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| *This document will be continually updated throughout the month of May. The expected date for the **next update is Friday, May 15, 2020 at 1pm USA ET**.* | | | | | | | |
| Children, PICU, child deaths, comorbidities, North America | 11-May-20 | Characteristics and Outcomes of Children With Coronavirus Disease 2019 (COVID-19) Infection Admitted to US and Canadian Pediatric Intensive Care Units | JAMA Pediatrics | Original Investigation | In this cross-sectional study of 46 North American pediatric intensive care units (PICUs), between March 14 and April 3, 2020, 48 children (median: 13 years, range: 4.2-16.6 years) with COVID-19 were admitted. 40 children (83%) had preexisting underlying medical conditions. Of 48 total children, 35 (73%) presented with respiratory symptoms, and 18 (38%) required invasive ventilation. Eleven patients (23%) had failure of 2 or more organ systems. Extracorporeal membrane oxygenation (ECMO) was required for 1 patient (2%). Targeted therapies were used in 28 patients (61%), with hydroxychloroquine being the most commonly used agent either alone (11 patients) or in combination (10 patients). At the completion of the follow-up period, 2 patients (4%) had died, and 15 (31%) were still hospitalized, with 3 still requiring ventilatory support and 1 receiving ECMO. The median (range) PICU and hospital lengths of stay for those who had been discharged were 5 (3-9) days and 7 (4-13) days, respectively. | This early study, from North American PICUs, shows that COVID-19 can result in significant disease burden in children but confirms that severe illness is less frequent than in adults. Prehospital comorbidities appear to be an important factor in children. | Shekerdemian LS, Mahmood NR, Wolfe KK, et al. Characteristics and Outcomes of Children With Coronavirus Disease 2019 (COVID-19) Infection Admitted to US and Canadian Pediatric Intensive Care Units [published online 2020 May 11]. JAMA Pediatrics. doi:10.1001/jamapediatrics.2020.1948 |
| Pregnancy, early postpartum, intensive care, mechanical ventilation, maternal morbidity, non-pregnant women, Sweden | 9-May-20 | Severe Maternal Morbidity and Mortality Associated With COVID-19: The Risk Should Not Be Down-Played | Acta Obstetricia et Gynecologica Scandinavica | Special Editorial | In a recent report released by the Public Health Agency of Sweden, between Match 19 and April 10, 2020, a total of 53 women with COVID-19 (range: 20-45 years) received intensive care; of these, 13 were or had recently been pregnant. 6/13 pregnant and early postpartum women required invasive mechanical ventilation. An analysis based on an estimate of the total number of pregnant and non-pregnant women in the population of Sweden revealed that the relative risk (RR) for pregnant and early postpartum women (<1 week) with COVID-19 to receive intensive care was 5.4 (95% CI 2.89-10.08) and to require invasive mechanical ventilation was 4.0 (95% CI 1.75-9.14), compared to non-pregnant women of similar age. This risk remained higher (RR 3.5; 95% CI 1.86-6.52) even after accounting for 50% more pregnancies in the denominator to include possible miscarriages and intrauterine deaths. Although the results are based on a relatively small number of cases, the potential elevated risk of maternal morbidity and mortality is significant and should not be ignored. | The authors estimate relative risks of pregnant and early postpartum women with COVID-19 to require intensive care and mechanical ventilation, compared to their non-pregnant counterparts in Sweden. | Westgren M, Pettersson K, Hagberg H, Acharya G. Severe maternal morbidity and mortality associated with COVID-19: The risk should not be down-played [published online, 2020 May 9]. Acta Obstet Gynecol Scand. 2020. doi:10.1111/aogs.13900 |
| Children, hygiene, asymptomatic transmission, face masks | 9-May-20 | To mask or not to mask children to overcome COVID-19. | European Journal of Pediatrics | Original Article | To reduce the role of asymptomatic or poorly symptomatic people in COVID-19 transmission, universal use of face masks in addition to hand hygiene and safety distance seems extremely useful. Consequently, preparing the healthy child to use face masks is strongly needed. In addition to the need for masks available in different sizes, the use of masks in children must be preceded by parental and school-based guidance on issues of hygiene, with the aim of ensuring cooperation of children. | Children must be appropriately guided to learn how to use face masks, in order to help reduce asymptomatic COVID-19 transmission. | Esposito S, Principi N. To mask or not to mask children to overcome COVID-19 [published online 2020 May 9]. Eur J Pediatr. doi:10.1007/s00431-020-0367-9 |
| Children, chilblain-like lesions, peak incidence, Spain | 9-May-20 | Chilblains in Children in the Setting of COVID-19 Pandemic | Pediatric Dermatology | Original Article | Acral lesions on the hands and feet, closely resembling chilblains, have been observed during the peak incidence of the COVID-19 pandemic. In this retrospective review of 22 children and adolescents with chilblain-like lesions in Madrid, Spain, all had lesions of the toes or feet, with 3 also having lesions of the fingers. Pruritus and mild pain were the only skin symptoms elicited, and only 10 had mild respiratory and/or GI symptoms. None had fever. Coagulation tests, hemogram, serum chemistry and lupus anticoagulant were normal in all patients tested. One out of 16 tested cases had elevated D-dimer results, but without systemic symptoms or other lab | Acute chilblain-like lesions in children and adolescents are reported during a period of peak COVID-19 incidence in Madrid, Spain. These lesions are mildly symptomatic, | Andina D, Noguera-Morel L, Bascuas-Arribas M, et al. Chilblains in children in the setting of COVID-19 pandemic [published online, 2020 May 9]. Pediatr Dermatol. 2020. doi:10.1111/pde.14215 |

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| | | | | | anomalies. SARS-CoV-2 detection by PCR was positive in 1 out of 19 cases tested. Skin biopsies obtained in 6 patients were consistent with chilblains. On follow-up, all cases showed spontaneous marked improvement or complete healing. | often requiring no therapy. | |
| Pregnancy, labor, social distancing, social support | 8-May-20 | Coronavirus Disease 2019 (COVID-19) and Pregnancy Combating Isolation to Improve Outcomes | Obstetrics & Gynecology | Current Commentary | With the current global pandemic, new challenges arise as social distancing and isolation have become the standard for safety. Evidence supports the protective benefits of social connections and support during pregnancy and labor. As health care professionals take appropriate precautions to protect patients and themselves from infection, there must be a balance to ensure that the importance of social and emotional support during important milestones, such as pregnancy and childbirth, are not neglected. Resources are available to help pregnant women, and technology represents an opportunity for innovation in providing care. | Social and emotional support have protective benefits during pregnancy and labor and should be preserved in an era of social distancing measures. | Jago CA, Singh SS, Moretti F. Coronavirus Disease 2019 (COVID-19) and Pregnancy Combating Isolation to Improve Outcomes [published online 2020 May 8]. Obstet Gynecol. doi:10.1097/AOG.0000000000003946 |
| Pregnancy, hospitalization, ARDS, preterm delivery, cardiac arrest, United States | 8-May-20 | Clinical course of severe and critical COVID-19 in hospitalized pregnancies: a US cohort study | American Journal of Obstetrics & Gynecology MFM | Original Research | This cohort study presents 64 pregnant women with COVID-19, hospitalized at 12 U.S. institutions between March 5 and April 20, 2020. 44/64 (69%) had severe disease, and 20/64 (31%) had critical disease. The following pre-existing comorbidities were observed: 25% had a pulmonary condition, 17% had cardiac disease, and the mean BMI was 34 kg/m$^2$. Gestational age was a mean of 29±6 weeks at symptom onset and 30±6 weeks at hospital admission. The median duration of hospital stay was 6 days for severe and 10.5 days for critical patients ($p$=0.01). In women with critical disease, prone positioning was performed in 20% of cases, the rate of ARDS was 70%, and re-intubation was necessary in 20%. There was one case of maternal cardiac arrest, but no cases of cardiomyopathy and no maternal deaths. 32 (50%) women in this cohort delivered during the course of hospitalization. 15/17 (88%) of pregnant women with critical COVID-19 had preterm delivery, 94% of them via cesarean. There were no stillbirths, neonatal deaths, or cases of vertical transmission. | In this study of severe and critical COVID-19 in pregnant women, there was a high rate of ARDS, one case of cardiac arrest, but no deaths reported. | Pierce-Williams R, Burd J, Felder L, et al. Clinical course of severe and critical COVID-19 in hospitalized pregnancies: a US cohort study [published online 2020 May 8]. AJOG MFM. doi:10.1016/j.ajogmf.2020.100134 |
| Pregnancy, placental swab, fetal membrane swab, intrapartum viral exposure, vertical transmission, New York | 8-May-20 | Detection of SARS-COV-2 in Placental and Fetal Membrane Samples | American Journal of Obstetrics & Gynecology MFM | COVID-19 Pregnancy Research | Of 32 COVID-19 positive pregnant patients who gave birth between March 1 and April 20, 2020 at NYU Langone Health, placental or membrane swabs were collected from 11 patients. Placental swabs were obtained from the amniotic surface after clearing the surface of maternal blood. Membrane swabs were obtained from between the amnion and chorion after manual separation of the membranes. Three of 11 swabs were positive for SARS-CoV-2 RNA on RT-PCR. None of the neonates tested positive for SARS-CoV2 on days of life 1 through 5, and none displayed symptoms of COVID-19. While there were no clinical signs of vertical transmission, these findings raise the possibility of intrapartum viral exposure. Given the mixing of maternal and fetal fluid and tissue during delivery, the origin of detected SARS-CoV-2 RNA may represent contamination from maternal blood, amniotic fluid, or COVID-19 infection of the membranes and amniotic sac. For infants who were delivered vaginally, contamination with vaginal secretions is also a possible source. Many neonates in this study were born via cesarean section, with decreased length of exposure to potentially contaminated tissues. | SARS-CoV-2 RNA was detected in 3/11 placental or membrane swab samples, suggesting the possibility of intrapartum viral exposure. However, no neonates tested positive for COVID-19 in this study. | Penfield CA, Brubaker SG, Limaye MA, et al. Detection of SARS-COV-2 in Placental and Fetal Membrane Samples [published online 2020 May 8]. AJOG MFM. doi:10.1016/j.ajogmf.2020.100133 |

