

# Protecting Labor and Delivery Personnel from COVID-19 during the Second Stage of Labor

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## Abstract

The novel coronavirus disease 2019 (COVID-19) is spreading fast and is affecting the clinical workers at much higher risk than the general population. Little is known about COVID-19 effect on pregnant women; however, the emerging evidence suggests they may be at high risk of asymptomatic disease. In light of projected shortage of personal protective equipment (PPE), there is an aggressive attempt at conservation. In obstetrics, the guidelines on PPE use are controversial and differ among hospitals, globally, as well as nationally. The centers for disease control and prevention (CDC) recommend using N95 respirators, which are respirators that offer a higher level of protection instead of a facemask for when performing or present for an aerosol-generating procedures (AGP). However, the second stage of labor is not considered an AGP. The second stage of labor can last up to 4 hours. During that time, labor and delivery personnel is in close contact to patients, who are exerting extreme effort during and frequently blow out their breath, cough, shout, and vomit, all of which put the health care team at risk, considering that COVID-19 transmission occurs through aerosol generated by coughing and sneezing. The CDC and the American College of Obstetricians and Gynecologists (ACOG) do not provide clarification on the use of N95 during the second stage. We recommend that labor and delivery personnel have the utmost caution and be granted the protection they need to protect themselves and other patients. This includes providing labor and delivery personnel full PPE including N95 for the second stage of labor. This is critical to ensure the adequate protection for health care workers and to prevent spread to other health care workers and patients.

## Keywords

- ▶ COVID-19
- ▶ second stage of labor
- ▶ N95 mask
- ▶ aerosol

## Key Points

- Second stage of labor exposes providers to aerosol.
- COVID-19 risk during second stage of labor is high.
- N95 should be used during second stage of labor.

The novel coronavirus disease 2019 (COVID-19) has spread in more than 170 countries and, to date, affected close to 800,000 people world-wide (as of March 30, 2020). Evidence from past epidemics suggests that clinical workers are at

much higher risk than the general population of being infected. Indeed, globally, COVID-19 infects thousands of health workers. Figures from China's National Health Commission show that more than 3,400 health care workers have

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been infected and at least 13 died. In Italy, according to the Italian research institute, around 5,760 health care workers in the country have been diagnosed with COVID-19, which is approximately 8% of all cases in Italy and hundreds are dead (The Daily Mail). In Spain, out of 40,000 confirmed coronavirus cases, 5,400 (~14%) are medical professionals (The New York Times). The numbers regarding medical professionals in the United States affected by COVID-19 have not yet been reported (as of March 30, 2020).

As there has been an exponential increase in the number of positive patients in the United States requiring hospitalization, there is a real trepidation that hospitals will run out of personal protective equipment (PPE). In fact, many hospitals are already starting aggressively to conserve their gear. In obstetrics, the guidelines on PPE use are controversial and differ between hospitals, globally, as well as nationally. The transmission of COVID-19 is thought to occur through respiratory droplets generated by coughing and sneezing, and through contact with contaminated surfaces. The centers for disease control and prevention (CDC) recommend using N95 respirators, which offer a higher level of protection instead of a general face mask when performing or present for an aerosol-generating procedures (AGP). Examples of AGPs include positive pressure ventilation, endotracheal intubation, airway suction, high-frequency oscillatory ventilation, tracheostomy, chest physiotherapy, nebulizer treatment, sputum induction, and bronchoscopy.<sup>1</sup> Neither the CDC nor the American College of Obstetricians and Gynecologists (ACOG) include the second stage of labor (stage that starts at full dilation of the cervix and lasts until delivery of the baby) as an AGP. The academic center where the authors practice recently changed their guidelines and recommended using N95 masks while attending COVID-19 positive patients in second stage of labor. The recommendation for attendance of the second stage of labor for person under investigation or asymptomatic laboring woman is to wear a standard surgical mask.

