Published in final edited form as:

J Pediatr Surg. 2016 January ; 51(1): 131–136. doi:10.1016/j.jpedsurg.2015.10.030.

Exposure to prenatal consultation during pediatric surgery residency: Implications for training

Loren Berman^{a,*}, Rashmi Kabre^b, Anne Kazak^c, Barry Hicks^d, and Francois Luks^e

^aNemours-A.I. DuPont Hospital for Children, Dept of Surgery, 1600 Rockland Rd., Wilmington, DE 19803

^bAnn and Robert H. Lurie Children's Hospital, Department of Surgery, Chicago IL

^cNemours-AI DuPont Hospital for Children, Center for Healthcare Delivery Science, Wilmington DE

^dNemours-A.I. DuPont Hospital for Children, Department of Surgery, Wilmington DE

^eHasbro Children's Hospital, Department of Surgery, Providence RI

Abstract

Purpose—Prenatal consultation is an important skill that should be learned during pediatric surgery training, but there are no formal guidelines for fellowship programs at this time. We sought to characterize the fellowship experience of recent pediatric surgery graduates and assess preparedness for providing prenatal consultation.

Methods—An anonymous online survey of pediatric surgery fellows graduating in 2012 and 2013 was performed. We asked respondents to describe participation in prenatal consultation and preparedness to perform consultation. We measured demographics and fellowship characteristics and tested associations between these variables and preparedness to perform prenatal consultation.

Results—A total of 49 out of 80 fellows responded to the survey (61% response rate). Most respondents (55%) saw five or fewer prenatal consults during fellowship, and 20% had not seen any prenatal consults. 47% said that fellowship could have better prepared them to perform prenatal consults. Fellows who saw more than 5 prenatal consults during fellowship (33% vs 77%, $p = 0.002$) or described their fellowship as being structured to facilitate participation in prenatal consults (83% vs 27%, $p < 0.0001$) were more likely to feel prepared. Stepwise logistic regression revealed that after adjusting for covariates, fellows graduating from programs that were 1) structured to facilitate participation in prenatal consults (OR 18, 95% CI 3.7–86.7), or 2) did NOT have an established fetal program (OR 5.5, 95% CI 1.1–27.8) were more likely to feel prepared.

Conclusion—Exposure to prenatal consultation varies greatly across pediatric surgery fellowships, and many recent graduates do not feel prepared to perform prenatal consultation. The presence of an established fetal program did not necessarily translate into improved fellow training. Efforts should be made to standardize the approach to fellow education in this area and ensure that adequate guidance and resources are available to recently graduated pediatric surgeons.

*Corresponding author. Tel.: +1 302 651 5888; fax: +1 302 651 5990. lorenberman1@gmail.com (L. Berman).

Keywords

Prenatal consultation; Education; Competency; Fellowship training; Pediatric surgery

Pediatric surgeons play an essential role in prenatal consultation for fetuses with certain congenital anomalies. Understanding the surgical perspective is crucial in order for prospective parents to fully appreciate the significance of a prenatal diagnosis and make important decisions ranging from where and how the baby will be delivered to considering an in utero intervention or even terminating the pregnancy [1,2]. It is critical that pediatric surgeons, upon completion of their training, be able to competently provide evidence-based information to future parents and set up realistic expectations as to how this anomaly will impact the life of their future child.

Pediatric surgery residency training is typically a fast-paced two-year period with emphasis placed on operative skills and hands-on in-patient care. Outpatient and clinic exposure, which is already limited, tends to focus on “bread-and-butter” pediatric surgical pathology. In order to graduate from pediatric surgery residency and become board-eligible, fellows have strict requirements in terms of operative cases completed and trauma patients cared for. However, there are no specific guidelines with respect to outpatient activities, including participation in prenatal counseling [3]. The objective of this study was to characterize exposure to prenatal consultation during pediatric surgery residency and assess fellows’ comfort level with this important skill.

1. Methods

1.1. Study design and sample

An anonymous cross-sectional survey was conducted online using SurveyMonkey® (www.surveymonkey.com). We surveyed fellows graduating from pediatric surgery residency programs in the United States and Canada in 2012 and 2013. The survey was developed and pilot-tested on five recently graduated pediatric surgery fellows, revised, and then distributed by e-mail (see Appendix A). All research procedures were approved by the Institutional Review Boards at Nemours and the Lurie Children’s Hospital.

