Acute respiratory viral infections (ARVI)

ARVI - unite a large group of acute infectious viral diseases, characterized by symptoms of infectious toxicosis and primary damage to the mucous membranes of the respiratory tract.

It is believed that over 90% of "colds" are caused by viruses. The remaining 10 account for other microorganisms.

In the epidemic period may be ill up to 20% of the population, and in pandemics to 50% (every second!).

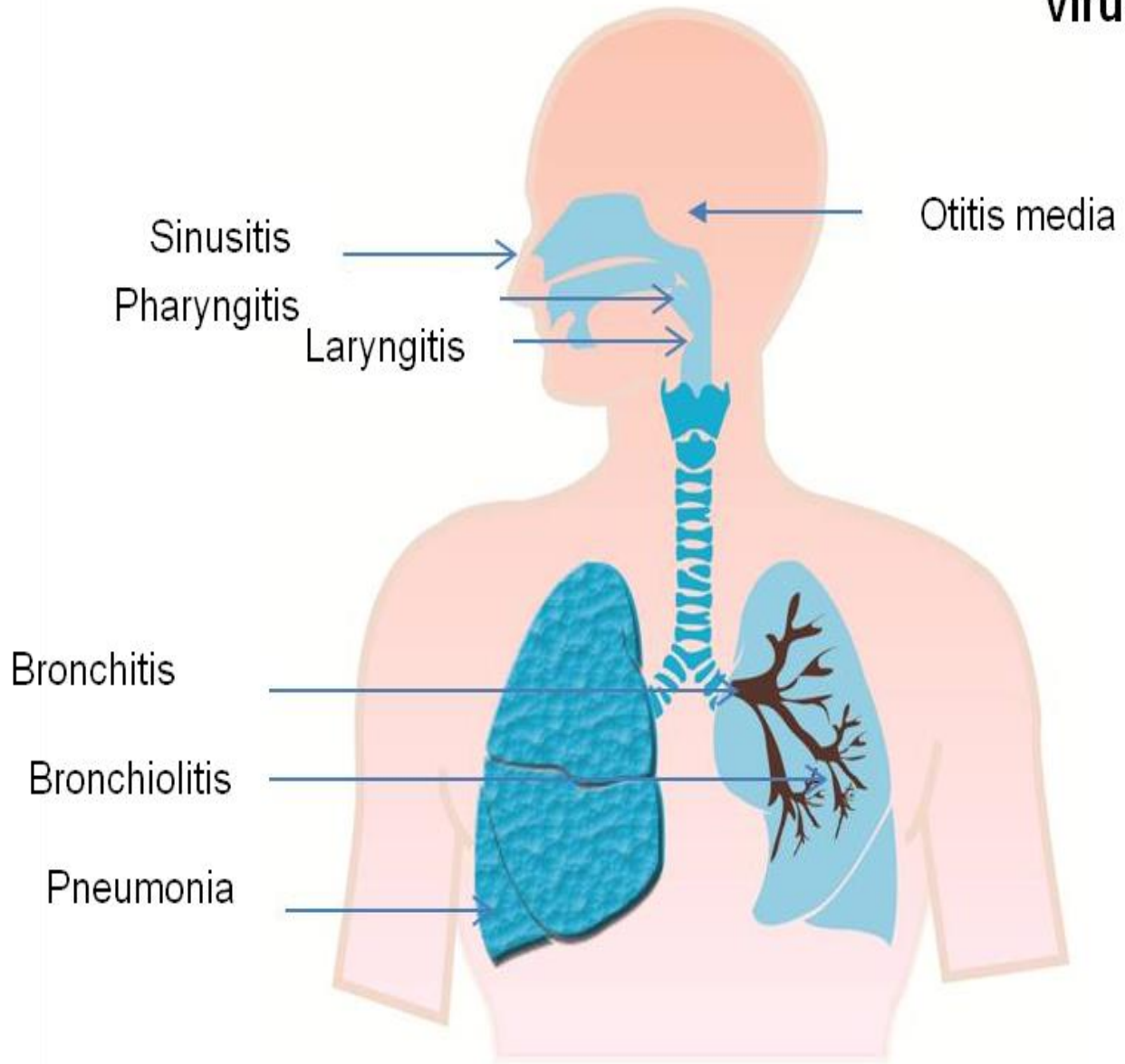
Amazes the number of types of viruses, pathogens ARVI - more than two hundred! Among them is the well-known flu, a fan of mutating and surprising humanity with its new varieties.

(“avian” influenza, swine flu ...),

and less well-known

parainfluenza, rhinovirus, adenovirus infection.

Then everything is more outlandish and outlandish: respiratory syncytial infection, coronavirus, bokaruvirus, metapneumovirus infection ...



Viruses that infect the upper respiratory tract

Rhinovirus
Coronavirus
Influenza virus
Parainfluenza virus
Respiratory Syncytial virus
Herpesvirus
Adenovirus
Bocavirus
Coxsackivirus

Viruses that infect the lower respiratory tract

Influenza virus
Parainfluenza virus
Respiratory Syncytial virus
Adenovirus
Bocavirus
Metapneumovirus

The source of the infection is a sick person, especially if this person is in the initial stage of the disease:
feeling sick and weak until the person realizes himself sick, already isolating the virus,
he infects his environment –
the work collective,
fellow travelers in public transport,
the family.

The main way of transmission is airborne, with small particles of mucus and saliva secreted during conversation, coughing, sneezing

The *World Health Organization* (WHO) declared the COVID-19 outbreak a public health emergency of international concern (PHEIC) on 30 January 2020 and a pandemic on 11 March 2020.

Local transmission of the disease has occurred in most countries across all six WHO regions.

Coronavirus disease 2019 (COVID-19) is an infection disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It was first identified in December 2019 in Wuhan, Hubei, China, and has resulted in an ongoing pandemic.

Today the coronavirus COVID-19 is affecting 221 countries and territories.

Current coronavirus statistics as of 29/03/2023 (worldwide),

Coronavirus Cases:

683.567.637

Deaths:

6 .828.672

Recovered:

656.524.151

This epidemic is the first pandemic in human history that can be brought under control. In connection with the epidemic, the World Health Organization (WHO) has declared a public health emergency of international concern, and the risks at the global level are assessed as very high.

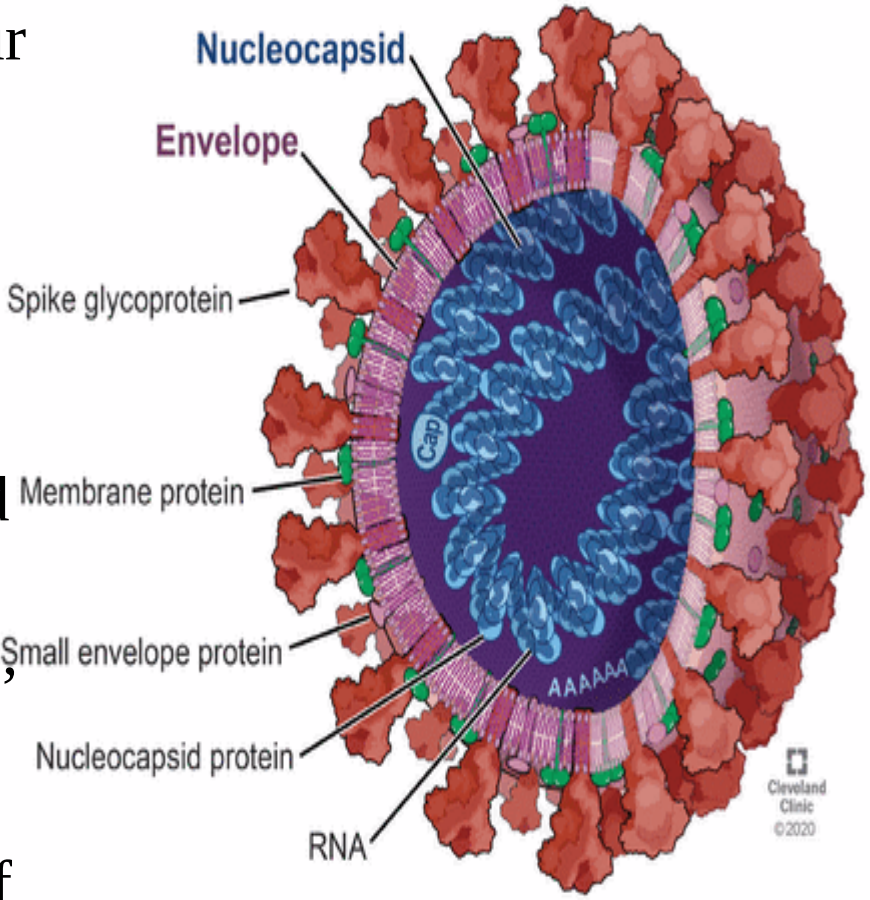
The situation is developing rapidly, the number of cases and deaths is increasing daily. Various scientific and clinical studies are underway.

Many scientific and medical publishing houses and organizations have signed up to the declaration of free access and exchange of information related to the new disease.

The virus is transmitted via respiratory droplets and aerosols from person to person. Once inside the body, the virus binds to host receptors and enters host cells through endocytosis or membrane fusion.

