EDITORIAL

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THE TREATMENT OF CHILDREN INFECTED WITH COVID-19 IN A NON-CORE HOSPITAL

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According to the World Health Organization (WHO), viral diseases form serious public health problem. WHO announced that the disease caused by the new virus named "coronavirus disease 2019" or "Coronavirus disease 2019" (COVID-19), and the virus causing the infection was named SARS-Cov-2 by the International Committee on Taxonomy of Viruses. Children usually have asymptomatic or mild forms. However, children with comorbidity are in risk of developing severe forms of COVID-19. The review presents modern ideas about the amount of laboratory tests in cases of suspected presence of the SARS-CoV-2 virus, methods of radio diagnostic (computer tomography, x-ray, thorax ultrasound), features of the clinical course of infection in children depending on the severity of the of infection and indicated detailed criteria for severe forms of coronavirus infection. Special attention is focused on the clinical monitoring of children in a non-core hospital: the detection of leukopenia and lymphopenia, CRP level control, monitoring of coagulation disorders, providing tests on other respiratory viruses. Specific recommendations, comprehensive to date, on the use of drugs for the treatment of children with COVID-19 upon admission to a non-core hospital are given. The organisational issues of treatment children infected with COVID-19 in a non-core hospital are described in details. Special attention is focused on the compliance of strict safety rules by staff working with infected patients entering and leaving the "Red" zone. Thus, the proper organisation of the units for the treatment of children infected with COVID-19 in a non-core hospital, taking into account the features of their disease, will make it possible to provide complete and high-quality treatment of infection during the pandemic.

Keywords: SARS-CoV-2; COVID-19; non-core hospital; coronovirus in children; treatment of COVID-19 in children.

ЛЕЧЕНИЕ ДЕТЕЙ, ИНФИЦИРОВАННЫХ COVID-19, В НЕПРОФИЛЬНОМ СТАЦИОНАРЕ

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По данным Всемирной организации здравоохранения (ВОЗ) вирусные заболевания представляют серьезную проблему для общественного здравоохранения. ВОЗ объявила, что заболевание, вызванное новым вирусом, представляет собой «коронавирусную болезнь 2019» или «CoronaVirus Disease 2019» (COVID-19), а вирусу, вызывающему инфекцию, Международный комитет по таксономии вирусов присвоил наименование SARS-CoV-2. Дети болеют в бессимптомной и легкой формах. Однако опасность развития тяжелого течения COVID-19 характерна для детей, имеющих сопутствующую патологию. В статье описаны современные представления об объеме лабораторных исследований при подозрении на наличие вируса SARS-CoV-2, способы и методы лучевой диагностики (компьютерная томогра-

фия, рентгенография, ультразвуковое исследование органов грудной клетки), приведены особенности клинического течения инфекционного поражения у детей в зависимости от степени тяжести протекания инфекции, подробно изложены критерии тяжелых форм коронавирусной инфекции. Особое внимание уделено вопросам клинического мониторинга детей при их нахождении в непрофильном стационаре: выявление лейкопении и лимфопении, оценка уровня С-реактивного белка, нарушений коагуляционных свойств крови, взятие мазков на другие респираторные вирусы. Даны исчерпывающие на сегодняшний день конкретные рекомендации по использованию лекарственных препаратов для лечения детей с COVID-19. Подробно описаны организационные вопросы лечения детей, инфицированных COVID-19, при поступлении в непрофильный стационар. Особое внимание уделено соблюдению персоналом строгих правил безопасности при работе с инфицированными пациентами при входе в «красную» зону и выходе из нее. Таким образом, правильная организация отделений для лечения детей, инфицированных COVID-19, в непрофильном стационаре с учетом особенностей течения их заболевания позволит обеспечить полноценную и качественную терапию инфекционного поражения в период пандемии.

Ключевые слова: SARS-CoV-2; COVID-19; непрофильный стационар; коронавирус у детей; лечение COVID-19 у детей.

