Infection Control & Hospital Epidemiology (2024), **45**, 483–490
doi:10.1017/ice.2023.233

Original Article

Physician perceptions of barriers to infection prevention and control in labor and delivery

Laura E.A. Barnes MPH[1], Katelyn A. White MPH[1], Marisa R. Young MD, PhD[2], Patrick S. Ramsey MD, MSPH[3], Ronda L. Cochran MPH[1] and Kiran M. Perkins MD, MPH[1]

[1]Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention, Atlanta, Georgia, [2]Department of Gynecology and Obstetrics, Emory University School of Medicine, Atlanta, Georgia and [3]Infectious Diseases Society for Obstetrics and Gynecology, Burnsville, Minnesota

Abstract

Objective: To learn about the perceptions of healthcare personnel (HCP) on the barriers they encounter when performing infection prevention and control (IPC) practices in labor and delivery to help inform future IPC resources tailored to this setting.

Design: Qualitative focus groups.

Setting: Labor and delivery units in acute-care settings.

Participants: A convenience sample of labor and delivery HCP attending the Infectious Diseases Society for Obstetrics and Gynecology 2022 Annual Meeting.

Methods: Two focus groups, each lasting 45 minutes, were conducted by a team from the Centers for Disease Control and Prevention. A standardized script facilitated discussion around performing IPC practices during labor and delivery. Coding was performed by 3 reviewers using an immersion-crystallization technique.

Results: In total, 18 conference attendees participated in the focus groups: 67% obstetrician-gynecologists, 17% infectious disease physicians, 11% medical students, and 6% an obstetric anesthesiologist. Participants described the difficulty of consistently performing IPC practices in this setting because they often respond to emergencies, are an entry point to the hospital, and frequently encounter bodily fluids. They also described that IPC training and education is not specific to labor and delivery, and personal protective equipment is difficult to locate when needed. Participants observed a lack of standardization of IPC protocols in their setting and felt that healthcare for women and pregnant people is not prioritized on a larger scale and within their hospitals.

Conclusions: This study identified barriers to consistently implementing IPC practices in the labor and delivery setting. These barriers should be addressed through targeted interventions and the development of obstetric-specific IPC resources.

(Received 27 June 2023; accepted 1 October 2023; electronically published 20 November 2023)

Infection prevention and control (IPC) and obstetrics have a longstanding entwined history, beginning in the 19th century when hand hygiene as a preventative measure was discovered in a maternity ward. Through the implementation of hand hygiene, the cornerstone of IPC, Dr. Ignaz Semmelweis significantly reduced puerperal infection for pregnant patients delivering in a hospital.[1] This demonstrates that simple, targeted interventions can considerably affect the health outcomes of pregnant patients. Despite gains in the scientific basis of IPC, severe maternal morbidity and mortality rates in the United States have increased, with pregnancy-related deaths rising from 7.2 to 17.6 per 100,000 live births since the 1980s.[2,3] Infection and sepsis are the second leading cause of maternal mortality during the peripartum period in the United States, accounting for 14.3% of pregnancy-related deaths, and infectious morbidity appears to be rising.[3,4] However, maternal morbidity and mortality may be responsive to intervention; ∼80% of pregnancy-related deaths were found to be preventable, but infection-specific mortality data are limited.[5]

Preventing healthcare-associated infections (HAIs) among patients receiving obstetric care during the peripartum period can play a key role in reducing maternal morbidity and mortality due to infection. The consistent implementation of evidence-based IPC practices can prevent the spread of HAIs, both between patients and between patients and healthcare personnel (HCP) during obstetric care. Obstetric HCP are routinely exposed to the

Corresponding author: Laura Elizabeth Anderson Barnes; Email: kqv8@cdc.gov

Cite this article: Barnes LEA, White KA, Young MR, Ramsey PS, Cochran RL, Perkins KM. Physician perceptions of barriers to infection prevention and control in labor and delivery. *Infect Control Hosp Epidemiol* 2024. 45: 483–490, doi: 10.1017/ice.2023.233

© The Society for Healthcare Epidemiology of America, 2023. To the extent this is a work of the US Government, it is not subject to copyright protection within the United States. To the extent this work is subject to copyright outside of the United States, such copyright shall be assigned to The Society for Healthcare Epidemiology of America and licensed to the Publisher. Outside of the United States, the US Government retains a paidup, nonexclusive, irrevocable worldwide license to reproduce, prepare derivative works, distribute copies to the public and display publicly the Contribution, and to permit others to do so. Published by Cambridge University Press on behalf of The Society for Healthcare Epidemiology of America.

https://doi.org/10.1017/ice.2023.233 Published online by Cambridge University Press

bodily fluids of laboring patients, placing them at a higher risk of becoming infected with bloodborne and other pathogens, which in turn increases risk of infection for the subsequent patients for whom they care.[6] Although previous outbreaks such as Ebola and Zika raised concerns and emphasized the importance of IPC in the specific care and context of laboring patients,[7,8] the global and widespread COVID-19 pandemic more widely highlighted gaps in IPC in the obstetric setting and the urgent need to examine IPC practices across all labor and delivery units. Critical to informing IPC guidance to help prevent the transmission of SARS-CoV-2 and other pathogens is understanding and considering the unique dynamics, procedures, and patient populations served in labor and delivery settings.

