



# Barriers to collaborative anesthetic care between anesthesiologists and nurses on the labour and delivery unit: a study using a modified Delphi technique

## Obstacles à des soins anesthésiques collaboratifs entre anesthésiologistes et personnel infirmier à l'unité des naissances: une étude basée sur une méthode de Delphes modifiée

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Received: 26 September 2016/Revised: 9 March 2017/Accepted: 1 May 2017/Published online: 5 May 2017  
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### Abstract

**Introduction** *The practice of obstetrical anesthesia relies on collaborative effort between anesthesiologists and nurses, but teamwork remains a challenge. We sought to identify a consensus on the perceived barriers to collaborative care between anesthesiologists and perinatal nurses in a Canadian tertiary labour and delivery (L&D) unit.*

**Methods** *A cross-sectional consensus-building study was conducted using a modified Delphi technique. We aimed to reach consensus on the barriers to collaborative care as well as to identify the reasons behind the issues and possible interventions. This technique involved conducting four parallel sequential rounds of questionnaires: Round 1 - posing open-ended questions to nurses and anesthesiologists; Round 2 - establishing an initial within-group consensus; Round 3 - conducting a cross-over round to determine the interprofessional consensus and the remaining anesthesia and nursing consensus;*

*Round 4 - ranking to identify the top three barriers identified by the three consensuses.*

**Results** *Twenty-one anesthesiologists and 15 nurses were recruited. Themes of barriers to collaboration included issues on professionalism, availability, dissonance, team coordination, communication, organizational structure, educational gaps, and role clarity. The top two barriers from the interprofessional consensus were communication issues.*

**Discussion** *Anesthesiologists and nurses at our tertiary L&D unit identified communication as a major barrier to collaborative care. This study also shows the feasibility of using the modified Delphi technique in L&D units seeking to improve collaborative care.*

### Résumé

**Introduction** *La pratique de l'anesthésie obstétricale dépend des efforts concertés des anesthésiologistes et du personnel infirmier, mais le travail d'équipe est bien souvent un défi. Nous avons tenté d'identifier les éléments consensuels concernant les obstacles perçus à des soins collaboratifs entre les anesthésiologistes et le personnel infirmier en périnatalité à l'unité des naissances d'un centre canadien de soins tertiaires.*

**Méthode** *Une étude transversale de recherche de consensus a été réalisée en utilisant une méthode de Delphes modifiée. Nos objectifs étaient de trouver un consensus concernant les obstacles à des soins collaboratifs ainsi que d'identifier les raisons expliquant ces problèmes et des interventions possibles pour y pallier. Pour ce faire, nous avons mené quatre séries d'entrevues séquentiels en parallèle, soit : 1<sup>er</sup> tour : questions ouvertes au personnel infirmier et aux anesthésiologistes; 2<sup>e</sup> tour :*

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*élaboration d'un consensus initial au sein de chaque groupe; 3<sup>e</sup> tour : réalisation d'un tour transversal afin de déterminer le consensus interprofessionnel et d'identifier les consensus restants dans chacun des groupes, soit anesthésie et soins infirmiers; 4<sup>e</sup> tour : classification afin de déterminer les trois principaux obstacles identifiés par les trois consensus précédemment identifiés.*

**Résultats** Au total, 21 anesthésiologistes et 15 infirmiers et infirmières ont été recrutés. Parmi les obstacles à la collaboration, des problèmes liés au professionnalisme, à la disponibilité, à la dissonance, à la coordination d'équipe, à la communication, à la structure organisationnelle, aux fossés entre les formations et à la clarté des rôles ont été cités. Les problèmes de communication constituaient les deux obstacles principaux dans le consensus interprofessionnel.

**Discussion** Selon les anesthésiologistes et le personnel infirmier de notre unité des naissances de soins tertiaires, la communication constitue un obstacle majeur à des soins collaboratifs. Cette étude montre également qu'il est possible d'utiliser une méthode de Delphes modifiée dans les unités des naissances cherchant à améliorer les soins collaboratifs.