According to the World Health Organization (WHO), viral diseases pose a serious public health care problem. Over the past 20 years, several viral epidemics have been reported, such as severe acute respiratory coronavirus syndrome (SARS-CoV) in 2002–2003, H1N1 influenza in 2009, and Middle East respiratory coronavirus syndrome (MERS-CoV) in 2012 [6].

On December 31, 2019, the WHO in China first reported cases of unexplained lower respiratory infections in Wuhan, the largest metropolis in the Chinese province of Hubei. Because the causative agent was not identified, the first cases were classified as pneumonia of unknown etiology. The Chinese Center for Disease Control and Prevention has established that the occurrence of pneumonia of unknown etiology is associated with a pathogen from the coronavirus (CoV) family. On February 11, 2020, WHO Director General Tedros Adhanom Ghebreyesus announced that the disease caused by the new virus was "coronaviral disease 2019" or "coronavirus disease 2019" (COVID-19).

The virus causing COVID-19 was named SARS-CoV-2 by the International Committee on Taxonomy of Viruses. SARS-CoV2 is not highly resistant to the external environment and is sensitive to major disinfectants [11].

Because of tendency of the coronavirus infection to exponentially increase the number of infected patients globally, WHO described the situation as a pandemic on March 11, 2020. According to preliminary data, the probability of infection in newborns and children corresponds to that in adults. However, the course of COVID-19 in children, as a rule, is mild, and severe forms of the disease develop in isolated cases. Moreover, a child with a confirmed diagnosis of COVID-19, even if asymptomatic, is a carrier of viral infection and poses a danger to others. Given the epidemiological situation in St. Petersburg and the Leningrad Region, a decision was made to organize departments for children infected with COVID-19 in the clinical hospital of the Pediatric University.

The source of infection is a sick person, including the incubation period of the disease. The infection is transmitted through air and contact. The entrance is the epithelium of the upper respiratory tract and epithelial cells of the stomach and intestines. The main target of SARS-CoV-2 is lung type II alveolar cells with receptors for type II angiotensin-converting enzyme. The second pathway for the virus to enter the cell was suggested to be the CD147 receptor (Basigin (CD147, EMMPRIN), a human protein from the immunoglobulin family that is expressed on many cell types, including the epithelial, endothelial, and T-lymphocytes). Thus, drugs affecting CD147 expression can also have a beneficial effect on the treatment of COVID-19 [14, 15].

Currently, there is no unequivocal opinion on the interaction of the virus with the porphyrin of the red blood cells, which leads to a disorder of hemoglobin binding to oxygen and hyperferritinemia.

The infective stage starts from the last 1–2 days of the incubation period and within 7–14 days from the disease onset (most infectious in the first 7 days). In severe forms, a longer release of the virus is possible. There are no data on the duration and intensity of immunity against SARS-CoV-2 [1, 9].

Asymptomatic and mild forms are registered in children [2]. However, the danger of developing severe COVID-19 is typical for children from risk groups, namely newborns and young children; children with an unfavorable premorbid background, especially congenital malformations, diseases of the cardiovascular system, respiratory system, diabetes mellitus, malignant neoplasms, Kawasaki disease; children with immunodeficiency states of different genesis; children with co-infection, especially respiratory syncytial virus at an early age [2]. The disease in newborns occurs extremely rarely, whereas intrauterine transmission of infection has not been proven [2, 5, 8]

COVID-19 proceeds clinically as an acute respiratory viral infection (only the upper respiratory tract is affected), pneumonia without respiratory failure, pneumonia with acute respiratory failure, respiratory distress syndrome (RDS), sepsis, septic shock, and multiple organ failure; however, approximately 45% of patients are asymptomatic [1, 2, 4, 12, 13]. The clinical presentation in pediatric patients does not reveal characteristic manifestations at various stages of the disease. As a rule, general and respiratory symptoms prevail in 40% of patients without pyretic fever. The disease is more severe in children aged 0 to 3 years. Diarrheal syndrome is noted more often. In the absence of typical complaints in children, changes in the lungs characteristic of coronavirus pneumonia can be detected.