1.2. Survey measures

The survey collected demographics, current (post-fellowship) practice setting, and fellowship characteristics. These specifically included features relevant to prenatal consultation experience such as presence of a fetal diagnosis and treatment program and participation in a multidisciplinary fetal conference. We quantified the number of prenatal consults seen during fellowship overall, and for the following diagnoses: congenital diaphragmatic hernia (CDH), congenital lung mass, sacrococcygeal teratoma (SCT), abdominal wall defect (AWD), dilated bowel/atresia, and abdominal cyst. We asked about the number of operative cases performed by fellows for the same list of diagnoses. Finally, we measured fellows’ comfort level to perform prenatal consultations independently for each diagnosis and asked how the residency could have better prepared them to perform prenatal consultations. Answer choices were a combination of Likert scales (e.g., 1 through

5 where 1 = “not at all comfortable” and 5 = “very comfortable”) and categorical numerical choices (e.g., number of prenatal consultations for a given diagnosis). The survey also included open-ended questions in order to better understand why fellows did or did not feel prepared to perform prenatal consultations at the end of fellowship. We asked respondents what resources they currently use to guide them in performing prenatal consultations, and to describe deficits in the available resources.

1.3. Data analysis

We performed standard frequency analyses to describe the study sample and responses to survey questions. We dichotomized Likert scale responses into “comfortable independently performing prenatal consultation for a diagnosis” (“5”) or not (less than “5”). In order to examine associations between fellow and residency program characteristics and likelihood of feeling prepared, we performed bivariate analyses using the chi square test. To identify independent predictors of feeling prepared after adjusting for covariates, we used multivariable logistic regression. All quantitative statistical analyses were performed using the SAS Enterprise Guide (SAS Institute, Cary, NC).

Open-ended responses were analyzed in order to characterize fellows’ opinions regarding how their training could have better prepared them to perform prenatal consultations. Two of the authors with experience in qualitative research (L.B., A.K.) analyzed qualitative data using the constant comparative method, a systematic data coding and analysis procedure [4,5]. This method involves the categorization of specific quotes from participants with the use of codes developed iteratively to reflect the data. We focused our analysis on those aspects of the qualitative data that would enhance our interpretation of the quantitative findings and provide additional insights into perceptions and experiences not measured quantitatively [6].

2. Results

2.1. Description of sample and training programs (Table 1)

A total of 49 pediatric surgeons responded out of 80 who were contacted (response rate 61%). Most respondents were male and Caucasian. The vast majority described their current practice setting as academic practice and stated that they were currently participating in prenatal consultation as attendings. Most respondents trained in larger programs, with six or more attending pediatric surgeons. The majority (65.2%) described their training programs as having established fetal programs (11 respondents categorized this program as a fetal diagnosis and counseling program, while 21 described it as a diagnosis and therapy program). Most respondents (83.7%) had attended neonatal resuscitations of newborns with pediatric surgical congenital anomalies, and 33.0% had observed fetal surgical procedures.

2.2. Frequency of prenatal consultation participation and preparedness

The majority of respondents (54.1%) participated in five or fewer prenatal consultations during their pediatric surgery residency. Most fellows saw at least one prenatal consult for CDH and AWD. The diagnoses for which participants were least likely to have performed prenatal consultation were as follows: 68% of fellows saw no prenatal consults for SCT,

56% of fellows saw no consults for abdominal cyst, 45% for dilated bowel/atresia, and 40% for lung masses. Ten fellows (20%) did not participate in any prenatal consults during their entire training period (Fig. 1). This is in stark contrast to fellows' operative experience, as the vast majority performed at least five operative cases for each of the diagnoses (with the exception of SCT) while many fellows did not participate in more than one prenatal consult for that diagnosis (Fig. 2). In fact, 31 respondents (63.2%) reported that they had rarely or never participated in the prenatal consult when taking care of a neonate whose mother had been seen prenatally.