The coronaviruses are made up of four structural proteins, namely, the spike (S), membrane (M), envelop (E) and nucleocapsid (N) proteins.

The S protein is seen to be protruding from the viral surface and is the most important one for host attachment and penetration. This protein is composed of two functional subunits (S_1 and S_2), among which S_1 is responsible for binding to the host cell receptor and S_2 subunit plays a role in the fusion of viral and host cellular membranes.



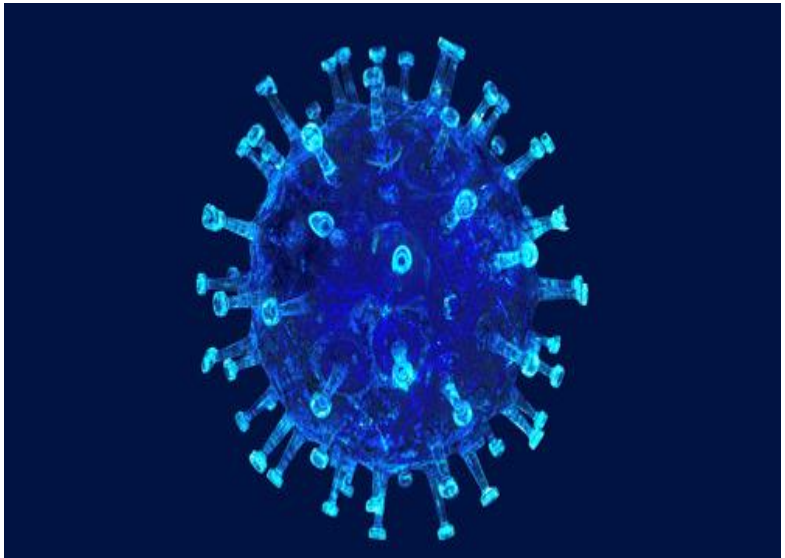
An early Chinese study of 103 COVID-19 cases found two strains, which they named L and S.

The S type is older, but the L type was more common in early stages of the outbreak. They think one may cause more cases of the disease than the other, but they're still working on what it all means.

It is also normal for a virus to change, or mutate, as it infects people and this virus has done so. There are several variants that are now spreading, some proving to be more contagious as well as more deadly than the original virus.

Throughout the pandemic, scientists have kept a close eye on variants like:

Alpha
Beta
Gamma
Delta
Omicron
Lambda
Mu



INFLUENZA

Influenza

an acute infectious disease of the respiratory tract caused by a virus of influenza.

Included in the group of acute respiratory viral infections (ARI).

Periodically it distributed in the form of epidemics and pandemics .

Currently, more than 2000 variants of the influenza virus have been identified, which differ in antigenic spectrum.

According to estimates by WHO , people 65 years of age and older die from the flu more often than people of other ages: up to 89% of all flu-related deaths occur in this age group.

In many European languages, the flu known as "influenza" (ital. *Influenza* - "impact"), the name, at the time arose in Rome in the mid-18th century due to the potential virulence of infection, as it impacts on public health.

Archaic terms for influenza include *epidemic catarrh*, *la grippe* - from the French, first used by Molyneaux in 1694 ((fr. *Grippe,* on it. *Grippen* - "grab", "dramatically shrink") , *sweating sickness*, and *Spanish fever* (particularly for the 1918 flu pandemic strain).

How dangerous is the flu?

- **Often leads to severe, sometimes to fatal complications**
- **Not treated with antibiotics**
- **Quickly passed to the nearest environment**
- **severe course (high fever, chills, headache and muscle pain, aches, general weakness)**
- **Chains to bed for several days, knocks out of the usual rhythm Life for at least 2 weeks**

Characterized by aerosol (inhalation of tiny droplets of saliva, mucus, which contain the flu virus) transmission mechanism and extremely rapid spread of epidemics and pandemics.

Influenza epidemics caused by serotype A, occur approximately every 2-3 years and due to serotype B - every 4-6 years. Serotype C does not cause epidemics, only isolated outbreaks in children and weak people.

Susceptible to the flu all ages of people. The source of infection is a sick man with obvious or obliterated form of the disease excrete virus with coughing, sneezing, and so on.

The patient is contagious from the first hours of the disease and to 5-7-th day of the disease.

In the 18-19th centuries there were 8 pandemics.
In the 20th century - 4.
One of the global problems that all humanity faced in the 21st century was the "avian flu" virus.

and

COVID-19

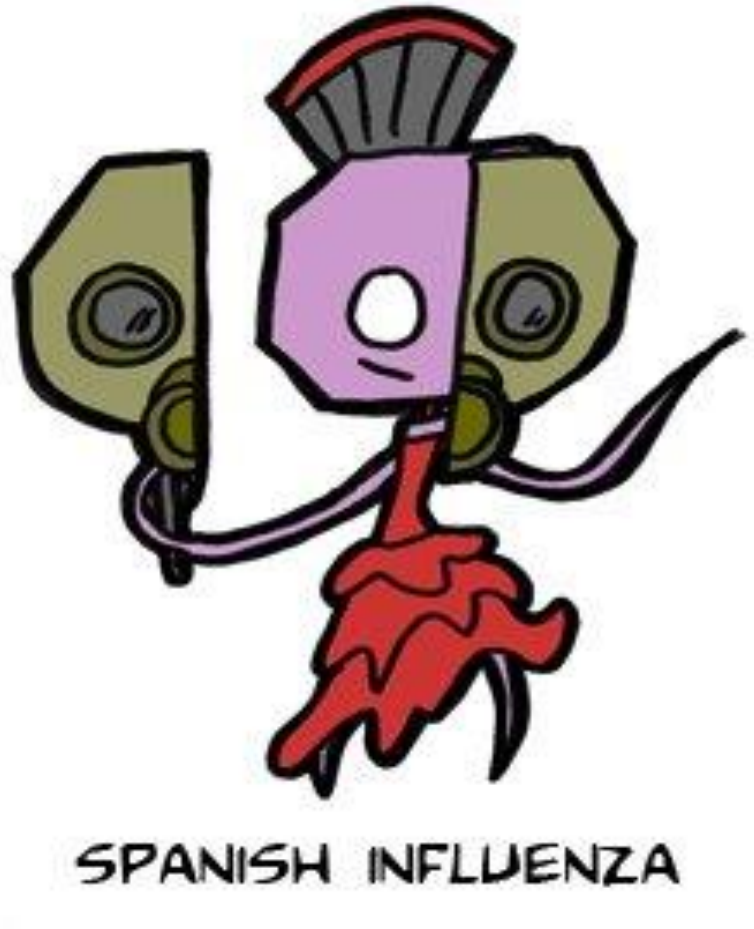
"la grippe"

Reason: H1N1

•In Spain, in 1918,

"la grippe" was called. Duration 2 years

- **Killed more than 50 million people, more than in the First World War.**



ASIAN FLU

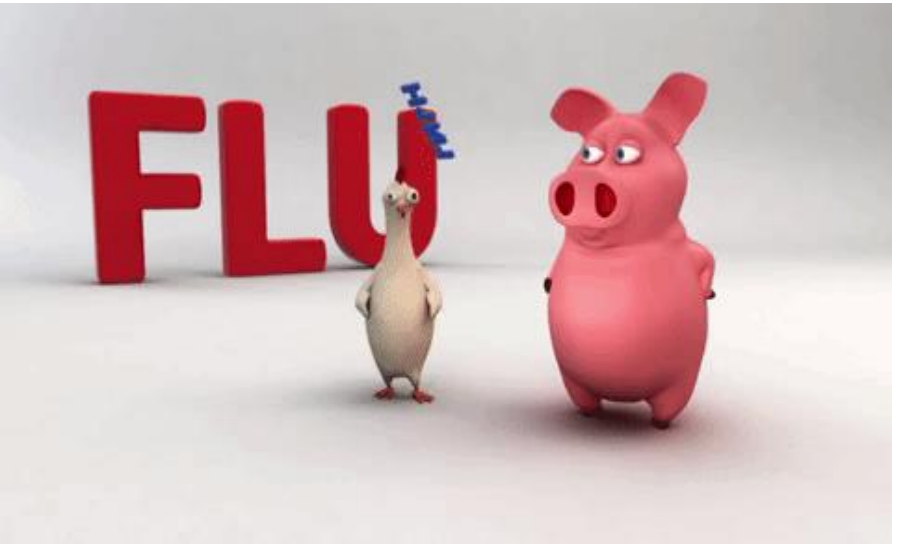
H2N2
It began in China in 1957.
Spread from Singapore to Hong Kong.
Lasted until 1959
Died 2 million people
A vaccine was developed

HONG KONG FLU

H3N2
In 1968, the antigenic shift was changed
H3N2 from Singapore spread to Hong Kong.
2 years lasted
Mix of human and avian virus

“Avian” influenza

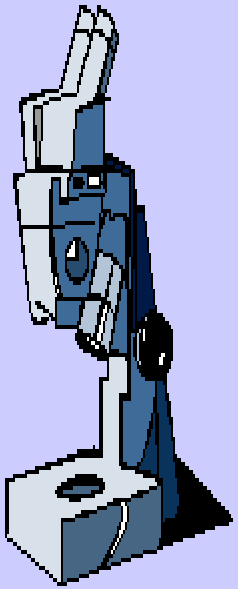
H5N1
For the first time in 1978, in Italy,
In 2003 it was discovered on the territory of Thailand



H1N1 flu is also known as swine flu. It's called swine flu because in the past, the people who caught it had direct contact with pigs. That changed several years ago, when a new virus emerged that spread among people who hadn't been near pigs.