In terms of severity, COVID-19 occurs in mild, moderate, severe, and extremely severe forms.

The clinically mild form of COVID-19 is manifested by hyperthermia up to 38.5 °C, cough, weakness, and sore throat. Some children have gastrointestinal manifestations (nausea, vomiting, abdominal pain, and diarrhea) [1, 2].

The moderate form is characterized by fever >38.5 °C, dry nonproductive cough, increased respiratory rate (RR), and shortness of breath during physical exertion. Dry and moist rales are heard on auscultation. Pneumonia can develop, which is diagnosed using computed tomography (CT) of the lungs, accompanied by a decrease in transcutaneous saturation SpO_2 <95% and an increase in C-reactive serum protein level to ≥10 mg/l [2].

In severe form of COVID-19, signs of acute respiratory infection progress within a week, with symptoms of respiratory failure, shortness of breath (RR of ≥30/min), and SpO_2 of ≤92%. Impairment of consciousness, unstable hemodynamics (systolic blood pressure [BP] <90 mm Hg or diastolic BP <60 mm Hg, and diuresis <20 ml/h) are noted. Radiograph or CT scan of the chest organs demonstrate the progression of pneumonia as increased area of infiltrative changes by >50% within 24–48 h [1, 2, 5].

The extremely severe course of COVID-19 is characterized by a rapidly progressing disease with the development of RDS and the need for respiratory support (invasive mechanical ventilation), septic shock, and multi-organ dysfunction [1, 2].

Immediate laboratory testing for the presence of SARS-CoV-2 virus must be performed in patients diagnosed with community-acquired pneumonia, who were exposed to a patient with COVID-19, and if symptoms occur that do not exclude COVID-19, as well as in individuals staying in institutions of permanent residence regardless of the type of legal entity (special educational institutions of closed type, cadet schools, boarding schools, institutions of the Federal Penitentiary Service of Russia) in case of emergence of symptoms of a respiratory disease [1, 2, 4].

Laboratory diagnostics includes a clinical blood test (detection of leukopenia and lymphopenia), biochemical blood tests with a mandatory assessment of the level of C-reactive protein, coagulograms, smear tests for other respiratory viruses, if necessary, study for *Streptococcus pneumoniae*, *Haemophilus influenzae* type B, and *Legionella pneumophila*, as well as mycoplasma and chlamydial infections, by using the culture and/or polymerase chain reaction method or the rapid method [1, 2, 4].

Radiation diagnostic methods, such as CT, X-ray, and ultrasound of the chest, are performed in all patients with clinical signs of acute respiratory disease [1, 2, 17]. Focal infiltrates can be identified on chest X-ray even in the absence of cough. However, performing CT is a priority, with bilateral lung damage seen in children younger than 3 years, and unilateral lung damage is seen in children older than 6 years [18, 19]. For the severe course, the bilateral nature of the lesion and the greater severity of the changes are most characteristic [2, 10, 12].

Currently, no antiviral drug was proven to be effective. According to international authors, drugs, such as interferons, chloroquine, hydroxychloroquine, umifenovir, remdesivir, favipiravir, oseltamivir, danoprevir, lopinavir, ritonavir, darunavir, human immunoglobulin, combination of hydroxychloroquine and azithromycin, were most often used in COVID-19 therapy [1, 2, 4].

To date, the use of antiviral drugs for children with COVID-19 are not recommended because of the lack of evidence on their efficiency and safety. According to the recommendations of the Ministry of Health of Russia, the prescription of antiviral drugs should be individualized, justified collectively with the participation of an infectious disease specialist, and a pediatrician. When prescribing antiviral etiotropic therapy, the child's age, presence of concomitant pathology, disease severity, and possible drug interactions and contraindications must be considered [3]

Etiotropic therapy is not required for children with asymptomatic form of COVID-19. In children with mild forms (acute respiratory viral infections, mild pneumonia), the administration of antiviral drugs is advisable only to the risk groups with severe concomitant diseases and immunodeficiency. In this situation, recombinant interferon alfa-2b is prescribed intranasally or rectally, or umifenovir and oseltamivir with confirmed concomitant infection with the influenza virus [3].

