

Infections of
Fetus
Newborns
Elderly

Congenital and neonatal infections

Congenital infections occur when a pregnant woman is infected with an organism that enters her bloodstream and eventually the placenta and fetus. A **vertically transmitted infection** is caused by pathogenic bacteria or viruses that use **mother-to-child transmission**, that is, transmission directly from the mother to an embryo, fetus, or baby during pregnancy or childbirth.

Jaan A, Rajnik M (2021). "[TORCH Complex](#)". National Center for Biotechnology Information, U.S. National Library of Medicine. PMID 32809363. Retrieved 27 August 2021.

Neonatal infections are infections of the neonate (newborn) acquired during prenatal development or in the first four weeks of life (neonatal period). Neonatal infections may be contracted by mother to child transmission, in the birth canal during childbirth, or contracted after birth. Some neonatal infections are apparent soon after delivery, while others may develop in the postnatal period.

Infections of fetus, newborns

- Chickenpox in pregnancy. ...
- **CMV in pregnancy. ...**
- **Group B streptococcus in pregnancy. ...**
- Infections transmitted by animals. ...
- Hepatitis B. ...
- **Herpes in pregnancy. ...**
- HIV in pregnancy. ...
- slapped cheek syndrome in pregnancy
- **Syphilis**
- **Rubella (German measles)**
- **Toxoplasma gondii**

CMV in pregnancy

- less than 1% of births
- risk – the highest - first trimester
- prematurity, low birthweight, hepatomegaly, splenomegaly, thrombocytopenia, prolonged jaundice, cerebral irritability, fits and/or abnormal muscle tone or movement
- microcephaly, deafness
- cerebral calcification, hemiplegia, psychomotor retardation, chorioretinitis and myopathy
- **diagnosis** - IgM antibodies or cytomegalovirus (CMV) excretion - first 20 days of life

Herpes in pregnancy

- transplacental transmission
- **congenital** infection- pneumonitis, meningoencephalitis, hepatosplenomegaly, cytopenia
- herpetic skin or mucosal lesions – rare
- **primary** infection – at birth - from maternal genital herpes
- skin, conjunctival, oral, genital lesions
- Aciclovir - reduces mortality (from 80-90% to 10-15%)

Varicella in pregnancy

- first trimester - birth defects - 0.5-1%
- 13th and 20th week- birth defects - 2 %
- 5 days or less of delivery - 20-25% - chickenpox- ***congenital varicella***
- chickenpox antibodies
- scars, eye problems, poor growth, small head size, delayed development, and/or mental retardation

Rubella (German measles) in pregnancy

- **transmitted through placenta,**
- spontaneous abortion, fetal death, congenital abnormalities (patent ductus arteriosus, pulmonary and aortic stenosis, coarctation of the aorta, defects of the atrial or ventricular septum, ocular lesions (cataracts, glaucoma, and chorioretinitis), deafness, microcephaly, mental retardation, and retarded growth)
- infection during the first trimester - most serious
- classic triad - congenital rubella - ocular abnormalities, heart disease, deafness
- detection of rubella-specific IgM

Group B streptococcus in pregnancy

- Group B *Streptococcus* (GBS)
Streptococcus agalactiae - G+ bacteria
- colonizes GIT and UGT

GBS infections (neonates, fetus):

- **early** onset - first week of life
- **late** onset infections - beyond first week of life
- risk factor - early-onset GBS infection - colonization of maternal genital tract - during delivery
- positive GBS urinary tract infection - marker of heavy colonization- prophylaxis

Group B streptococcus in pregnancy

- meningitis, bloodstream infections - newborn's first three months
- increased risk for GBS disease - mother tests positive late in pregnancy
- 2 to 3 in every 50 babies (4–6%) die
- miscarriages, stillbirths, preterm deliveries
- 1 in 4 pregnant women carries GBS bacteria
- test pregnant women for GBS - 36 through 37 weeks
- early onset GBS infection - vertical transmission
- **fetus** - ascending infection - amniotic fluid, with / without rupture of membranes

- penicillin G, ampicillin

Syphilis in pregnancy

- **all women** – serology - first prenatal care visit
- **antepartum** screening - nontreponemal antibody testing (e.g., RPR) , treponemal antibody testing (e.g., immunoassays)
- maternal **risk factors** - sex with multiple partners, sex + drug use , late care(first visit during the second trimester or later,) no prenatal care, methamphetamine or heroin use, unstable housing or homelessness
- **Penicillin G** -treating fetal infection + preventing congenital syphilis