The practice of obstetrical anesthesia relies on the collaborative efforts of interprofessional healthcare teams to ensure safe and effective patient care. Effective collaboration between anesthesiologists and nurses is of particular importance, considering the frequency of their interactions and the interdependence of their roles. Nevertheless, effective teamwork in healthcare remains a challenge.<sup>1-3</sup> Anecdotally, these relationships can appear even more strained in anesthetic obstetrical care. This may be due in part to the “call as needed” presence of the anesthesiologist (which limits opportunities to establish relationships), cultural norms, high volumes, night shifts, and other reasons. Failures in teamwork can lead to staff distress, tension and inefficiency,<sup>4</sup> job departure,<sup>5</sup> poor patient care,<sup>6</sup> and even preventable medical errors.<sup>7</sup> As a result, there is a need to explore this relationship in greater detail.

A recent review of the literature suggests that interprofessional educational interventions may lead to better patient care.<sup>3</sup> Targeting these interventions towards relevant and specific issues is key, but identifying barriers to collaboration can be challenging. Barriers to physician-nurse collaboration have been shown to be multifactorial and varied. Experts blame the influence of traditional professional territorial boundaries and hierarchical structures engrained in medical socialization.<sup>1</sup> Descriptive

studies cite barriers such as hesitation to challenge the physician's “authority”,<sup>8</sup> poor communication,<sup>9</sup> lack of role clarity,<sup>10</sup> intimidation and bullying,<sup>11</sup> dependence on electronic systems,<sup>11</sup> linguistic/cultural barriers,<sup>11</sup> and perceived reluctance on the physician's part to collaborate with nurses.<sup>2</sup>

Recent studies have investigated physician-nurse collaborative relationships in either semi-structured groups<sup>11</sup> or individual<sup>8-10</sup> interviews. Bias may be evident in group interviews due to personality traits, seniority, and employment pressures, while individual interviews lack opportunities to build on ideas from peers. In contrast, the Delphi technique is a structured survey method that aims to minimize these issues and gain a consensus of ideas among a group of experts.<sup>12</sup> This method involves collating the judgment of participants in a series of sequential questionnaires or rounds. During each round, participants are asked to make judgments on the anonymous summarized submission of the other participants. Once participants' responses reach a certain threshold of agreement with the summary, they continue on to the next round. At each round, responses are summarized and fed back to participants to make further judgments, and this continues until a consensus is achieved, typically after four rounds. Given the potentially sensitive nature and challenges of discussing failure of teamwork in a group setting, in our view, the Delphi technique may be specially suited to initiate dialogue on exploring barriers to collaboration.

Few studies have investigated the barriers to collaborative care between anesthesiologists and nurses, and to date, such studies are lacking in the context of obstetrical care. The purpose of this study was to seek a consensus on the perceived barriers to collaboration amongst anesthesiologists and perinatal registered nurses in a tertiary labour and delivery (L&D) unit. We also aimed to determine the reasons behind the barriers and possible interventions to facilitate change.

## Methods

Following institutional research ethics board approval (REB number 15-0226-E; October 6, 2015), this study was conducted from November 2015 to March 2016 as a prospective blinded cross-sectional survey.

We aimed to enroll 20 anesthesiologists and 20 nurses over a broad range of clinical experience, including staff/fellow/resident anesthesiologists, senior (>five years' experience) and junior nurses (<five years' experience) on L&D. While the Delphi technique traditionally uses a panel of “experts”, the rationale for this practice and the definition of an “expert” have been debated.<sup>13</sup> Instead, we

recruited participants with knowledge of collaborative care who were willing to engage in a discussion on the topic. Professionals with a wide range of experience were included in the study in order to reflect the proportion of team members on a typical working day. Participants were invited by email and through recruitment posters placed in the nursing and anesthesia lounges. Emails were sent to all staff, fellow, and resident anesthesiologists, as well as all permanent nurses on L&D. To balance the experience level in each group, potential participants, selected based on their level of experience, were also approached with additional reminder emails or individually in person. Participation in the survey was taken as informed consent. No written informed consent was sought.