Recombinant interferon alfa-2b (intranasally or rectally) or umifenovir can be prescribed for children with moderate form of COVID-19 (pneumonia with respiratory failure) who do not have severe concomitant diseases during symptomatic therapy. Oseltamivir is prescribed in patients with confirmed concomitant infection with the influenza virus.

In children from risk groups with severe concomitant diseases and immunodeficiency, the use of hydroxychloroquine or a combination of hydroxychloroquine with lopinavir/ritonavir or recombinant interferon alfa-2b (intranasally or rectally) or umifenovir is recommended. Oseltamivir is prescribed in patients with confirmed concomitant infection with the influenza virus.

The treatment of children with severe concomitant chronic diseases and severe and critical forms of COVID-19 must be coordinated with the specialists of the Federal Remote Consultative Center for Anesthesiology and Resuscitation for Children on the diagnosis and treatment of COVID-19 infection.

Hydroxychloroquine or a combination of hydroxychloroquine with tocilizumab or lopinavir/ritonavir or tocilizumab and lopinavir/ritonavir should be prescribed to children with severe or critical COVID-19. The administration of systemic glucocorticosteroids is also indicated. With the progression of bacterial complications, intravenous immunoglobulins should be used with extreme caution.

In children aged 15 years and older, the approach of administration of etiotropic drugs, recommended also to adults, can be considered.

The characterization of drugs for treatment of children with COVID-19 is presented below [3].

Children with laboratory-confirmed diagnosis of COVID-19 are discharged in the absence of clinical manifestations of the disease and a double-negative result of laboratory examination for the presence of SARS-CoV-2 RNA with an interval of at least 1 day [1, 2, 4].

According to the Order of the Ministry of Health of Russia[1], in a hospital providing care for patients with COVID-19, 70% of the hospital beds must be equipped with oxygen supply. In turn, 25% of beds equipped with oxygen supply should be configured for artificial pulmonary ventilation (APV). However, as evidenced in practice, in children's hospitals, such requirement is excessive, which is associated with the characteristics of the disease in the pediatric population. Currently, available publications do not allow an objective assessment of the incidence of coronavirus infection in children because of the relatively small number of children diagnosed with COVID-19. According to WHO, as of February 20, 2020, the incidence of coronavirus in children younger than 19 years in China was 2.4% [17].

In general, the course of COVID-19 in children is known to be milder than that in adults. In the United States, as of April 2, 2020, the proportion of children infected with coronavirus was 1.7% (2572 children), including 0.58% (15 children) of severe cases requiring hospitalization in the intensive care unit. One third of the children hospitalized in the intensive care unit

[1] Order of the Ministry of Health of the Russian Federation of March 19, 2020 No. 198n "On the temporary procedure for organizing the work of medical organizations in order to implement measures to prevent and reduce the risks of the spread of new coronavirus infection COVID-19". The current latest edition of 04/02/2020.

Drug	Age restrictions	Doses	Therapy duration	Contraindications and adverse effects. Other restrictions of use
Interferon alfa-2b, drops/gel, rectally: suppositories	No	In each nasal passage: • <12 months: 1 drop (500 IU) 5 times daily; • 1–3 years: 2 drops 3–4 times daily; • 3–14 years: 2 drops 4–5 times daily; • >15 years: 3 drops 5–6 times daily. Rectal: <7 years: 500,000 IU2 times daily	5–7 days	Only in cases of lesion of the upper respiratory tract. Possible individual intolerance. Severe allergic reactions are possible.
Umifenovir *per os*, suspension/tablets/capsules	>2 years	Single dose: 2–6 years: 50 mg; 6–12 years: 100 mg; > 12 years: 200 mg. Frequency (according to recommendations for the treatment of acute respiratory viral infections): 4 times daily.	5 days	Hypersensitivity to the drug. Efficacy is questionable in adults with COVID-19 infection.