Understanding barriers to performing appropriate IPC practices in the labor and delivery setting is essential to improving adherence to best practice and potentially reducing pregnancy-related infections. The Centers for Disease Control and Prevention (CDC) Division of Healthcare Quality Promotion (DHQP) conducted exploratory focus groups at the 2022 Infectious Diseases Society for Obstetrics and Gynecology (IDSOG) Annual meeting to learn about the experiences of HCP to inform the development of IPC resources and tools for this HCP population. The aims of these focus groups were to understand perceptions of IPC practices while providing care during labor and delivery, to assess HCP needs, and to identify barriers to the implementation of IPC practices.

Materials and methods

Recruitment

IDSOG is an international professional society focused on the advancement of standard-of-care practices for treating infectious diseases related to reproductive and maternal health. It largely comprises those in academic obstetric practice and infectious disease research (idsog.org). Focus-group recruitment was performed in collaboration with the IDSOG annual conference team. Recruitment materials were shared on Facebook, Twitter, and via email to IDSOG members five weeks prior to the conference. Conference attendees registered to participate through a SurveyMonkey link and were asked a series of demographic and screening questions, including their practice setting, years of experience, and clinical role. No incentives were provided. Registrants were excluded if their clinical activities did not involve providing obstetric care during labor and delivery, with the exception of infectious disease physicians.

Focus groups

A trained moderator conducted 2 focus groups. A standardized pool of 9 questions was utilized, and the questions that were asked varied by focus group depending on the natural flow of the discussion. Additional notes and observations were taken by an assistant moderator and the discussions were recorded.

Analysis

Recordings of the focus groups were manually transcribed and analyzed using NVivo (released in March 2020). Personal identifiers were not associated with responses. Responses were qualitatively coded by question and then across all questions using an immersion-crystallization technique for systematic analysis.[9] This was performed by a team of 3 trained coders to ensure intercoder reliability. Of the 9 questions, 3 were chosen for further analysis due to having the highest response rate between the 2 focus groups. All responses were provided voluntarily, and not every participant provided a response to every question. For coding by question, participants may be coded to multiple themes and subthemes but are only counted once within each. All responses were reviewed and coded within the context of the question, so every response given may not be coded. For coding across all questions, the most common themes were ordered from greatest number of constructs reported to the least. Participants' own words have been utilized to operationalize each theme.

Results

Participant demographics

In total, 18 attendees participated in the focus groups; 29 conference attendees registered to participate, of whom 8 were absent at the time of the focus groups, and 3 were excluded. Focus group A had 11 participants and focus group B had 7 participants. Also, 67% of the participants were OB/GYN physicians; 58% of whom were subspecialists and 42% of whom were generalists. The remaining one-third of participants were infectious disease physicians (17%), medical students (11%), and an obstetric anesthesiologist (6%). Furthermore, 83% of participants reported that their clinical activities included providing obstetric care in labor and delivery. Participants represented 12 states and 1 Canadian province with an average of 12 years in practice (range, 0–30 years). All 18 participants reported having practiced in teaching hospitals, 9 (50%) in public institutions, 4 (22%) in private, and 1 (6%) in a federal setting.

Themes by question

The most common theme that emerged when participants described the greatest need for IPC guidance in labor and delivery was for it to be easily accessible, clear, and simple to understand (44%) (Table 1). HCP commented that labor and delivery guidance should account for their unit's unique workflow and that future recommendations be pragmatic to implement when practiced "out on the battlefield." Also, 5 participants (31%) called for guidance to be consistent across hospitals, stages of care (eg, labor and delivery, postpartum), and across the professionals involved in delivery (eg, nurses, trainees, midwives, OB/GYNs).

When asked about barriers that impede their ability to follow IPC practices while providing care, issues around training and education were most frequently reported (53%) (Table 2). Furthermore, 7 participants (47%) spoke of how performing IPC protocols within labor and delivery's workflow is affected by a "lack of time" when responding to emergencies, and further impeded by "having true staffing shortages." HCP described labor and delivery as being inadequately funded and not consistently included in hospital initiatives. Some HCP felt there was an insufficient allocation of monetary resources for labor and delivery when compared to other units such as "cardiac surgery or neurosurgery."