Syphilis in pregnancy

Early Congenital Syphilis - Clinical Manifestations



- IUGR
- Nonimmune hydrops fetalis
- Enlarged placenta
- Mucocutaneous manifestations
 - Persistent rhinitis (snuffles)
 - Maculopapular eruption
 - Superficial desquamation
 - Pemphigus syphiliticus
 - Condylomata lata

LATE CONGENITAL SYPHILIS

- Hutchison's triad
 - Hutchinson's teeth
 - Interstitial keratitis
 - 8th nerve deafness.
- Other manifestations
 - Saddle nose
 - Frontal bossing
 - Cluttons joint (painless swelling of joint)



Gonorrhoea in pregnancy

- highly contagious STD
- untreated - increased risk – miscarriage, premature birth
- passed to newborn - severe eye infection
- ceftriaxone



https://en.wikipedia.org/wiki/Neonatal_conjunctivitis

Listeriosis in pregnancy

- Neonatal - transplacentally or during or after delivery
- symptoms – sepsis
- diagnosis – culture, PCR
- treatment - ampicillin + aminoglycoside

Toxoplasmosis in pregnancy

- congenital toxoplasmosis - transplacental acquisition - *Toxoplasma gondii*
- prematurity, intrauterine growth restriction, jaundice, hepatosplenomegaly, myocarditis, pneumonitis, rash, microcephaly, seizures
- **classic triad**: chorioretinitis, hydrocephalus, intracranial calcifications,
- **diagnosis** – serologic, polymerase chain reaction testing
- **treatment** - pyrimethamine, sulfadiazine, leucovorin

Elderly

- Pneumonia
- Elderly skin infections
- Gastrointestinal infections
- Urinary tract infections

Pneumonia in elderly

- **Community-acquired pneumonia (CAP)**
- **Healthcare-associated pneumonia**
- **Aspiration pneumonia**

- *Streptococcus pneumoniae*
- *Haemophilus influenzae*
- respiratory viruses (influenza, COVID-19)

- **Blood tests, imaging, culture, PCR**

Pneumonia Classifications

Community-acquired pneumonia

- Development in the outpatient setting
- Excluding wound care and hemodialysis clinics

Aspiration pneumonia

- Either oropharyngeal or gastrointestinal contents

Hospital-acquired pneumonia

- Occurring ≥ 48 hours after admission
- Including wound care and hemodialysis clinics

Ventilator-associated pneumonia

- Endotracheal intubation for at least 48 hours before onset of pneumonia

Elderly skin infections

- **Methicillin-resistant Staphylococcus aureus (MRSA)** - red, swollen, painful, warm, and pus-filled bump
- **Fungal infections - feet and nails** - green, yellowed, discolored skin - painful
- **Shingles (herpes zoster)** - painful, itchy rash - single stripe around the right/left side
- **Pressure sores** - decubitus ulcers, or pressure ulcers - ankles, back, elbows, heels, hips
- **Cellulitis** - bacterial infection - red, swollen, warm, tender skin
- **Scabies** - microscopic mites – itching, pimple-like skin rash