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| Postpartum death, maternal mortality, multi-organ failure, cardiopulmonary arrest, New York | 8-May-20 | A Postpartum Death Due to Coronavirus Disease 2019 (COVID-19) in the United States | Obstetrics & Gynecology | Case Report | A 36-year-old patient at 37 weeks' gestation presented with 1-week history of shortness of breath, fever, cough, and sore throat, to a hospital in Queens, New York. Within 3 hours of admission, she experienced respiratory distress, required intubation, and underwent cesarean delivery and transfer to the intensive care unit. She subsequently decompensated, with multiorgan failure, sepsis, and cardiopulmonary arrest within 36 hours of initial presentation, despite aggressive supportive care and investigational therapies. The pathogenesis leading to rapid deterioration is unknown. | In this case report from Queens, New York, a third trimester pregnant patient with COVID-19 experienced rapid onset of critical complications that proved fatal, despite an indolent presentation. | Vallejo V, Ilagan JG. A Postpartum Death Due to Coronavirus Disease 2019 (COVID-19) in the United States [published online, 2020 May 8]. Obstet Gynecol. 2020. doi:10.1097/AOG.0000000000003950 |
| Children, age-related susceptibility, host factors, protective immunity | 8-May-20 | Lessons From COVID-19 in Children: Key Hypotheses to Guide Preventative and Therapeutic Strategies | Clinical Infectious Diseases | Review Article | The COVID-19 pandemic reveals a peculiar trend of milder disease and lower rates of case fatality in children compared to adults. Consistent epidemiologic evidence of reduced severity of infection in children across different populations and countries suggests there are underlying biologic differences between children and adults that mediate differential disease pathogenesis. The current review summarizes the current knowledge of pediatric clinical disease, role in transmission, risks for severe disease, protective immunity, as well as novel therapies and vaccine trials for children. The authors define key hypotheses and areas for future research that can use the pediatric model of disease, transmission, and immunity to develop preventive and therapeutic strategies for people of all age groups. | Authors review hypotheses, related to host factors and protective immunity between children and adults, that may explain differences in case fatality and severity of COVID-19 disease. | Singh T, Heston SM, Langel SN, et al. Lessons from COVID-19 in children: Key hypotheses to guide preventative and therapeutic strategies [published online, 2020 May 8]. Clin Infect Dis. 2020. doi:10.1093/cid/ciaa547 |
| Pregnancy, ARDS, preterm delivery, placental pathology, neonatal serology, San Francisco, CA | 8-May-20 | Acute Respiratory Distress Syndrome in a Preterm Pregnant Patient With Coronavirus Disease 2019 (COVID-19) | Obstetrics & Gynecology | Case Report | This case report describes a pregnant woman at 28 weeks' gestation, who developed acute respiratory distress syndrome (ARDS) from SARS-CoV-2 infection. Her medical history was significant for moderate asthma, gestational diabetes mellitus, obesity, and three prior cesarean deliveries. The patient's deteriorating respiratory condition prompted uncomplicated cesarean delivery; her oxygenation and respiratory mechanics improved within hours of delivery, though she required prolonged mechanical ventilation until postpartum day 10. After birth, the newborn was resuscitated and intubated for respiratory distress; he was clinically stable at day 16 of life. Neonatal oral, nasopharyngeal, and rectal swabs for SARS-CoV-2, as well as COVID-19 IgG and IgM, were all negative. Placental pathology showed acute chorioamnionitis, with no histologic evidence of other placental infections. | In this case report, early delivery improved respiratory function in a pregnant patient with ARDS requiring positive-pressure ventilation. A preterm male neonate was delivered via cesarean section and tested negative for both SARS-CoV-2 viral RNA on RT-PCR and COVID-19 serologies. | Blauvelt CA, Chiu C, Donovan AL, et al. Acute Respiratory Distress Syndrome in a Preterm Pregnant Patient With Coronavirus Disease 2019 (COVID-19) [published online, 2020 May 8]. Obstet Gynecol. 2020. doi:10.1097/AOG.0000000000003949 |
| Maternal psychological stress, fetal growth, neuro-developmental disorders | 8-May-20 | The COVID-19 Pandemic, Psychological Stress During Pregnancy, and Risk of Neurodevelopmental Disorders in Offspring: A Neglected Consequence | Journal of Psychosomatic Obstetrics & Gynecology | Letter to the Editor | Psychological stress is an emerging challenge of the COVID-19 pandemic and may be more prevalent among pregnant women than other individuals, although data are lacking. Maternal psychological distress (e.g. stress, anxiety, and depression) has been found to be a risk factor for child or adult neurodevelopmental disorders, such as attention deficit hyperactivity disorder, autism spectrum disorder, schizophrenia spectrum disorders, antisocial behavior and depressive symptoms. Psychosocial stress can augment maternal inflammation and changes in the hypothalamo-pituitary-adrenal (HPA)-axis related hormones. These changes consequently impact fetal neural development and may be involved in the etiopathogenesis of neurodevelopmental disorders of offspring. | The authors suggest that psychological stress during the COVID-19 pandemic during pregnancy may have an adverse impact on fetal growth and neurodevelopmental disorders. | Abdoli A, Falahi S, Kenarkoohi A, et al. The COVID-19 pandemic, psychological stress during pregnancy, and risk of neurodevelopmental disorders in offspring: a neglected consequence [published online, 2020 May 8]. J Psychosom Obstet Gynaecol. 2020;1-2. doi:10.1080/0167482X.2020.1761321 |

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| Pregnancy, neonatal infection, emergency cesarean section, London, UK | 7-May-20 | Re: Novel Coronavirus COVID-19 in late pregnancy: outcomes of first nine cases in an inner city London hospital | European Journal of Obstetrics & Gynecology and Reproductive Biology | Correspondence | The authors report on 9 cases of laboratory-confirmed COVID-19 in mothers who delivered at an inner-city hospital in London, between March 7 and April 22, 2020. The median age and gestation at delivery were 31 years (range 18-39 years) and 39 weeks (range 27-39 weeks) respectively. 7/9 (89%) women had mild to moderate prodromal symptoms that warranted high level of suspicion for screening. 2 of the 9 women delivered via emergency caesarean section (CS) due to deteriorating maternal respiratory function; accompanying lymphopenia was a notable clinical feature in these cases. Of the remaining 7 women, 1 mother had a vaginal delivery, 6 underwent elective CS for obstetric indications, while an emergency CS was performed in 1 woman for suboptimal cardiotocography. All neonates were immediately isolated from mothers at birth; only 1 neonate (born to the most respiratory-compromised mother) developed signs of pneumonia on day 6 of life and was confirmed to have SARS-CoV-2 based on nasopharyngeal RT-PCR. | In this case series of 9 mothers with COVID-19 from London, 2 women with deteriorating respiratory function delivered via emergency cesarean section. One neonate tested positive for SARS-CoV-2 infection. | Govind A, Essien S, Kartikeyan A, et al. Re: Novel Coronavirus COVID-19 in late pregnancy: outcomes of first nine cases in an inner city London hospital [published online, 2020 May 7]. Eur J Obstet Gynecol Reprod Biol. 2020;doi:10.1016/j.ejogrb.2020.05.004 |
| Pregnancy, hospitalization, ICU admission, non-pregnant women, New York State | 7-May-20 | Intensive Care Unit Admissions for Pregnant and Non-Pregnant Women with COVID-19 | American Journal of Obstetrics & Gynecology | Research Letter | Of all acutely symptomatic patients evaluated at a large hospital system in New York State, between March 2 and April 9, 2020, 1,168 symptomatic patients were diagnosed with COVID-19. Of these, 332 (28.4%) were non-pregnant women, and 82 (7.0%) were pregnant women. Of these pregnant symptomatic patients with diagnosed COVID-19, 2.8% had only mild respiratory disease and were admitted for obstetrical indications. In total, 50 non-pregnant women (15.1%, 50/332) and 8 pregnant women (9.8%, 8/82) were admitted to the ICU for worsening respiratory status, a difference that was not statistically significant ($p$=0.22). | The authors conclude that hospitalized pregnant women with COVID-19 are not at increased risk for ICU admission compared to their non-pregnant counterparts. | Blitz MJ, Grünebaum A, Tekbali A, et al. Intensive Care Unit Admissions for Pregnant and Non-Pregnant Women with COVID-19 [published online 2020 May 7]. AJOG. doi:10.1016/j.ajog.2020.05.004 |
| Children, neonates, pregnancy, clinical surveillance, Public Health England, UK | 7-May-20 | Prioritising Paediatric Surveillance During the COVID-19 Pandemic | Archives of Disease in Childhood | Editorial | This editorial describes efforts to collect surveillance data by Public Health England (PHE), which receives electronic notifications of all confirmed COVID-19 cases in children, from National Health Service (NHS) hospital laboratories in the UK. PHE is also working on a collaborative effort to conduct clinical surveillance of COVID-19 in neonates from birth up to 28 days of life through the British Pediatric Surveillance Unit, which will be linked to the UK Obstetric Surveillance System. Lastly, PHE is conducting sample collections to assess risk of vertical transmission in pregnant women with COVID-19, as well as seroprevalence surveys in children. | Public Health England is an executive agency, working in collaboration with the UK health system, to conduct clinical surveillance of COVID-19 in children, neonates, and pregnant women. | Ladhani SN, Amin-Chowdhury Z, Amirthalingam G, et al. Prioritising paediatric surveillance during the COVID-19 pandemic [published online, 2020 May 7]. Arch Dis Child. 2020. doi:10.1136/archdischild-2020-319363 |
| Children, primary care, routine, care, International Pediatric Association | 7-May-20 | Promoting and Supporting Children's Health and Healthcare During COVID-19 - International Paediatric Association Position Statement | Archives of Disease in Childhood | Original Research | This paper provides recommendations from the International Pediatric Association (IPA) for children's health and healthcare during COVID-19. The IPA is a membership organization of 169 pediatric societies, which includes 144 national pediatric societies, 10 regional pediatric societies, and 13 international pediatric specialty societies. The IPA outlines priorities for preserving newborn, child, and adolescent health during the COVID-19 crisis and beyond, where social distancing and lockdowns threaten access to routine care, immunization, and preventive services. The authors also recognize the need for specific strategies to reach children and youth at greatest risk, including those in low- and middle-income countries, as well as in fragile settings such as refugee camps. | This paper summarizes recommendations from the International Pediatric Association in preserving newborn, child, and adolescent health, by maintaining systems of primary care during the COVID-19 pandemic. | Klein JD, Koletzko B, El-Shabrawi MH, et al. Promoting and supporting children's health and healthcare during COVID-19 - International Paediatric Association Position Statement [published online, 2020 May 7]. Arch Dis Child. 2020. doi:10.1136/archdischild-2020-319370 |