An institutional consensus on barriers to collaborative care was obtained using a modified Delphi technique. This comprised four rounds of questionnaires via a web-based survey program ([www.fluidsurveys.com](http://www.fluidsurveys.com), Ottawa, ON, Canada). Parallel rounds of questionnaires were sent to both anesthesiologists and nurses (Figure). Three of the four investigators (J.C., L.F., and N.W.) were blinded to the identity of the respondents, while the unblinded investigator (K.D.) collected and coded the identification of each participant throughout the study.

Round 1 consisted of three open-ended questions:

1. Please list barrier(s) to collaborative care between anesthesiologists and nurses that affect patient care during the provision of anesthetic care on the L&D unit.
2. For EACH of the barriers listed, please state the reason(s) why you think the barrier exists.
3. For EACH barrier listed, please also suggest an intervention(s) to promote change.

Upon receipt of the responses, items were summarized and duplicates removed. Care was taken to minimize significant modification of responses. This step was completed by L.F. and reviewed by the remaining investigators to discuss and resolve discrepancies.

During Round 2, participants received a summarized list of barriers, reasons, and interventions identified in Round 1 by members of their group to achieve either the initial anesthesiology consensus or the initial nursing consensus. Participants in each group were asked to select yes/no in agreement/disagreement with each item, respectively. Items achieving >70% agreement were defined as achieving consensus and proceeded to the next round. The cut-off of >70% was chosen based on a previous similar study where a cut-off of >60% was arbitrarily chosen.<sup>14</sup> The cut-off was increased to >70% in the present study, as we expected a greater number of submissions given our larger sample size ( $n = 40$  vs  $n = 20$ ), and we wanted to include the items of agreement reached by more group members. Participants were also invited to revise

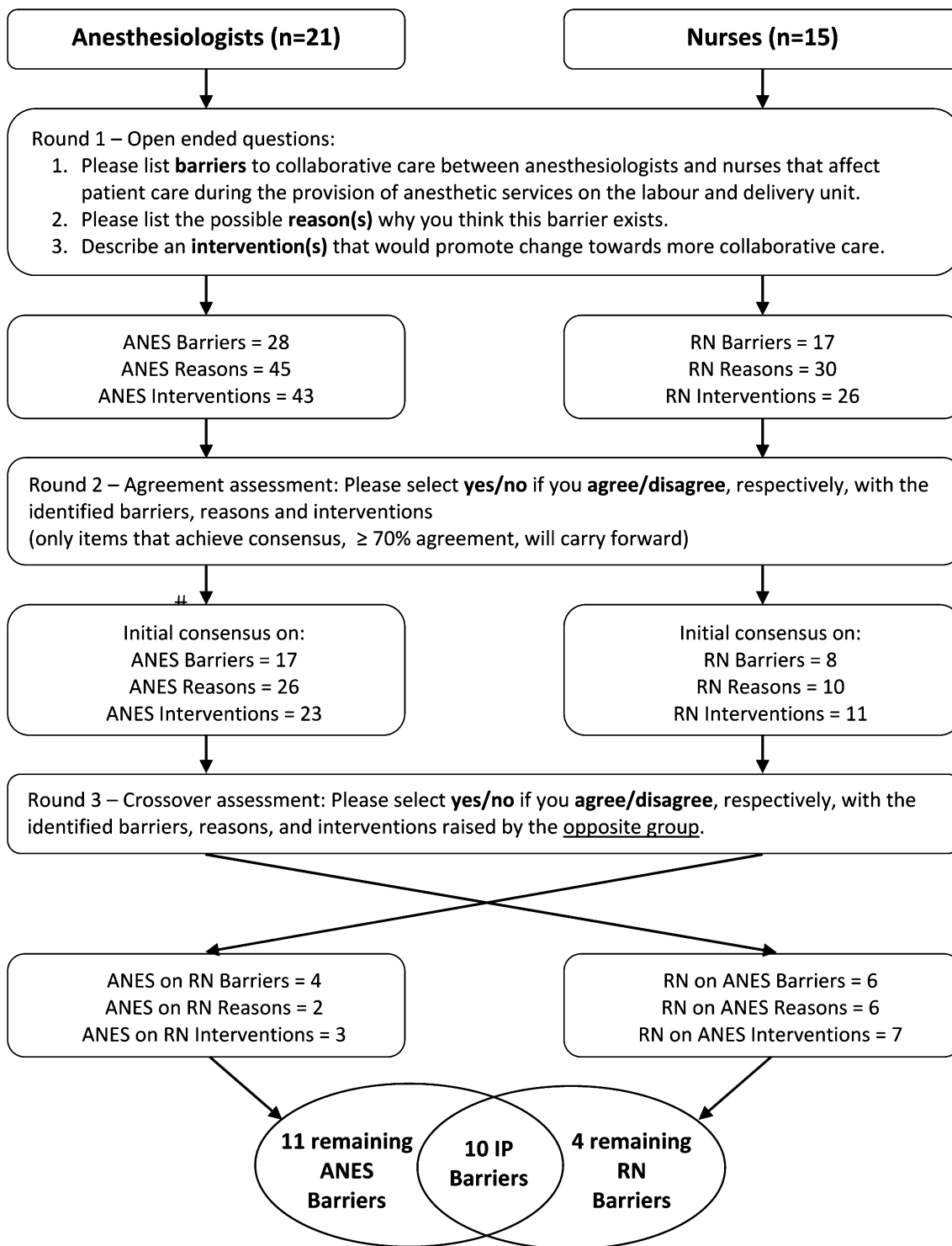
their own judgments and/or add new items in any of the three domains. If the overall number of items increased by >10% at the end of Round 2, another round was performed to seek agreement within the respective group (i.e., Round 2 was repeated). If new items made up <10% of the items at the end of Round 2, they would be included in the next round without repeating Round 2.