In evaluating the second stage of labor as a possible AGP, it is important to consider the length of time and close contact with a patient during the active phase of pushing. According to the obstetric care consensus to safely prevent the first cesarean delivery,<sup>2</sup> it is recommended to allow nulliparous women up to 4 hours and multiparous women up to 3 hours for the second stage of labor. During this time, most labor and delivery personnel is allowed less than 6-feet away as recommended and in close contact with their patients for an extended duration. Further, women exerting extreme effort during the second stage of labor and frequently blow out their breath, cough, shout, and vomit, all of which put the health care team at risk.

When evaluating whether or not the second stage of labor should be considered as an AGP, the data are scarce. However, it is helpful to review publications examining respiratory spread of similar viruses. In response to the H1N1 and severe acute respiratory syndrome (SARS) outbreak, Zayas et al characterized respiratory droplets to understand the possible respiratory spread of these diseases.<sup>3</sup> In their study, they found that 99% of droplets expelled were <10  $\mu\text{m}$ , which are of inhalable size and could potentially contribute directly, as well as indirectly,

to the airborne spread of respiratory infections the size similar of the influenza of SARS.<sup>3</sup> This route of transmission would be of concern during vaginal delivery. If indeed most of COVID-19 is transmitted via small aerosols, using N95 mask will filter out 95% of droplets smaller than 0.3  $\mu\text{m}$ . This is compared with the standard surgical mask that will filter only 75%.<sup>4</sup> With regard to the current pandemic, a study by van Doremalen et al demonstrated a significant presence of COVID-19 in aerosols for hours.<sup>5</sup> In light of this data, it is fair to assume that COVID-19 is associated with high respiratory and nosocomial spread. Of particular interest, a study by Liu et al examined infectious spread within the Wuhan Hospitals.<sup>6</sup> They recorded elevated levels of airborne COVID-19 inside the mobile toilet area. They attributed this to possible aerosolization from the patient's stool or urine.<sup>6</sup> This is of particular concern to labor and delivery personnel who is tasked with cleaning a patient's perineum of stool during the second stage of labor. If indeed there is an increased exposure from fecal content, in addition to respiratory exposure from the act of pushing and breathing, the need for appropriate PPE must strongly be considered.

The CDC statement for PPE during the COVID-19 pandemic in labor and delivery unit is vague. The ACOG does not offer further clarifications beyond what is within the CDC guidance. Given the close proximity of the labor and delivery personnel to an infected or possibly infected patient who would readily expose the team with respiratory droplets during pushing, this PPE is imperative for labor and delivery personnel. Most notably, the International Society for Ultrasound in Obstetrics and Gynecology has given several webinars and have included the second stage of labor, vaginal delivery, and cesarean delivery as possible AGP that should require appropriate PPE, including N95 or respirator. Yes, the surgical mask is decreasing the number of aerosol droplets behind the mask by a substantial four-fold compared with wearing no mask at all; however, exposing labor and delivery personnel to 25% risk of aerosol droplets leak for up to 4 hours of second stage of labor is negligent. Other hospitals on the forefront of the COVID-19 pandemic have already made this realization and have all required their labor and delivery teams to wear full PPE including N95 masks. These institutions are operating ahead of national guidelines.

In summary, we recommend that labor and delivery personnel have the utmost caution and be granted the protection they need to protect themselves and other patients. We recommend the following:

- Consider testing all laboring patients for COVID-19 in light of high percent of asymptomatic pregnant women testing positive.<sup>7</sup>
- All providers on labor and delivery should wear a face mask that is changed between patients.
- Number of staff and physicians should be kept to essential personnel for the second stage of labor and cesarean delivery.
- All staff and physicians in the room during the second stage of labor or cesarean delivery should be wearing full PPE including gown, gloves, eye protection, and N95 mask.

These measures are critical to ensure the adequate protection for health care workers and to prevent spread to other health care workers and patients. While we certainly realize the shortage of PPE, labor and delivery personnel deserves more than that. We deserve to be protected while we do our job. Our patients deserve their providers to be kept safe.

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#### Conflict of Interest

None declared.

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