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Abbreviations:
COVID-19: Coronavirus disease 2019
PCR: polymerase chain reaction
SARS: Severe Acute Respiratory Syndrome
NICU: Neonatal Intensive Care Unit
RSV: respiratory syncytial virus
PPE: personal protective equipment

Contributor's Statement Page
Dr. Boscia drafted, reviewed, and revised the manuscript; she approved the final manuscript as submitted and agrees to be accountable for all aspects of the work.

As an internal medicine and pediatric hospitalist in the home stretch of my third pregnancy, my daily focus is on squeezing into scrubs, following strict infection control procedures, and keeping up a good pace and extra hydration on rounds. But third trimester brings some broader concerns during this first COVID-19 season, and as I follow the medical literature I find myself wondering: what would happen if I were to be infected when I deliver this baby? How would I weigh the risk of transmitting the virus against the known costs of separation from my infant during the first days of life? And in a rapidly evolving clinical landscape, how should I as a physician counsel families asking similar questions?

Numbers from New York suggest that nearly 90% of COVID-positive women who deliver in the hospital setting are asymptomatic at time of presentation.[i] Given this, and the fact that masks are not tolerable for most women during second stage of labor, many hospitals around the country are moving toward universal COVID-19 screening on labor and delivery units, to protect healthcare workers and patients alike. For women who test positive, current AAP guidelines recommend physical separation from their infant when space allows, unless they choose rooming-in despite being counseled on risk.[ii] On the other hand, the WHO's recommendations for COVID-positive women encourage breastfeeding initiation within an hour of birth, and routine newborn care with added emphasis on respiratory and hand hygiene.[iii] As clinicians, we are tasked with understanding the data behind these guidelines, and translating them into family-centered practice.

The risk of COVID-19 disease in newborns due to maternal transmission is undefined, but appears to be low. In China, a country with over 80,000 symptomatic COVID-19 cases, there have been only six reported cases in infants born to COVID-infected women, and all six made a full recovery without requiring intubation.[iv] China adopted an early policy of mother-infant

separation, and we can't know what these numbers would look like had they not done so. In the United States, there have been two reported infant—not newborn—fatalities associated with a positive COVID-19 PCR, though neither with a formal cause of death yet declared.[v,vi] There has been no clear evidence of vertical transmission. In the SARS coronavirus outbreak, infants of infected mothers did not develop infection in the neonatal period, though some were born prematurely or small for gestational age due to severe maternal illness during pregnancy.[vii]

There are several reasons why neonates could be relatively protected from infection. Preliminary data suggest that infants born to COVID-positive mothers may benefit from some degree of passive immune protection at birth, with transplacental IgG acting as a natural form of convalescent plasma transfusion.[viii] Thus far there has been no COVID-19 viral shedding detected in breastmilk of infected women, and while we do not yet know whether breastfeeding is protective in this setting, it has known immune benefits in other viral respiratory infections.[ix,x] Even immune system immaturity may be protective for neonates, since much COVID-19 morbidity in older patients appears to be driven by the domino effect of cytokine storm.[xi]

Still, because data are limited, separation for COVID-positive mothers and their infants may seem the safest approach. But we must weigh the potential benefits of isolation against the real costs, for both women and infants, of losing postpartum contact. Skin-to-skin contact in the first hours of life is associated with reduced postpartum hemorrhage risk, decreased rates of postpartum depression and anxiety, and increased odds of successful breastfeeding.[xii,xiii,xiv] Breastfeeding is far easier to establish with an oxytocin-inducing newborn than with a cold plastic pump, and has myriad health benefits ranging from decreased risks of breast and ovarian cancer for women, to development of a diverse intestinal microbiome for infants and lower infection risk in the first year of life.[xv,xvi,xvii] As any NICU parent can attest, the impact of

postpartum separation on parents' mental health, and parent-child bonding, can be enormous; this is part of the reason why NICUs feel kangaroo care is so important even for tiny infants who are otherwise kept in the strict-quarantine environment of an isolette.[xviii]

There are other strategies beyond separation that would decrease COVID-associated risks for the newborns in our communities. The worst perinatal outcomes in this pandemic have been associated not with newborn infection, but with maternal morbidity and mortality, and premature birth due to maternal COVID-19 disease. One large cohort from China reported a preterm birth rate of 21% among COVID-positive women, three times higher than the national average.[xix,xx] Current circumstances reaffirm an age-old truth: to better protect infants, we must better support the women who bear and raise them.

We could start by facilitating physical distancing for pregnant women without fear of job repercussions. We could bolster safety-net programs for families because we know that poverty, housing instability, food insecurity, and other socioeconomic factors drive COVID-19 infection risk just as powerfully as they impact other public health concerns. We could, like other developed countries, recognize that paid parental leave helps keep infants out of group childcare settings in the first months of life, when they are most vulnerable to RSV and other infections *every* year, not just in 2020.

These interventions are the right thing to do for parents and children alike, but they require far more collective and political will than does a simple recommendation to separate babies and mothers. Asking a COVID-positive mother to sacrifice the first days of infant bonding during her hospital stay, and then find a round-the-clock 'clean infant caregiver' for a period of home quarantine, is logistically challenging and a setup for postpartum depression even in the most privileged of circumstances. More often, we ask women to go home to crowded living

conditions, take short unpaid maternity leaves, return to essential-shift jobs that provide inadequate PPE, and place their young infants in the care of others; simultaneously, we ask them to protect those infants from infectious risk. This is an incongruous 'plan of care.' Physicians should advocate at higher levels for the solutions we wish we could provide.

What can we do for our patients right now? At an institutional level, we can craft policies that leave room for patient choice in the setting of incomplete data; and we can arrange physical spaces to safely care for COVID-positive mother-baby dyads as well as separated mothers and infants. At the bedside, we can recognize that tangible infectious risks naturally elicit more fear than the more nebulous and longer-term harms of disrupting the postpartum experience; but when we have no clear data about the magnitude of COVID-19 risk for newborns, all factors merit consideration. And we can remember that words spoken during life's pivotal moments may have a lasting impact. Validating the importance of maternal instincts, even on a backdrop of fear or anxiety, sends an important and empowering message to women who are beginning their parenting journey amidst challenging circumstances.

For me, today, the benefits of bonding outweigh concerns about infection. If I tested positive, I would wear a mask, wash my hands, and breastfeed my baby skin-to-skin. If I were ill, that might tip the scales towards isolation. But I'm not sure. This is the point: none of us can truly know what choices we would make until we're the one in the hospital bed. Wise counsel in the face of unclear risk requires not fixed recommendations, but an ability to sit comfortably with uncertainty and mold it into something therapeutic for the patient before us. As a mother, uncertainty is part of the everyday job description; as a physician, acknowledging it can be the best way to help patients make informed decisions that are right for themselves and their families.

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