In Round 3, the cross-over round, participants received a summarized list of barriers, reasons, and interventions identified in Round 2 by members of the *opposite* group to form the interprofessional consensus. This modification from the traditional Delphi technique was modelled from a previous study.<sup>14</sup> In order to form the interprofessional consensus, participants were asked to agree/disagree with each item, as they had done in previous rounds. The interprofessional consensus represented items of agreement reached by each group's responses to the opposite group's initial consensus from Round 2. Just as before, participants were invited to add/modify statements in any domain. Consensus and new items were handled in the same manner as Round 2. When barriers did not reach interprofessional consensus (<70% agreement), they formed the remaining consensus within their respective professional group only (Figure).

In Round 4, the ranking round, participants were asked to select the top three barriers from two lists. The first list included the barriers identified in the cross-over round, i.e., the interprofessional consensus. The second list included the barriers identified in the remaining consensus of the respective groups, and participants were asked to rank only within their own group. Barriers that were ranked 1 (most important), 2, and 3 were assigned a value of 3, 2 and 1, respectively. A score was summed to obtain a prioritized interprofessional consensus of barriers to collaborative care. In the event of a "tie" for third and fourth place, the "top four" results would be accepted. If the sample sizes differed between the two groups, the scores for each barrier from each group would be weighted by dividing it by the sample size. The two weighted scores would then be summed for the barrier being ranked to form the interprofessional ranked list.

#### Sample size rationale and statistical analysis

There is lack of agreement in the literature as to what constitutes an optimum number of subjects in a Delphi study. Debecq *et al.*<sup>15</sup> have suggested that ten to fifteen subjects could be sufficient if the background of the Delphi subjects is homogenous.<sup>15</sup> If the sample size is too small, these subjects may not provide a representative pooling of judgments regarding the target issue. Too large a sample can result in drawbacks such as low response rates and a longer time commitment from respondents and researchers.<sup>16</sup> We decided to use 20 respondents from each group to comprise



**Figure** Flow diagram of the Delphi technique. Remaining anesthesia or nursing barriers were the result of initial barriers minus the barriers that made the interprofessional consensus. ANES = anesthesia; IP = interprofessional; RN = registered nurse

an expert panel of 40 respondents for the Delphi technique. This is double the number of subjects from a previous similar study<sup>14</sup> because the respondents from each group were more heterogeneous in their experience level.