In the spring of 2009, scientists recognized a particular strain of flu virus known as H1N1. This virus is actually a combination of viruses from pigs, birds and humans. During the 2009-10 flu season, H1N1 caused the respiratory infection in humans that was commonly referred to as swine flu. Because so many people around the world got sick that year, the World Health Organization declared the flu caused by H1N1 to be a global pandemic.

Discovery of Influenza Virus



- First isolated from a pig in 1931 (swine flu)
- Isolated from human in 1933

In August 2010, the World Health Organization declared the pandemic over. Since that time, scientists have changed the way they name viruses. The H1N1 virus is now known as H1N1v. The V denotes variant and indicates that the virus usually circulates in animals, but has been detected in humans.

Since 2011, another strain, H3N2v, has been circulating in humans and also causes the flu.

Both strains are included in the flu vaccine for 2018-19.

For the first time the virus was isolated in the 30 years of XX century.

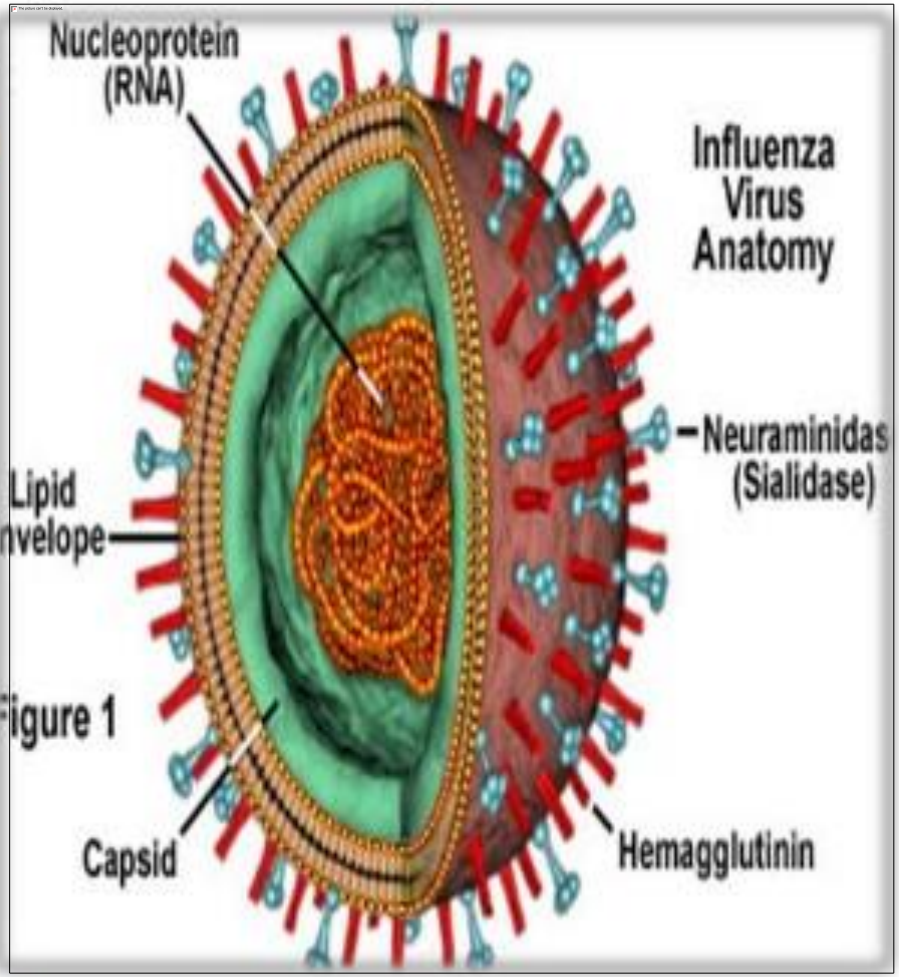
Influenza viruses belong to the family Ortomyxoviridae, which includes the genera Influenza A, B, C.

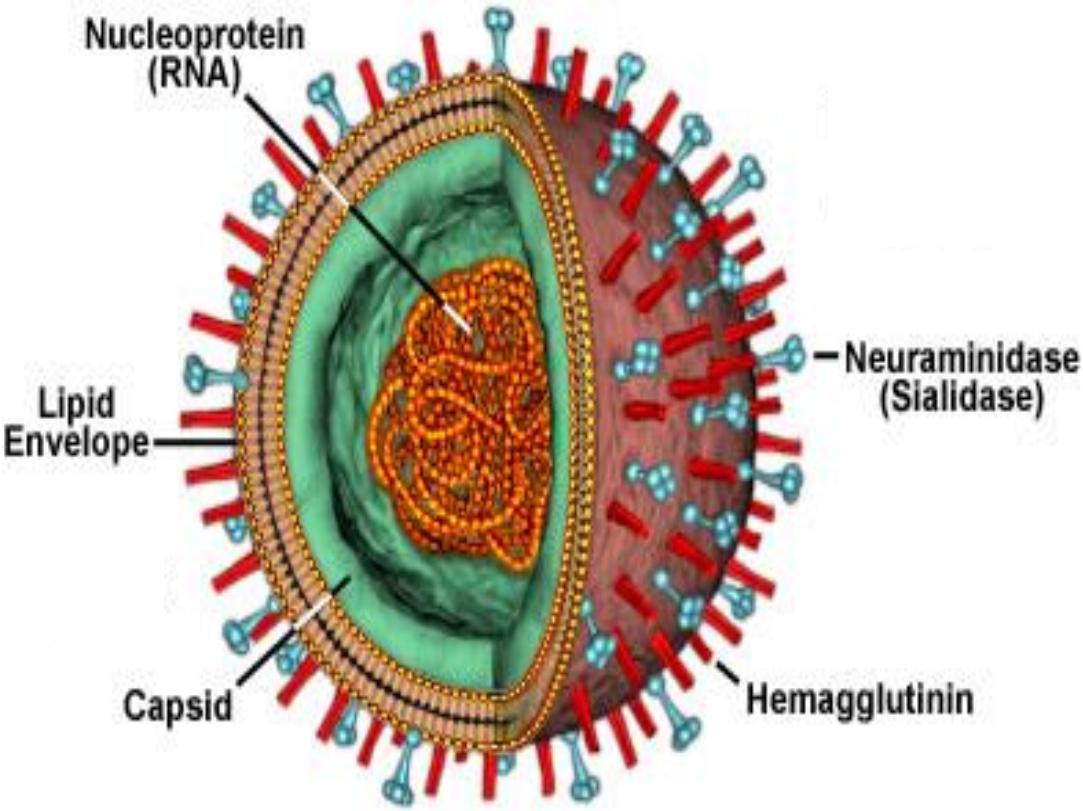
The antigenic properties of internal proteins of the virion (NP and M1) define belonging to the genus Influenza virus A, B or C.

INFLUENZA VIRUS

- Single-stranded RNA virus : Orthomyxoviridae family
- 3 types: A, B, C
- Subtypes of type A determined by
- hemagglutinin and neuraminidase

- Influenza Virus Strains :
- TYPE A:
  - moderate to severe illness
  - all age groups
  - humans and other animals
- TYPE B
  - milder disease primarily affects children & humans only
- TYPE C
  - rarely reported in humans
  - no epidemics

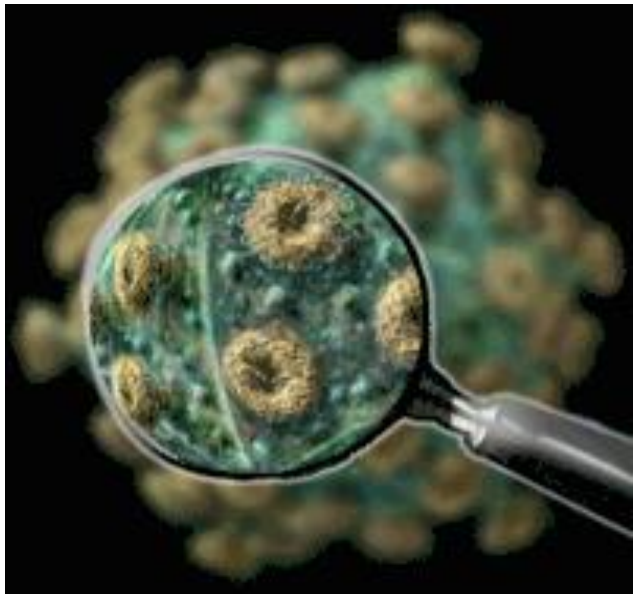




The influenza virus has a spherical shape with a diameter of 80-120 nm, in the center there are eight RNA fragments, enclosed in a lipoprotein envelope, on which surface there are "spikes" consisting of hemagglutinin (H) and neuraminidase of the (N).

Further division performed according to subtypes (serotypes) of surface proteins hemagglutinin (HA) and neuraminidase (NA).