Drug	Age restrictions	Doses	Therapy duration	Contraindications and adverse effects. Other restrictions of use
Oseltamivir per os, suspension/capsule	No	Single dose: <12 months: 3 mg/kg; • <10–15 kg: 30 mg; • 15–23 kg: 60 mg; • > 40 kg: 75 mg. Frequency: 2 times daily.	5 days	It is used only for influenza. Possible hypersensitivity, cardiac arrhythmias, dyspepsia, renal failure, and impaired liver function.
Hydroxychloroquine, per os, tablets	>6 years	>31 kg: not >6.5 mg/kg daily (not >400 mg daily) (calculated by "ideal" and not by real body weight)	5 days	Before treatment, an electrocardiogram (ECG) is mandatory, and ECG monitoring should be performed. Not applicable for retinopathy, hereditary lactose intolerance, lactase deficiency, galactosemia, and hypersensitivity. Restrictions for blood diseases (including in past medical history), severe neurological diseases, renal and liver failure, hepatitis, glucose-6-phosphate dehydrogenase deficiency, and severe gastrointestinal diseases. Visual impairment is possible.
Lopinavir/ritonavir *per os* (200/50 mg), solution/tablets	>6 months	Single dose: • 7–15 kg: 12 mg/3 mg/kg; • 15–40 kg: 10 mg/2.5 mg/kg;	5–14 days	Idiosyncrasy is possible. Severe hepatic impairment is possible. Use with caution in viral hepatitis, hepatic cirrhosis, pancreatitis, hemophilia, heart diseases.
Tocilizumab, solution for intravenous infusion	>2 years (used only for systemic arthritis)	8 mg/kg as a single dose (calculated for real body weight), maximum 800 mg	Single dose administration only	Anaphylaxis, infections, impaired hepatic function, hematological abnormalities are possible. Use with caution in case of recurrent infections, pathology of the liver, kidneys, neutropenia, and thrombocytopenia.
Intravenous immunoglobulins, solution for intravenous infusion	No	1 g/kg per day for 2 days or 400 mg/kg per day	For direct indications only!	No experience in application with COVID-19 infection.

were patients younger than 1 year (5 patients) [7]. According to some authors, a relatively low official incidence among children can be associated with low detection due to predominantly mild or asymptomatic forms of the disease [10, 16]. Nevertheless, at least 11 deaths among the child population are reported in the literature.

Despite the small number of severe cases of coronavirus among children, in the opening infectious unit of the clinical hospital of Saint Petersburg State Pediatric Medical University, 15 resuscitation beds can possibly be deployed on a separate floor. Each resuscitation site is equipped with all necessary equipment for implementing any intensive care methods, including APV and extracorporeal membrane oxygenation.

Indications for hospitalization in the resuscitation unit are severe forms of coronavirus infection (severe pneumonia, RDS, sepsis, and septic shock) and decompensated comorbidity.

According to WHO recommendations[2], the criteria for severe forms of coronavirus infection are defined as the following:

1. Severe pneumonia:

• children with cough or shortness of breath combined with at least one of the following symptoms:

◦ central cyanosis or SpO_2 <90%;
◦ severe respiratory disorders (e. g., rales, severe chest pain);
◦ signs of pneumonia with alarming symptoms, such as poor suck of newborns, inability to drink, apathy, loss of consciousness or convulsions;
◦ other signs of pneumonia may be noted, such as funnel chest, tachypnea (<2 months: ≥60 breaths/min; 2–11 months: ≥50; 1–5 years: ≥40);

[2] WHO: Guidelines for the management of severe acute respiratory infection (SARI) in suspected COVID-19: interim guidance dated March 13, 2020.

• adolescents with fever or suspected acute respiratory infection in combination with one of the signs:
◦ RR> 30 breaths/min;
◦ severe respiratory failure;
◦ SpO2≤93% at atmospheric air.