The results of the study are presented in a descriptive manner. Responses were organized into six categories based on the work by Weller *et al.*<sup>17</sup> and Baggs and Schmitt,<sup>9</sup> namely, professionalism, availability, dissonance,

team coordination, communication, and organizational structure.

## Results

Twenty anesthesiologists and 20 nurses were approached to participate in the study. Arrangements were made to replace recruits who declined the invitation. An extra anesthesia resident was included due to a delayed consent after a replacement was found. In the end, 21 anesthesia providers (ten staff, five fellows, six residents) and 18 nurses (ten senior and eight junior nurses) were enrolled at the start of the study. In the anesthesia group, 57% were female, while all the nursing participants were female. All of the anesthesia providers completed all rounds, while only 15/18 nurses fully completed the study.

Barriers were organized according to eight categories. Two new categories (role clarity and education gaps) were added *post hoc* based on some themes that emerged from the responses that were not represented in the existing literature (Table 1). The initial anesthesia consensus included barriers from all eight categories, while the initial nursing consensus included only four categories (Table 2). Dominant categories (i.e., >two barriers) within the anesthesia group were professionalism and communication, while availability and communication were dominant categories in the nursing group. Five categories of barriers were identified in the interprofessional consensus, the most dominant (five out of ten barriers) being communication (Table 2). A summary of the findings from the interprofessional consensus is presented in Table 3. Fewer than 10% of new/modified items were added at the end of Rounds 2 and 3. After Round 2, agreement over barriers was greater among anesthesiologists than among nurses [17/28 (60%) vs 8/17 (47%), respectively]. Following the cross-over round (Round 3), anesthesiologists agreed on 4/8 (50%) barriers identified by nurses, while nurses agreed on only 6/17 (35%) barriers identified by anesthesiologists. Finally, results at the completion of Round 4, the ranking round, showed that the top two interprofessional barriers identified by both anesthesiologists and nurses were communication issues (Table 4). Two of three prioritized barriers from the remaining anesthesiology or nursing consensus were issues on professionalism or availability, respectively. All three of the top barriers from the remaining nursing consensus were in the context of providing epidural anesthesia.

## Discussion

Modern anesthetic care in a tertiary L&D unit is characterized by high volumes, high-risk patients, and unpredictable emergencies, thus the safe delivery of care is

dependent on interdisciplinary collaboration between physicians and nurses. This study explores the barriers to collaborative care between anesthesiologists and nurses at a tertiary L&D unit.

Our findings show that communication is perceived as a major barrier to collaborative care between anesthesiologists and nurses at our L&D unit. The recognition that poor communication contributes to poor physician–nurse relations has already been thoroughly documented<sup>11,18–20</sup>; however, our results highlight communication as the area to prioritize (particularly interventions for change) over other barriers identified in this study. The top two barriers from the interprofessional consensus included communication breakdowns in two different settings. The first category concerned caregivers conveying patient care plans to their patients; and the second involved communication breakdown during clinical emergencies. These are distinguished primarily by urgency, which has implications on how effective communication occurs and, thus, will be discussed separately.

