic immunization of high-risk groups

FUNGAL INFECTIONS

Superficial fungal infections; A wide variety of fungi infect skin, hair and nails, without deeper penetration of the host tissues. The infective agents include species of

Epidermophyton, Trichophyton, Microsporon and *Mallassezia furfur* (causative agent of tinea versicolor). The various clinical manifestations include favus, ringworm of the scalp, body, feet (athlete's foot) and nails; some produce dyspigmentation, for example tinea versicolor.







***Occurrence*:** Worldwide.

***Organisms*:** Various species of *Epidermophyton, Trichophyton* and *Microsporon*; also *Mallassezia furfur* (now *Pityrsporum orbiculare*)

***Reservoir*:** Humans, animals and soil

***Transmission*:** Direct contact, indirect contact with contaminated articles

***Control*:** Personal hygiene Sanitation in baths and pools and treatment of infected persons.

Candidiasis: This is a mycotic infection which usually affects the following sites:

■ oral cavity (thrush); ■ female genitalia (vulvovaginitis);

■ moist skin folds (dermatitis); ■ nails (chronic paronychia).




***Occurrence*:** Worldwide

***Organism*:** *Candida albicans*

***Reservoir*:** Humans

***Transmission*:** Contact, parturition

***Control*:** Careful use of broad-spectrum antibiotics, elimination of local predisposing factors, treatment of pregnant women.

BACTERIAL INFECTIONS

Tetanus

This is an acute disease characterized by an increase in muscle tone, with spasms, fever and a high fatality rate in untreated cases.

***Occurrence*:** Worldwide, but very low incidence in developed countries as a result of immunization programme.

***Organism*:** *Clostridium tetani*

***Reservoir*:** Humans

***Transmission*:** Through wounds including the umbilicus in newborn babies

***Control*:** Toilet of wounds. Clean delivery and management of the umbilical cord

Penicillin prophylaxis. Passive immunization (antitetanus serum). Active immunization (tetanus toxoid)

Anthrax

This is an acute infection which may present as a localized necrotic lesion of the skin (malignant pustule) with regional lymphadenopathy; further dissemination will cause septicaemia. Pulmonary and gastrointestinal forms of infection occur from inhalation or ingestion of the infected material.

***Occurrence*:** Widespread in agricultural areas

***Organism*:** *Bacillus anthracis*

***Reservoir*:** Farm animals

***Transmission*:** Contact with infected animals or their products; inhalation; ingestion

***Control*:** Isolation of sick animals. Careful disposal of infected carcasses. Disinfection of hides, skins and hair. Protective clothing (e.g. gloves)

ARTHROPOD INFECTIONS

Scabies: This is an infection of the skin by the mite, *Sarcoptes scabiei*. The skin rash typically consists of small papules, vesicles and pustules, characterized by intense pruritus. Another typical feature is the presence of burrows, which are superficial tunnels made by the adult mite. Secondary bacterial infection is common. Lesions occur most frequently in the moist areas of skin, for example the web of the fingers.

The incubation period ranges from a few days to several weeks.

***Occurrence*:** Worldwide, in overcrowded poor areas

***Organism*:** *Sarcoptes scabiei*

***Reservoir*:** Humans

***Transmission*:** Direct contact, or indirectly through contaminated clothing

***Control*:** Improvement in personal hygiene. Treatment of affected persons (by the application of benzyl benzoate emulsion or tetraethylthiuram monosulphide following a thorough bath. Other affected members of the family should be treated at the same time).