



# The Coronavirus Disease 2019 (COVID-19)

Joseph R. Hageman, MD

The first case of the coronavirus, officially labeled COVID-19 by the World Health Organization, in the United States was confirmed in Washington state in a traveler who had visited Wuhan, China, and upon return became symptomatic.<sup>1</sup> Based on the most recent reports at the time of this publication, there are now 60 confirmed cases in the US.<sup>2,3</sup> COVID-19 is from the same group of ribonucleic acid (RNA) viruses that caused severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS). In China, there have been more than 80,000 cases of COVID-19 with 2,915 deaths.<sup>1-3</sup> The infection has been reported in other areas of China and 64 other countries.<sup>3</sup> Chinese authorities initially reported that most patients in the Wuhan outbreak were epidemiologically linked to a large seafood and animal market, suggesting a possible zoonotic origin to

the outbreak.<sup>2</sup> The market was closed on January 1, 2020 for disinfection.<sup>2</sup>

Human coronaviruses are common throughout the world.<sup>1-3</sup> Coronaviruses are enveloped, nonsegmented, single-stranded, positive-sense RNA viruses named after their corona- or crown-like surface projections observed on electron microscopy that correspond to large surface spike proteins. Coronaviruses are classified in the Nidovirales order.<sup>4,5</sup> These viruses are host specific and can infect humans and a variety of different animals as well. Four distinct genera have been identified: alpha-, beta-, gamma-, and deltacoronavirus.<sup>5</sup> SARS and MERS are both in the genus betacoronavirus.<sup>5</sup>

The clinical presentation is fever, nonproductive cough, and respiratory distress that tends to be more common in adults than in children. At this point, there are 965 cases reported in China in patients younger than age 19 years (416 cases in children younger than age 10 years).<sup>6</sup> There is one recent clinical description of nine infants younger than age 1 year who have been hospitalized in China.<sup>7</sup> All of these infants had mild illness and none required admission to the intensive care unit.<sup>7</sup> In general, during the SARS and MERS outbreaks, clinical infection in children was mild.<sup>8</sup> However, in a retrospective comparison study of children admitted to Seattle Children's Hospital with lower respiratory tract infection (LRTI) with corona-

virus between 2012 and 2016, the children who were immunocompromised (85 patients) were at greater risk for severe LRTI, (ie, requiring supplemental oxygen therapy compared with to the nonimmunocompromised children [1,152 patients]).<sup>9</sup> The nonimmunocompromised children with LRTI who had infection with a copathogen, most frequently with respiratory syncytial virus (RSV), were younger, had an underlying pulmonary disorder, and were also at risk for requiring supplemental oxygen therapy.<sup>9</sup> A study by Uddin et al.<sup>10</sup> observed infants in rural Nepal after birth and documented that 282 of 3,505 (8%) infants developed acute respiratory infection in the first 6 months of life with coronavirus. Eleven percent of these infants required medical attention from a physician. Also 46% had a coinfection with another coviral pathogen, most commonly human rhinovirus, then bocavirus and RSV.<sup>10</sup> In general, LRTIs with coronavirus in infants and children tend to be more mild unless the infant or child has an infection with a coviral pathogen, has an underlying pulmonary disorder like asthma or cystic fibrosis, or is immunocompromised (hematologic malignancy or solid tumor).<sup>7-10</sup>

Current guidelines for all medical professionals regarding COVID-19 include<sup>1</sup>:

- Health care providers should obtain a detailed travel history for patients being evaluated with fever and acute respi-

---

Pediatric Annals Editor-in-Chief Joseph R. Hageman, MD, is the Director of Quality Improvement, Section of Neonatology, Comer Children's Hospital; a Senior Clinician Educator, The University of Chicago Pritzker School of Medicine; and an Emeritus Attending Pediatrician, NorthShore University HealthSystem.

Address correspondence to Joseph R. Hageman, MD, via email: pedann@healio.com.

Disclosure: Joseph R. Hageman is a member of the Owlet, Inc advisory board.

doi:10.3928/19382359-20200219-01

ratory illness. At this time, diagnostic testing for COVID-19 can only be conducted at the Centers for Disease Control and Prevention (CDC)

- CDC has issued a level 2 travel alert (enhanced precautions, avoid contact with sick people, animals, and animal markets)<sup>11</sup>

- Airport screening is occurring at John F. Kennedy International Airport, San Francisco International Airport, Los Angeles International Airport, Hartsfield-Jackson Atlanta International Airport, and Chicago O'Hare International Airport. Air travelers from Wuhan, China, to the US will be sent to one of these airports, screened for symptoms, and issued a card in Mandarin/English on what to do if they develop symptoms