Non-urgent communication among caregivers has been studied by Robinson *et al.*<sup>11</sup> who suggested that effective communication should include clear and precise delivery, collaborative problem solving, and maintenance of mutual respect. These findings are similar to those in our present study. The authors also observed that the establishment of a relationship was seen as almost a precursor to effective communication—i.e., participants had to feel comfortable with each other in order to communicate effectively.<sup>11</sup> In this present study, anesthesiologists identified nurses' lack of respect for anesthesia trainees as a barrier. As Robinson *et al.* suggest, the establishment of a relationship may aid in addressing this difficult issue of professionalism. The challenge, however, is lack of opportunity and rapid turnover of trainees. One way to increase opportunities to become better acquainted may include the implementation of joint patient rounds. This suggestion was mentioned twice in the interprofessional consensus as a potential intervention for change. Scheduling joint rounds has been shown to have a positive impact on team collaboration<sup>21</sup> and patient care.<sup>3</sup> The implementation of joint physician–nurse rounds on a medical unit over a four-week period showed improvements in care efficiency and resulted in fewer calls to physicians. Furthermore, participants thought it enhanced interprofessional collaboration and the quality of patient care.<sup>21</sup> Participants in the present study also brought up the need for utilizing a clear flow of communication. Critical event reviews at our institution have revealed the need to clarify both leader and supporting roles when navigating the flow of communication as well as around the chain of command when disagreements occur between healthcare providers. Each member of the interdisciplinary

**Table 1** Categorization of barriers

1. Professionalism—attitude for collaboration, such as mutual respect, openness, and trust
2. Availability—in time, place, and knowledge
3. Dissonance—shared goals/mental models and *how well* they are shared
4. Team coordination—coordination of team roles, leadership quality
5. Communication
6. Organizational structure
7. Education gaps\*—lack of education around a topic
8. Role clarity\*—definition of team roles

\* Categories added *post hoc* based on findings from the present study

Adapted from: *Baggs JG, Schmitt MH. Nurses' and resident physicians' perceptions of the process of collaboration in an MICU. Res Nurs Health* 1997; 20: 71-80;<sup>9</sup> and *Weller JM, Barrow M, Gasquoin S. Interprofessional collaboration among junior doctors and nurses in the hospital setting. Med Educ* 2011; 45: 478-87<sup>17</sup>

**Table 2** Summary of barriers to collaborative care identified by the initial anesthesia, initial nursing, and interprofessional consensus

| Categorization of barriers | Initial anesthesia consensus* (n) | Initial nursing consensus* (n) | Interprofessional consensus† (n) |
|----------------------------|-----------------------------------|--------------------------------|----------------------------------|
| Professionalism            | 3                                 |                                |                                  |
| Availability               | 2                                 | 3                              | 2                                |
| Dissonance                 | 2                                 |                                | 1                                |
| Team coordination          | 2                                 | 1                              |                                  |
| Communication              | 3                                 | 3                              | 5                                |
| Organizational structure   | 1                                 |                                |                                  |
| Education gaps             | 2                                 | 1                              | 1                                |
| Role clarity               | 2                                 |                                | 1                                |
| Total                      | 17                                | 8                              | 10                               |

n = number of distinct barriers within each identified category; \* Initial anesthesia or nursing consensus formed at the end of Round 2; † Interprofessional consensus formed at the end of Round 3

team has a role to play in terms of maintaining the flow of communication. An exploration of this topic will be part of our ongoing work.

Communication during emergencies, however, is vastly different. Analyses of over 2,000 sentinel events in American healthcare organizations showed that over 70% were due to breakdowns in communication.<sup>22</sup> A more recent audit of 170 Canadian medico-legal cases involving obstetrical emergencies over ten years revealed a common thread of poor teamwork and communication as a root cause of these events.<sup>20</sup> One of the solutions brought forth by reviewing experts included the use of structured tools for sharing information. Such tools would include the SBAR (situation, background, assessment, recommendation) or the CHAT (current condition, history, assessment, and treatment)<sup>23</sup> techniques as possible mechanisms to improve physician–nurse communication during emergencies. In one study, use of the SBAR tool significantly improved perceptions of team communication and the safety climate among anesthesiologists and nurses, and it also decreased the proportion of critical incident reports related to

communication errors over a one-year period.<sup>24</sup> Interprofessional team training in a simulation setting has also been shown to be effective in improving communication and team performance in an obstetrical emergency setting.<sup>25</sup> Furthermore, checklists are being used to enhance teamwork during obstetrical emergencies.<sup>26</sup> The use of checklists not only standardizes critical clinical management steps, it also forces a shared mental model among team members, thereby enhancing crisis resource skills such as effective communication, role clarity, and anticipation of next steps. Finally, results from our study have called for more interprofessional teaching sessions, general education, and joint rounds. Effective communication, in any setting, is not acquired but learned; it requires skillful listening, advocacy, conflict management skills, as well as self-awareness. For these reasons, physicians and nurses should be required to engage in formal interdisciplinary education and training on the need for and methods of communication and collaboration.<sup>18</sup> Formal staff development programs, integrated annual skills evaluation, and a resident educational program have all