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| Pregnancy, obstetric practice, implementation, New York, USA | 7-May-20 | Caring for Pregnant Patients with COVID-19: Practical Tips Getting from Policy to Practice | American Journal of Perinatology | Clinical Opinion | Authors from New York have experience caring for over 80 COVID-19 infected pregnant women at their institution and have encountered many challenges in applying new national standards for care. In this article, they review how to change outpatient and inpatient practices, as well as develop and disseminate new hospital protocols, and highlight the psychosocial challenges for pregnant patients and their providers. | Authors offer a blueprint for implementation of new standards of care for obstetric practice, to help providers and hospitals prepare as the number of COVID-19 cases increases in the United States. | London V, McLaren R Jr, Stein J, et al. Caring for Pregnant Patients with COVID-19: Practical Tips Getting from Policy to Practice [published online, 2020 May 7]. Am J Perinatol. 2020. doi:10.1055/s-0040-1710539 |
| Pregnancy, preterm neonate, breast milk sample, Belgium | 7-May-20 | COVID-19 in a 26-week preterm neonate | Lancet Child & Adolescent Health | Case Report | An extremely preterm female neonate (26 gestational weeks + 4 days) was born at a tertiary level hospital in Brussels, Belgium, on March 1, 2020. The mother had been referred from a peripheral hospital for pre-eclampsia and suspected cholecystitis. During hospitalization, the mother developed HELLP (hemolysis, elevated liver enzymes, and low platelet count) syndrome and intramuscular corticosteroids were administered for fetal pulmonary maturation. The neonate was delivered by cesarean section 48 hours later and transferred to the NICU, where she received non-invasive intermittent positive pressure ventilation and surfactant therapy. Despite a pneumothorax requiring drainage, the neonate remained stable in a closed incubator throughout her admission. On day 6 after delivery, the mother's nasopharyngeal swab tested positive for SARS-CoV-2, and the neonate tested positive the following day. Prior to the mother's diagnosis, the neonate had received maternal expressed breast milk, which had tested negative for SARS-CoV-2. RT-PCR testing of the neonate's nasopharyngeal swab was positive 7 days after the initial positive test and tested negative after 14 days; the mother tested negative only after 21 days. | This case study describes an extremely preterm neonate, born to a mother with COVID-19. Both were diagnosed with SARS-CoV-2 following delivery and remained clinically stable. A maternal breast milk sample tested negative for SARS-CoV-2 RNA. | Piersigilli F, Carkeek K, Hocq C, van Grambezen B, Hubinont C, Chatzis O et al. COVID-19 in a 26-week preterm neonate [published online 2020 May 7]. Lancet Child & Adol Health. doi:10.1016/S2352-4642(20)30140-1 |
| Pregnancy, vaginal swab, rectal swab, perineal contamination, cesarean vs. natural delivery | 7-May-20 | SARS-CoV-2 Possible Contamination of Genital Area: Implications for Sexual and Vertical Transmission Routes | Journal of the European Academy of Dermatology and Venereology | Letter to Editor | The SARS-CoV-2 virus can be transmitted from person to person, directly or indirectly, via the respiratory, oro-fecal and probably sexual routes. However, mother-to-child transmission through the placenta probably does not occur, or likely occurs very rarely. This letter proposes a decision algorithm that takes into account these possible routes of transmission. Routine RT-PCR assays for SARS-CoV-2 detection should be performed in all pregnant women, on nasopharyngeal, vaginal, and rectal swabs. The possibility of perineal contamination, including the vulvar-vaginal area, should also be considered. The authors suggest cesarean delivery should be performed if SARS-CoV-2 is detected on vaginal or rectal swab; natural delivery could be otherwise permitted, since it has several advantages for maternal and neonatal health over cesarean section. | The authors suggest that cesarean delivery should be performed if SARS-CoV-2 viral RNA is detected in either vaginal or rectal swabs from a pregnant woman. Otherwise, natural delivery should be prioritized. | Delfino M, Guida M, Patrì A, Spirito L, Gallo L, Fabbrocini G. SARS-CoV-2 possible contamination of genital area: implications for sexual and vertical transmission routes [published online, 2020 May 7]. J Eur Acad Dermatol Venereol. 2020. doi:10.1111/jdv.16591 |
| Children, pediatric immune system, asymptomatic carrier | 7-May-20 | COVID-19 in Newborns and Infants-Low Risk of Severe Disease: Silver Lining or Dark Cloud? | American Journal of Perinatology | Clinical Opinion | Data from China and the United States suggest a low prevalence of COVID-19 among neonates, infants, and children, with those affected not suffering from severe disease. In this article, the authors consider different theories to explain why this novel agent is sparing neonates, infants, and young children. These theories include the protective role of fetal hemoglobin in neonates; immature ACE2 interfering with viral entry into host cells; cross-immunity with other viral agents common in childhood; incomplete development of natural immunity leading to reduced risk for systemic | Various features of the pediatric immune system are discussed to provide explanations for lower rates of infection and severe COVID-19 among children. Since most | Rawat M, Chandrasekharan P, Hicar MD, Lakshminrusimha S. COVID-19 in Newborns and Infants-Low Risk of Severe Disease: Silver Lining or Dark Cloud? [published online, 2020 May 7]. Am J Perinatol. 2020. |

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| | | | | | inflammatory response syndrome (i.e. cytokine storm); differences in humoral immunity; and more efficient T-cells. The low severity of SARS-CoV-2 infection in the pediatric population is associated with a high incidence of asymptomatic or mildly symptomatic infection, making them efficient carriers and potentially major players in SARS-CoV-2 transmission to vulnerable adults. | pediatric cases are asymptomatic, children are likely to be efficient carriers of infection according to the authors. | doi:10.1055/s-0040-1710512 |
| Neonatal emergency transport system, standardized operational procedures, Italy | 7-May-20 | Neonatal Emergency Transport System During COVID-19 Pandemic in the Veneto Region: Proposal for Standard Operating Procedures | Pediatric Research | Correspondence | Neonatal Emergency Transport Service (NETS) is an essential service, especially during the COVID-19 pandemic. This report from the Veneto region of Italy presents the first recommendations available on how to reorganize NETS in order to centralize SARS-CoV-2 positive newborns and protect low-risk patients. The authors identify safe, standardized, operational procedures that are crucial for recognizing cases of SARS-CoV-2 infection in newborns, creating a pathway for the best stabilization and ambulance transport, and minimizing the risk of contamination while providing the best possible care for the newborn. | This report from Italy outlines standardized operational procedures for reorganizing a Neonatal Emergency Transport Service during the COVID-19, in order to minimize contamination risk and better stabilize potentially infected newborns. | Cavicchiolo ME, Doglioni N, Ventola MA, et al. Neonatal emergency transport system during COVID-19 pandemic in the Veneto Region: proposal for standard operating procedures [published online, 2020 May 7]. Pediatr Res. 2020. doi:10.1038/s41390-020-0937-z |
| Children, hospitalization, clinical characteristics, multicenter study, China | 7-May-20 | Children hospitalized for coronavirus disease 2019 (COVID-19): a multicenter retrospective descriptive study. | Journal of Infection | Letter to the Editor | Reports analyzing pediatric patients with COVID-19, particularly outside Wuhan, China, are limited. This letter presents data on 46 hospitalized children (≤18 years), with SARS-CoV-2 positive RT-PCR results of throat swabs, from 4 tertiary-care hospitals in Guangdong, Hunan, and Hubei provinces, China between January 9 and March 9, 2020. The median age of children was 8 years (IQR: 4-14 years), and 32 children (70%) had at least one infected family member. All cases were non-severe by clinical examination, and no children had comorbidities. 22 children (48%) were asymptomatic at onset; none experienced gastrointestinal symptoms. 20 children (43%) had chest imaging abnormalities. None required mechanical ventilation or intensive care. All have been discharged, as of March 9. The median length of hospital stay was 15 days. Four children had positive rectal swabs but negative throat swabs after recovery. | This case series reports on 46 hospitalized children with SARS-CoV-2 infection from hospitals in 3 provinces of China, who had mild symptoms and favorable clinical course. | Zhang V, Liu S, Zhang J et al. Children hospitalized for coronavirus disease 2019 (COVID-19): a multicenter retrospective descriptive study [published online 2020 May 7]. Journal of Infection. doi:10.1016/j.jinf.2020.04.045 |
| Children, asymptomatic, hyperinflammatory syndrome, Kawasaki disease shock syndrome, child mortality, UK | 7-May-20 | Hyper-inflammatory shock in children during COVID-19 pandemic | The Lancet | Correspondence | During a period of 10 days in mid-April 2020, South Thames Retrieval Service (London, UK) noted an unprecedented cluster of eight children with hyperinflammatory shock, showing features similar to Kawasaki disease shock syndrome. Six of the eight children were of Afro-Caribbean descent, and five were boys. All children except one were well above the 75th centile for weight. Four children had known family exposure to COVID-19. All tested negative for SARS-CoV-2 infection during the course of hospitalization. Clinical presentations included unrelenting fever, variable rash, conjunctivitis, peripheral edema, and generalized extremity pain with significant gastrointestinal symptoms. All progressed to warm, vasoplegic shock, requiring hemodynamic support and mechanical ventilation for cardiovascular stabilization. One child developed arrhythmia with refractory shock and died from a large cerebrovascular infarct. Since discharge of the remaining patients, two of the children have tested positive for SARS-CoV-2 infection (including the child who died, in whom SARS-CoV-2 was detected postmortem). | A clinical picture of hyperinflammatory syndrome, with multiorgan involvement similar to Kawasaki disease shock syndrome, may represent a new phenomenon affecting previously asymptomatic children with SARS-CoV-2 infection. | Riphagen S, Gomez X, Gonzalez-Martinez C, Wilkinson N, Theocharis P. Hyperinflammatory shock in children during COVID-19 pandemic [published online 2020 May 7]. Lancet. doi:1.1016/S0140-6736(20)31094-1 |