Participants were then asked to give one piece of advice to a new HCP on labor and delivery with respect to IPC (Table 3). Notably, 4 participants (29%) spoke of the unpredictability of labor and delivery, their frequent interactions with bodily fluids (eg, amniotic fluid, blood, placental tissue), and the importance of being prepared for anything. Several discussed the significant impact of performing IPC and the value of understanding the evidence behind it.

https://doi.org/10.1017/ice.2023.233 Published online by Cambridge University Press

Table 1. What is the Greatest Need for Standardized Guidance During Labor and Delivery (L&D)?

Qualitatively Coded Themes	No. of Respondents (N = 16)[a]
Increase accessibility and ease of use	**7**
Guidance that is easy to find, understandable for multiple roles	4
Guidance that is streamlined, concrete, and simple	3
Guidance that improves adherence to existing protocols	3
To consider the workflow of L&D	**6**
The role of infection prevention and control champions in L&D	3
Pragmatic guidance for the delivery room	2
Feasibility on the “fast-paced L&D battlefield”	2
Consistency across specialties and stages of care	**5**
Transmission-based precautions	**4**
Personal protective equipment (PPE)	**4**
Consistent use of eye protection	2
Knowledge of appropriate PPE on L&D	2
Ready access to PPE (eg, the infection control cart at the door)	1
More research and funding to inform evidence-based standardized guidance	**3**

[a]All responses were provided voluntarily and not every participant provided a response to every question. Participants may have been coded to multiple themes and subthemes but were only counted once within each. Themes and subthemes were ordered by the number of respondents from high to low. All responses were reviewed and coded within the context of the question, so every response given may not have been coded.

Themes across all questions

Across the discussion, the most reported barrier was that the urgent nature of labor and delivery impacts the ability of HCP to consistently implement IPC protocols into their unique workflow (Table 4). Participants described how “labor and delivery is a different beast” when it comes to IPC, and how it is very “technically difficult to implement” personal protective equipment (PPE) donning and doffing protocols as they go from “room to room to room” or to the operating room in emergencies. One HCP commented that they “intercept a lot [of infections] in labor and delivery” as it is a “mixture of people with different healthcare conditions that come to us in pregnancy.”

The second most frequently reported barrier was a lack of training and education (Table 4). Several participants described that IPC training and education was usually an annual training that did not have any specificity to their setting. One HCP stated, “The only infection prevention training I get that’s formalized is my annual training through my hospital system, which is delivered on a PowerPoint. I’ve memorized it, so I just jump and take the quiz at the end.” In addition, disseminating a hospital’s IPC protocols to residents, travel nurses, and private physicians often proves difficult because “there are so many people working,” and once “they finally figure it out . . . a new team comes on.” When one medical student began clinical rotations, they had a “talk on PPE donning and doffing . . . a self-train module on OSHA and bloodborne pathogens, [but] beyond that . . . not much.”

Table 2. Do You Feel That There Are Barriers to Healthcare Personnel (HCP) Ability to Follow Infection Prevention and Control (IPC) Practices When Caring for Laboring Patients?

Qualitatively Coded Themes	No. of Respondents (N = 15)[a]
Lack of training and education	**8**
Need to increase HCP buy-in (understanding the “why”)	3
Training roles that rotate on labor and delivery (L&D) (eg, travel nurses, residents)	3
Difficulty implementing audit and feedback in L&D setting	1
Knowledge of IPC practices	1
Adequate training, including simulation	1
Urgency and emergency of L&D	**7**
Performing IPC in emergency situations is difficult and takes time	5
Staffing shortages (lack of sufficient staff to handle emergent situations)	2
L&D should be treated like an emergency department or trauma unit	2
HCP on L&D enter and exit rooms more frequently than other units	2
Difficulty implementing personal protective equipment (PPE) into workflow	1
L&D lacks adequate funding and initiative planning	**5**
Hospitals do not invest resources in L&D like other units	3
Need better research to inform implementation science and IPC practice for L&D	2
L&D funding requirements should be part of accreditation model	1
Difficulty accessing resources for IPC	**4**
PPE is difficult to find when needed on unit	3
Infrastructure and supply chain	1
Lacking standardized best practices	**3**
Everyone is doing IPC differently on L&D	2
Lack of core best practices for each infection type on L&D	1
Practices are followed if the Joint Commission on Accreditation of Healthcare Organizations requires them	1
Medicalization of the birthing experience	**1**

[a]All responses were provided voluntarily and not every participant provided a response to every question. Participants may be coded to multiple themes and subthemes but are only counted once within each. Themes and subthemes are ordered by the number of respondents from high to low. All responses were reviewed and coded within the context of the question, so every response given may not be coded.