**Table 3** Detailed description of the interprofessional consensus on barriers to collaboration, reason(s) for the barriers, and intervention(s)

| Barriers to collaborative care  | Categorization of barrier | Reason(s)  | Intervention(s)  |
|---|---------------------------|--|--|
| Lack of understanding of competing interests of anesthesiologist time   | Availability              | Complicated cases requiring more time  | Clarification of expectations about the timing of labour epidural<br>An established protocol to contact other providers if a resident isn't immediately available  |
| Time pressures prevent the anesthesiologist from providing the ideal level of collaborative care with the nurse for the patient | Availability              | Very busy unit with multiple simultaneous requests   |  |
| Unclear communication regarding the plan for certain patients   | Communication             | Rapidly evolving nature of care<br>Time/staff pressures                                    | Regular joint updates<br>Central coordination by nursing team leader   |
| Poor communication around the urgency of a situation  | Communication             | Time pressures   |  |
| Unclear communication during crash Cesarean delivery  | Communication             |  |  |
| Communication breakdowns, i.e., multiple simultaneous requests and changes in care plans not shared                             | Communication             | Busy unit with multiple requests for anesthetic care without knowing what else is going on | Clear communication chain established at start of each shift so that team leader is aware of any other issues<br>Discussion of care plans in a professional manner |
| Nursing often acts as the middle person communicating between anesthesia and obstetrics   | Communication             |  | Particularly for high-risk patients, joint patient rounds should be performed  |
| Lack of knowledge where to access anesthetic equipment, particularly when the anesthesia assistant is busy                      | Education                 |  | Education  |
| Conflicting priorities during emergency situations  | Dissonance                |  |  |
| Nurses and physicians have a poor understanding of each other's job pressures and expectations                                  | Role Clarity              | Nurses may lack exposure to anesthesia<br>Mutual lack of education                         | Interprofessional teaching sessions or case-based "trouble rounds"<br>Frequent debriefing with nursing, led by anesthesia  |

Blank fields indicate a lack of consensus on the reason or intervention

led to improvements in communication, collaboration, patient outcomes, and job satisfaction.<sup>18</sup>

The Society of Obstetricians and Gynaecologists of Canada (SOGC) has recently published a consensus statement outlining the roles of multidisciplinary team members on L&D, which included many themes consistent with the findings in our study including respectful communication and interprofessional education.<sup>27</sup> The modified Delphi technique, however, allowed us to acknowledge barriers that are specific to the needs of our institution. Therefore, a notable finding of this study is the feasibility of applying the modified Delphi technique to an L&D unit seeking a means to initiate dialogue on collaborative care. The survey can be set up at no or low

cost and can be completed at the convenience of the participants. It is relatively easy to complete and has low risk of retribution since anonymity is preserved. Nevertheless, survey developers should be sensitive to the language or tone of strongly written responses, especially when members of the opposite group read these replies during the cross-over round. Perhaps the ability to remain anonymous allows some participants to speak more freely than others. It is also important to remember that not all responses should be taken at face value. Some responses may initially seem personal, contradictory, or vague, but they may represent deeper barriers such as a lack of collaborative problem solving, poor knowledge of the other's professional role, or a frank

**Table 4** Prioritized barriers identified by the interprofessional, remaining anesthesia, and remaining nursing consensus**Interprofessional consensus**

1. Communication breakdowns, i.e., multiple simultaneous requests and changes in care plans not shared (communication)
2. Unclear communication during crash Cesarean deliveries (communication)
3. Lack of understanding of competing interests of an anesthesiologist's time (availability)