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| Children, clinical trial enrollment, pediatric treatment | 7-May-20 | Inclusion of Children in Clinical Trials of Treatments for Coronavirus Disease 2019 (COVID-19) | JAMA Pediatrics | Viewpoint | Clinical trials of several therapies for COVID-19 are being rapidly designed or already enrolling patients, but few are currently enrolling children. Between February 1 and April 11, 2020, there were 275 COVID-19 interventional clinical trials registered on ClinicalTrials.gov, of which only 30 were open to any patients younger than 18 years. In addition, global large-scale trials by the National Institutes of Health and WHO plan to enroll only adults. The exclusion of children from COVID-19 clinical trials is a lost opportunity to generate timely knowledge to guide treatment of pediatric populations. Simple extrapolation from adult to pediatric patients may not account for developmental differences in pathophysiology and drug metabolism, leaving children vulnerable to ineffective dosing or possibly unsafe treatments. Past experience demonstrates that it is possible to enroll children in clinical trials during epidemics, like the 2014 Ebola epidemic. | The exclusion of children from the majority of clinical trials for COVID-19 therapies may lead to ineffective dosing or unsafe treatments, due to a lack of evidence in pediatric populations. | Hwang TJ, Randolph AG, Bourgeois FT. Inclusion of Children in Clinical Trials of Treatments for Coronavirus Disease 2019 (COVID-19) [published online 2020 May 7]. JAMA. doi:10.1001/jamapediatrics.2020.1888 |
| Infant, anal swab, throat swab, hospitalization, Brazil | 6-May-20 | An infant with a mild SARS-CoV-2 infection detected only by anal swabs: a case report | The Brazilian Journal of Infectious Diseases | Case Report | This case report presents an 8-month-old infant, who was hospitalized with 1-day history of non-productive cough and runny nose. Chest CT showed no abnormal findings. The patient's anal swab was positive for SARS-CoV-2 via RT-PCR on day 2 after admission and remained positive for 8 days. Throat swabs were persistently negative throughout the hospital stay. Mild and asymptomatic cases of COVID-19, especially in children, might present with RT-PCR negative nasal/pharyngeal swabs and RT-PCR positive anal swabs. These patients are potential sources of infection via fecal–oral transmission. | This brief case report describes a hospitalized infant SARS-CoV-2 infection, confirmed in anal swab samples, which remained positive for 8 days. Throat swab samples were negative throughout the patient's hospital stay. | Li J, Feng J, Liu TH, Xu FC, Song GQ. An infant with a mild SARS-CoV-2 infection detected only by anal swabs: a case report [published online, 2020 May 6]. Braz J Infect Dis. doi:10.1016/j.bjid.2020.04.009 |
| Pregnancy, postpartum respiratory distress, decompensation, neonates, Canada | 6-May-20 | Postpartum exacerbation of antenatal COVID-19 pneumonia in 3 women | Canadian Medical Association Journal | Original Article | In this case series, 3 women with histories of COVID-19 exposures were admitted in their third trimester for delivery. All women delivered by cesarean section, and all newborns tested negative for SARS-CoV-2 on RT-PCR. Between 28-81 hours postpartum, all women showed postpartum respiratory distress with deoxygenation and sudden clinical decompensation, associated with lymphopenia, elevated CRP, and changes in chest CT consistent with SARS-CoV-2 infection. The authors hypothesize that the develop of serious symptoms after delivery may be due to hemodynamic, immunologic and plasma volume changes that interfered with normal hormonal and diuresis changes postpartum. These changes may have predisposed to further changes in pulmonary vasculature and decompensation, particularly in immunocompromised hosts with COVID-19, who have systemic inflammatory changes. | Three reported cases of pregnant women with COVID-19 show that normal peripartum chest CT, in the presence of mild symptoms, does not preclude an abrupt postpartum decompensation. | An P, Wood BJ, Li W, Zhang M, Ye Y. Postpartum exacerbation of antenatal COVID-19 pneumonia in 3 women [published online, 2020 May 6]. CMAJ. 2020. doi:10.1503/cmaj.200553 |
| Infants, neonates, preterm delivery, pediatric intensive care, UK | 6-May-20 | COVID-19 in Neonates and Infants: Progression and Recovery | The Pediatric Infectious Diseases Journal | Brief Report | This case series reports on 8/70 (11.4%) SARS-CoV-2 positive infants (range: 5 days-12 months), who were tested between March 10 and April 17, 2020. 5/8 (63%) developed fever, 4/8 (50%) had lower respiratory tract involvement, 2/8 (25%) had neutropenia and thrombocytosis, and 4/8 infants (50%) were treated for suspected sepsis with broad-spectrum antibiotics. Only 1/8 (13%) required pediatric intensive care following premature delivery at 34 weeks' gestation; the neonate was still able to be breastfed after delivery. All patients were eventually discharged. | In this case series of neonates and infants, cases of COVID-19 ranged from asymptomatic to moderately severe; all recovered quickly and were asymptomatic by discharge. | Ng KF, Bandi S, Bird PW, Wei-Tze Tang J. COVID-19 in Neonates and Infants: Progression and Recovery [published online, 2020 May 6]. Pediatr Infect Dis J. 2020. doi:10.1097/INF.0000000000002738 |

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| Children, risk factors, inflammatory biomarkers, lung segment involvement, China | 6-May-20 | The Risk of Children Hospitalized With Severe COVID-19 in Wuhan | The Pediatric Infectious Diseases Journal | Original Studies | This retrospective case-control study of children with SARS-CoV-2 infection, at Wuhan Children's Hospital, analyzed risk factors associated with the development and progression of COVID-19. Of 260 children admitted by March 14, 2020, 8 children were diagnosed with severe COVID-19 pneumonia and included in this study. Thirty-five children with non-severe COVID-19 infection, matched for age, sex and date of admission, were randomly selected from hospital admissions. In severe cases, the most common symptoms were dyspnea (87.5%), fever (62.5%) and cough (62.5%). White blood cell count was significantly higher in severe children than non-severe children. Levels of inflammatory bio-makers, such as CRP, IL-6, IL-10 and D-dimer, were elevated in severe children compared with non-severe children on admission. In addition, levels of total bilirubin and uric acid were clearly elevated in severe children compared with non-severe children on admission. All severe children displayed lesions on chest CT; more lung segments were involved in severe children than in non-severe children, which was the only risk factor associated with severe COVID-19 pneumonia in multivariable analysis. | In this case-control study comparing severe vs. non-severe cases of COVID-19 in children, the involvement of ≥3 lung segments was associated with greater risk of severe disease. Elevated inflammatory biomarkers, like IL-6, high total bilirubin, and D-dimer, were also identified as early risk factors for severe disease. | Wang Y, Zhu F, Wang C, et al. The Risk of Children Hospitalized With Severe COVID-19 in Wuhan [published online, 2020 May 6]. Pediatr Infect Dis J. 2020. doi:10.1097/INF.0000000000002739 |
| Child, hematuria, multi-organ involvement, respiratory virus panel, Brazil | 6-May-20 | Hematuria Associated With SARS-CoV-2 Infection in a Child | The Pediatric Infectious Diseases Journal | Letters to the Editor | This case report describes a 10-year-old female, previously healthy, who was admitted to the emergency department with a one-day history of fever, mild respiratory symptoms, and hematuria. Urinalysis showed the presence of normally shaped red blood cells and renal ultrasound showed no abnormalities. The patient's nasopharyngeal swab specimen was positive for SARS-CoV-2 RNA and negative for all other respiratory viruses. The urine sample was negative for SARS-CoV-2 RNA. Nasopharyngeal RT-PCR tests remained positive on day 7 but negative on day 21 after onset of symptoms. Hematuria and renal injury have been commonly described in viral respiratory infections, like influenza and adenovirus, and have been observed in adults hospitalized with COVID-19. Pediatricians should be aware of the possibility of similar presentations of multi organ involvement in children. | A case of mild COVID-19 in a 10-year-old child presented with mild respiratory symptoms and hematuria, suggesting the possibility of multi-organ involvement. | Almeida FJ, Olmos RD, Oliveira DBL, et al. Hematuria Associated With SARS-CoV-2 Infection in a Child [published online, 2020 May 6]. Pediatr Infect Dis J. 2020. doi:10.1097/INF.0000000000002737 |
| Children, co-infection, respiratory pathogens, China | 6-May-20 | Co-infection and Other Clinical Characteristics of COVID-19 in Children | Pediatrics | Peer-Reviewed Article (pre-publication release) | A total of 74 pediatric patients with RT-PCR confirmed COVID-19 were included in this study. None of the children had comorbidities. Of the 68 cases whose epidemiological data were complete, 65 (95.6%) cases were household contacts of adults. Cough (32.4%) and fever (27.0%) were the predominant symptoms of 44 (59.5%) symptomatic patients at illness onset. Abnormalities in leukocyte count were found in 23 (31.1%) children and 10 (13.5%) children presented with abnormal lymphocyte count. Of the 34 (46.0%) patients who had nucleic acid testing results for common respiratory pathogens, 19 (51.4%) showed co-infection with other pathogens other than SARS-CoV-2. Ten (13.5%) children had RT-PCR analysis for fecal specimens and 8 of them showed prolonged existence of SARS-CoV-2 RNA. | Pediatric COVID-19 patients presented with symptoms distinct from adults and were susceptible to co-infection with other respiratory pathogens. Persistent fecal shedding of viral RNA was found after respiratory specimens turned negative. | Wu Q, Xing Y, Shi L, et al. Co-infection and Other Clinical Characteristics of COVID-19 in Children [published online, 2020 May 6]. Pediatrics. 2020. doi:10.1542/peds.2020-0961 |

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| Children, pediatric emergency department attendance, UK | 6-May-20 | Where Have All the Children Gone? Decreases in Paediatric Emergency Department Attendances at the Start of the COVID-19 Pandemic of 2020 | Archives of Disease in Childhood | Letter | Although children and young people (CYP, defined here as <16 years) can become infected with SARS-CoV-2, it appears that they are mainly asymptomatic or experience mild symptoms, resulting in a much smaller number of COVID-19 related emergency department (ED) attendances. This letter reports findings from a comparison of ED attendance data for CYP since the first reported cases of COVID-19 with the same weeks in 2019. There was a 5.6% decrease between February 2019 and February 2020, and a 30.4% decrease between March 2019 and March 2020 at a large district general hospital in Greater Manchester, UK. There was a 0.6% decrease between February 2019 and February 2020, and a 33.8% decrease between March 2019 and March 2020 at a regional children's hospital in the same area. The reasons why children were not attending likely reflect changing behaviors and concerns of their caregivers during the pandemic. | Based on Emergency Department (ED) attendance data from two hospitals in the UK, findings show that children are presenting to the ED at a lower rate during the pandemic (February and March 2020) compared to the same months in 2019. | Isba R, Edge R, Jenner R, Broughton E, Francis N, Butler J. Where have all the children gone? Decreases in paediatric emergency department attendances at the start of the COVID-19 pandemic of 2020 [published online, 2020 May 6]. Arch Dis Child. 2020. doi:10.1136/archdischild-2020-319385 |
| Children, immune preparedness, innate immunity, natural antibodies, memory B cells | 6-May-20 | The immune system of children: the key to understanding SARS-CoV-2 susceptibility? | The Lancet Child & Adolescent Health | Comment | To date, there is no evidence to support a lower degree of expression or function of the SARS-CoV-2 receptor (namely ACE2) in children, who experience milder COVID-19 disease than adults. During the first years of life, frequent infections build the pool of memory T and B cells that will prevent reinfection by commonly encountered pathogens. Pediatric immune preparedness, fit to react to novel pathogens including SARS-CoV-2, might be based on the abundance of natural antibodies in children. These antibodies (mostly IgM) are generated independently of previous antigen encounters, have broad reactivity, and contain infection during the 2 weeks necessary for production of high-affinity antibodies and memory B cells. Preliminary results from a prospective study designed to test these hypotheses suggest an early polyclonal B-cell response with production of substantial numbers of plasmablasts (mostly IgM) in children. This response is not observed in adults with severe disease. | The immune preparedness of children, who are better equipped to respond to frequent, novel infection through innate immunity (e.g. natural IgM antibodies), may explain differences in COVID-19 susceptibility and disease course between children and adults. | Carsetti R, Quintarelli C, Quinti L, Mortari EP, Zumla A, Ippolito G et al. The immune system of children: the key to understanding SARS-CoV-2 susceptibility? [published online 2020 May 6]. Lancet Child & Adol Health. doi:10.1016/S2352-4642(20)30135-8 |
| Neonatal nutrition, breastfeeding, human milk banking | 6-May-20 | Maintaining safety and service provision in human milk banking: a call to action in response to the COVID-19 pandemic | The Lancet Child & Adolescent Health | Comment | A Virtual Communication Network of milk bank leaders formed on March 17, 2020, and now has more than 80 members from 34 countries. Data collated from regional and country leads show that more than 800,000 infants are estimated to receive donor milk worldwide annually. The group actively discusses COVID-19-specific challenges and has developed mitigation strategies to ensure donor milk safety and service continuation, which will shortly be made available as a publication. Unlike HIV, where transmission via breastfeeding was a source of infection, there is no evidence to support SARS-CoV-2 transmission from human milk, and the virus is inactivated by heat treatment. In line with WHO recommendations, the promotion of breastfeeding and a human milk diet, using donor milk bank resources, must be prioritized as an essential component of early newborn care. | A Virtual Communication Network of international milk bank leaders considers issues related to the provision of donor milk services during the COVID-19 pandemic and provides guidance around breastfeeding. | Shenker N, on behalf of the Virtual Collaborative Network of Human Milk Banks and Associations. Maintaining safety and service provision in human milk banking: a call to action in response to the COVID-19 pandemic [published online 2020 May 6]. Lancet Child & Adol Health. doi:10.1016/S2352-4642(20)30134-6 |