In accordance with the antigenic specificity of the surface glycoproteins HA and NA of a currently 16 known HA subtypes and 9 NA subtypes (NA).



Value for epidemic human viruses have containing three subtypes of HA (H1, H2, H3) and two subtypes of NA (N1, N2).

Influenza viruses A and B contain NA and NA as main structural and antigenic components of viral particles having hemagglutinating and neuraminidase activities.

There is no influenza virus neuraminidase, he has instead hemagglutinin-esterase (penetrating) protein (HEF).

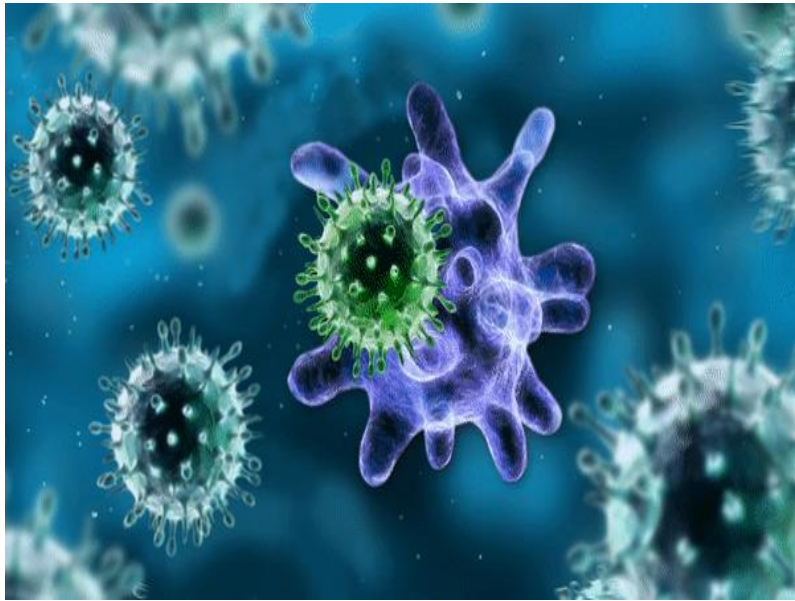
Thread RNA surrounded by a protein and packaged into lipoprotein membrane.

Virions able to agglutinate erythrocytes and elute them by virus-specific enzymes.

The antibodies produced in response to hemagglutinin (H) and neuraminidase (N), are the basis of immunity against a specific subtype of influenza virus.

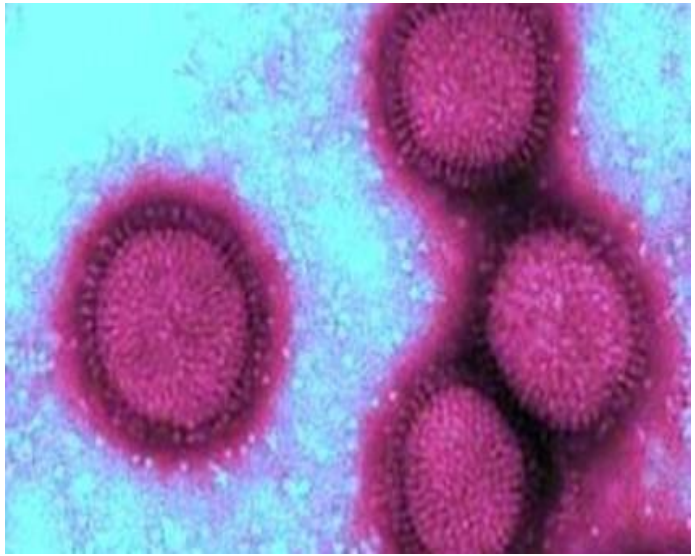
Unusually for a virus properties of influenza virus genome is fragmented and variability of proteins - hemagglutinin and neuraminidase.

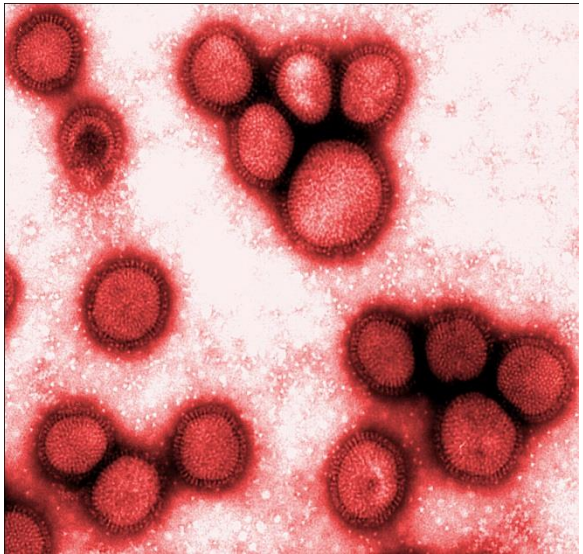
These proteins can be a sharp change in the properties - antigenic shift - resulting in the emergence of forms of the virus causing the pandemic, and in this new form, or revive old forms of the virus can occur slowly changing properties – antigenic drift - contribute to the continuation of the epidemic



Influenza viruses have weak resistance to the action of physical and chemical factors and are destroyed at room temperature for several hours, while at low temperatures (from -25°C to -70°C) several years remain.

Quickly die with heating, drying, and also when exposed to small concentrations of chlorine, ozone, ultraviolet radiation





In the form of epidemics more common in autumn and winter.

The risk of epidemics is highest at temperatures from +5 to -5, where a decrease in humidity creates favorable conditions for the penetration of viruses into the human body, in force cooling and dryness of the respiratory tract :

High-risk groups are

children

elderly people

High-risk groups are

pregnant women

people with chronic diseases

of the heart,

lungs.

Pathophysiology

- Binding and destruction of epithelial cells from nasopharynx to alveoli

pathogenesis

Portal of entery to the influenza virus are cells of the ciliated epithelium of the upper respiratory tract - the nose, trachea, bronchi.

In these cells, the virus multiplies and leads to destruction and death.

This explains the irritation of the upper airway cough, sneezing, nasal congestion.

Getting into the blood and causing viremia, the virus has a direct, toxic effect, manifesting itself in the form of fever, chills, myalgias, headache.

In addition, the virus increases vascular permeability, causes the development of stasis and plasma-hemorrhages.

It can cause depression and protective systems, which makes joining a secondary infection and complications.

Pathogenesis:

Entrance gate: mucous membranes
upper respiratory tract

Phases of the pathological process:

1 phase - Reproduction of the virus in the cells of organs respiratory system

Phase 2 - Viralemia, toxic and toxic-allergic Of the reaction of the macroorganism

Phase 3 - Development of inflammatory processes In the respiratory system

Phase 4 - The onset of bacterial complications (pneumonia)

Phase 5 - Reverse development of the pathological process

In the basis of the defeat of various organs and systems with influenza, the leading role is played by circulatory disorders, caused by disturbances in the tone, elasticity and permeability of the vascular wall, primarily the capillaries.
Increased permeability of the vascular wall leads to a violation of microcirculation and the emergence of hemorrhagic syndrome (nasal bleeding, hemoptysis, and in severe course - hemorrhage into the substance and membranes of the brain, into the alveoli, which is manifested by the syndrome of infectious-toxic encephalopathy or hemorrhagic toxic pulmonary edema).

By type:

1. Typical
2. Atypical
(afebrile,
acatarrhal and fulminant)

By gravity:

1. Midl form.
2. Moderate form.
3. Severe (toxic) form

Develops respiratory toxicosis of 3 degrees:

I degree - compensated,
II degree - subcompensated,
III degree - uncompensated

Severity criteria:

severity of the intoxication syndrome
severity of local changes

The incubation period

can range from a few hours to 3 days, usually 1-2 days.

The severity of the disease ranges from mild to severe forms of hypertoxic.

Some authors indicate that the typical influenza infection usually begins with a sudden rise in body temperature (up to 38°C - 40°C), which is accompanied by the usual symptoms of intoxication: fever, muscle pain, headache, fatigue and lasts 3-4 days.

CLINIC

The duration of the incubation period for influenza is 12-48 hours. Typical flu begins acutely. During the first 2 days, a picture of infectious toxicosis develops: the body temperature rises to 39-40 ° C, anorexia, anxiety or weakness, sleep disturbance, often delirium, hallucination, short-term seizures, vomiting, and headache are observed. These symptoms are due to the reaction nervous system to toxic action of influenza virus.

Simultaneously with fever, general weakness, fatigue, weakness, increased sweating, muscle pain, severe headache with a characteristic localization in the frontal region and superciliary arches appear.

Appear pain in the eyeballs, aggravated by the movement of the eyes or when pressing on, them,

photophobia, lacrimation.

Nasal discharge, usually have, in contrast, have expressed the feeling of dryness in the nose and throat.

Usually there is a dry, intense coughing accompanied by pain behind the breastbone.

When smooth flow of these symptoms persist for 3-5 days, and the patient is recovering, but a few days lingering feelings expressed fatigue, especially in older patients. In severe forms of influenza develops a vascular collapse, cerebral edema, hemorrhagic syndrome, joined by secondary bacterial complications. Clinical findings on objective research is not marked - only redness and swelling of the mucous throat, pale skin, injected sclera. It should be noted that the flu is very dangerous due to the development of serious complications, especially in children, the elderly and debilitated patients.

