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COVID-19 – what a pediatrician should know

COVID-19 – co powinien wiedzieć pediatra

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INTRODUCTION

The first cases of an acute respiratory disease (COVID-19), caused by a novel SARS-CoV-2 coronavirus, emerged in December 2019, in Wuhan, the capital of Hubei province in China. The infection has since spread dynamically across the globe, spanning 181 countries on all continents of the world [1, 2]. On 11 March 2020, the World Health Organization (WHO) officially declared the outbreak of COVID-19 a pandemic, defining the disease as a serious threat to international public health.

In the early days of the COVID-19 epidemic, children were rarely infected, with sporadic cases reported among pediatric patients. It was believed that children were not susceptible to the infection or that lower disease incidence in that age group was related to their fewer number of contacts and limited travel [3]. The first confirmed pedi-

STRESZCZENIE

W grudniu 2019 r. w Wuhanie pojawiły się pierwsze przypadki ostrej choroby układu oddechowego (COVID-19) wywołanej przez nowy szczep koronawirusa (SARS-CoV-2). W marcu 2020 r. WHO oficjalnie ogłosiła pandemię COVID-19. Wirus SARS-CoV-2 (zwany także HCoV-19) w porównaniu z innymi koronawirusami jest mniej wirulentny i ma znacznie niższe wskaźniki śmiertelności, za to jest dużo bardziej zakaźny, również w okresie bezobjawowym.

Większość dzieci zakażonych SARS-CoV-2 ma łagodne objawy kliniczne, bez podwyższonej temperatury ciała ani objawów zapalenia płuc, przez co zakażenie może wydawać się bezobjawowe. Czasami pojawiają się gorączka, suchy kaszel i zmęczenie, niekiedy występują objawy z górnych dróg oddechowych, w tym przekrwienie błony śluzowej nosa i katar. U niektórych pacjentów odnotowano objawy żołądkowo-jelitowe, w tym dyskomfort w jamie brzusznej, nudności, wymioty, ból brzucha i biegunkę. U każdego pacjenta z podejrzeniem infekcji koronawirusem musi zostać przeprowadzone badanie PCR (*polymerase chain reaction*) w kierunku SARS-CoV-2 (wymaz z nosogardła).

W terapii, w zależności od nasilenia objawów, zastosowanie mają leki objawowe (paracetamol lub ibuprofen), azytromycyna (3-dniowa kuracja) oraz chlorochina (arechina). By zminimalizować prawdopodobieństwo zakażenia, należy zawsze stosować środki ochrony osobistej i specjalnie przygotować gabinet lekarski.

Wiedza na temat wirusa SARS-CoV-2 i choroby COVID-19 stale się pogłębia, a zalecenia często zmieniają, dlatego pediatrzy muszą śledzić aktualne informacje i dostosowywać swoje działania do zmieniającej się wiedzy medycznej oraz sytuacji epidemiologicznej.

SŁOWA KLUCZOWE

COVID-19, koronawirus, dzieci, diagnostyka, leczenie

atric case of SARS-CoV-2 infection was announced in Shenzhen on 20 January 2020. [4]. With time, when more patients were identified, and there was closer contact with the infected individuals within families, COVID-19 symptoms started to be observed in children too. It also applied to newborns of infected mothers. Presently, children account for a few percent of the total number of infected patients, and the course of disease is usually mild. A more severe course of COVID-19 is rare in children. In a review presented by Chinese physicians, only 5.6% of pediatric patients were found to develop a severe infection (defined as hypoxia), with 0.6% of them developing respiratory insufficiency or acute respiratory distress syndrome (ARDS). Reports prepared by authors from other high incidence COVID-19 areas indicate that hospitalization is rarely required in children, and deaths of pediatric patients are sporadic [5]. Those figures stand in stark contrast with the 4-percent global mortality rate in adult patients with COVID-19.

Fighting the virus and containing the pandemic requires a good knowledge of the enemy (the new virus, appropriate diagnostic methods and management procedures as well as strict adherence to guidelines and recommendations).