Overall, nearly half of the respondents (47%) stated that pediatric surgery residency could have better prepared them to perform prenatal consultation. Abdominal wall defects were the only diagnosis for which the majority of fellows reported that they felt comfortable independently conducting prenatal consultation (Fig. 3). In terms of current preparation strategies for performing prenatal consultations, 90% use a textbook, 80% speak to colleagues, 71% use journal articles, and 41% use the American Pediatric Surgical Association (APSA) handbook [7]. We asked about several different modalities of resources and whether or not they would be helpful, if available. These responses are described in Table 2. Patient handouts and/or computer-based presentations to be used during consultation were regarded as particularly helpful.

2.3. Associations between study variables and preparedness

The variables that were found to be significantly associated with feeling prepared to perform prenatal consultation at the end of training (Table 3) were seeing greater than five prenatal consults during residency (77% vs 33% prepared, $p = 0.002$) and graduating from a training program that was structured to facilitate participation in prenatal consults (83% vs 27%, $p < 0.0001$). After adjusting for demographics and residency characteristics, fellows graduating from programs that 1) were structured to facilitate participation in prenatal consults (odds ratio (OR) 18, 95% confidence interval (CI) 3.7–86.7), or 2) did NOT have an established fetal program (OR 5.5, 95% CI 1.1–27.8) were more likely to feel prepared.

2.4. Open-ended responses

Fellows were asked to explain how their programs were structured in a way that would facilitate their participation in prenatal consultation. If they answered that their fellowships could have better prepared them to perform prenatal consultation, they were asked to explain why. Analysis of the open-ended responses revealed several themes (Table 4).

1. A range in approach to planning, prioritizing, and evaluating fellow participation in prenatal consultation: No structured approach: "There was no structured program and the fellows were essentially unaware of when the prenatal consults were happening. Unless someone took significant initiative most fellows missed most prenatal consults." Observation without true participation: "I never participated in the counseling per se but was exposed to the thought processes and decision making." Formal evaluation system: "[My fellowship] implemented an evaluation form for both antenatal consultations and postnatal discussions with parents — this means the attending sits back and the trainee must navigate

through a sometimes complex/difficult discussion while setting the stage and providing adequate information to the parent(s).”

2. Culture in which the program leadership supported fellow participation in prenatal consultation:

“I had to go to clinic once a week. [This was mandatory] and it was rare that a case was ‘important enough’ that it kept me out of clinic, even as a senior fellow. Therefore, I saw everything and personally thought it would be important to participate in prenatal consultations.”

3. A formal requirement to participate in prenatal consultation was recommended:

“I was definitely very busy in fellowship, and although my attendings would've loved to have me participate in prenatal counseling, I was just never able to find the time. I think that, as is the case with making it to clinic, it IS an important part of our training, and in much the same way that my program had a strict minimum of 8 clinic patients per month, maybe it would also be good to have a minimum of ... one prenatal counseling session per month.”

Even when participation was a requirement, however, it was not always enforced effectively:

“Attendance at fetal clinic was required at least twice per year (a total of 4 consults needed). However, it was often very difficult in practice to make time for these consults since they frequently conflicted with the OR schedule.”

4. Importance of multidisciplinary conferences to augment the consultation experience:

“If I wasn't in OR I was expected to attend our MFM–Neonatology–Surgery conference, and then participate in consults after the conference. I was included on the email distribution list for this group as well, so even if I couldn't attend I knew what patients were being discussed.”

5. Importance of post-fellowship learning:

“There was a knowledge gap, as well as a practice gap, from my not specifically participating in prenatal consultation. But it's not an insurmountable one to adapt to post-fellowship.” “This aspect of training was completely neglected during my fellowship. As an attending, I am doing consults about twice per month and based on that I believe that a course on prenatal consults would serve trainees even more than the MIS course.”

3. Discussion

Birth defects are one of the leading causes of infant mortality, accounting for more than 20% of all infant deaths, and creating an ongoing source of morbidity for many afflicted children who survive infancy [8]. Technical advances in prenatal ultrasonography have led to increased accuracy and the ability to detect anomalies earlier in pregnancy, many of which are surgically correctable [9]. Prenatal counseling plays an increasingly important role in influencing decision-making during pregnancy, and for surgical anomalies, the input of surgical specialists is critical.