A lack of access to PPE was the third most frequently cited barrier to performing IPC (Table 4). When PPE is not made easily accessible during emergencies, HCP described providing clinical care without it. Two participants shared the sentiment, “It is what it is. I’ve got to do what’s best for my patient, and you take that sacrifice.” Repeatedly, HCP spoke of the importance of having a fully stocked PPE cart outside of every room.

https://doi.org/10.1017/ice.2023.233 Published online by Cambridge University Press

Table 3. What One Piece of Advice Would You Give New Healthcare Personnel Regarding Infection Prevention and Control (IPC) in Labor and Delivery?

Qualitatively Coded Themes	No. of Respondents (N = 14)[a]
Obstetrics is messy business, be prepared to practice IPC	4
Recognize the importance of IPC	3
Keep yourself informed and understand the evidence	2
Buy your own eye protection	2
If you have an injury at work, report it and get tested	1
Have a plan in place for alternative antibiotics during an emergency C-section	1
Get your respirator fit tested	1
Listen to your colleagues, there is no hierarchy	1

[a]All responses were provided voluntarily and not every participant provided a response to every question. Participants may be coded to multiple themes and subthemes but are only counted once within each. Themes and subthemes are ordered by the number of respondents from high to low. All responses were reviewed and coded within the context of the question, so every response given may not be coded.

The fourth most described theme that emerged was a sense that women's healthcare is "chronically underfunded, understaffed, and under involved" and that "women's health services and L&D is not treated like a serious place" (Table 4). During the COVID-19 pandemic, one HCP recounted how "OB was completely left out of all the planning" until they began "fighting with people" to get infection control support on labor and delivery and that the "leadership of the hospital was like, 'We just never even thought this would be an issue for you.'" Participants perceived that their leadership did not understand how labor and delivery functions in the hospital (eg, "an entry point into the hospital"), and what their needs are within the unit (eg, PPE volume on infection control carts, maternal sepsis watch).

Other common themes included the lack of standardization of labor and delivery IPC protocols across institutions and specialties within the hospital. One HCP described practicing during the COVID-19 pandemic as "living in [a] world of decentralization," with "policies being different wherever you went and a lack of central leadership." Participants echoed this point, calling for "centralized guidance" that is "all the information you need, in one place." HCP wanted a user-friendly "website that is very easy to search and find information quickly" and for that information to be "very clear" and not "unnecessarily tedious for people who are very busy." One participant highlighted the value of guidelines being "streamlined, concrete, and very simple to follow because we are trained to react to a situation and go really fast." This perceived lack of clarity was exemplified by participants' reported confusion about when to implement different transmission-based precautions (TBP) and how to recognize the appropriate signage outside of a patient room. Additional common themes are operationalized in Table 4.

Comment

Principal findings

This qualitative study identified the most common themes across participants regarding barriers to implementing IPC protocols in the labor and delivery setting, and specific opportunities to inform the development of tools and resources to guide practices. The labor and delivery setting is unique to the rest of the hospital, both in the type of care provided and the fast-paced nature of the workflow. Participants felt that their hospitals did not understand the fundamental needs of the unit, and this had negative impacts on resource allocation and pandemic preparation. There was a shared sense that the labor and delivery unit and women's healthcare at large is not prioritized as compared to other specialties, especially as it relates to a lack of obstetric-specific research for evidence-based practice. HCP expressed that training and education materials are not adapted to their setting. They also had concerns regarding an environment where high staff turnover lead to gaps in knowledge and required the need to constantly train new staff. Participants cited a lack of standardization of labor and delivery best practices and IPC protocols, leading them to be implemented differently by each institution. Hospital policies were disparate and difficult to locate, and participants wanted IPC policies and protocols to be on a user-friendly, centralized-resource webpage. Some participants speculated that the rationale behind IPC protocols and best practices were poorly understood across all HCP, leading to low or discordant adherence between team members within different clinical disciplines. Participants also described difficulties with implementing and differentiating TBP, highlighting the importance of obstetric-specific education and clear, consistent protocols.

Results in the context of what is known

Few studies have examined HCP perceived barriers to implementing IPC practices in the labor and delivery setting. The recent COVID-19 pandemic, however, has increased attention to IPC in all healthcare settings. Hanley et al[10] sought to examine facilitators and barriers to the implementation of England's IPC guidance in maternity units during the COVID-19 pandemic. Consistent with our findings, participants described that "digestible maternity-specific guidance being filtered down to staff" was a facilitator to implementing IPC successfully, and voiced the need for streamlined guidance that could be implemented consistently across hospitals, professional specialties involved in delivery, and across the obstetric care continuum.[10] Like the Hanley study, our participants identified the lack of specificity to the labor and delivery setting as a barrier, and that general IPC guidance fails to address the "unique aspects of care at birth."