OUR ENEMY – CHARACTERISTIC FEATURES OF THE SARS-COV-2 VIRUS

Coronavirus was first described in 1966 by Tyrell and Bynoe, who isolated a new virus species in patients suffering from colds. Coronaviruses belong to the family Coronaviridae, which has been subdivided into four genera: α , β , δ and γ . Coronaviruses are enveloped, single-stranded RNA viruses, whose diameter ranges from 60 to 140 nm; they have spinous processes on their surface, which make them resemble the solar corona under electron microscopy (hence the name “coronavirus”) [6]. They are so-called large RNA viruses, as their genome size ranges from 26.4 to 31.7 thousand nucleotides. Four human coronaviruses (HKU1, NL63, 229E and OC43) were previously known to cause mild respiratory diseases in the human population. Over the past

ABSTRACT

In December 2019, the first cases of acute respiratory disease (Coronavirus disease 2019 – COVID-19) caused by the new coronavirus strain (SARS-CoV-2) appeared in Wuhan, China. In March 2020, WHO officially announced the COVID-19 pandemic. SARS-CoV-2 (also called HCoV-19) compared to other coronaviruses is less virulent with much lower mortality rates, but much more infectious, also in the asymptomatic period.

Most infected children have mild clinical symptoms, no fever or signs of pneumonia or appear asymptomatic. Sometimes there is fever, dry cough and fatigue, sometimes there are symptoms from the upper respiratory tract, including nasal congestion and runny nose. Some patients have experienced gastrointestinal symptoms, including abdominal discomfort, nausea, vomiting, abdominal pain and diarrhea. All patients with suspected coronavirus infection must have a SARS-CoV-2 PCR test (nasopharyngeal swab).

Depending on the severity of the symptoms, symptomatic medications (paracetamol or ibuprofen), azithromycin (3-days treatment) and chloroquine (arechine) are used in therapy. To minimize the likelihood of infection, always use personal protective equipment and specially prepare your doctor's office.

Knowledge about the SARS-CoV-2 virus and COVID-19 disease is constantly growing, and the recommendations often change, so pediatricians need to be up to date and adapt their activities to changing medical knowledge and epidemiological situations.

KEY WORDS

COVID-19, coronavirus, children, diagnostics, treatment

two decades, β -coronaviruses were transmitted from animals to humans twice, causing severe acute respiratory syndromes (SARS). The first instance dates back to the years 2002–2003, when a new β -coronavirus, deriving from bats, was transmitted to humans via cats in the Chinese province of Guangdong. The virus, causing acute respiratory syndrome, affected 8422 people, primarily in China and Hong Kong, and led to 916 deaths (mortality rate of 11%). Nearly a decade later, in 2012, the Middle East Respiratory Syndrome Coronavirus (MERS CoV), also derived from bats, emerged in Saudi Arabia. The intermediary hosts were dromedaries. 2494 people were infected, out of which 858 died (mortality rate of 34%) [7].

The SARS-CoV-2 (also referred to as HCoV-19) is less virulent as compared with the SARS and MERS viruses, and its mortality rates are much lower, but it is much more infectious, also in the asymptomatic phase. Elimination of the new virus is likely faster than in the case of SARS and MERS, but findings regarding critical cases are not unequivocal [8, 9]. What we know, however, is that in 50% of those who have recovered, the virus is detectable and may be transmitted onto others for up to 8 days. Recent data also point out that the virus stays in the surroundings for a relatively long time, i.e. for up to 3 hours in the air (half-life of 66 min.), for up to 24 hours on paper/cardboard (half-life of 3.5 hours), and for up to three days on metal and plastic surfaces (half-life of ca. 6 hours) [10].

The primary clinical manifestation in those initial cases reported in China was severe pneumonia. However, later observations have indicated that the course of the disease may vary significantly in individual patients. The percentage of completely asymptomatic patients is unknown.

WHY IS SARS-COV-2 MORE DANGEROUS THAN OTHER CORONAVIRUSES?

Out of the seven coronaviruses that are known to affect people, only three (SARS-CoV-2, MERS-CoV and SARS-CoV) are linked to a severe course of disease. However, SARS-CoV-2 infections are quicker to spread, and are thus more deadly. Why is that so? In order to enter a host cell, the virus needs to bind with a specific surface receptor through its receptor-binding domain (RBD) protein. Recent studies indicate that RBD of the SARS-CoV-2 virus shows stronger affinity to the ACE-II receptor protein (angiotensin-converting enzyme 2) than RBD of other coronaviruses. The stronger the affinity, the higher the capacity of the virus to infect cells. That special quality of the receptor-binding protein may stem from genetic mutation [11]. Another phenomenon which may help explain the dangerous nature of SARS-CoV-2 with respect to other viruses is the very high level of pro-inflammatory cytokines involved (so-called cytokine storm, a life-threatening immune reaction). Cytokine

profiles are frequently disturbed during viral infections. In patients infected with SARS-CoV-2 the level of inflammatory cytokines is significantly elevated. Additionally, there is a significant correlation between the level of cytokines and disease severity; the higher the concentration of pro-inflammatory cytokines (e.g. IL-2, IL-7, IL-10, GCSE, TNF- α), the more intensive the symptoms [7].