**Remaining anesthesia consensus**

1. Lack of respect for anesthesia trainees among nurses (professionalism)
2. Lack of nursing assistance for anesthesia during emergencies when anesthesia assistants are unavailable (team coordination)
3. The perception that epidural requests from nurses are clustered around nursing breaks or reports, instead of patient requests (professionalism)

**Remaining nursing consensus**

1. Some staff anesthesiologists relying too much on their trainees to do the epidurals, even when it's busy (team coordination)
2. Patients having to wait for an epidural during anesthesia handover periods (availability)
3. Not enough anesthesia staff to deal with epidurals during busy times (availability)

Categories of barriers indicated in brackets

misunderstanding. An example of the latter was seen around the issue of delivery of epidural anesthesia. Both groups highlighted issues with the procedure, but with opposing concerns. Nurses wanted them to be performed more often and faster, while anesthesiologists considered themselves limited by time and resources. It would be ineffective to take the individual responses at face value, but seen together, the issue may reflect a lack of collaborative problem solving that requires further discussion. Lastly, it should be emphasized that the issues around interprofessional teamwork are complex. The purpose of our study was to determine a consensus on what local stakeholders *perceived* as barriers to collaborative care. The results may or may not be the most "important" or even "truest" barriers, but the key distinction here is that the majority of participants agreed on these barriers. We recognize that not all interprofessional collaborative issues will be strictly captured in the interprofessional consensus and that some important issues may remain the concerns of only one professional group. Take, for example the issues regarding professionalism. These were dominant concerns amongst the anesthesiologists in the study, but none of these barriers reached consensus when presented to the nursing group. It is not clear whether the anesthesiologists misjudged the acts of unprofessionalism or whether lack of insight from nursing was the root of the unprofessionalism. For this reason, even items that do not reach interprofessional consensus need to be considered thoughtfully. The strength of the Delphi technique lies in engaging participants of varying opinions to reach common ground by identifying issues that would be challenging to discuss in an open-group setting. In our view, this strategy for consensus is a strong starting point to frame future interprofessional interventions; participants will become engaged because they are actively involved in the consensus process.

Limitations to the present study include using a survey to generate items and attrition bias. The Delphi technique was designed to obtain consensus and not necessarily to generate new ideas, which took place in Round 1. It can be argued that item generation may be better suited to a qualitative method, such as group interviews where ideas can be discussed and refined in real time. On the contrary, holding a group discussion on the potentially sensitive topic of poor collaborative efforts may be highly biased by fear of retribution, dominant talkers, and pressures to conform to the group's ideas. It is also possible that the dominantly female nursing group in this study may have biased the results, since gender roles may affect physician–nurse collaboration.<sup>28,29</sup> Nevertheless, for many reasons, L&D units have traditionally been, and remain, dominated by female nurses, so we suggest that our data reflect real-life gender proportions in L&D units. Despite our efforts to reduce the number of drop outs, this study may have been subject to an attrition bias, since only 15/18 nurses completed the study compared with all 21 anesthesia providers.

In summary, this study shows the feasibility of using a modified Delphi technique as a means to identify barriers to collaboration between anesthesia providers and nurses in a tertiary L&D unit. Results of the interprofessional consensus show that both nurses and anesthesiologists agree that communication is a major barrier to collaborative care. The identification of barriers to collaboration is the first step towards working as our best selves, together.

**Acknowledgement** The authors sincerely thank Dr. Desire Onwochei for her editorial contributions.

**Conflicts of interest** None declared.

**Editorial responsibility** This submission was handled by Dr. Steven Backman, Associate Editor, *Canadian Journal of Anesthesia*.



**Author contributions** Lillia Fung and Jose Carvalho contributed substantially to the conception and design of the project. Kristi Downey contributed substantially to the acquisition of data. Lillia Fung prepared the original manuscript, while Kristi Downey, Nancy Watts, and Jose Carvalho contributed to the interpretation of data and critical review of the manuscript.

**Financial disclosures** None.

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