Ebola fever.
Every pediatrician must know that.

- What is the Ebola fever in children?

It is an acute zoonotic disease, a viral hemorrhagic fever with pronounced hemorrhagic syndrome characterized by high mortality. It is an extremely dangerous viral infection (V.I. Pokrovskiy, 2007).

- What are the virus's routes of transmission?

Endophilic rodents (mice, rats etc.), guenons and some species of bloodsucking bats are considered the virus's natural reservoir. Transmission may occur during patient care, via household articles, filthy hands and medical instruments. A diseased poses a threat to other people regardless of his/her age and stage of the disease. The highest incidence rate is observed in spring and summer. Suppressed and subclinical forms of the disease are observed in endemic regions; 7-10% of children and adults feature Ebola virus antibodies.
Ebola virus is prevalent in the Western and Central African countries (Democratic Republic of the Congo, Senegal, Sudan, Nigeria, Ethiopia, Gabon, Cameroon and the Central African Republic). Virus outbreaks are observed in other countries as well, e.g., Spain, USA, Turkey.
The fever is caused by *Ebolavirus* (genus: *Marburgvirus*, family: *Filoviridae*) with a branching, filamentous, spider-shaped virion of up to 12,000 nm in length. The genome structure is represented with unispiral negative RNA surrounded with a lipoprotein membrane. 4 Ebola virus serotypes are distinguished depending on glycoprotein antigenicity; 3 of them cause human diseases of various severity (Ebola-Zaire – EBO-Z, Ebola-Sudan – EBO-S and Ebola-Ivory Coast – EBO-CI). Moderate environmental resistance. The virus may be affected by the humidity level, exposure to sunlight and ambient temperature.

- How does the Ebola virus enter the body?

The infection's sites of entry are mucosae of the upper airways and damaged skin. The virus is characterized by rapid generalization of the infection, development of general intoxication and thrombohemorrhagic syndrome. Acute disease onset is characterized by body temperature increase up to fever and coincides with development of intensive viremia and multiple organ dissemination of the causative agent.

- What are signs and symptoms of the Ebola virus in children?

The incubation period in children varies from several days to 2-3 weeks. The disease is characterized by acute onset with body temperature increase up to fever, severe headache, myalgiae and arthralgiae, abdominal pains and nausea. Children may feature sunken eyes and amimic face as early as in the beginning of the disease.
Most patients develop dry cough and stabbing chest pains within the first days of the disease. Intractable emesis, abdominal pains, gastric and intestinal hemorrhages, hemorrhages at sites of injections and damaged skin, mucosal bleeding and conjunctival hemorrhage develop at the height of the disease. Signs of dehydration develop in patients in the setting of the aforementioned symptoms at hemorrhagic fever. Maculopapular rash occurs after that; skin flaking is observed after the rash disappears. Neurological symptoms are observed; patients become somnolescent and obtunded and have confused mental state; however, in some cases patients experience psychomotor agitation and become aggressive. Fatal outcome usually occurs in the second week of the disease; it is caused by hemorrhagic, hypovolemic and toxic shock

syndromes. Reconvalescence usually lasts for 2-3 months; it is characterized by pronounced asthenization, anorexia, cachexia and mental disorders.

- How to diagnose the disease in children?

The disease does not feature any specific symptoms. The disease may be suspected in the presence of pyretic fever, multiple organ failure, hemorrhagic and neurological symptoms in a child. Anamnesis is based on anamnestic data (child's stay in endemic countries, contact with persons diseased with Ebola fever or similar diseases), clinical pattern and results of a clinical laboratory examination.

Specific laboratory diagnosis includes virological and serological methods. The virus is extracted from the patient's upper airways, blood and urine. Electron microscopic study of skin and visceral biopsy specimens is performed. All studies are carried out at special biosafety level IV laboratories.

Non-specific laboratory diagnosis includes complete blood count (for anemia and leukopenia), biochemical blood test (for increase in aminotransferase, amylase and azotemia levels), coagulogram, clinical urine analysis (proteinuria is typically observed), acid-base composition of the patient's blood. Instrumental examination methods employed in the event of suspected Ebola fever include electrocardiography, chest radiography, as well as abdominal and renal ultrasonography. If Ebola fever is suspected, the child is to be immediately hospitalized and isolated.

- Are there any methods of treating the disease in children?

No etiotropic therapy of the disease has been developed yet. Immune plasma taken from Ebola fever convalescents is administered if the diagnosis is confirmed. Treatment of toxic shock, hemorrhagic and hypovolemic syndrome mainly involves pathogenetic and symptomatic therapy. The child must remain at the healthcare facility under doctoral supervision around the clock.

- How can the disease be prevented?

No specific preventive methods have been developed yet. Non-specific preventive methods include placement of patients to special isolators; plastic or metal-glass isolation boxes equipped with an autonomous life-support system are desirable. When transported, patients are also placed into special transport isolators. The medical personnel must observe the standard precautions at all times when handling patients regardless of the tentative diagnosis. Individual protective clothing must be used in order to avoid droplet transmission of the infection (gauze veils or respirators, goggles, gloves, protective suit); hand hygiene, injection safety, thorough sterilization of syringes, needles and instruments at healthcare facilities, as well as safe burial of dead bodies must be observed.

Medical personnel handling patients with suspected or confirmed Ebola virus infection must take additional infectious control measures in order to avoid contact with the patient's blood and bodily fluids, as well as the patient's filthy surfaces and materials, including clothing and bedding. Laboratorians are also at risk. Specially trained personnel and properly equipped laboratories are required to work with biological fluids taken from humans and animals.

All the diseased persons with suspected Ebola fever in endemic foci must be isolated and monitor the humans and animals the diseased had come in contact with.

According to the Centers for Disease Control and Prevention (CDC), frequent hand washing or use of an alcohol-based disinfectant is the main precaution. As West African residents do not observe hygienic and sanitary precautions, Ebola virus continues to spread.

- What is the disease prognosis?

The disease prognosis is unfavorable; mortality may be as high as 50-90%. In favorable cases the recovery takes up a long period of time, up to several months. The immunity of convalescents is durable; reinfection occurs in no more than 5% of the cases.

- What does the World Health Organization (WHO) do about the Ebola fever?

The WHO aims to prevent Ebola outbreaks by carrying out epidemiological surveillance over the Ebola virus-induced disease and supporting the countries at risk, including assistance in disease preparedness planning. If an outbreak is detected, the WHO reacts by providing assistance in epidemiological surveillance, treatment, laboratory diagnosis and monitoring of exposed persons. The WHO has prepared methodological recommendations on prevention and control of the Ebola virus infection (Interim Infection Prevention and Control Guidance for Care of Patients with Suspected or Confirmed Filovirus Haemorrhagic Fever in Health-Care Settings, with Focus on Ebola, 2014: 24 p. (http://www.who.int/csr/resources/publications/ebola/filovirus_infection_control/en/).