THE FIRST STEP – DIAGNOSIS AND DIFFERENTIAL ASSESSMENT

The first step in the management of children suspected of coronavirus infection should involve differential diagnostics [12]. It should start from history-taking (possibly by phone). It may be helpful to pay attention to a few symptoms characteristic of different respiratory diseases (Table 1) [13].

Based on the current epidemiological data, we know that the SARS-CoV-2 incubation period ranges from 1 to 14 days, usually amounting to 3–7 days. Data reported on pediatric patients have revealed that the age at onset ranged from 1.5 months to 17 years in that group of patients, and most of the patients were in close contact with infected persons or came from family clusters. Infected children may be asymptomatic or develop a fever, dry cough and fatigue; sometimes, they experience upper respiratory tract symptoms, including nasal mucosa hyperemia and running nose. In some patients, gastro-intestinal symptoms have been observed, such as abdominal discomfort, nausea, emesis, stomachache and diarrhea [12]. Most of the infected children experience mild clinical symptoms, without fever or signs of pneumonia. Prognosis is good, and patients usually recover within 1–2 weeks from the onset of symptoms. Sometimes, the infection may progress into lower respiratory tract infection. Taking into account the clinical course of infection in children, we may single out several scenarios (Table 2). Every patient suspected of coronavirus infection should undergo the PCR (polymerase chain reaction) test for SARS-CoV-2 (nasopharyngeal swab). The peak of viral shedding occurs between day 3 to day 5 from the onset of symptoms, and that is the best time for collecting specimens. Serological tests only serve as auxiliary diagnostic methods, and as such should always be verified with molecular testing [13]. At the early stage of disease, the number of white cells remains within normal limits or is lower (with lower lymphocyte counts).

In some patients, liver enzymes are elevated, and activity of muscle enzymes and myohemoglobin is also increased. Most of the sick children also present with elevated levels of C-reactive protein (CRP), and normal levels of procalcitonin. In severe cases, high concentrations of D-dimers, and gradual drops in lymphocyte counts, are observed. Poor prognostic factors include elevated concentrations of lactate dehydrogenase (LDH),

TABLE 1

COVID-19 differential diagnostics (based on [13], modified by the authors).				
Symptoms	Coronavirus (COVID-19)	Cold	Flu	Allergy
Duration of symptoms	7-25 days	up to 14 days	7-14 days	Several weeks
Cough	often (usually dry)	often (mild)	often (usually dry)	rarely (usually dry, frequent in asthma)
Shortness of breath	sometimes	no*	no*	no*
Sneezing	no	often	no	often
Nasal discharge	rarely	often	sometimes	often
Nasal congestion	sometimes	often	sometimes	often
Loss of smell	sometimes	sometimes	sometimes	sometimes
Tearing	no	no	no	often
Sore throat	sometimes	often	sometimes	sometimes (usually mild)
Fever	often	short-lasting fever	often	no
Fatigue and general weakness	sometimes	sometimes	often	sometimes
Headache	sometimes	rarely	often	sometimes (in the region of paranasal sinuses)
Muscle pain	sometimes	often	often	no
Diarrhoea	sometimes	no	sometimes in children	no

*If accompanied by asthma or COPD, shortness of breath may be intensified. In the case of COVID-19, it may appear without concomitant symptoms of asthma or COPD.