Uncomplicated course flu short (5-7days),
temperature reaction lasts no more than
4-5 days, maximum severity of toxicosis
lasts no more than 2-3 days.

In addition to general toxic symptoms at the height of the disease, mild meningeal symptoms (stiff neck, Kernig, Brudzinsky symptoms) may appear, which disappear after 1-2 days.

There are no pathological changes in the cerebrospinal fluid.

Complications of flu

The incidence of complications of the disease is relatively low, but in the case of their development, they can pose a significant danger to the health of the patient. Moderate, heavy and hypertoxic form of flu can cause serious complications.

Causes of complications of the flu may include the following features of infection: influenza virus has a marked effect capillary toxic, is able to suppress the immune system destroys the tissue barriers, thereby facilitating the aggression of tissues resident flora.

Complications related directly to the flu

Hemorrhagic swelling lung, meningitis, meningoencephalitis (serous), infectious toxic shock

Complications associated with the accession of a secondary bacterial infection

Pneumonia, otitis, sinusitis, glomerulonephritis, purulent meningitis and encephalitis, septic conditions

There are several main types of complications of the flu:

***Pulmonary*: *bacterial* pneumonia, hemorrhagic pneumonia, the formation of an abscess of lung, education empyema, respiratory distress syndrome.**

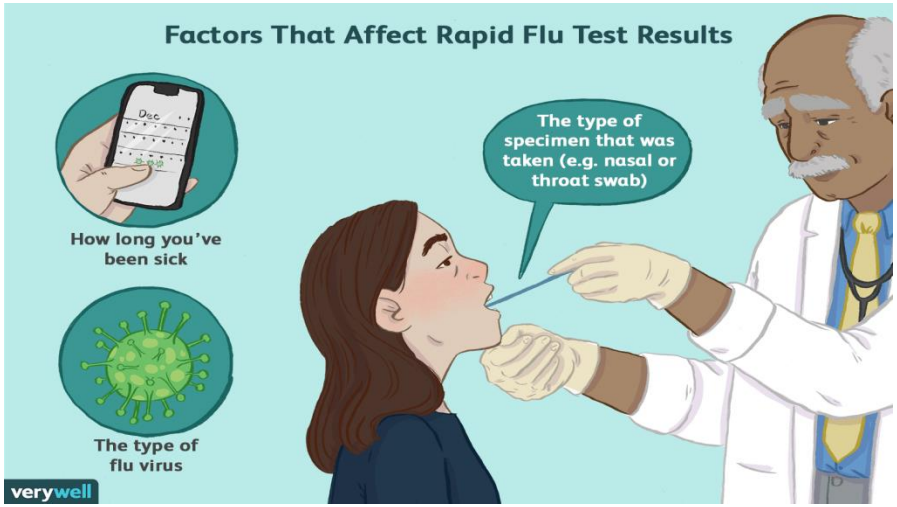
***Extrapulmonary*: *bacterial rhinitis, sinusitis, otitis, racheitis*, viral encephalitis, meningitis, optic neuritis, radiculoneuritis, liver Reye's syndrome, myocarditis, toxic and allergic shock.**

In most cases of the flu deaths occur among children under 2 years and elderly people over 65 years

Diagnosis

Diagnosis of the flu is a typical clinical picture: the sudden rise in temperature should immediately consult a doctor. A visit to the doctor will allow us to identify the risk of possible bacterial complications. In the diagnosis of influenza great attention is paid to re-elevated temperature, in particular with a sharp, as well as increased cough, a general deterioration of health after starting to improve - usually with influenza like events appear on the 4-5th day of illness.

In this case, the doctor directs to perform laboratory and functional studies of how common blood test, X-rays of the sinuses, chest X-ray and others.



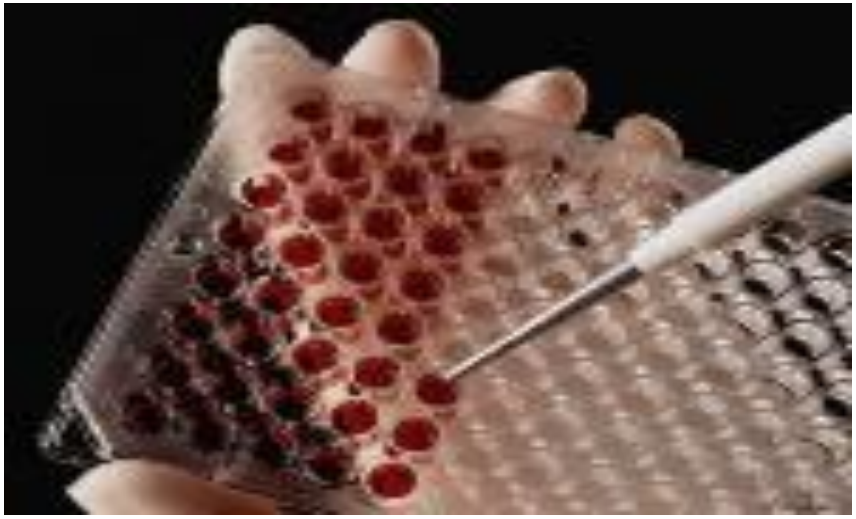
Diagnostics and laboratory diagnostics

Reference diagnostic signs of influenza:

- Epidemic rise in morbidity in the winter-spring period;
- Acute, sudden onset
- Severe intoxication syndrome in I-II day of illness
- Severe (39 ° C and above) fever in the I-II day of the disease
- Moderate catarrhal syndrome, on II - III day of illness

Express diagnostics - immunofluorescence method and enzyme immunoassay

Serologic methods for diagnosis require comparison of antibody titers in sera obtained during the acute illness with those in sera obtained 10–14 days after the onset of illness and are useful primarily in retrospect. Fourfold or greater titer rises as detected by HI or CF or significant rises as measured by ELISA are diagnostic of acute infection.



Virological methods - virus isolation in developing chicken embryos.

The patient's blood - leukopenia, lymphocytosis, ESR is normal.

Differential diagnosis:

WITH ACUTE RESPIRATORY VIRAL INFECTIONS OF NON-INFLUENZA ETIOLOGY:

1. parainfluenza
2. adenoviral infection
3. PC infection
4. rhinovirus infection
5. reovirus infection.

Leading clinical symptom

with flu - intoxication,

at 1, 2,3,4 - catarrhal,

PC infection - respiratory failure.

SYMPTOMS	COLD	FLU
ONSET	SLOW, days	SUDDEN, hours
FEVER	RARE, low	COMMON, high
HEADACHE	RARE, mild	COMMON, severe
BLOCKED NOSE	COMMON	OFTEN
DRY COUGH	COMMON	OFTEN
CHEST PAIN	NO or mild	OFTEN
MUSCLE PAINS	NO or mild	COMMON
TIREDNESS	NO or mild	COMMON
DURATION	7-10 DAYS	3-7 DAYS

TREATMENT

Treatments for influenza include a range of medications and therapies that are used in response to disease influenza.

Treatments may either directly target the influenza virus itself; or instead they may just offer relief to symptoms of the disease, while the body's own immune system works to recover from infection.

WHO recommends that persons suffering from influenza infections:

Stay at home

Get plenty of rest

Drink a lot of liquids

Do not smoke or drink alcohol

Consider over-the-counter medications to relieve flu symptoms

Consult a physician early on for best possible treatment

Remain alert for emergency warning signs

Warning signs are symptoms that indicate that the disease is becoming serious and needs immediate medical attention. These include:

Difficulty breathing or shortness of breath
Pain or pressure in the chest or abdomen
Dizziness
Confusion
Severe or persistent vomiting

In children other warning signs include irritability, failing to wake up and interact, rapid breathing, and a blueish skin color.

Another warning sign in children is if the flu symptoms appear to resolve, but then reappear with fever and a bad cough.

Symptom(s)	Medicine
fever, aches, pains, sinus pressure, sore throat	analgesics
nasal congestion, sinus pressure	decongestants
sinus pressure, runny nose, watery eyes, cough	antihistamines
cough	cough suppressant
sore throat	local anesthetics

Bed rest for an acute period (at least 3-5 days).
Hospitalization (severe flu and small children).
Diet - preferably dairy and vegetable food, rich in vitamins, drink lot of warm fluids

antipyretics in the treatment of influenza

The main antipyretic drugs for both adults and children include ibuprofen and paracetamol. In children, the appointment of these drugs is advisable only with an increase in temperature of 38.0 C or higher.

Paracetamol is prescribed in a dose of not more than 30 mg per 1 kg of body weight, breaking 3-4 times a day, ibuprofen 60 mg per 1 kg of body weight, also breaking 3-4 times a day. For children older than 1 year, the drug is given in the form of a suspension, up to 1 year - in the form of rectal suppositories.

In adults, paracetamol is prescribed at a dose of 500 mg 3 times a day, and ibuprofen - 200 mg 2-3 times a day. However, usually in order to bring down the temperature of one tablet is enough. Repeated administration of the drug in this case is not required.