Participating HCP repeatedly described labor and delivery as an unrecognized entry point into the hospital, and that it should be treated similarly to the emergency department. The significance of considering labor and delivery as an entry point was further highlighted in research conducted early in the COVID-19 pandemic. Sutton et al[11] found that the majority of pregnant patients testing positive for SARS-CoV-2 were asymptomatic. A survey measuring safety practices in obstetric units conducted by the Society of Maternal-Fetal Medicine (SMFM) in April 2020 revealed that only 20% of respondents' hospitals performed universal testing for women admitted to labor and delivery.[12,13] A second survey administered by SMFM in May 2020 demonstrated a substantial increase in the use of universal testing in obstetric units but still found disparities in the utilization of screening practices across hospital types.[13] These findings underscore the importance of labor and delivery being recognized as an entry point, and appropriate quantities of testing supplies, PPE, and

https://doi.org/10.1017/ice.2023.233 Published online by Cambridge University Press

Table 4. Themes Across All Questions

Qualitatively Coded Themes	Quotes to Exemplify Themes
Urgency and emergency influence labor and delivery's unique workflow	"Sometimes with the urgency of the situation, we lose it on the way to the door. It is frustrating for the team to have to slow down and really think about protection in an emergency situation." "Labor and delivery is different than a lot of the rest of the hospital. It looks different in every unit and labor and delivery is very unique in the care that we give. So, infection control [and L&D] aren't always at times able to fit into the same box. And COVID proved that. We would get in trouble for too many people in the room. Why do you need all these people in the room when you're delivering? Well, that's what happens. It's not medicine, right? You have to have a team." "A lot of times I feel like we should be treated like the ER or a trauma unit because of everything that we do . . . Another thing that we found out with the pandemic was that the hospital didn't understand that OB is an entry point into the hospital, so they didn't treat us like the ER as far as having testing and appropriate PPE for our workers because they thought L&D was something else. And they didn't realize that people walk in there [to L&D] just like they walk into the ER."
Inadequate training and education	"It's like a check list . . . I don't think there's a lot of effort put into that kind of training, which is why we have a breakdown in the protocols." "Audit and feedback is a problem for labor and delivery. We have tried to implement more feedback stuff and it just doesn't work because it's not appropriate to have someone with a clip board standing there watching you wash your hands while a woman is in labor pushing." "Everything is not OB specific, so if we had some OB specific examples of training modules, that might be better. All I hear about is CAUTIs and CLABSIs and all that stuff. Things that are OB specific with education around that might be helpful . . . Also, something case-based, like at time of delivery, normal delivery, urgent delivery. What would be evidence-based? What would be the bare minimum [in terms of IPC]? And throughout labor. Like best practices, patient-based, not only just at the time of delivery, but before. And in different settings as far as emergency C-sections, or more scheduled C-sections."
Lack of access to personal protective equipment	"This seems so silly but, in our hospital, it is really hard to find the PPE that you need. When it is sitting outside the room, it's amazing . . . Having the N95s, the eyewear, the gowns, the infection control cart at the door. Instant access to everything that we need . . . because, access is so, so important. On the COVID floors, on the internal medicine rotation, every single room has PPE outside of it. That's not happening on our labor and delivery floors. That's not happening on our postpartum wing. We are seeing moms with COVID. We were there during the Delta surge, every other patient had COVID and there was no PPE accessible for the healthcare team on L&D the way there was on other floors." "The first time I went into delivery as a medical student, I remember that we couldn't find sterile gloves anywhere, and we were running trying to find what we needed. I remember my resident was wearing a glove size that was way too big. She's reaching in and her gloves are coming off her hand. I didn't have much training, but I knew that's not right." "We would get the carts and they [leadership] would be upset that we would go through the PPE on the carts so quickly, but we go into the room and outside of the room much more often than you would on other units, so sometimes just having the volume [of PPE supplies]."
Women's healthcare is not prioritized	"What doesn't work for labor and delivery is a real thing where you stand up in a meeting and say, 'So, what if she's pregnant?' Or 'So, what if we have to do a C-section?' They're [leadership] a little bit shocked and surprised. Women's services were left off the list [for support]. And we were told to figure it out on our own. And we don't want your patients on our unit because they're pregnant. In general, with COVID, sure. But as it related to pregnancy care, I didn't feel that support." "Our pay line for getting studies funded to actually establish what is evidence-based practice [in L&D] is complete crap. NICHD has the lowest pay line. We need way more money to do studies, compared to internal medicine where you have 20 RCTs with 10,000 people in them. We get one RCT and we're like WOOH! Yeah! We did it! So, to get to standardized evidence, you have to do the studies. We need billions of dollars to do the studies on the thing that most humans who have two X chromosomes will undergo in their lifetimes." "The biggest problem is the [lack of] prioritization of L&D with initiatives. It's probably due to the fact that L&D doesn't make [as much] money like all the other [units], like cardiac surgery or neurosurgery so they tend to get put way down on the list as to when they start prioritizing other things and allocating money to do so. And that's been really frustrating. Why is it in the ER and in different areas they have sepsis watch going on but oh no, we can't do that for L&D? They have different vital signs, but we'll look into that later. And so, until there's money involved with reimbursement is the only time they ever care. It's kind of an administrative problem and it's really frustrating . . . Right now, labor and delivery is the exclusion. So, everybody gets support, except labor and delivery."

