

# ***INFECTIOUS DISEASES***

*Dr. Gábor Lotz*

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# ***INFECTIOUS DISEASES***

***are disorders in which tissue damage  
or dysfunction is produced by a  
microorganism.***

# *Changing pattern of infectious diseases*

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**Vaccines have controled or eliminated:**

***smallpox, measles, pertussis, poliomyelitis, mumps***

**Insecticides have helped to control:**

***malaria, schistosomiasis, thyphus***

**Purification of drinking water lessened the threat of water-born epidemics:**

***Amoebiasis and hepatitis A***

***however,***

***Occurence of therapy resistant agents***

***Opportunistic infections have appeared (AIDS, organ transpl.)***

***Increased speed of disease spreading (globalisation)***

***Changing geographical distribution (climate changes)***

# ***CLASSES OF ORGANISMS THAT CAUSE INFECTIOUS DISEASES***

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***VIRUSES***

***Obligate intracellular***

***CHLAMYDIAE***

***Obligate intracellular***

***RICKETTSIAE***

***Obligate intracellular***

***MYCOPLASMS***

***Extracellular***

***BACTERIA***

***Extracellular***

***(Spirochetes,  
Mycobacteria)***

***Facultative intracellular***

***FUNGI***

***Superficial***

***Deep/Systemic***

***PROTOZOA***

***Extracellular***

***Intracellular***

***obligate***

***facultative***

***HELMINTHS***

# ***HOST DEFENCES AGAINST INFECTION***

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- » *Skin*
- » *Tears*
- » *Normal bacterial flora*
- » *Gastric acid*
- » *Bile*
- » *Salivary and pancreatic secretions*
- » *Filtration system of nasopharynx*
- » *Mucociliary blanket*
- » *Bronchial, cervical, urethral,  
and prostatic secretions*
- » *Neutrophils*
- » *Monocytes*
- » *Complement*
- » *Stationary, mononuclear  
phagocyte system*
- » *Immunoglobulins*
- » *Cell-mediated immunity*

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## VIRAL *INFECTION*

*Viral replication in host cells*

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## VIRAL *DISEASE*

*Viral replication + tissue injury*

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# *Mechanisms of cell injury in viral infections*

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## *Direct*

- **Cell fusion**
- **Formation of inclusions**  
*HSV, CMV, rabies, smallpox*
- **Cytolysis**  
*influenza, yellow fever, poliomyelitis*

## *Indirect*

- **Immunmediated cell injury**  
*hepatitis B*
- **Secondary infections**

## *RESPIRATORY VIRUSES*

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- ***Influenza A,B,C,  
Changing antigenic identities***
- ***Parainfluenza viruses (croup)***
- ***RSV (Paramyxovirus) 1-6 month of age***
- ***Adenoviruses (in children)***
- ***Measles (rubeola)***



# ***VIRAL PNEUMONIAS***

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- ***MORPHOLOGY***

- Interstitial pneumonia*

- ***INFLAMMATORY INFILTRATION IN***

- alveolar septa*

- peribronchial tissue*

- *Hyalin membranes (ARDS)*

- *Necrotizing bronchiolitis (RSV)*

- *Hemorrhagic feature (Influenza)*

- *Squamous metaplasia of bronchial epithelium*

# ***HERPESVIRUS INFECTIONS (DNA viruses)***

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**HERPES SIMPLEX**

**TYPE 1, TYPE 2**

**VARICELLA - ZOSTER**

} **HSV**  
**VZV** **neurotropic**

**HUMAN HERPES VIRUS**

**TYPE 6, 7**

**HUMAN HERPES VIRUS Type 8 (Kaposi's src.)**

**CYTOMEGALOVIRUS**

**EPSTEIN - BARR VIRUS**

**(Mononucleosis infectiosa**

**BURKITT'S lymphoma**

**Nasopharyngeal carcinoma)**

# ***Cytomegalovirus infection***

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***Connatal***

***Perinatal***

***Postnatal***

***Transmission: intrauterin, perinatal, suckling, body fluids,  
respiratory, sexual, transfusion, transplantation***

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## ***Cytomegalovirus disease***

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- ***Connatal form: brain lesions  
(microcephaly, cysts, periventricular calcification, hydrocephaly)***

***One of the most common opportunistic infections in  
immunodeficiency***

- ***Myocarditis after transplantation***
- ***Generalised viral disease after transplantation***
- ***Generalised infection in AIDS patients***

# ***EBV-Infection***

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- 1. Mononucleosis infectiosa*
- 2. Burkitt's lymphoma („stary sky”)*
- 3. Nasopharyngeal carcinoma*
- 4. PTLD*  
*(Post-transplant lymphoproliferative disorder)*
- 5. Oral hairy leucoplakia (OHL)*

# *Bacterial infections*

# ***RESPIRATORY TRACT INFECTIONS***

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## ***Lobar (pneumococcal) pneumonia:***