Symptomatic treatment

To relieve nasal breathing apply vasoconstrictor agents.
However, many such tools dry and destroy the mucous membrane.
A large variety of over-the-counter “cold and flu” drugs offered by almost all large firms do not act on viruses and do not shorten the duration of the illness.
These are all possible combinations of antipyretic, expectorant, antihistamine preparations, vitamins, which some what alleviate the condition of patients, but do not have proven effectiveness against the flu.
Aggressive advertising of such drugs usually includes cautious claims regarding efficacy, for example, the product is advertised not as a “cold medicine”, but as “used for a cold”.

Antivirals

In general, the beginning of antiviral treatment should be started before the onset of clinical symptoms of influenza, delayed their admission virtually ineffective.

The two main classes of antiviral drugs used against influenza are neuraminidase inhibitors, such as zanamivir and oseltamivir, or inhibitors of the viral M2 protein, such as amantadine and rimantadine.

These drugs can reduce the severity of symptoms if taken soon after infection and can also be taken to decrease the risk of infection.

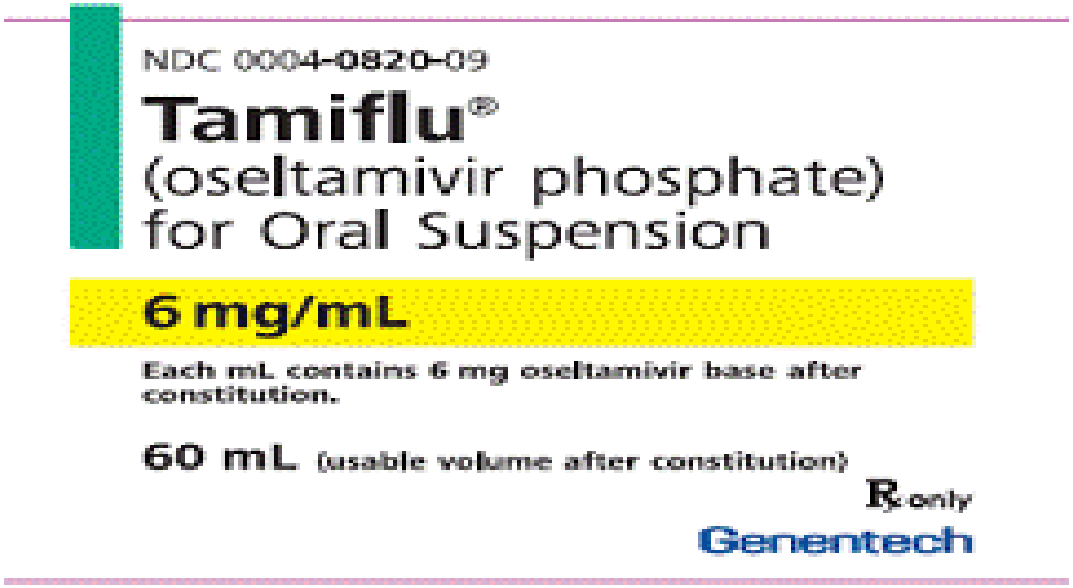
However, virus strains have emerged that show drug resistance to both classes of drug.

Only these medicines have proved clinical effect for influenza treatment:
Oseltamivir 75 mg - 2 times daily in capsules for 5 days.
Zanamivir 10 mg - 2 times daily ingalations for 5 days.

Two other antiviral medicines Rematadine and Amantadine were used in past and are not effective now because of viral resistance.

Neuraminidase inhibitors

Neuraminidase inhibitors are effective against many strains of influenza, including avian :
Inhibit the spread of the virus in the body, reduce the severity of symptoms, reduce the duration of disease and reduces the incidence of secondary complications.
However, there is evidence that the said drugs cause a number of side effects such as nausea, vomiting, diarrhea, and mental disorders impairment of consciousness, hallucinations, psychoses.



Immunoglobulins

Studies showed that a distinct antiviral and therapeutic effect in influenza have only donor serum and influenza gamma globulin having high titers of antibodies.

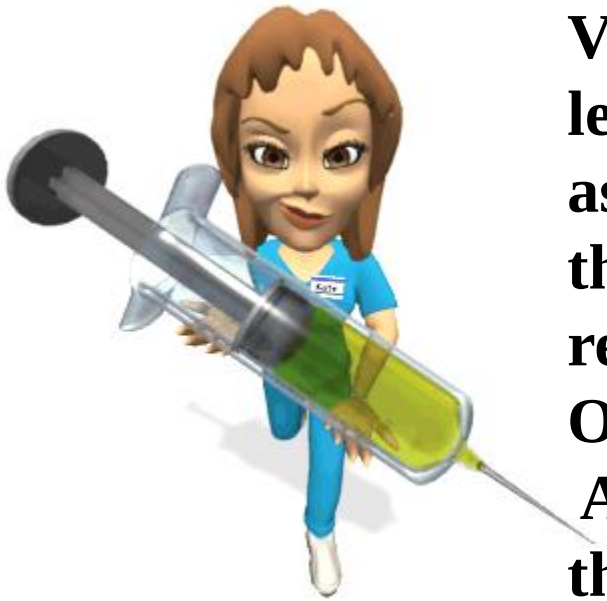
Gamma globulin should be administered as possible at an earlier date intramuscularly:

the children of 0.15-0.2 ml / kg for adults and 6 ml. In the same dosages can be used normally (placental) and gamma globulin serum poliglobulin

Prevention

The traditional way to prevent the flu, recommended by the World Health Organization is vaccination.

Prevention of influenza is the most effective management strategy. Influenza A and B vaccine is administered each year before flu season. Traditionally, the vaccine is trivalent (i.e., designed to provide protection against 3 viral subtypes, generally an A-H1, an A-H3, and a B).



Vaccination is carried out corresponding to the leading influenza vaccine strains and contains, as a rule, antigens of three influenza strains that are selected on the basis of the recommendations of the World Health Organisation.

A vaccine for the prevention of influenza in the form of live, killed (inactivated), subunit vaccine.

Vaccination is a particularly at-risk groups - children, the elderly, patients with chronic diseases of the heart and lungs, as well as doctors.

Usually it occurs when an epidemiological forecast shows the usefulness of events (usually in mid-autumn).

There's also a second vaccination in the middle of winter

As a non-specific prevention in the room where the sick with influenza, wet cleaning is carried out using any disinfectant having virucidal activity.
To disinfect the air using ultraviolet radiation, aerosol disinfectants and catalytic air purifiers. Sneezing and coughing patients are dangerous to others. Prevention of influenza must include their removal from public places (by appeals to be conscious).

PARAINFLUENZA

Etiology.

Human Parainfluenza viruses (HPIVs) are paramyxoviruses of the family *Paramyxoviridae*. 144

Their pathogenic spectrum includes upper and lower respiratory tract infections:

- **common cold with fever,**
- **laryngotracheobronchitis (croup),**
- **bronchiolitis,**
- **and pneumonia.**

HPIVs are one of the most frequent causes of community-acquired respiratory tract infections of variable severity in adults.

Transmission

Human parainfluenza viruses (HPIVs) usually spread from an infected person to others through—

- the air by coughing and sneezing,
- close personal contact, such as touching or shaking hands, and
- touching objects or surfaces that have HPIVs on

Pathogenesis.

HPIV transmission occurs via direct inoculation of contagious secretions from the hands or via large-particle aerosols into the eyes and nose.
Prolonged survival of HPIV on skin, cloth, and other objects emphasizes the importance of fomites in nosocomial spread.
Respiratory epithelium appears to be the major site of virus binding and subsequent infection.
Although immunity to HPIV infection is long-lasting, reinfection may occur many times throughout life and at variable intervals, even in the presence of neutralizing antibodies.

Clinical features.

The incubation period of HPIV infection generally lasts 1-7 days. Patients with HPIV infection typically present with a history of coryza and low-grade fever; they then develop the classic barking cough. On physical examination, HPIV infection is associated with a broad range of findings, which may include fever, nasal congestion, pharyngeal erythema, nonproductive to minimally productive cough, inspiratory stridor, rhonchi, rales, and wheezing. Systemic flulike symptoms are not common in HPIV-infected patients, but adult patients more frequently present with flulike symptoms compared with children.

Diagnosis.

The white blood cell count is usually normal; however, lymphocytosis may be noted. The diagnosis of HPIV infection can be confirmed in either of the following 2 ways:

1) Isolation and identification of the virus in cell culture or direct detection of the virus in respiratory secretions by means of immunofluorescent assay, enzyme-linked immunosorbent assay (ELISA), or polymerase chain reaction (PCR) assay;

2) Demonstration of a significant rise in specific immunoglobulin G (IgG) antibodies between appropriately collected paired serum specimens

or in specific immunoglobulin M (IgM) antibodies in a single serum specimen.

Differential diagnosis:

adenoviruses, atypical pneumonia, influenza.

Treatment.

No specific antiviral agents have been established as beneficial for treating human parainfluenza virus (HPIV) infections; however, ribavirin is sometimes given. Ribavirin appears safe but is expensive. Its efficiency and effectiveness have not been clearly demonstrated in large, randomized, placebo-controlled trials. At present, routine use of ribavirin cannot be recommended.

Rest until disease is fully resolve, fluids in the case of intoxication, acetaminophen against temperature.

Anti-inflammatory drugs help reduce the inflammation in case of croup.

Prevention.