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| Fetal surgery, perinatal management, vertical transmission | 6-May-20 | Fetal Diagnosis and Therapy During the COVID-19 Pandemic: Guidance on Behalf of the International Fetal Medicine and Surgery Society | Fetal Diagnosis and Therapy | Original Paper | This review discusses potential modifications to obstetric management and fetal procedures in both SARS-CoV-2 negative and positive patients with fetal anomalies or disorders. Most fetal therapies are time sensitive and cannot be delayed. If personnel and resources are available, procedures of proven benefit should continue to be offered, acknowledging any fetal and maternal risks, including those to health care workers. There is, to date, minimal, unconfirmed evidence of spontaneous vertical transmission, though it may theoretically be increased with some procedures. It is important to know a mother's preoperative SARS-CoV-2 status to avoid or defer certain procedures while she is contagious. Some fetal conditions may alternatively be managed neonatally. Counseling regarding fetal interventions that carry the possibility of additional intra- or postoperative morbidity must be provided in the context of local resource availability. | Fetal interventions of proven benefit should continue to be offered, taking into account the added maternal and fetal risks presented by positive SARS-CoV-2 status. | Deprest J, Choolani M, Chervenak F, et al. Fetal Diagnosis and Therapy during the COVID-19 Pandemic: Guidance on Behalf of the International Fetal Medicine and Surgery Society [published online, 2020 May 6]. Fetal Diagn Ther. 2020;1-10. doi:10.1159/000508254 |
| Children, clinical characteristics, epidemiology, chest CT lesions, discharge criteria, China | 6-May-20 | A Single-Center, Retrospective Study of COVID-19 Features in Children: A Descriptive Investigation | BMC Medicine | Research Article | Among 50 children with positive SARS-CoV-2 RT-PCR tests, admitted to Wuhan Children's Hospital, five had negative results initially but showed positive results in subsequent tests. Eight (16%) patients had lymphopenia, seven (14%) had thrombocytopenia, four (8%) had lymphocytosis, two (4%) had thrombocytosis, ten (20%) had elevated C-reactive protein, four (8%) had hemoglobin above, and six (12%) had below standard reference values. Seven (14%) of the 50 had no radiologic evidence of disease on chest CT. For the 43 patients who had abnormal CT findings, in addition to previously reported patterns of ground-glass opacity (67%), local patchy shadowing (37%), local bilateral patchy shadowing (21%), and lesion location of lower lobes (65%), other CT features showed an overwhelming number of pediatric patients with lesions in the subpleural area (95%), and 22 of the 28 lower lobe lesions were in the posterior segment (78%). Lesions were not completely absorbed in 67% of the 15 patients who received a chest CT at discharge, and 26% of these patients had CT lesions that were either unchanged or worse. All 15 patients had normal body temperatures, no clinical symptoms, and consecutive negative PCR tests at discharge. | This retrospective study concludes that CT is a powerful tool to detect and characterize COVID-19 pneumonia but has little utility in evaluating clinical recovery for children, prior to discharge. | Ma H, Hu J, Tian J, et al. A single-center, retrospective study of COVID-19 features in children: a descriptive investigation. BMC Med. 2020;18(1):123. Published 2020 May 6. doi:10.1186/s12916-020-01596-9 |
| Children, viral shedding, Kaplan-Meier analysis, China | 5-May-20 | Symptomatic Infection Is Associated With Prolonged Duration of Viral Shedding in Mild Coronavirus Disease 2019: A Retrospective Study of 110 Children in Wuhan | The Pediatric Infectious Diseases Journal | Original Studies (peer-reviewed) | Data from 110 children (median age: 6 years) with COVID-19 at Wuhan Children's Hospital, from January 30 to March 10, 2020, were analyzed retrospectively. The median period of viral SARS-CoV-2 RNA shedding, assessed via RT-PCR on throat or nasopharyngeal swab, was 15 days (IRQ: 11-20 days) as measured from illness onset to discharge. This period was shorter in asymptomatic patients (26.4%) compared with symptomatic patients (73.6%) (11 vs. 17 days). Multivariable regression analysis showed increased odds of symptomatic infection was associated with age <6 years (OR 8.9, 95% CI 2.6-31.4; $p$=0.001), hypersensitive C-reactive protein >3.0 mg/L (OR 4.89; 95% CI 1.1-21.8; $p$=0.037) and presenting pneumonia in chest radiologic findings (OR 8.5; 95% CI 2.7-26.6; $p$<0.001). Kaplan-Meier analysis revealed that symptomatic infection ($p$<0.001), fever ($p$=0.006), pneumonia ($p$=0.003) and lymphocyte counts <$2.0\times10^9$/L ($p$=0.008) were associated with prolonged duration of viral RNA shedding in children with COVID-19. | In this study, prolonged duration of viral RNA shedding in children with COVID-19 was associated with symptomatic infection, fever, pneumonia and lymphocyte count of $2.0\times10^9$/L. | Lu Y, Li Y, Deng W, et al. Symptomatic Infection is Associated with Prolonged Duration of Viral Shedding in Mild Coronavirus Disease 2019: A Retrospective Study of 110 Children in Wuhan [published online, 2020 May 5]. Pediatr Infect Dis J. 2020. doi:10.1097/INF.0000000000002729 |

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| Children, super spreaders, transmission, community testing, family clusters, school closures | 5-May-20 | Children Are Not COVID-19 Super Spreaders: Time to Go Back to School | Archives of Disease in Childhood | Viewpoint | Early contact tracing data from Shenzhen, China appeared to confirm a role for children in COVID-19 transmission; however, in some regions where widespread community testing has been implemented (e.g. South Korea, Iceland), children are significantly underrepresented in the number of positive cases among the general populations. Thus, evidence is emerging that children could be less likely to become infected than adults. Alternatively, children could have a more transient upper respiratory infection with minimal viral shedding; data on family clusters have shown that children are not likely to be the index case in households. Currently, children do not appear to be super spreaders but until there is high-quality sero-surveillance data, these questions cannot be answered with certainty. | Based on studies of widespread community testing and family clusters, the authors argue that children do not appear to play a significant role in COVID-19 transmission. | Munro APS, Faust SN. Children are not COVID-19 super spreaders: time to go back to school [published online, 2020 May 5]. Arch Dis Child. 2020. doi:10.1136/archdischild-2020-319474 |
| Children, renin-angiotensin-aldosterone system, cardiovascular disease, chronic kidney disease | 5-May-20 | ACE2, COVID-19, and ACE Inhibitor and ARB Use During the Pandemic: The Pediatric Perspective | Hypertension | Original Article | This review highlights the relationship of COVID-19 and the use of ACE inhibitors and angiotensin II receptor blockers (ARB) to treat chronic kidney and cardiovascular disease, from a pediatric perspective. A summary of the renin-angiotensin-aldosterone system and review of the literature pertaining to the ACE2/Angiotensin-(1-7) pathway in children are provided. Currently, there is no evidence that children who are taking ACE inhibitors or ARBs are at increased risk of SARS-CoV-2 infection or severe disease. Given the proven benefits of these medications, especially for youth with chronic conditions, many scientific societies affirm the continued use of these agents. | ACE inhibitors and angiotensin II receptor blockers have not been conclusively shown to increase risk of SARS-CoV-2 infection and should continue to be used in children with chronic conditions. | South AM, Brady TM, Flynn JT. ACE2, COVID-19, and ACE Inhibitor and ARB Use during the Pandemic: The Pediatric Perspective [published online, 2020 May 5]. Hypertension. 2020. doi:10.1161/HYPERTENSIONAHA.120.15291 |
| Pregnancy, questionnaire, systematic screening, Italy | 5-May-20 | Effectiveness of a COVID-19 Screening Questionnaire for Pregnant Women at Admission to an Obstetric Unit in Milan | International Journal of Gynaecology & Obstetrics | Brief Communication | Sutton et al. reported on universal testing with nasopharyngeal swabs to detect severe SARS-CoV-2 infection in 215 women admitted for delivery at the Presbyterian Allen Hospital in New York, USA. However, this approach is only feasible in major hospitals in high-resource countries with efficient lab facilities in-house. An alternative approach is considered in this report from a COVID-19 maternity hub in Milan, Italy. This facility opted for systematic screening for SARS-CoV-2 using a specific questionnaire, administered at obstetrics admission; suspected cases underwent nasopharyngeal swab testing and were managed as suspected COVID-19 cases until results were available. Of 139 women screened (between April 1-9, 2020) using this questionnaire, 6 (4.3%) were considered suspected cases while the remaining 133 (95.7%) were not. Nasopharyngeal swab results were positive in 2 suspected cases and 1 woman with an unremarkable screening response. This screening approach may be less efficient in areas where the absolute rate of undetected COVID-19 cases would be markedly higher. | A COVID-19 maternity hub in Milan, Italy employed a questionnaire to systematically screen for suspected cases of SARS-CoV-2 among pregnant women at obstetrics admission. This is an inexpensive and possibly effective tool in settings with relatively lower incidence. | Tassis B, Lunghi G, Frattaruolo MP, Ruggiero M, Somigliana E, Ferrazzi E. Effectiveness of a COVID-19 screening questionnaire for pregnant women at admission to an obstetric unit in Milan [published online, 2020 May 5]. Int J Gynaecol Obstet. 2020. doi:10.1002/ijgo.13191 |
| Pregnancy, breast milk samples, vaginal secretions, China | 5-May-20 | Coronavirus Disease 2019 Among Pregnant Chinese Women: Case Series Data on the Safety of Vaginal Birth and Breastfeeding [link was not working on 8 May 2020 when posted] | BJOG | Case Series | In this single center cohort study, 13 pregnant women with SARS-CoV-2 infection, diagnosed between January 31 and March 9, 2020 at Renmin Hospital, Wuhan, China, were included. Of the 13 women, 5 were in their first trimester, 3 in their second trimester, and 5 in their third trimester. Of the 5 women during their third trimester who gave birth, all delivered live newborns. Among these 5 deliveries, the primary adverse perinatal outcomes included premature delivery (n = 2) and neonatal pneumonia (n = 2). One of 9 maternal stool samples was positive for SARS-CoV-2 on RT-PCR; all 13 vaginal secretion samples in addition to 5 neonatal throat swabs and 4 neonatal anal swabs were negative. However, 1 of 3 samples of breast milk was positive by viral nucleic acid testing. | Negative SARS-CoV-2 test results for vaginal secretion specimens, from pregnant women with COVID-19, suggest that vaginal delivery may be a safe option. However, a positive breast milk sample in this study warrants further study of the risk for viral contamination. | Wu Y, Liu C, Dong L, et al. Coronavirus disease 2019 among pregnant Chinese women: Case series data on the safety of vaginal birth and breastfeeding [published online, 2020 May 5]. BJOG. 2020. doi:10.1111/1471-0528.16276 |