2. Respiratory distress syndrome:
• the appearance of new or worsening of existing respiratory symptoms within a week of the disease onset;
• during radiation diagnostics (radiography, CT, or ultrasound examination of pleural cavities):
◦ bilateral shadowing not associated with volume overload, pulmonary collapse of the lobe, lobes, or the entire lung, focal formations;
◦ respiratory failure not associated with heart failure or fluid overload.

3. Oxygenation disorder in children:
◦ for non-intubated patients: $PaO_2/FiO_2 \leq 300$ mmHg or $SpO_2/FiO_2 \leq 264$;
◦ mild RDS (invasive mechanical ventilation): $4 \leq OI$ * <8 or $5 \leq OSI$** ≤ 7.5;
◦ moderate RDS (invasive mechanical ventilation): $8 \leq OI \leq 16$ or $7.5 \leq OSI \leq 12.3$;
◦ severe RDS (invasive mechanical ventilation): $OI \geq 16$ or $OSI \geq 12.3$.

* $OI = (FiO_2 \cdot P_{mean}) / PaO_2$.
** $OSI = (FiO_2 \cdot P_{aw} \cdot 100) / SpO_2$.

4. Sepsis: suspected or proven infection, and the presence of ≥2 criteria for a systemic inflammatory response syndrome, considering age, one of which must be an abnormal level of body temperature or white blood cells.

5. Septic shock: despite infusion of intravenous bolus isotonic fluid >40 ml/kg:
• a decrease in BP (hypotension) below the 5th age-related percentile or systolic pressure is reduced by two square deviations from the normal age;
• or the need for vasoconstrictors to maintain BP within normal limits (dopamine>5 μg/kg/min or dobutamine, adrenaline, or norepinephrine at any dosage);
• or two of the five symptoms listed below:
◦ unexplained metabolic acidosis, base deficiency>5.0 mmol/l;
◦ increase in the level of lactate in arterial blood by >2 times from normal;
◦ oliguria (diuresis <0.5 ml/kg/h);
◦ prolongation of capillary imbibition time by >5 s;
◦ difference between central and peripheral temperature >3 °C.

Risk factors for the development of severe forms of coronavirus infection include age up to 1 year and the presence of congenital malformations and concomitant diseases, primarily accompanied by immunodeficiency states of various etiologies (cancer and autoimmune diseases, diabetes mellitus, etc.). In young children, the disease severity is often associated with co-infection, primarily the respiratory syncytial virus [1, 3].

In the clinic of the Saint Petersburg State Pediatric Medical University, a separate building has been allocated to patients with COVID-19 to provide specialized care in a non-infectious hospital. The building is located at a distance from the clinical units, has a separate entrance for specialized transport, and is surrounded with a fence to isolate the quarantine zone. Because the designated building with a non-infectious profile does exclude boxes for isolating patients with infectious diseases, the entire building is considered a "red" zone.

Routing algorithms are designed in accordance with the strict safety conditions for patients and staff, excluding flow crossings; separate routes were organized for the movement of 19 personnel not involved in working with COVID in the clinic territory. A mobile vehicle group has been formed to move employees from the "clean" zone to the "contaminated" zone. There is a separate equipped building for rest, food intake, and storing things of specialists working with patients with confirmed or probable diagnosis of the new coronavirus infection. In the "red" zone, personnel may only be allowed when using personal protective equipment during a 6-h shift. For each specialist, a set consisting of a cap, protective overalls made of airtight material, diapers, respirator, goggles, two pairs of medical gloves, and durable overshoes was prepared.

Work with patients with confirmed COVID-19 or suspected disease can be performed only by employees who have been trained especially in dangerous infectious diseases and were instructed in the use of personal protective equipment. The spread of COVID-19 is prevented by thermometry for medical personnel throughout the entire period of treatment and care of patients with a confirmed or probable diagnosis, as well as within 14 days after the last contact with an infected patient.