(*Continued*)

https://doi.org/10.1017/ice.2023.233 Published online by Cambridge University Press

Table 4. (*Continued*)

Qualitatively Coded Themes	Quotes to Exemplify Themes
Lack of standardization of labor and delivery IPC protocols across institutions and specialties	"Maybe it shouldn't be that every single time you go to a different hospital, you have to learn that hospital's [protocol] . . . .right? We work at two different hospitals. One does it this way, one does it that way, and they're both reasonable approaches because we have the absence of what is the best approach." "So, you get your OB team, your anesthesia, your pediatric team. Not everybody agrees on what should be going on in terms of PPE. Pediatrics will do stuff different than anesthesia. And then the matching side of things in labor and delivery is the nursery and the NICU. And you would have certain recommendations that would occur, you'd have a baby that needed to go to the NICU and somehow if they were in our shared unit [the mom] would go, but if not, that mom would be excluded from being able to go. So, consistency between those two would be super helpful, and consistency between specialties and for all that are involved from labor to delivery to postpartum." "Institutions, our healthcare system is so decentralized, and hospitals are following their own things . . . I remember going through an academic center and a public city hospital which were carrying out very different IPC strategies. And it felt very destabilizing."
Need to increase HCP buy-in (understanding the "why")	"For any of the people who think or know what they're doing, they don't really understand why or buy-in, and are probably not doing it . . . Semmelweis would be saying we need to wash our hands and you need to get on board. You're seeing them when they're crashing, but you're not seeing them 3 days later when they're bacteremic and they're having their surgical scar re-explored." "A lot of providers are not necessarily understanding why certain things are being done. My hospital recently rolled out adding azithromycin to an SSI prevention bundle, which before was on an individual's decision-making level. And that roll out was so interesting to watch because all of the academic physicians were like 'okay, we see the evidence,' and many of the community docs or the private docs were like 'Ugh, this sucks. Why are we having to . . . this is just delaying my C-section and now the azithromycin has to infuse over 30 minutes.' Even with well protocolized bundles, there is push back . . . So, we are also not communicating the research we have appropriately to make people understand why things are necessary." "Maybe I'm generalizing, but I think that obstetrics is like algorithm driven prenatal care, and then it's really really busy, and you just want to get the work done. So, anything that's introduced, that's like please do this extra stuff, where you have to put on the glasses, well why do I have to do that? I just want to go deliver the baby. Anytime something is added to the routine of just getting the work done that I think people resist."
Obstetrics is messy business	"Obstetrics is messy business. In general, there's varying forms of bodily fluids everywhere, all the time. For a while, we were, at least in our area, kind of laissez faire. For quite a while, we weren't too miffed about blood on your shoes and placenta bits everywhere." "When you talk about patient vomiting, for us it's like a ruptured membrane, gushes of blood, babies come shooting out and things go everywhere, and the cord clamp comes off . . . and, you may not have eye protection on. You know, it is what it is. Sometimes you have to accept a little bit of risk to do the right thing for the patient." "Amniotic fluid tastes terrible. Like, when you're in training and you don't realize that they can push the baby out quickly when they're unanesthetized and in one push. When you're next to the ocean, don't turn your back because that next rogue wave can take you down."
Lacking clear, simple, and easy to find guidance	"It would be super helpful to have really clear guidelines. I was hopeful that there's something you could give to the trainee like 'Here is where to go, for all the information you need, in one place'. Including septic abortions, including things that are really timely. Centralized guidelines where people can know where they are." "Guidance for healthcare workers, patients, and family members. I would love for there to be digestible information for everyone on a trustworthy site where they can get that information." "To go back to a nursing perspective, they might say 'Well, where is the institutional policy on this, I won't follow what you're saying, I'll follow the policy if you show it to me.' Then that policy is really hard to find, and you spend hours on the internet trying to find it . . . for example, our hospital policies around which infections get which kind of isolation precautions are really hard to find."