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| Pregnancy, neonatal death, maternal hypoxia, ARDS, inflammatory storm, fetal myocardium, China | 5-May-20 | Critically Ill Pregnant Patient With COVID-19 and Neonatal Death Within Two Hours of Birth | International Journal of Gynaecology & Obstetrics | Brief Communication | Most pregnant women with COVID-19 appear to experience a milder clinical course. In contrast, the present report describes a critical case of COVID-19 in a 31-year-old pregnant woman, admitted to Xiaolan People's Hospital of Zhongshan at 35+2 weeks of pregnancy with no known comorbidity or history of chronic illness. Onset of symptoms in the patient began with a sore throat and dry cough for 4 days, followed by fever and dyspnea for half a day. Within 12 hours of hospitalization, the patient experienced rapid aggravation of disease, progressing to acute respiratory distress syndrome and septic shock. An emergency cesarean delivery was performed at the bedside, but the neonate died within two hours of birth. Maternal hypoxia may have caused sudden changes in the fetal intrauterine environment, while the inflammatory storm caused by maternal infection may have triggered a systemic immune response that attacked fetal organs. Biochemical examination of umbilical cord blood at birth revealed a marked increase in myocardial enzymes, suggesting severe damage to the fetal myocardium. | This case report describes neonatal death following emergency cesarean delivery in a pregnant woman with severe COVID-19, which progressed to ARDS and septic shock. Causes of death may relate to conditions of maternal hypoxia and inflammatory storm, leading to damage of fetal organs. | Li J, Wang Y, Zeng Y, et al. Critically ill pregnant patient with COVID-19 and neonatal death within two hours of birth [published online, 2020 May 5]. Int J Gynaecol Obstet. 2020. doi:10.1002/ijgo.13189 |
| Pregnancy, breastfeeding, breast milk samples, whole vs. skim milk, Germany | 4-May-20 | Detection of SARS-CoV-2 in Human Breast Milk | medRxiv | Preprint (not peer reviewed) | Recent reviews show no evidence for SARS-CoV-2 in human breast milk, however sample sizes are small, and specimens have only been collected once from each mother. In this report, authors analyzed whole and skim milk (after removal of the lipid fraction) samples from 2 nursing mothers who were diagnosed with COVID-19 days after delivery of and room sharing, with each other and with their newborns. Newborn 1 tested positive for SARS-CoV-2 infection on day 8. Four milk samples from Mother 1, between day 12 and 14, all tested negative. In contrast, SARS-CoV-2 RNA was detected in milk samples from Mother 2 on days 10, 12, 13, and 14. A later sample from Mother 2 on day 25 was negative. Detection of viral RNA in the milk of Mother 2 coincided with mild COVID-19 symptoms and a SARS-CoV-2 diagnosis of Newborn 2 on day 11. Mother 2 wore a surgical mask beginning at symptom onset and followed safety precautions during handling and feeding of the neonate. Whether Newborn 2 was infected by breastfeeding or other modes of transmission remains unclear. | In this case study of two nursing mothers with COVID-19, both newborns tested positive for SARS-CoV-2 infection within 1-2 weeks of birth. SARS-CoV-2 RNA was only detected in one mother's consecutive breast milk samples. | Groß R, Conzelmann C, Müller J, Stenger S, Steinhart K, Kirchhoff F, Münch J. Detection of SARS-CoV-2 in Human Breast Milk [published online 2020 May 4]. medRxiv. doi:10.1101/2020.04.28.20075523 |
| Female reproductive system, pregnancy, renin-angiotensin system | 4-May-20 | Potential Influence of COVID-19/ACE2 on the Female Reproductive System | Molecular Human Reproduction | Review | The SARS-CoV-2 virus invades the target cell by binding to angiotensin-converting enzyme (ACE) 2 and modulates the expression of ACE2 in host cells. ACE2, a pivotal component of the renin-angiotensin system, exerts its physiological functions by modulating the levels of angiotensin II (Ang II) and Ang-(1-7). In this article, authors review existing literature on the distribution and function of ACE2 in the female reproductive system, hoping to clarify the potential harm of SARS-CoV-2 to female fertility. Available evidence suggests that ACE2 is widely expressed in the ovary, uterus, vagina and placenta. Therefore, the possibility of mother-to-child and sexual transmission exists. Ang II, ACE2 and Ang-(1-7) regulate follicle development and ovulation, modulate luteal angiogenesis and degeneration, and also influence the regular changes in endometrial tissue and embryo development. Taking these functions into account, by modulating the expression of ACE2 receptors, SARS-CoV-2 may disturb female reproductive functions. | Wide expression of the ACE-2 receptor in the ovary, uterus, vagina, and placenta suggest the possibility of mother-to-child and sexual transmission of SARS-CoV-2. Binding of SARS-CoV-2 virus to the ACE-2 receptor may disrupt female reproductive functions regulated by the renin-angiotensin system. | Jing Y, Run-Qian L, Hao-Ran W, et al. Potential influence of COVID-19/ACE2 on the female reproductive system [published online, 2020 May 4]. Mol Hum Reprod. 2020. doi:10.1093/molehr/gaaa030 |

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| Neonatal infection, hypoxemia, perioral cyanosis, poor sucking, maternal expressed milk, Italy | 4-May-20 | Early Neonatal SARS-CoV-2 Infection Manifesting With Hypoxemia Requiring Respiratory Support | Pediatrics | Case Report | On the second day after uncomplicated vaginal delivery of a male neonate, the mother developed fever without respiratory symptoms, and her nasopharyngeal swab was positive for SARS-CoV-2. A nasopharyngeal swab obtained on the same day was also positive for the neonate, who was isolated from his mother. After 48 hours of isolation, on day 5 of life, the neonate developed perioral cyanosis and poor sucking without signs of respiratory distress. Arterial blood gas analysis demonstrated moderate hypoxia. The neonate was admitted to the NICU and placed on 30% inspired oxygen via high-flow nasal cannula, and his condition improved. He was fed maternal expressed milk by nasogastric tube for 48 hours, after which he was able to be fully fed orally. On days 15 and 21 of life, his qualitative PCR for COVID-19 remained positive. | A case of COVID-19 in a 3-day-old neonate manifested with silent hypoxemia. The neonate was fed expressed maternal milk via nasogastric tube until he was able to be fed orally. The nasopharyngeal swab remained positive for more than two weeks, unlike previous reports showing rapid virologic clearance. | Sinelli MT, Paterlini G, Citterio M, Di Marco A, Fedeli T, Ventura ML. Early Neonatal SARS-CoV-2 Infection Manifesting With Hypoxemia Requiring Respiratory Support [published online, 2020 May 4]. Pediatrics. 2020. doi:10.1542/peds.2020-1121 |
| Obesity, young age, ICU admission, USA | 4-May-20 | Obesity could shift severe COVID-19 disease to younger ages | Lancet | Correspondence | Obesity is an underappreciated risk factor for COVID-19 and is particularly relevant in the USA, where the prevalence of obesity is around 40%, versus a prevalence of 6.2% in China, 20% in Italy, and 24% in Spain. In a dataset of 265 patients (58% male) with COVID-19 admitted to the ICU at various university hospitals at 6 sites across the country, a significant inverse correlation between age and BMI was observed. In other words, younger individuals admitted to the ICU were more likely to be obese. The median BMI was 29.3kg/$m^2$, with 25% exceeding a BMI of 34.7kg/$m^2$. Obesity can restrict ventilation by impeding diaphragm excursion, impairs immune responses to viral infection, is pro-inflammatory, and induces diabetes and oxidant stress to adversely affect cardiovascular function. The authors conclude that in populations with a high prevalence of obesity, COVID-19 will affect younger populations more than previously reported. | Younger patients with COVID-19, admitted to ICUs across various university hospitals in the USA, were more likely to be obese than older patients. Obesity warrants further attention as a pro-inflammatory risk factor for COVID-19, especially in younger individuals. | Kass DA, Duggal P, Cingolani O. Obesity could shift severe COVID-19 disease to younger ages [published online 2020 May 4]. Lancet. doi:10.1016/S0140-6736(20)31024-2 |
| Pregnancy, antenatal, intrapartum, postpartum care, UK | 4-May-20 | Covid-19 and pregnancy | BMJ | Practice | The UK Royal College of Obstetricians and Gynaecologists (RCOG) recently published a set of guidelines related to COVID-19 in pregnancy, on April 17, 2020. This summary reviews the development of the guideline and key recommendations. The guideline itself summarizes the available evidence on the effects of COVID-19 on pregnant women and fetuses. It provides recommendations on the care of pregnant women with suspected or confirmed COVID-19 in the antepartum, intrapartum, and postnatal stages. | This brief summary reviews guidelines recently published by the UK Royal College of Obstetricians and Gynaecologists on caring for pregnant women with COVID-19. | Covid-19 and pregnancy. BMJ. 2020;369:m1672. Published 2020 May 4. doi:10.1136/bmj.m1672 |
| Pediatric, neonatal resuscitation, basic life support | 4-May-20 | Interim Guidance for Basic and Advanced Life Support in Children and Neonates With Suspected or Confirmed COVID-19 | Pediatrics | Scientific Statement | The American Heart Association, in collaboration with other organizations, has compiled interim guidance to help rescuers treat victims of cardiac arrest with suspected or confirmed COVID-19. The challenge is to ensure that patients with or without COVID-19 who experience cardiac arrest have the best possible chance of survival without compromising the safety of rescuers. The present statement applies specifically to pediatric and neonatal resuscitations, with situation- and setting-specific considerations. | These guidelines offer considerations for pediatric and resuscitation in suspected or confirmed COVID-19 patients. | Topjian A, Aziz K, Kamath-Rayne BD, et al. Interim Guidance for Basic and Advanced Life Support in Children and Neonates With Suspected or Confirmed COVID-19 [published online, 2020 May 4]. Pediatrics. 2020. doi:10.1542/peds.2020-1405 |