This survey has shown that exposure to prenatal consultation during pediatric surgery fellowship is highly variable, and that many graduating pediatric surgeons do not feel prepared to perform prenatal consultation. These results are not particularly surprising when one considers the emphasis on operative experience and active inpatient care that exists in many training programs. It is a common scenario for fellows to find themselves torn between operating and going to clinic, or seeing a sick child in the neonatal intensive care unit and participating in prenatal consultation. The vast majority of the time, when faced with these kinds of choices, fellows will choose the operation or the sick child over the less acute option.

There are several reports in the literature of prenatal consultation for certain congenital anomalies leading to increased anxiety or unrealistic expectations [10,11]. There are also reports that the information that is conveyed prenatally varies widely according to the type of provider doing the consultation [12]. The quality of the prenatal consultation and the decisions that result from it will affect the life of the child and parents forever. It is critical to provide up to date, evidence-based information in a way that parents are able to process it and make decisions consistent with their values.

How, then, can we train fellows who will graduate not only with technical competence, but also the knowledge and experience that will produce effective skills in prenatal consultation? Not surprisingly, we found that fellows graduating from programs that are structured to facilitate participation in prenatal counseling were more likely to feel prepared. A somewhat unexpected finding was the suggestion that training programs with fetal centers might be less likely to graduate fellows who feel prepared to perform prenatal consultation. It is possible that fellows from programs with a fetal therapy center may have dedicated trainees and activities that are segregated from the pediatric surgery residency program. This might have a similar effect as that of specialty fellowships on general surgery training experience [13].

The qualitative analysis offers an explanation as to why fellows are underprepared and how training can be optimized to increase exposure to prenatal consultation. Respondents described the culture of the training institution as either being supportive of participation or clearly not prioritizing this experience. There are some programs where fellows have consistent clinic obligations and the chairman or program director demands their presence in clinic on a weekly basis. In contrast, other programs leave it up to the fellow to take initiative and show up to clinic whenever possible. This opportunity is often squandered by

competing interests in acute patient care. A culture in which the leadership strongly values participation in prenatal consultation is likely the most important aspect of a program that will produce fellows who are confident and prepared in this regard. Some respondents suggested implementing a formal requirement for participation in the same way there is an operative case requirement, and this is an approach that could be considered and would likely lead to a culture change for programs that do not currently prioritize prenatal consultation or other outpatient activities.

In addition to the role of fellowship experience, respondents described the importance of ongoing participation in educational activities after fellowship. The vast majority of fellows (90%) stated that they currently use a textbook to prepare for prenatal consultation, but currently there is no designated prenatal consultation textbook available. Most fellows (76%) said a dedicated resource like this would be useful, as well as patient-specific handouts or computer presentations to be used during the consultation.

We found that participation in prenatal consultation during training does not seem to be the only pathway to feeling prepared (for example, less than 10% of respondents did a prenatal for sacrococcygeal teratoma but 30% said they feel comfortable seeing this diagnosis in prenatal consultations as an attending). This suggests that education can be achieved in ways other than actually performing these consults, perhaps through effective didactics or even simulated patient interactions.

This study has several important limitations. First, the response rate was only 61%, which is low but within the typical range of published surveys of medical professionals [14]. There is an inherent bias that survey respondents are more likely to have a particular interest in exposure to prenatal consultation so that their opinions and experience may not be generalizable to the larger population of recently trained surgeons. Second, recall bias is an important consideration. Prenatal consultation participation is not tracked formally during fellowship, so the numbers quoted by survey respondents are only as accurate as their memory. Even if there is a margin of reporting error, the survey findings still suggest that there is a wide range of exposure during fellowship.

Prenatal consultation with the pediatric surgeon is the beginning of a relationship that will last well into the life of the child, a time when trust is just beginning to be established. It is a time when there is an important multidisciplinary conversation taking place with maternal fetal medicine, neonatology and other pediatric specialists. In order to produce pediatric surgeons who are well-equipped to support and educate their patients throughout this process and participate meaningfully in multidisciplinary decision-making, fellowship training and the resources that are available to trainees and attending pediatric surgeons must be optimized.

Clearly, there is a need to improve the resources available to guide surgeons in their preparation for prenatal consultation. This should ideally be addressed during pediatric surgery training. As the training curriculum continues to adapt to the landscape of modern pediatric surgery practice, up-to-date information and didactic tools in fetal medicine should become part of it. Meanwhile, the fetal therapy community, and its surgical members in

particular, should upscale their efforts to provide accurate and evidence-based information for the general pediatric surgeon to perform prenatal consultations.