***Phases:*** ***Streptococcus pneumoniae***

**I. Congestion (1-2<sup>nd</sup> days)**

***(hyperemic capillaries, serous alveolar exsudate)***

**II. Red hepatization (3<sup>rd</sup> day)**

***(red blood cell rich serofibrinous alveolar exsudate)***

**III. Grey hepatization (4-5<sup>th</sup> days)**

***(degradation of RBCs, grey color due to the fibrin-filled alveoli containing macrophages and neutrophils)***

**IV. Yellow hepatization (7<sup>th</sup> day)**

***(massive neutrophil infiltration in the fibrin-filled alveoli)***

**V. Resolution (8-9<sup>th</sup> days)**

***(fibrinolytic dissolution of the exudate by neutrophils & mac.)***

# ***BACTERIAL TOXINS***

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## ***EXOTOXINS***

### ***NEUROTOXINS***

***Clostridium tetani***

***Clostridium botulinum***

***TETANUS***

***BOTULISM***

### ***ENTEROTOXINS***

***Vibrio cholerae***

***Clostridium difficile***

***S. aureus***

***CHOLERA***

***COLITIS***

***FOOD POISONING***

### ***CYTOTOXINS***

***Clostridium perfringens***

***Corynebact. diphtheriae***

***GAS GANGRENE***

***DIPHTERIA***

***ENDOTOXINS - Gram-negative bacteria***

# ***Common bacterial infections of the gastrointestinal tract***

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## ***E. coli diarrhea***

***Enterotoxigenic E. coli***

***travellers***

***Enteropathogenic E. coli***

***babies***

***Enterohemorrhagic E. coli***

***colon***

***Enteroinvasive E. coli***

***colon, distal ileum***

## ***Salmonella enterocolitis***

***Fecal-oral transmission***

***superficial ulceration***

## ***Typhoid fever***

***Salmonella typhi ; Fecal –oral transmission; carrier status***

***Mucosal invasion and swelling, fibrinous necrosis, ulcerations of Peyer patches, S.typhi passes into the circulation leading to systemic infection***

## ***Cholera***

***Exotoxin effect /functional disturbances only/***

## ***Shigellosis (shigella dysentery)***

***Pseudomembranous colitis***

## ***Antibiotics associated colitis***

***Pseudomembranous colitis caused by Clostridium difficile***



***Acute enterocolitis: superficial ulceration***

***Ulcers of the terminal ileum in  
fatal typhoid fever: deep ulceration***

***Pseudomembranous colitis: deep ulceration***

**Pseudopolyps (remaining islands of mucosa in the ulcerated area)**

# ***MENINGOCOCCAL INFECTIONS***

***GRAM negative DIPLOCOCCUS***

***Two fatal lesions:***

## ***I. Meningococcal meningitis***

***FEVER, HEDACHE, STIFF NECK,  
CONFUSION, VOMITING***

***Tachycardia, Myocardial damage,***

***Purulent meningitis***

## ***II. Fulminant meningococcemia***

***Waterhouse-Fridericksen syndrome***

## ***II. WATERHAUSE -FRIDERICHSEN SY.***

***(Fulminant meningococcemia)***

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***(IN CHILDREN UNDER 5 YEARS)***

- ***Rapid onset, fever, fulminant development of symptoms***
- ***Cutan hemorrhages, (purpura)***
- ***DIC***
- ***Endotoxin shock***
- ***Hemorrhagic necrosis of adrenals***

***PURULENT MENINGITIS MAY OR  
MAY NOT BE PRESENT***

# ***ZOONOTIC DISEASES\****

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*\* Infection is aquired from ANIMAL RESERVOIR*

## ***BRUCELLOSIS***

*Granulomatous lesions*

## ***TULARAEMIA***

*Abscedating - granulomatous lesions*

## ***ANTHRAX***

*Haemorrhagic inflammation*

## ***LISTEROSIS***

*Septicaemia, meningitis*

*Granulomatosis infantiseptica*

## ***CAT-SCRATCH FEVER***

*Suppurative - granulomatous lesions*

# *Tularemia*

*Injury of the skin from the bites of a rabbit  
infected with *Francisella tularensis**

*→ Abscedating lymphadenitis*

# CAT SCRATCH DISEASE

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- *Self limited infection caused by  
Bartonella henselae*
- *Site of entry: skin, conjunctiva  
(oculoglandular syndrome)*
- *Lymphadenitis:  
suppurative and  
granulomatous*

# *Sexually transmitted bacterial diseases*

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- ***Syphilis (lues)-Treponema pallidum***
- ***Gonorrhoea- Gonococcus***
- ***Ulcus molle (chancroid)***  
***( Hemophilus ducreyi)***
- ***Granuloma inguinale***  
***(Calymmatobacter granulomatis)***
- ***Lymphogranuloma venereum***  
***( Chlamydia trachomatis L1.L3))***

# CHLAMYDIAL DISEASES

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- ***Psittacosis* /parrot fever, ornitosis/; *Chl. psittaci***
- ***Trachoma* /leading cause of blindness/; *Chl. trachomatis* A-C**
- ***Inclusion conjunctivitis* /paratrachoma/; *Chl. trach.* D-K**
- ***Lymphogranuloma venereum*; *Chl. trachomatis* L1, L3**
- ***Infections of the genital tract*; *Chl. trachomatis* D-K**
- ***Neonatal pneumonitis*;  
*Chl. pneumoniae***



**SEXUALLY TRANSMITTED, Non-gonococcal urethritis (NGU),  
SALPINGITIS → STERILITY**