(*Continued*)

https://doi.org/10.1017/ice.2023.233 Published online by Cambridge University Press

Table 4. (*Continued*)

Qualitatively Coded Themes	Quotes to Exemplify Themes
Adherence to existing IPC protocols and PPE use	"From a PPE perspective, before COVID, I had to be the eye protection [enforcer], because people would go into a delivery with a gown and gloves but no eye protection. And I was the crazy one that was always constantly kicking people out of the room to get eye protection and now it's not just [me] yelling at people to put on eye protection." "Infection control for who? For the healthcare workers who aren't wearing appropriate PPE? What is the appropriate PPE?" "There is always time for an infection prevention moment. When you're running in, grab [an extra] glove, sometimes you have time to prep. There is always time to foam in and foam out. Sometimes we feel so rushed, and we feel so distracted by the urgency of the care, there's always time for an infection prevention moment. It may not be the best moment. But there's a moment."
Knowledge of transmission-based precautions	"Levels of precautions, the signs outside the door [remains unclear to many]. Like who to put on what? Who to put on airborne, who to put on for contact and droplet? What's the difference between contact and droplet and airborne? Like what you actually need to do is a magical mystery on labor and delivery." "Knowing what types of protections we use for different types of infections and patients . . . For example, we have a MRSA patient, and we have our contact precautions, but then a different patient may have a different level of contact precautions. It just doesn't seem consistent." "We get a lot of questions from healthcare workers about what kind of precautions they need to take . . . for example, [questions about] the signs that are outside of the doors and what type of precautions people are on."
Labor and delivery needs an IPC champion	"There needs to be a champion on every shift who believes in [IPC]. What I've noticed is that, for example, the antibiotics before labor, we used to just remember, and now it's part of the time-out. Now that's too late, it's got to be a huddle outside of the room, the charge nurse makes us all do it. And when we have other emergencies, there's a list that has to be read and somebody's in charge of that. There has to be a champion on the unit that is reminding all of the people running around trying to just do the emergent thing that says, 'You have to stop and do this.' " "We really need a champion, but you also need a champion that people respect. If you're always the person who is having to say, 'Do this, do this, do this,' it's not always appreciated." "There's a checklist which doesn't always get followed when heading into the OR. When you're just visiting a room of someone who's laboring, to what extent is nursing also involved as a champion for IPC and enforcing that 'this is how we do it' if there are things we need to be doing for folks just in their bed laboring."
Staffing challenges	"There are a lot of different people that work on labor and delivery. So, especially in an academic place, there are different residents that are rotating every three weeks, so they finally figure it out and then a new team comes on. There's a lot of people rotating through that. If you're in a private practice, you deliver in a [hospital], so that person may come in once a week, and then there are other people. So, disseminating that [IPC] information is just hard. There are so many people working on L&D [at different times]." "In terms of all the different people coming in, I think a lot of places in labor and delivery are having true staffing shortages. And we have a ton of travel nurses right now. They do great but they are constantly learning [about] how things work, but now there's extra learning. Financially, it makes sense for people to travel instead of being a staffer. So, there is learning the [IPC] protocols and that takes time, that's one of our problems." "Staffing is a problem too. And that goes into time. You think time, okay how long does it take me to gown and [glove] to go from room to room to room to room. Gel in and gel out or do what you need to do . . . It's time, it's staffing. There are lots of issues that ultimately come down to time and staff needed on labor and delivery."
Medicalization of the birthing experience	"Medicalization of the birth experience [is a challenge in L&D]. Most of the women are coming in, they're low-risk pregnancy to have a birth. In the old days you used to stay at home. You know, everyone is trying to make things homey and welcoming so patients can have the birth experience that they want. But at the same time, they are walking into a hospital where hospital-acquired infection is a thing. It's detracting from what families, women, and pregnant people see as their ideal birth experience." "I found the pandemic very provider centered. As opposed to patient and provider centered, the exclusion of partners, the exclusion of doulas, the exclusion of indigenous support groups, stuff like that. You have to feed in that patient component too to keep everybody safe." "And the midwives are like 'eeehh that [IPC] detracts from the birthing experience.' You know, you're in this wonderful birth, and then you have to put on your eye shield."

https://doi.org/10.1017/ice.2023.233 Published online by Cambridge University Press

other IPC resources should be allocated to the unit to effectively protect against emerging infectious threats.

Research implications

This cohort only captured the experiences of physicians. Although informative, it does not provide a complete picture of the IPC needs of all HCP in labor and delivery. As such, additional research on this topic should be explored to include the experiences and perceptions of other HCP, especially nurses, midwives, and nursing assistants. Partnering with infection preventionists, medical epidemiologists, and environmental services staff may also provide helpful insight into important IPC practices beyond clinical care and direct patient interaction. Such research should aim to translate HCP perceptions into practical implementation guidance to improve adherence to IPC practices in this specialized setting.

A strength of this study was the qualitative nature of inquiry, in which HCP were able to share their thoughts and experiences openly in a small group setting of their peers. This study also had several limitations, including limited generalizability due to the small sample size and the use of a convenience sample. However, by nature of attending the IDSOG conference, these HCP may have a greater interest in IPC than other groups in this specialty, and as such were able to provide valuable insight into this topic. Furthermore, all responses collected were self-reported.