A laboratory test for COVID-19 is performed once weekly to all employees of the quarantine facility. When symptoms of a respiratory disease are manifested, the specialist urgently examines the employee[3].

[3] Letter of the Federal Service for Consumer Rights Protection and Human Welfare dated 04/09/2020 No. 02/6475-2020-32 "On the use of personal protective equipment" (together with the "Recommendations on the use and handling of protective clothing and personal protective equipment when working in contact with COVID-19 patients (suspected with the disease)) or when working with biological material from such patients").

The "clean" and "contaminated" flows is regulated with the help of instructors–observers involved in the "red" zone and outside the building; they used walkie-talkies for communication. The use of mobile phones is strictly prohibited.

Medical documentation filled in the "red" zone is not taken out of the building; it is scanned and printed in the clean area of the separately allocated building.

Work in the repurposed building is conducted in accordance with the requirements of the Decree of the Chief State Sanitary Doctor of the Russian Federation[4]. Entrance to the "red" zone is allowed through a "clean" entrance; personal protective equipment is put on in the equipped gateway, tight fit and their serviceability are checked by a dedicated instructor. For self-control of the correct donning of personal protective equipment, the entrance gateway is equipped with mirrors. The use of a respirator must comply with the requirements for its use. The respirator should tightly adjoin to the face skin, covering the nose, mouth, and chin. It is necessary to check The adjoining of the respirator must be checked before entering the room with patients positive for COVID-19 infection.

Particular attention is paid to the gateway exit from the "red" zone where the personnel has the greatest probability of infection when doffing the personal protective equipment. The procedure for doffing the personal protective equipment should exclude the possibility of contamination of a medical worker in the process of changing clothes. Given the non-infectious profile of the allocated building due to the lack of an exit gateway, the M30 frame tent equipped with airtight separation into three specialized zones was installed.

The "contaminated" zone is represented by a room for disinfection of personal protective equipment with subsequent disposal in accordance with the Decree of the Chief State Sanitary Doctor of the Russian Federation[5]. At the exit from the "red zone", the on-duty instructor–disinfector irrigates the medical worker with a solution of disinfectant and assists the employee in doffing the personal protective equipment after the exposure time.

For self-control of the correct doffing of the personal protective equipment, the exit gateway is equipped with mirrors. Subsequently, the medical worker, in surgical overalls, goes to a conditionally "clean" zone. At the zone borders, the employee's hands are disinfected with an alcohol-containing skin antiseptic to remove transient microflora.

In the "conditionally clean" zone, the employee takes a shower and puts on a clean set of clothes. The final "clean" zone in the sanitary inspection room registers the employee's exit and gives permission to go by specialized transport to the facility for rest.

Patients staying in the hospital should follow strict ward isolation mode for maximum isolation of flows in the quarantine zone and determining low- and high-risk zones. Medical manipulations are performed in the ward; the patient is transported in an isolated capsule if manipulations or diagnostic tests in the ward are impossible. The patient is transferred to an equipped operating unit located in the facility if surgical assistance is necessary.

Disinfection measures are one of the main activities to reduce the risks of the spread of infection and viral load on the medical personnel. In the "red" zone, routine, overall, and final cleaning is performed using disinfectants. In each room, air is disinfected in the presence of people using an ultraviolet irradiator–recirculator.

Clean linen, drugs, supplies, and food are collected by the personnel of the building in the organized buffer zone, excluding contact with the personnel who delivered the goods. Used dishes, patient care items, and linen are treated by immersion in a disinfectant solution. Beddings are subject to chamber disinfection after the patient is discharged. All wastes generated in the building are disposed in accordance with the Decree of the Chief State Sanitary Doctor of the Russian Federation. Vehicles and items used during patient transportation are disinfected with a disinfectant solution in a specially equipped area.

Thus, the proper organization of departments for the treatment of children infected with COVID-19 in a non-core hospital, considering the aspects of the disease course, possible critical complications, and their adequate intensive care described in the article, will increase the effectiveness of measures aimed at combating the pandemic.

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