TABLE 2

Clinical classification of children with coronavirus infection [12].	
Degree of disease severity	Symptoms and characteristic features
Asymptomatic (silent) infection	positive PCR test result for SARS-CoV-2, but no clinical symptoms or abnormal chest imaging findings
Acute upper respiratory tract infection	only fever, cough, sore throat, nasal hyperemia, fatigue, headache, muscle pain, general discomfort, etc., without signs of pneumonia in imaging tests or signs of septicemia
Mild pneumonia	fever or lack thereof, mild respiratory symptoms (e.g. cough) and signs of pneumonia in imaging tests, but no criteria of severe pneumonia met
Severe pneumonia	One of the following criteria has to be met: <ul style="list-style-type: none"> • increased respiratory rate: $\geq 70/\text{min}$ (< 1 year of age), $\geq 50/\text{min}$ (≥ 1 year) • saturation $< 92\%$ • hypoxia: respiratory effort (whimpers, nasal flaring), cyanosis, interrupted breathing (apnea) • altered level of consciousness; drowsiness, coma or seizures • rejection of food or difficulty feeding, with signs of dehydration
Critical cases	One of the following criteria has to be met, and ICU care is required: <ul style="list-style-type: none"> • respiratory insufficiency requiring mechanical ventilation • shock • failure of other organs

ICU – Intensive Care Unit; PCR – polymerase chain reaction.

fibrinogen and D-dimers, granulocytic leukopenia with lymphocytopenia, and abnormalities that indicate functional damage of different bodily organs.

Imaging tests may come in handy in differential diagnostics. Even though they do not reveal much in children, it appears that especially high-resolution CT may be of great value in diagnosing, monitoring and implementing efficacious treatment in pediatric patients. The lesions revealed resemble those observed in SARS (severe acute respiratory syndrome). The im-

age is characteristic of severe respiratory infections involving both lungs. At early stages of disease, chest imaging reveals ground-glass opacities and interstitial lesions. At a later stage, the shadows become round, and their character changes, with infiltrating lesions setting in. In the most severe cases, consolidation-type lesions appear. Pleural effusion is rarely observed, which is highly characteristic of the infection. Several findings also indicate that transthoracic ultrasound may be helpful, as the lesions primarily involve peripheral lungs [12, 14, 15].

MANAGEMENT OF PEDIATRIC PATIENTS DURING THE CORONAVIRUS PANDEMIC

Following initial differential diagnostics and assessment of the patient's clinical status, one has to take decisions on further management. If the clinical picture and epidemiological history do not point to SARS-CoV-19 infection, there are no indications for PCR testing (swabs). Such children should be treated symptomatically or the underlying cause of infection should be targeted (antibiotics if bacterial infection is suspected) in accordance with standard guidelines. Parents or caregivers should also be informed about the further course of action (Table 3) [16]. If it is known, based on the patient's history, that the

TABLE 3

Information for parents or caregivers of children who present no symptoms, and have had no contact with persons infected with SARS-CoV-19 [16].

Rules that limit the spread of infection

Limit to a minimum contacts with other people.

When contacting other people is unavoidable:

- maintain a 1.5-meter distance at minimum
- cover your mouth and nose, when sneezing or coughing
- wash and disinfect your hand frequently.

If you observe the following symptoms in your child:

- elevated bodily temperature > 38°C
- cough
- diarrhea

make sure to contact Sanepid or call the NFZ hotline.

NFZ – National Health Fund; Sanepid – State Sanitary Inspection.

child was in contact with a person infected with SARS-CoV-19, the clinic or pediatrician in charge is obliged to report suspected COVID-19 infection to the State Sanitary Inspection (Sanepid in Poland), but patient management remains the same. One should always consider whether the child requires specialist or hospital care. Current guidelines for the management of patients with COVID-19 are based on empirical experience as well as theoretical assumptions. Treatment involves:

- azithromycin – a macrolide antibiotic whose antiviral qualities are used (it reduces viral-related exacerbation) as well as the immunomodulatory (numerous pathways inhibiting production of pro-inflammatory cytokines) and anti-inflammatory ones (elimination of pathogens through modification of strain virulence) [17, 18]
- chloroquine (arechin) – a medication which, based on different findings, has qualities that inhibit the so-called cytokine storm [19].

Both products are now subject to intensive in vivo tests, whose preliminary results indicate their high clinical efficacy (faster

reduction of fever, and shorter recovery time). The best therapeutic effects were linked to combined treatment of chloroquine and azithromycin [20]. It is also worth mentioning that after the initial concerns related to the use of non-steroid anti-inflammatory drugs (NSAIDs), and ibuprofen in particular, it is now believed that they are safe to use in symptomatic management of COVID-19.