In conclusion, participating HCP identified barriers to performing IPC on labor and delivery that spanned across intrapersonal, institutional, and public policy levels. IPC may be challenging to implement in the obstetric setting due to the specialized nature of clinical care provided and the barriers identified by the study participants. Targeted interventions should be established to ensure HCP are able to access the tools they need to perform their duties efficiently without compromising patient care. Another way to improve implementation and adherence of IPC practices is to distill infection control guidance to simple steps that can be applied realistically within the fast-paced workflow of obstetric care. Furthermore, the development of future resources should aim to increase hospital leadership's understanding and awareness of labor and delivery's unique needs to improve resource allocation to support implementation of IPC practices. This includes personnel resources and strong partnerships with infection preventionists, medical epidemiologists, and infectious disease physicians. Overall, labor and delivery will likely benefit from specialized attention to their corner of the hospital through the provision of obstetric-specific infection control support, creating a safer environment for both patients and HCP. Using the results and lessons learned from these focus groups, we hope to create obstetric-tailored resources that HCP and hospitals can utilize to decrease patient risk of HAIs and protect HCP during the process of labor and delivery.

Acknowledgments. We want to thank the Infectious Diseases Society for Obstetrics and Gynecology for their collaboration to hold these focus groups, and the HCP who graciously shared their experiences and opinions on this important topic. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Financial support. No financial support was provided relevant to this article.

Competing interests. All authors report no conflicts of interest relevant to this article.

References

1. Davis R. The doctor who championed handwashing and briefly saved lives. National Public Radio website. https://www.npr.org/sections/health-shots/2015/01/12/375663920/the-doctor-who-championed-hand-washing-and-saved-women-s-lives. Published January 12, 2015. Accessed February 7, 2023.
2. Callaghan WM, Creanga AA, Kuklina EV. Severe maternal morbidity among delivery and postpartum hospitalizations in the United States. *Obstet Gynecol* 2012;120:1029–1036.
3. Division of Reproductive Health. Pregnancy mortality surveillance system. Centers for Disease Control and Prevention website. https://www.cdc.gov/reproductivehealth/maternal-mortality/pregnancy-mortality-surveillance-system.htm?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Freproductivehealth%2Fmaternalinfanthealth%2Fpregnancy-mortality-surveillance-system.htm#. Published June 22, 2022. Accessed November 21, 2022.
4. Kendle AM, Salemi JL, Tanner JP, Louis JM. Delivery-associated sepsis: trends in prevalence and mortality. *Am J Obstet Gynecol* 2019;220:391.e1–391.e16.
5. Trost SL, Beauregard J, Njie F, *et al. Pregnancy-Related Deaths: Data From Maternal Mortality Review Committees in 36 US States, 2017–2019*. Atlanta, GA: Centers for Disease Control and Prevention, US Department of Health and Human Services; 2022.
6. Helfgott AW, Taylor-Burton J, Garcini FJ, Eriksen NL, Grimes R. Compliance with universal precautions: knowledge and behavior of residents and students in a department of obstetrics and gynecology. *Infect Dis Obstet Gynecol* 1998;6:123–128.
7. Kamali A, Jamieson DJ, Kpaduwa J, *et al.* Pregnancy, labor, and delivery after ebola virus disease and implications for infection control in obstetric services, United States. *Emerg Infect Dis* 2016;22:1156–1161.
8. Olson CK, Iwamoto M, Perkins KM, *et al.* Preventing transmission of Zika virus in labor and delivery settings through implementation of standard precautions—United States, 2016. *Morb Mortal Wkly Rep* 2016;65:290–292.
9. Krueger RA, Casey MA. *Focus Groups: A Practical Guide for Applied Research*, Fifth Edition. Thousand Oaks, CA: Sage; 2014.
10. Hanley SJ, Jones AB, Oberman J, *et al.* Implementation of Public Health England infection prevention and control guidance in maternity units in response to the COVID-19 pandemic. *J Hosp Infect* 2022;129:219–226.
11. Sutton D, Fuchs K, D'Alton M, Goffman D. Universal screening for SARS-CoV-2 in women admitted for delivery. *N Engl J Med* 2020;382:2163–2164.
12. Werner EF, Louis JM, Hughes B, Han CS, Norton ME, Srinivas SK. Community obstetrical units less likely than academic units to have universal COVID-19 testing. *Am J Perinatol* 2020;37:1074–1076.
13. Johnson JD, Melvin E, Srinivas SK, *et al.* COVID-19 testing, personal protective equipment, and staffing strategies vary at obstetrics centers across the country. *Am J Perinatol* 2020;37:1482–1484.

https://doi.org/10.1017/ice.2023.233 Published online by Cambridge University Press