Currently, there are no effective vaccines for prevention of infections by HPIVs.

To prevent the spread of infection, the same rules for the cold or flu apply: Wash hands after coming in contact with someone who has a cold or the flu.

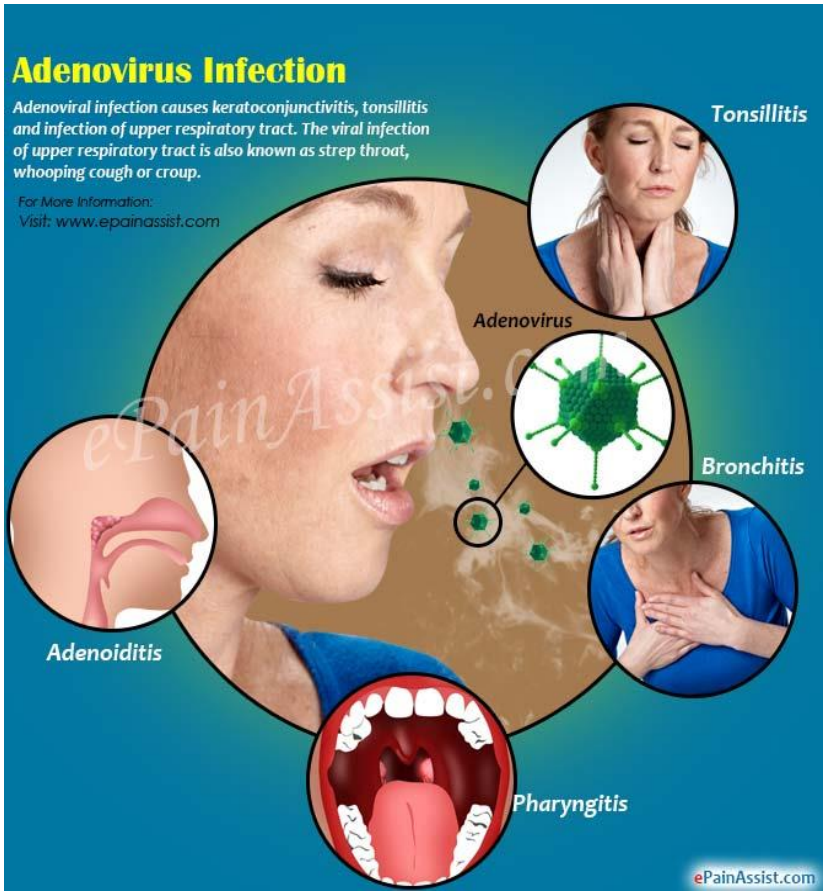
ADENOVIRUS INFECTIONS

Infectious disease, belongs to the group of respiratory viral infections, affects the mucous membranes of the

respiratory tract,

organs of vision,

intestines and lymph nodes



ADENOVIRUS INFECTIONS

Etiology

Adenoviruses are DNA viruses often found in human and animal populations. They survive long periods outside a host, and stay endemic throughout the year. Possessing 52 serotypes, adenovirus is recognized as the etiologic agent of various diverse syndromes.

Pathogenesis.

The site of entry generally determines the site of infection; respiratory tract infection infections result from droplet inhalation, while gastrointestinal tract involvement results from fecal-oral transmission. After acute adenovirus infection there may be chronic or latent infection, the exact mechanism of which is unknown, which frequently involves asymptomatic infection of lymphoid tissue.

High contagiousness of adenovirus is facilitated by very high levels of viral particles in the sputum or oral secretions of infected adults.

Transmission:

1)Aerosol droplets.

2)Fecal-oral route.

3)Direct inoculation of conjunctivas by tonometer or fingers.

Clinical features.

The major clinical variants of adenovirus infection include:
acute respiratory disease (ARD),
pharyngoconjunctival fever,
epidemic keratoconjunctivitis,
acute hemorrhagic cystitis and gastroenteritis
atypical adenovirus pneumonia.

Adenovirus infections may be dangerous and have special clinical features in immunocompromised hosts.

***Acute respiratory disease*.** Fever, rhinorrhea, cough, and sore throat, usually lasting 3-5 days, are typical symptoms of adenoviral ARD.

Pharyngoconjunctival fever. The classic presentation is characterized by fever, sore throat, coryza, and red eyes. Upper respiratory tract symptoms may precede ocular findings or may be absent.

***Epidemic keratoconjunctivitis*.** Highly contagious, with approximately 10% transmission in household contacts via hands. After a 5-8 days incubation period, an insidious onset of unilateral red eye occurs, spreading to involve both eyes. Patients have photophobia, tearing, and pain (indicating corneal involvement).

Gastroenteritis. Fever and watery diarrhea are usually limited to 1-2 weeks.

A severe Adenoviral Infection

Diagnosis. Antigen tests based on indirect immunofluorescence assays may be used for direct examination of tissue specimens. Serology is not always useful in clinical practice: a 4-fold rise in acute titers to convalescent titers is diagnostic.

PCR is being used with high specificity on various specimens (respiratory, tissue, urine, blood) to identify adenovirus.

Treatment. Currently, specific therapy for adenovirus infection, other than supportive and symptomatic treatment, is not recommended. Most infections are self-limited in the setting of a normal immune response. Treatment of adenovirus infections in immunocompromised patients is widely discussed.

Prevention. Vaccination against certain strains of adenovirus exists but has been limited in most countries because of the increased risk of clinically significant disease and potential for hospitalization. Effective isolation procedures, handwashing and hygiene may prevent the spread of adenovirus.

is an acute viral disease characterized by moderate intoxication and damage to the lower parts of the respiratory system, with frequent development of bronchitis, bronchiolitis, pneumonia.

Respiratory syncytial virus are the cause of infections that cause seasonal lower respiratory infections, especially in young infants. The disease can be asymptomatic, mild or severe, including bronchiolitis and pneumonia.

Although the diagnosis is usually clinical, laboratory diagnosis is acceptable.

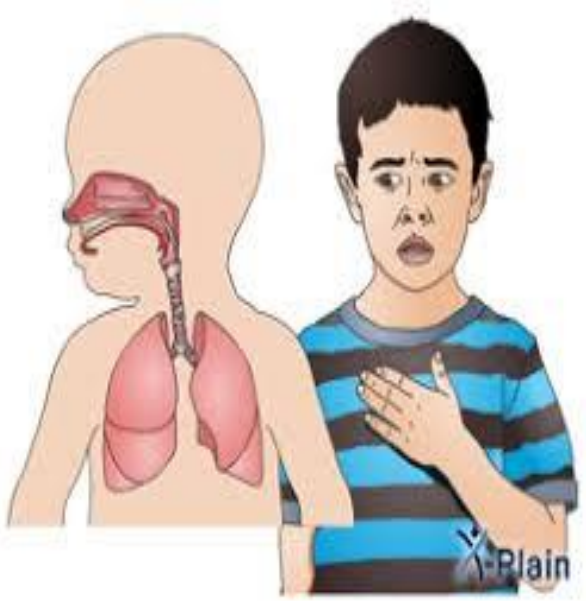
The treatment is supportive.

RESPIRATORY SYNCYTIAL VIRUS INFECTION

Etiology

Respiratory syncytial virus (RSV) is one of the major causes of lower respiratory tract illness. RSV belongs to the family *Paramyxoviridae*. RSV is a medium-sized RNA virus. Most frequent RSV clinical manifestations are bronchiolitis, pneumonia, tracheobronchitis.

Pathogenesis.



Infection with RSV is primarily acquired through close contact with an infected individual or direct inoculation into the eyes and nose of infectious secretions. RSV replicates in respiratory epithelium. Spread of the virus down the respiratory tract occurs through cell-to-cell transfer of the virus along intracytoplasmic bridges (syncytia) from the upper to the lower respiratory tract.

Clinical features. The illness may begin with upper respiratory symptoms and progress rapidly over 1-2 days to the development of diffuse small airway disease characterized by cough, coryza, wheezing and rales, low-grade fever. Among healthy adults RSV infection is symptomatic in 84% and 22% have lower respiratory tract manifestations (pneumonia or bronchiolitis). In comparison to influenza infection occurring in these same individuals, fever is less frequent, but earache and sinus pain and a persistent productive cough are significantly more common with RSV infection.

Diagnosis. Secretions can be analyzed for RSV in the laboratory by means of culture, antigen-revealing techniques, or polymerase chain reaction (PCR).

Treatment. For most of the patients symptomatic care has to be given, fever control, and adequate fluid intake. In case of immunocompromised patients (i.e. transplant recipients, chemotherapy patients) RSV-immunoglobulin may be prescribed. One of the new treatment possibilities for immunocompromised patients with RSV is palivizumab, a humanized monoclonal antibody directed against the F (fusion) protein of RSV.

Prevention. Special preventive measures against RSV are not indicated for healthy adults.