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| Pediatrics, ethical issues, ventilator allocation | 4-May-20 | Pediatric Ethical Issues During the COVID-19 Pandemic Are Not Just About Ventilator Triage | Acta Paediatrica | View | Administrators and providers worry about an overwhelming shortage in critical life-saving ventilators for adults during the COVID-19 pandemic. However, algorithms for ventilator allocation do not easily translate to pediatric medicine nor does ventilator allocation represent an urgent crisis for pediatric medicine. In this report, authors highlight underrecognized pediatric ethical concerns: other triage decisions for scarce resources (e.g. redeployment of skilled pediatric personnel to adult medicine), the negative psychosocial effects of the pandemic on children, including food insecurity, the moral and emotional toll on clinicians, and system inadequacies. | Attention has focused on triage decisions surrounding ventilator shortages for critically ill adult patients. In contrast, this report highlights ethical concerns specific to children during the COVID-19 pandemic. | Haward MF, Moore GP, Lantos J, Janvier A. Pediatric ethical issues during the COVID-19 pandemic are not just about ventilator triage [published online, 2020 May 4]. Acta Paediatr. 2020. doi:10.1111/apa.15334 |
| Pediatric physicians, survey, Australia, New Zealand | 4-May-20 | COVID-19 and Paediatric Health Services: A Survey of Paediatric Physicians in Australia and New Zealand | Journal of Paediatrics and Child Health | Original Article | The aim of this study was to assess attitudes, readiness and confidence in the early stages of the COVID-19 pandemic through an online survey of pediatric physicians and sub-specialists across Australia and New Zealand, between March 17 and 24, 2020. Of 542 respondents (an estimated 11% of the pediatric physician workforce in Australia and New Zealand), a minority (36.6%) agreed that their national response had been well coordinated; the majority (92.7%) agreed that senior-level hospital administrators were taking the situation seriously. Most reported a good understanding of the natural history of COVID-19 in children, and knowledge of where to find local information. A large proportion of physicians (86.1%) were worried about becoming infected through their work; few (5.8%) reported that they would not come to work to avoid infection. Closure of school and childcares would reduce the ability to continue work at current capacity for 23.6% of respondents. | In this survey of pediatric physicians in Australia and New Zealand, most felt informed and were willing to work despite concerns about exposure at work. | Foley DA, Kirk M, Jepp C, et al. COVID-19 and paediatric health services: A survey of paediatric physicians in Australia and New Zealand [published online, 2020 May 4]. J Paediatr Child Health. 2020. doi:10.1111/jpc.14903 |
| Vertical transmission, congenital vs. perinatal transmission, placenta, breast milk samples, maternal antibodies | 3-May-20 | Evidence for and Against Vertical Transmission for SARS-CoV-2 (COVID-19) | American Journal of Obstetrics and Gynecology | Review (journal pre-proof) | Twelve articles, published between February 10 and April 4, 2020, reporting on 68 cases of maternal infection in the third trimester of pregnancy and deliveries of 71 neonates were identified. In these studies, SARS-CoV-2 viral nucleic acid was recovered by RT-PCR from nasal/throat swabs, sputum and feces of symptomatic patients, including neonates, but not from maternal vaginal swabs, amniotic fluid, placenta, cord blood, neonatal blood or breast milk samples. Understanding perinatal exposure, influenced by mode of delivery (e.g. exposure to maternal feces during vaginal delivery) and time interval from delivery to the diagnosis of neonatal infection (e.g. exposure to maternal respiratory secretions after birth), is crucial in differentiating congenital from perinatal infection. The low presence of viremia (observed in only 1% of symptomatic adults) decreases the likelihood of placental infection. In addition, the interpretation of IgM and IgG antibodies levels in cord and neonatal blood, in the context of serological evidence for vertical transmission, is also discussed in this review. | This review discusses published literature to date that support or refute the possibility of vertical transmission, both congenital and perinatal, of SARS-CoV-2 infection. | Lamouroux A, Attie-Bitach T, Martinovic J, Leruez-Ville M, Ville Y. Evidence for and against vertical transmission for SARS-CoV-2 (COVID-19) [published online, 2020 May 3]. Am J Obstet Gynecol. 2020. doi:10.1016/j.ajog.2020.04.039 |
| Children, athletes, alveolar ventilation, immunological model | 2-May-20 | The First, Holistic Immunological Model of COVID-19: Implications for Prevention, Diagnosis, and Public Health Measures | Pediatric Allergy and Immunology | Review Article | In this proposed, immunological model of COVID-19, authors argue that the confrontation between SARS-CoV-2 and innate immunity is crucial in determining outcomes. Natural antibodies and other components of innate immunity are the first line of defense and must block the virus from spreading past the upper airways in the first 10-12 days from infection (5-7 days from disease onset), i.e. in the time required to prepare an efficient adaptive primary antibody response. Mannose Binding Lectin (MBL) plays a pivotal role in innate immunity as a pattern-recognition receptor and may | Authors describe key features of innate immunity (e.g. Mannose Binding Lectin, natural IgM antibodies), which form the first line of defense against viral infection | Matricardi PM, Dal Negro RW, Nisini R. The first, holistic immunological model of COVID-19: implications for prevention, diagnosis, and public health measures [published online, 2020 May 2]. Pediatr Allergy |

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| | | | | | inhibit interaction between SARS-CoV-2 and the ACE2 binding site. Serum MBL levels are distinctly higher in children (3-19 years) than adults and decline with age. In addition, natural IgM antibody levels have been shown to reach adult values in children 5 to 10 years old and decline with age, especially after the early 40s. | and may serve a protective role in children. | Immunol. 2020. doi:10.1111/pai.13271 |
| Neonates, postnatal infection, NICU, respiratory support modalities | 2-May-20 | COVID-19 and Neonatal Respiratory Care: Current Evidence and Practical Approach | American Journal of Perinatology | Review Article | Authors comprehensively review current evidence regarding COVID-19 perinatal transmission, respiratory outcomes of neonates born to mothers with COVID-19 and infants with documented SARS-CoV-2 infection, and the evidence for using different respiratory support modalities and aerosol-generating procedures in this specific population. The results demonstrated that to date, neonatal COVID-19 infection is uncommon, generally acquired postnatally, and associated with favorable respiratory outcomes. The reason why infants display a milder spectrum of disease remains unclear. Nonetheless, the risk of severe or critical illness in young patients exists. Currently, the recommended respiratory approach for infants with suspected or confirmed infection is not evidence based but should include all routinely used types of support, with the addition of viral filters, proper personal protective equipment, and separation of infants with suspected or confirmed COVID-19 from their mothers and placement in isolation rooms, ideally with negative pressure. | This report outlines current evidence on neonatal COVID-19, including recommended approaches for respiratory support for neonates with suspected or confirmed infection. | Shalish W, Lakshminrusimha S, Manzoni P, Keszler M, Sant'Anna GM. COVID-19 and Neonatal Respiratory Care: Current Evidence and Practical Approach [published online, 2020 May 2]. Am J Perinatol. 2020. doi:10.1055/s-0040-1710522 |
| Neonatal, late onset infection, pregnancy, breastfeeding, maternal antibodies, Italy | 2-May-20 | Neonatal Late Onset Infection With Severe Acute Respiratory Syndrome Coronavirus 2 | American Journal of Perinatology | Short Communication | This observational study aimed to evaluate post-discharge SARS-CoV-2 status of newborns (born to pregnant women with COVID-19) who were negative for SARS-CoV-2 infection at birth. Of seven pregnant women with documented SARS-CoV-2 infection, one woman had a spontaneous abortion at 8 weeks of gestational age, four women recovered and are still in follow-up, and two women delivered, at term and pre-term respectively. At birth and 3 days of life, both neonates were negative for SARS-CoV-2 infection. At the 15-day follow-up, one newborn tested positive on nasopharyngeal swab, although he was asymptomatic. This newborn had been breastfed by his mother, who wore a mask while recovering from COVID-19. Since breast milk samples tested negative, respiratory secretions were the likely source of late-onset neonatal infection. Authors speculate that SARS-CoV-2 IgG antibodies (documented at birth in neonatal blood) protected the newborn from symptomatic infection, preserving the benefits of breastfeeding. At follow-up, the second newborn tested negative for SARS-CoV-2 on nasopharyngeal and rectal swabs and had been fed expressed milk by his father. These findings highlight the importance of long-term follow-up of newborns to mothers with COVID-19 in pregnancy. | This case report describes one case of late-onset, asymptomatic neonatal infection, following delivery by a COVID-19 positive mother. It is possible that maternal SARS-CoV-2 IgG antibodies, documented in neonatal blood at birth, protected the newborn from a symptomatic course of infection. | Buonsenso D, Costa S, Sanguinetti M, et al. Neonatal Late Onset Infection with Severe Acute Respiratory Syndrome Coronavirus 2 [published online, 2020 May 2]. Am J Perinatol. 2020. doi:10.1055/s-0040-1710541 |
| Infant, malnutrition, critical disease, T cell counts, nasopharyngeal viral shedding | 1-May-20 | A Typical Case of Critically Ill Infant of Coronavirus Disease 2019 With Persistent Reduction of T Lymphocytes | The Pediatric Infectious Disease Journal | Original Studies | This case presents a critically ill, 8-month-old male infant with COVID-19 and a history of poor growth and malnutrition, in addition to past neonatal cardiac surgery and two episodes of pneumonia in early infancy. Once admitted to the hospital, he developed life-threatening clinical features of COVID-19, including high fever, septic shock, recurrent apnea, petechiae and acute kidney injury and persistent reduction of CD3+, CD4+ and CD8+ T cells. The duration of nasopharyngeal virus shedding lasted 49 days despite administration of lopinavir/ritonavir for 8 days. CD3+, CD4+ and CD8+ T cell counts were partially recovered 68 days post-disease onset. Nucleic acid | A persistent reduction of CD4+ and CD8+ T cells as well as prolonged nasopharyngeal viral SARS-CoV-2 shedding were key clinical features of a critically ill | Qiu L, Jiao R, Zhang A, et al. A Typical Case of Critically Ill Infant of Coronavirus Disease 2019 With Persistent Reduction of T Lymphocytes [published online, 2020 May 1]. Pediatr Infect Dis J. 2020. |