Gastrointestinal infections in elderly

Table 1. Agents That Commonly Cause Acute Gastrointestinal Illness.*

Bacteria

Salmonella
Shigella
Campylobacter
Escherichia coli O157:H7
Clostridium difficile

Viruses

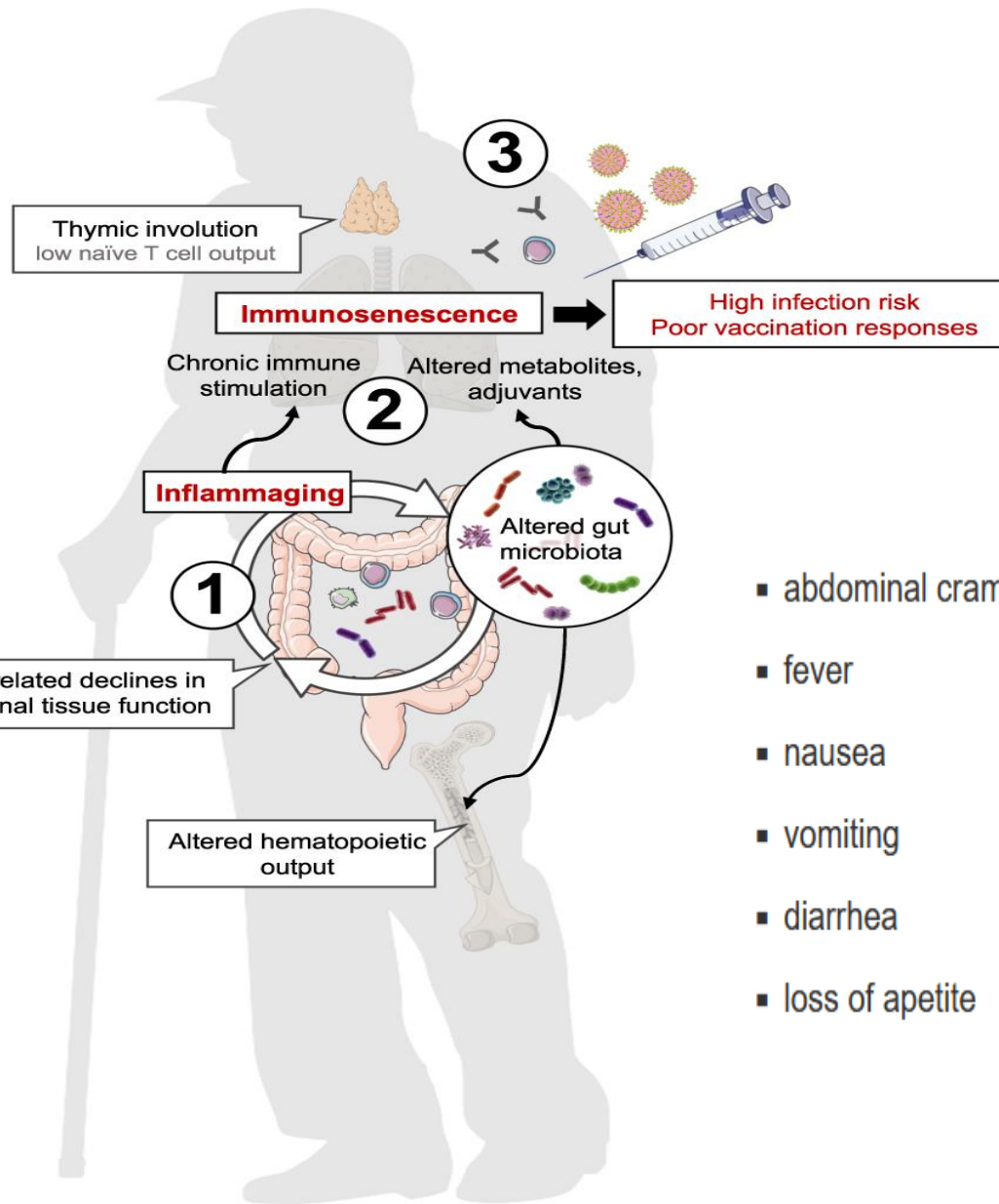
Caliciviruses (Norwalk-like and related viruses)
Rotavirus†
Adenovirus types 40 and 41
Astrovirus

Protozoa

Giardia
Cryptosporidium
Entamoeba histolytica

* These organisms commonly cause acute gastrointestinal infection in otherwise healthy children and adults in developed countries. The frequency of infection is similar among such countries — for example, the United States, United Kingdom, France, and Argentina.

† Symptomatic disease usually occurs only in infants or very young children.