A runny nose or congested nose

Dry cough

Fever

Low-grade fever

Sore throat

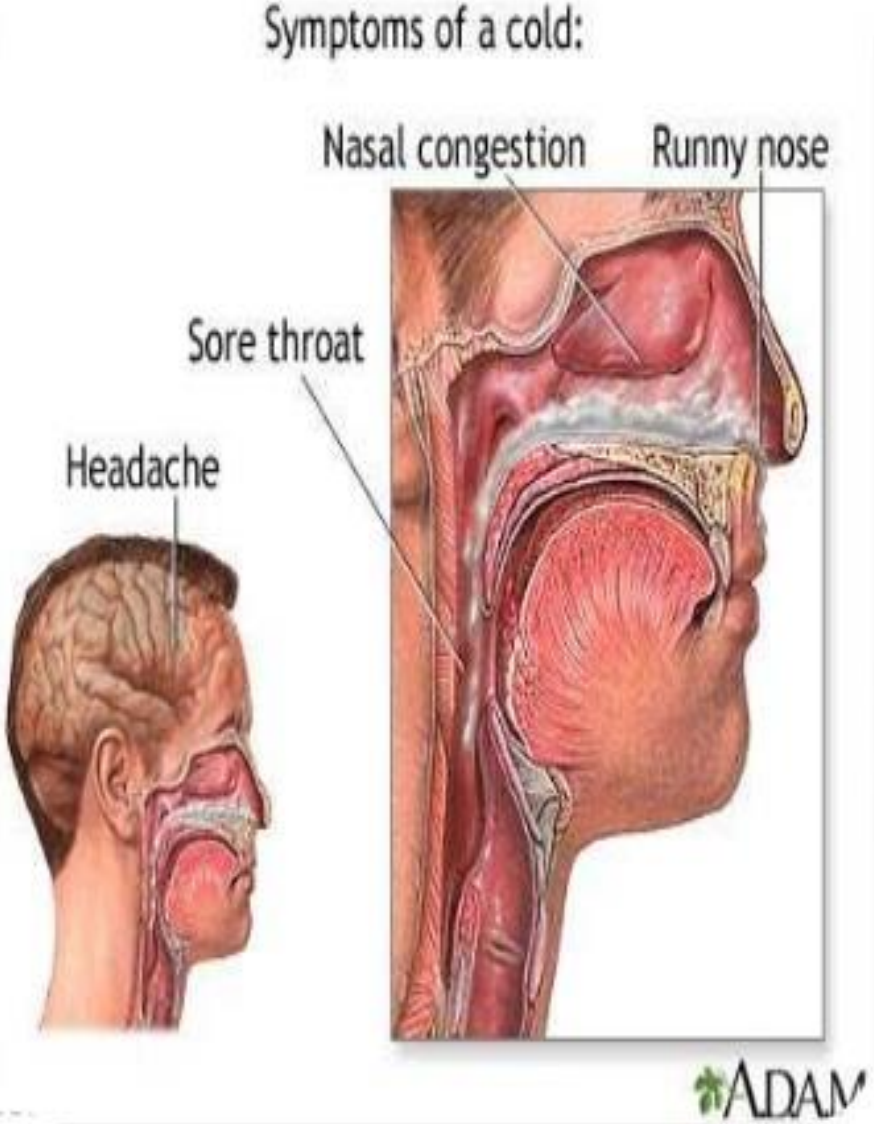
Symptoms Of Respiratory Syncytial Virus

RHINOVIRUS INFECTION

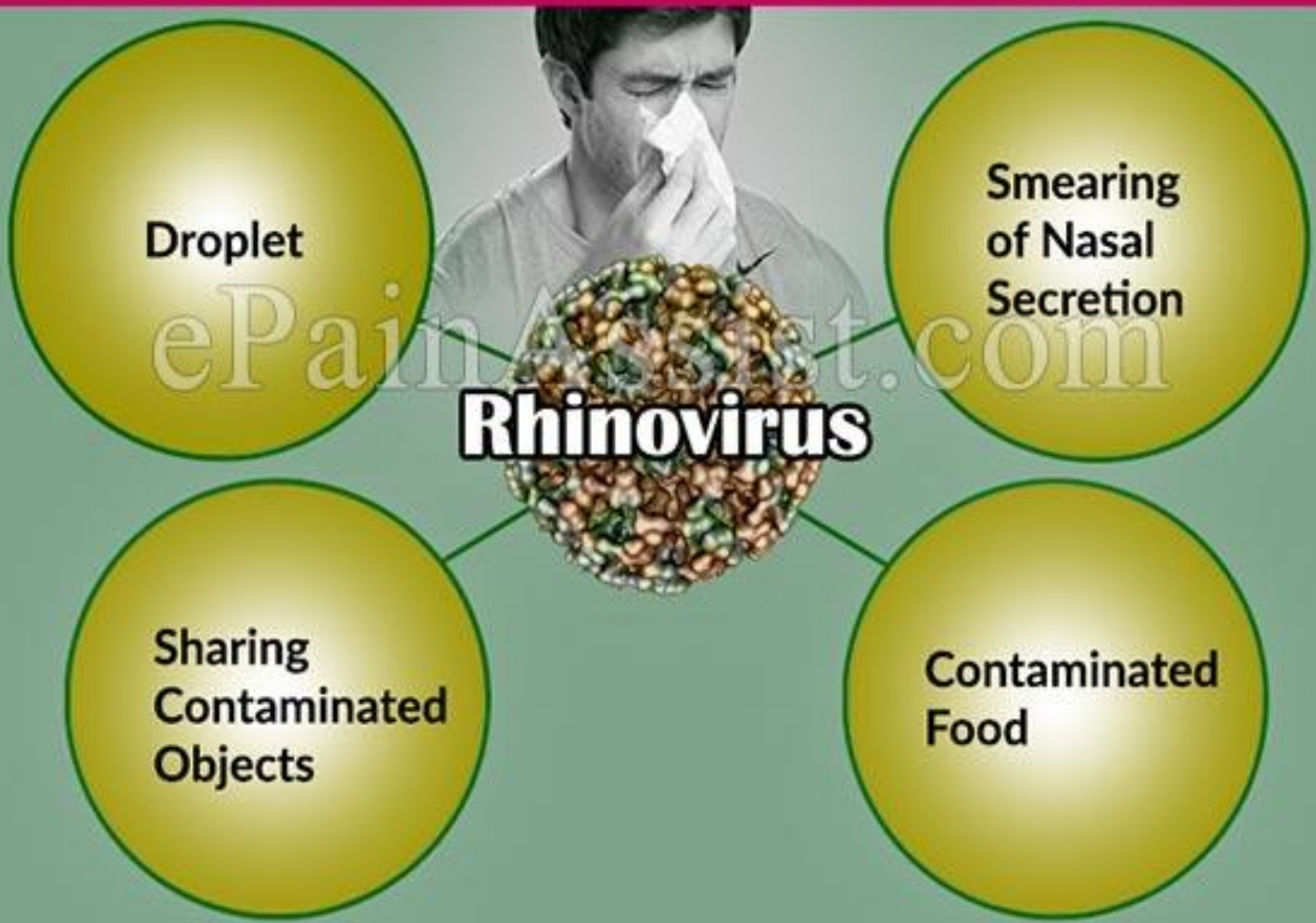
- Rhinoviruses (from the Greek (gen.) "nose") are the most common viral infective agents in humans and are the predominant cause of the common cold. Rhinovirus infection proliferates in temperatures between 33–35 °C (91–95 °F), and this may be why it occurs primarily in the nose. Rhinovirus is a species in the genus Enterovirus of the **Picornaviridae family of viruses.**

Transmission of Rhinoviruses

- There are two modes of transmission: via aerosols of respiratory droplets and from contaminated surfaces, including direct person-to-person contact.



Spread of Rhinovirus Infection



Pathogenesis - Rhinoviruses

- Entry through Respiratory tract.
- Nasal Mucosa, can infect Lower Respiratory tract.
- Chilling, wearing wet cloths do not produce infection.
- But common cold starts with chills.
- Local inflammation and cytokines may be responsible for the symptoms of common cold.
- Interferon production occurs early and specific antibody appears in nasal secretions

Clinical features

The incubation period is 12-72 hours.

Nasal dryness or irritation may be the first symptom of RV infection.

A sore throat or throat irritation is also a common initial symptom and is frequently the most intense of the early symptoms.

This is followed by nasal discharge, nasal congestion, and sneezing, which intensify over the next 2-3 days.

Nasal secretions typically become thicker and colored after the first few days of illness. Other associated complaints include headache, facial and ear pressure.

Systemic signs and symptoms, such as fever and malaise, are unusual.

Diagnosis.

If findings from a thorough history and physical examination are consistent with a viral etiology and no complications are noted, an additional laboratory workup is rarely necessary.

Treatment

Rhinovirus infections are predominantly mild and self-limited; thus, treatment is generally focused on symptomatic relief and prevention of person-to-person spread and complications. Symptomatic treatment with analgesics, decongestants, antihistamines usually needed.

Prevention.

Because infection is spread by hand-to-hand contact, autoinoculation, and, possibly, aerosol particles, it is important to emphasize appropriate handwashing, avoidance of finger-to-eyes or finger-to-nose contact.

TREATMENT

- Rhinovirus infections are predominately mild and self-limited:

  thus, treatment is generally focused on symptomatic relief and prevention of person-to-person spread and complications.

The mainstays of therapy include:

- **Rest,**
- **Hydration,**
- **Antihistamines,**
- **Nasal decongestants**

- Antibacterial agents are **not effective** unless bacterial superinfection occurs.