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| | | | | | tests and serum antibody levels for SARS-CoV-2 in the infant's mother, who kept intimate contact with the infant, were negative despite inconsistent personal protection. | infant with COVID-19 in this case study. | doi:10.1097/INF.0000000000002720 |
| Pregnancy, maternal morbidity, critical care, mechanical ventilation, USA | 1-May-20 | Care of Critically Ill Pregnant Patients With COVID-19: A Case Series | American Journal of Obstetrics and Gynecology | Research Letter | This retrospective, multi-center case series describes 5 symptomatic pregnant women with positive SARS-CoV-2 testing and requiring critical care. Women were in their late second (n=3) or third (n=2) trimester. At the end of the study period, 1 woman is still critically ill and hasn't delivered, 3 had uncomplicated cesarean delivery, and 1 was discharged and is receiving close outpatient follow up. Intubation timing ranged from 7-14 days from symptom onset in these cases. Various oxygen delivery methods, including high flow nasal cannula, noninvasive positive pressure ventilation, and endotracheal intubation, can all be utilized safely in pregnancy. For intubated patients with COVID-19, timing of delivery must balance maternal and neonatal risk and benefit, with delivery considered a potential tool to improve ventilation due to physiologic changes associated with pregnancy. There is limited evidence to guide specific management around fetal monitoring, administration of antenatal corticosteroids, and delivery in patients with COVID-19. | This case series presents strategies for management of critically ill pregnant women with COVID-19, using various oxygen delivery methods. | Hirshberg A, Kern-Goldberger AR, Levine LD, et al. Care of critically ill pregnant patients with COVID-19: a case series [published online, 2020 May 1]. Am J Obstet Gynecol. 2020. doi:10.1016/j.ajog.2020.04.029 |
| Immuno-compromised children, immuno-modulatory therapy, UK NICE | 1-May-20 | Covid-19 Is No Worse in Immunocompromised Children, Says NICE | BMJ | News | The UK National Institute for Health and Care Excellence (NICE) recently issued a guideline, stating that "COVID-19 usually causes a mild, self-limiting illness in children and young people, even in those who are immunocompromised." NICE advises continuation of usual treatment with reduced face-to-face contact where safely possible, as well as discussion between patients and providers regarding the risks and benefits of initiating immuno-modulatory therapies. Patients taking drugs that affect the immune response may have atypical presentations of COVID-19; for example, patients taking prednisolone may not develop fever. In addition, the guidelines warn against the use of empirical antibiotics, unless there is clinical suspicion of bacterial infection or co-infection. | This news report describes recent rapid guidelines from the UK on caring for immuno-compromised children during the COVID-19 pandemic. Existing data suggests that immuno-compromised children are not at higher risk for severe disease. | Wise J. Covid-19 is no worse in immunocompromised children, says NICE. BMJ. 2020;369:m1802. Published 2020 May 1. doi:10.1136/bmj.m1802 |
| Child, sickle cell disease, acute chest syndrome, anti-human IL-6 receptor monoclonal antibody | 1-May-20 | Dramatic Improvement After Tocilizumab of a Severe COVID-19 in a Child With Sickle Cell Disease and Acute Chest Syndrome | American Journal of Hematology | Correspondence | Tocilizumab (TCZ) was administered to a 16-year-old girl with homozygous sickle cell disease (SCD) who developed severe COVID-19 associated with acute chest syndrome and pulmonary embolism. On admission, levels of C-reactive protein, lactate dehydrogenase, and D-dimer were increased. The patient required non-invasive ventilation, red blood cell exchange transfusion followed by simple transfusion, and anticoagulation. Plasma levels of pro-inflammatory IL-6 were extremely high and increased further, after TCZ injection, before decreasing. The patient's respiratory status, as well as CT pulmonary angiography imaging, improved dramatically following TCZ treatment. | Tocilizumab, an anti-human IL-6 receptor monoclonal antibody, appears to be safe and effective treatment for severe COVID-19 and acute chest syndrome in children with sickle cell disease. | Odièvre MH, de Marcellus C, Ducou Le Pointe H, et al. Dramatic improvement after Tocilizumab of a severe COVID-19 in a child with sickle cell disease and acute chest syndrome [published online, 2020 May 1]. Am J Hematol. 2020. doi:10.1002/ajh.25855 |
| Neonatal management, infection control, telehealth, routine follow-up, China | 1-May-20 | Neonatal Management During the Coronavirus Disease (COVID-19) Outbreak: The Chinese Experience | NeoReviews | Article | This article reviews published information from Chinese pediatric and neonatal societies regarding their approach to neonatal management during the 2019-2020 COVID-19 outbreak in China. These approaches include consensus guidelines focused on perinatal infection prevention and high-risk neonatal transport, as well as strategies for transitioning routine neonatal outpatient follow-up to an online program. | This review summarizes infection control measures and telehealth strategies for routine, neonatal follow-up, published by Chinese pediatric and neonatal societies. | Ma X, Zhu J, Du L. Neonatal Management During the Coronavirus Disease (COVID-19) Outbreak: The Chinese Experience. Neoreviews. 2020;21(5):e293-e297. doi:10.1542/neo.21-5-e293 |

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| Pediatric pulmonology, pediatric care, podcast | 1-May-20 | Brief Report: International Perspectives on the Pediatric COVID-19 Experience | Pediatric Pulmonology | Commentary | On March 31, 2020, the International Committee of the American Thoracic Society Pediatrics Assembly recorded an online podcast, during which pediatric pulmonologists worldwide shared their experience on COVID-19 in children. The aim was to share personal experience in organizing pediatric care in different health care settings globally, protecting health care workers, and isolation practices. This manuscript summarizes the common themes of the podcast which centered around three main topics: more benign clinical disease and progression in pediatric cases compared to adults, a strong need for strategies to protect health care workers, and social or economic disparities as a barrier to successful pandemic control. | International pediatric pulmonologists discuss clinical characteristics of COVID-19 in children, strategies to protect health care workers, and the role of socioeconomic disparities in the pandemic. | Yilmaz O, Gochicoa-Rangel L, Blau H, et al. Brief report: International perspectives on the pediatric COVID-19 experience [published online, 2020 May 1]. Pediatr Pulmonol. 2020. doi:10.1002/ppul.24800 |
| Children, age-related susceptibility, thymus, adaptive immune system, prolonged viral elimination | 1-May-20 | Why the SARS-Cov-2 Has Prolonged Spreading Time in Children? | Pediatric Pulmonology | Letter to the Editor | Aging presents structural and functional loss, affecting the immune system. Thymus hypoplasia and the gradual decrease in both function and number of T cell/$T_{reg}$ cells in the elderly increase susceptibility to viral infections. In contrast, in children, the thymus is active and associated with an adequate adaptive immune response, shaped dynamically by vaccines and common viral infections in childhood. This controlled and organized immune response protects children from severe tissue damage but also makes viral elimination more difficult, resulting in prolonged elimination time as observed in existing case studies. | This letter argues that a functional thymus and a controlled, adaptive immune response prevents children from COVID-19 related tissue damage but contributes to prolonged viral elimination time. | Yurttutan S, İpek S, Güllü UU. Why the SARS-Cov-2 has prolonged spreading time in children? [published online, 2020 May 1]. Pediatr Pulmonol. 2020. doi:10.1002/ppul.24795 |
| Children, pediatric emergency department, clinical characteristics, epidemiology, Italy | 1-May-20 | Children with Covid-19 in Pediatric Emergency Departments in Italy | New England Journal of Medicine | Correspondence | The Coronavirus Infection in Pediatric Emergency Departments (CONFIDENCE) study involved a cohort of 100 Italian children (<18 years) with COVID-19, confirmed by RT-PCR testing of nasal or nasopharyngeal swabs. Children (median age 3.3 years, range 0-27.5 years) were assessed between March 3 and March 27, 2020 in 17 pediatric emergency departments. Exposure to SARS-CoV-2 from an unknown source or from a source outside the child's family accounted for 55% of the cases of infection. Common symptoms were cough (44%) and no feeding or difficulty feeding (23%). Among the entire cohort, 21% of patients were asymptomatic, 58% had mild disease, 19% had moderate disease, 1% had severe disease, and 1% were in critical condition. Of the 9 patients who received respiratory support, 6 had coexisting conditions. No deaths were reported. | Most children with COVID-19 in this Italian cohort had mild disease; no deaths were reported. The incidence of transmission through family cluster exposure was lower in this cohort, compared to previously studied cohorts in other countries. | Parri N, Lenge M, Buonsenso D. Children with Covid-19 in Pediatric Emergency Departments in Italy [published online, 2020 May 1]. NEJM. doi:10.1056/NEJMc2007617 |
| Pregnancy, mother-newborn separation, breastfeeding, infection control, prenatal clinics | 1-May-20 | Coronavirus Disease 2019 (COVID-19) and Pregnancy: Responding to a Rapidly Evolving Situation | Obstetrics & Gynecology | Current Commentary | Although guidelines for pregnant women have been rapidly developed based on the best available evidence, additional information is critically needed to inform key decisions, such as whether pregnant health care workers should receive special consideration, whether to temporarily separate infected mothers and their newborns, and whether it is safe for infected women to breastfeed. Some current recommendations are well supported, based largely on what we know from seasonal influenza: patients should avoid contact with ill persons, avoid touching their face, cover coughs and sneezes, wash hands frequently, disinfect contaminated surfaces, and stay home when sick. Prenatal clinics should ensure all pregnant women and their visitors are screened for fever and respiratory symptoms, and symptomatic women should be isolated from well women and required to wear a mask. The authors recommend that as COVID-19 rapidly spreads, obstetricians must keep up to date on the latest information. | This review discusses current guidelines for infection control in pregnant women. | Rasmussen SA, Jamieson DJ. Coronavirus Disease 2019 (COVID-19) and Pregnancy: Responding to a Rapidly Evolving Situation. Obstet Gynecol. 2020;135(5):999-1002. doi:10.1097/AOG.0000000000003873 |