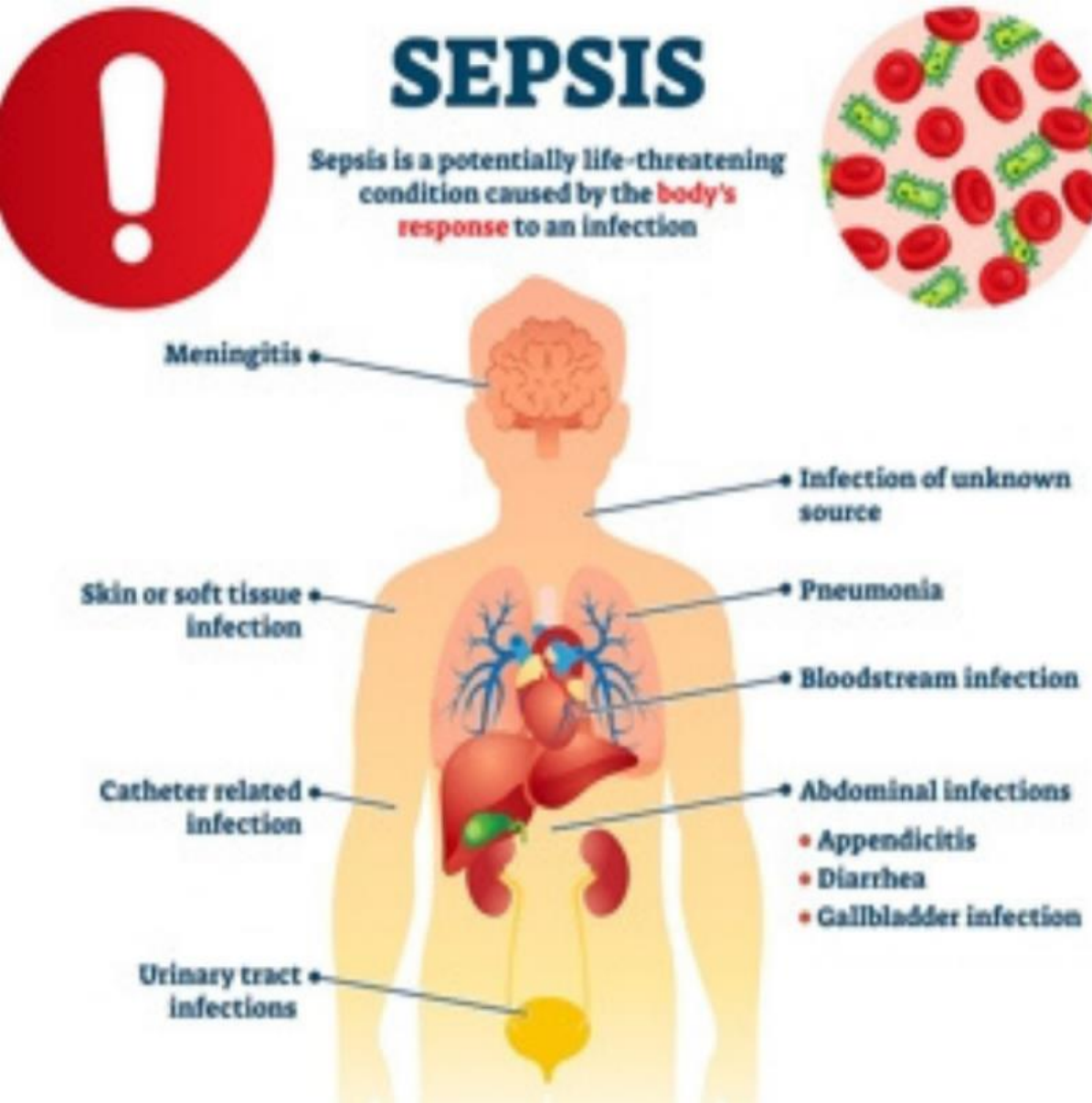
- abdominal cramps and pain
- fever
- nausea
- vomiting
- diarrhea
- loss of appetite

Urinary tract infections in elderly

- **catheter** insertion
- improper **hygiene** (incontinence)
- **elderly - more susceptible - weakened immune system**
- weakened bladder or pelvic floor muscles
- confusion or delirium

- ***Escherichia coli***
- *Proteus, Serratia, Klebsiella, Pseudomonas*
- *Enterococcus*
- Coagulase-negative staphylococci
- *Candida*
- **polymicrobial**

Elderly



MENINGITIS

Bacterial Causes Related to Age

Age Group	Pathogen
0 – 4 Weeks	<i>Streptococcus agalactiae</i> <i>Escherichia coli</i> <i>Listeria monocytogenes</i> <i>Streptococcus pneumoniae</i>
1 – 3 Months	<i>Haemophilus influenzae</i> <i>Listeria monocytogenes</i> <i>Neisseria meningitidis</i> <i>Streptococcus pneumoniae</i>
3 Months – 18 Years	<i>Haemophilus influenzae</i> <i>Neisseria meningitidis</i> <i>Streptococcus pneumoniae</i>
18 – 50 Years	<i>Neisseria meningitidis</i> <i>Streptococcus pneumoniae</i>
> 50 Years	<i>Listeria monocytogenes</i> <i>Streptococcus pneumoniae</i>

Sources:

- Mouton CP, Bazaldua OV, Pierce B, Espino DV. Common infections in older adults. *Am Fam Physician*. 2001 Jan 15;63(2):257-68. PMID: 11201692.
- Morgan JA, Zafar N, Cooper DB. Group B Streptococcus And Pregnancy. [Updated 2022 Jul 25]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK482443/>
- Sauerbrei, A., Wutzler, P. Herpes simplex and varicella-zoster virus infections during pregnancy: current concepts of prevention, diagnosis and therapy. Part 1: Herpes simplex virus infections. *Med Microbiol Immunol* **196**, 89–94 (2007).
<https://doi.org/10.1007/s00430-006-0031-0>
- <https://www.msdmanuals.com/professional/pediatrics/infections-in-neonates/congenital-toxoplasmosis>
- <https://www.serenityhomecare.ca/2022/07/26/the-5-most-common-infections-in-the-elderly/>
- <https://www.dispatchhealth.com/blog/most-common-skin-infections-in-seniors/>