An issue that should definitely be discussed is inhaled therapy during the coronavirus pandemic. Present guidelines indicate that irrespective of the PCR test result (patient is infected or not), the treatment of asthma or other allergic diseases should be continued. There are no findings that would indicate that medications administered in allergies (antihistamine drugs, glucocorticoids, β 2-mimetics, etc.) should have any impact on increased risk of COVID-19 morbidity or that they should worsen the course of disease and its prognosis, once infection is confirmed [21, 22]. In children with a mild course of infection (without signs of pneumonia), and without exacerbation of the allergic disease, one should continue managing the primary disease, while closely monitoring the patient. Preventative or adjunctive treatment does not appear to be necessary. At times of exacerbation (e.g. of allergic rhinitis), anti-allergic treatment should be intensified in accordance with the generally adopted principles.

According to the guidelines of the Polish Society of Allergology, anti-inflammatory treatment with inhaled GCS should be continued, provided they are administered in the form of MDIs (metered dose inhalers) or DPIs (dry powder inhalers). Nebulization is contraindicated, as it may enhance virus aerolization, thus contributing to the spread of infection [23]. If asthma exacerbation or acute laryngitis is diagnosed in children without confirmed or suspected COVID-19, nebulization should be administered, though, as the most efficacious form of inhaled treatment of acute spasmodic laryngitis. To our best medical knowledge, and based on our experience, if no alternative route of administration is available, one should also use nebulized treatment in children with suspected coronavirus infection, ensuring adherence to special rules which help prevent virus spread (tightly fitting mask/mouthpiece, protective equipment for the medical staff and caregivers).

MANAGEMENT OF CHILDREN WITH COVID-19 WITHOUT CONCOMITANT DISEASES

1. Children who do not require hospitalization; with symptoms of upper respiratory tract infection. Symptomatic treatment should be offered (appropriate fluid intake, antipyretic drugs, such as acetaminophen or ibuprofen, if needed, for 3-5 days, and salbutamol if indicated, preferably orally) combined with

azithromycin dosed at 10 mg/kg of body weight, once daily, for three days.

Home isolation is mandatory for 14 days since the onset of disease. The family remains under the supervision of the State Sanitary Inspection, and the patient has a follow-up PCR test for SARS-CoV-2 performed from nasopharyngeal swab 14 days later. If the result is positive, another test is taken 7-8 days later.

2. Children requiring a short (1 day) hospital stay, appropriately hydrated, in a good general condition, with symptoms of upper respiratory tract infection or (rarely) following an episode of diarrhea, may be discharged home. Symptomatic treatment should be offered (appropriate fluid intake, antipyretic drugs (acetaminophen or ibuprofen) if needed, for 3-5 days, and salbutamol if indicated, preferably orally) combined with azithromycin dosed at 10 mg/kg of body weight, once daily, for three days.

Azithromycin may not be administered in children with diagnosed long QT syndrome. Home isolation is mandatory for 14 days from the onset of disease, the family is placed under the supervision of the State Sanitary Inspection, and 14 days later a follow-up PCR test for SARS-CoV-2 is performed from nasopharyngeal swab. If the result is still positive, another test is performed 7–8 days later.

3. Children requiring hospitalization longer than 24 hours. In children under the age of 14, one should administer symptomatic treatment, i.e. appropriate fluid intake, anti-pyretic drugs if needed (acetaminophen or ibuprofen) for 3-5 days, and salbutamol if indicated. Azithromycin should be administered once daily for five days (day 1: 10 mg/kg body weight, days 2-5: 5 mg/kg body weight).

Based on item 37 of the World Medical Association's Declaration of Helsinki of 1964, with further amendments, it is acceptable to use chloroquine (arechin). In children with COVID-19 under the age of 14, it should be administered at the dose of 10 mg/kg body weight/24 hours (5 mg/kg body weight/12 hours). The pediatric dose has been specified based on the experience of chronic administration of the drug in autoimmune arthritis and systemic diseases in children. The empirical dose for children with COVID-19 should be the same as for adults, i.e. 7–14 mg/kg body weight/24 hours. In line with the suggestions of pediatricians, the average daily therapeutic dose has been set at 10 mg/kg body weight.

In children above the age of 14, one should administer symptomatic treatment (appropriate fluid intake, anti-pyretic drugs, acetaminophen or ibuprofen, if needed), and salbutamol if indicated.