If symptoms are suspected, the following actions should be taken<sup>12</sup>:

- Determine travel history to the Wuhan province or contact with person confirmed or under investigation for COVID-19 in a patient with fever and respiratory illness;

- Suspect cases should be discussed immediately with state or local health officials, and your facility's infection prevention personnel;

- Patients should wear a surgical mask and be placed in a private room (an airborne isolation room if available) with the door closed as soon as possible;

- Because the modes of transmission are not clear currently, CDC recom-

mends standard, contact, and airborne precautions and eye protections (goggles or face shield).<sup>13,14</sup>

For information on clinical specimens, see <https://www.cdc.gov/coronavirus/2019-nCoV/guidelines-clinical-specimens.html>. If the patient does not require hospitalization, CDC guidance for home care can be found at <https://www.cdc.gov/coronavirus/2019-ncov/guidance-home-care.html>.

## REFERENCES

1. The New York Times. As new cases surge, businesses face grim fallout. [https://www.nytimes.com/2020/02/21/world/asia/china-coronavirus.html?te=1&nl=morning-briefing&emc=edit\\_NN\\_p\\_20200221&section=topNews&campaign\\_id=9&instance\\_id=16161&segment\\_id=21479&user\\_id=7012abec23da8c7f221b495e52676f4b&regi\\_id=80268415tion=topNews](https://www.nytimes.com/2020/02/21/world/asia/china-coronavirus.html?te=1&nl=morning-briefing&emc=edit_NN_p_20200221&section=topNews&campaign_id=9&instance_id=16161&segment_id=21479&user_id=7012abec23da8c7f221b495e52676f4b&regi_id=80268415tion=topNews). Accessed February 24, 2020.
2. Lai RKK, Wu J, McCann A, Watkins D, Patel JK, Harris R. Coronavirus map: tracking the spread of the outbreak. <https://www.nytimes.com/interactive/2020/world/asia/china-wuhan-coronavirus-maps.html>? Accessed February 24, 2020.
3. Centers for Disease Control and Prevention. Coronavirus disease 2019 (COVID-19) situation summary. <https://www.cdc.gov/coronavirus/2019-nCoV/summary.html>. Accessed February 19, 2020.
4. World Health Organization. WHO Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020. <https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020>. Accessed February 19, 2020.
5. Red Book Online. Coronaviruses, including SARS and MERS. <https://redbook.solutions.aap.org/chapter.aspx?sectionid=189640073&bookid=2205>. Accessed February 26, 2020.
6. Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China. Summary of a report of 72,314 cases from the Chinese Center for Disease Control and Prevention [published online ahead of print February 24, 2020]. *JAMA*. doi:10.1001/jama.2020.2648
7. Wei M, Yuan J, Liu Y, et al. Novel coronavirus infection in hospitalized infants under 1 year of age in China [published online ahead of print February 14, 2020]. *JAMA Network*. doi:10.10001/jama.2020.2131.
8. Bartenfeld M, Griese S, Uyeki T, et al. Middle east respiratory syndrome coronavirus and children: what pediatric health professionals need to know. *Clin Pediatr*. 2017;56(2):187-189. doi:10.1177/0009922816678820.
9. Ogimi C, Englund JA, Bradford MC, et al. Characteristics and outcomes of coronavirus infection in children: the role of viral factors and in immunocompromised state. *J Pediatric Infect Dis Soc*. 2019;8(1):21-28. doi:10.1093/jpids/pix093.
10. Uddin SMI, Englund JA, Kuypers JY, et al. Burden and risk factors for coronavirus infections in infants in rural Nepal. *Clin Infect Dis*. 2018;67(10):1507-1514. doi:10.1093/cid/ciy317.
11. Red Book Online. 2019 novel coronavirus (COVID-19) infections. [https://redbook.solutions.aap.org/ss/rbo\\_outbreaks\\_page\\_3.aspx](https://redbook.solutions.aap.org/ss/rbo_outbreaks_page_3.aspx). Accessed February 19, 2020.
12. Centers for Disease Control and Prevention. Novel coronavirus in China. <https://wwwnc.cdc.gov/travel/notices/alert/novel-coronavirus-china>. Accessed February 19, 2020.
13. Centers for Disease Control and Prevention. Evaluating and reporting persons under investigation (PUI). <https://www.cdc.gov/coronavirus/2019-nCoV/clinical-criteria.html>. Accessed February 19, 2020.
14. Centers for Disease Control and Prevention. Interim infection prevention and control recommendations for patients with confirmed 2019 novel coronavirus (2019-nCoV) or persons under investigation for 2019-nCoV in healthcare settings. <https://www.cdc.gov/coronavirus/2019-nCoV/infection-control.html>. Accessed February 19, 2020.