Azithromycin should be administered for 5 days (day 1 at the dose of 500 mg, days 2-5 at the dose of 250 mg) once daily. Additionally, chloroquine (arechin) may be used at the dose of 2 × 250 mg for 7 (or a maximum of 10) days (in line with the sum-

mary of product characteristics), provided there are no contraindications involved. Arechin may not be used in children with a history of epilepsies, long QT syndrome or ventricular arrhythmia. It should also not be administered concurrently with phenobarbital, rifampicin, carbamazepine, phenytoin, and amiodarone. Occurrence of adverse reactions following the administration of chloroquine (emesis, rash, jaundice) is an indication for withdrawal of the drug.

Due to the risk of prolonged QT interval during the combined treatment with arechin and azithromycin, it is recommended to perform an ECG examination before the initiation of therapy, and to monitor the patient closely throughout the treatment. If bedside ECG is not available (need for disinfection, disposable electrodes), it is not to be considered as a contraindication to start therapy [16].

PREPARE YOURSELF AND YOUR OFFICE FOR THE PANDEMIC

Every person visiting your clinic is a potential source of infection! Every child entering a healthcare facility (including a pediatrician's or a GP's office), with a suspicion of COVID-19, and their caregivers must receive and wear masks covering their mouths and noses, and they should also be familiar with the recommendations on keeping at least a 1.3-meter distance from other people. The parent or caregiver may be provided with a questionnaire to fill out, including questions on the child's personal data, contacts with persons diagnosed with coronavirus infection within the past 14 days, and the symptoms involved (bodily temperature, cough, shortness of breath). History-taking may also be done on the phone. In order to minimize the risk of infection, one should always use personal protective equipment in the form of FFP2/N95 surgical masks, disposable protective gowns, and eye protection (Table 4) [24]. All recommendations that are binding in public places should also be adhered to at the clinic: social distance, isolation, wear-

TABLE 4

Recommended personal protective equipment for healthcare professionals managing COVID-19 patients.

- single-use disposable FFP2 or FFP3 masks (with or without valves) (if there are no FFP2/FFP3 masks available, regular surgical masks are recommended)
- eye protection – face shield, goggles or protective glasses (also reusable ones, subject to disinfection)
- water-resistant (reinforced) long-sleeve gowns (e.g. surgical gowns), and specialist protective coveralls for aerosol-generating procedures
- non-sterile diagnostic disposable latex or nitrile gloves (sterile for aseptic procedures) – two pairs worn at the same time
- disposable surgical cap

ing masks and gloves, hand and face hygiene. One should pay special attention to restrooms, and faucets and toilet seats in particular, where direct contact occurs between human skin and usable surfaces. Doors with handles should remain open at all times; otherwise, door handles should be disinfected after each use. Suggestions on how to prepare your office for the coronavirus pandemic have been presented in Table 5 [24].

SUMMARY

We are currently in the middle of the epidemic. Our knowledge on the SARS-CoV-2 virus and COVID-19 grows as days go by, and recommendations are modified accordingly. Thus, we are all obliged to follow the recent news and keep up to date with the binding recommendations. We need to keep abreast of the latest reports, and adjust our actions to the changing medical knowledge and general epidemiological situation.

TABLE 5

Advice on how to ensure the safety of your medical practice (based on [24], modified by the authors).

- Stay up to date with the local COVID-19 situation and be prepared to undertake action in your community.
- Communicate with your staff and keep them safe.
- Share information about what is currently known about the virus and your preparedness plans.
- Ensure you have enough personal protective equipment on hand.
- Make sure staff who are sick know it is recommended to stay home.
- Prepare your office to safely triage and manage patients with respiratory illness.
- Post signs at entrances and other strategic locations on proper hand and respiratory hygiene.
- Establish a script/recommendations which may be used by staff and the clinical team, when patients call the office to ask about COVID-19.
- Ensure appropriate sanitary supplies are available (hand sanitizer, tissues, waste receptacles).
- Consider re-arranging your waiting room to promote social distancing (e.g. set up a special area just for patients with respiratory symptoms).
- Consider alternatives to in-person visits – phone calls, e-mailed information (e.g. imaging scans).
- Provide information on your website, patient portal or through direct text messaging to patients on when to come to the office, and when to stay home and self-monitor symptoms.

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