References

1. Aite L, Trucchi A, Nahom A, et al. Multidisciplinary management of fetal surgical anomalies: the impact on maternal anxiety. *Eur J Pediatr Surg.* 2002; 12(2):90–4. [PubMed: 12015651]
2. Crombleholme TM, D'Alton M, Cendron M, et al. Prenatal diagnosis and the pediatric surgeon: the impact of prenatal consultation on perinatal management. *J Pediatr Surg.* 1996; 31(1):156–62. [discussion 162–153]. [PubMed: 8632271]
3. [Accessed 2/2/15] Association of Pediatric Surgery Training Directors Pediatric Surgery Training Curriculum. 2013. http://www.eapsa.org/AM/Template.cfm?Section=APSTPD_Curriculum&Template=/CM/ContentDisplay.cfm&ContentID=3510
4. Glaser, BGSA. The discovery of grounded theory: strategies for qualitative research. Chicago: Aldine; 1967.
5. Bradley EH, Curry LA, Devers KJ. Qualitative data analysis for health services research: developing taxonomy, themes, and theory. *Health Serv Res.* Aug; 2007 42(4):1758–72. [PubMed: 17286625]
6. Creswell, J., Plano Clark, V. Designing and conducting mixed methods research. London: Sage; 2006.
7. Feltis, B., Muratore, C., editors. Fetal Diagnosis and Treatment Committee. American Pediatric Surgical Association; 2013. Fetal diagnosis and therapy: a reference handbook for pediatric surgeons. <http://www.eapsa.org/AM/Template.cfm?Section=Publications&Template=/CM/ContentDisplay.cfm&ContentID=3817> [Accessed 2/ 13/2015, 2015]
8. Contribution of birth defects to infant mortality. *MMWR Morb Mort Wkly Rep.* Apr.2009 57(14) 2006.
9. Pooh RK, Kurjak A. 3D/4D sonography moved prenatal diagnosis of fetal anomalies from the second to the first trimester of pregnancy. *J Matern Fetal Neonatal Med.* 2012; 25(5):433–55. [PubMed: 22082334]
10. Aite L, Zaccara A, Trucchi A, et al. Is counselling for CCAM that difficult? Learning from parental experience. *J Prenat Med.* 2011; 5(3):65–8. [PubMed: 22439079]
11. Aite L, Zaccara A, Trucchi A, et al. When uncertainty generates more anxiety than severity: the prenatal experience with cystic adenomatoid malformation of the lung. *J Perinat Med.* 2009; 37(5): 539–42. [PubMed: 19492915]
12. Brown SD, Ecker JL, Ward JR, et al. Prenatally diagnosed fetal conditions in the age of fetal care: does who counsels matter? *Am J Obstet Gynecol.* 2012; 206(5):409.e1–409.e11. [PubMed: 22340943]
13. Snyder RA, Phillips SE, Terhune KP. Impact of implementation of a pediatric surgery fellowship on general surgery resident operative volume. *J Surg Educ.* 2012; 69(6):753–8. [PubMed: 23111042]
14. Asch DA, Jedrzejewski MK, Christakis NA. Response rates to mail surveys published in medical journals. *J Clin Epidemiol.* 1997; 50(10):1129–36. [PubMed: 9368521]

Appendix A. Pediatric Surgery Fellow Survey

1. How would you describe your current/future practice setting? (private practice/academic practice)
2. Do you expect to be participating in/are you currently participating in prenatal consultation as an attending?
3. Did you observe or participate in fetal surgical procedures in your training program? (Yes/No)

4. In your training program did you attend or participate in the neonatal resuscitation of newborns with known pediatric surgical birth defects? (Yes/No)
5. How many prenatal consultations did you participate in during fellowship? (1–5; 6–10; 11–15; >15; N/A: I was not required to participate in prenatal consultation)
6. How important was it to you to participate in prenatal consultation as a fellow? (0: It should not be required, Likert 1 to 5)
7. Was your fellowship program structured in such a way that you would have time to participate in prenatal consultation? (i.e., scheduling consultation during protected time when you would not be pulled away to operating room or other patient care responsibilities) If yes, please describe how this was accomplished.
 - a. Please indicate how many times you participated in a prenatal consultation for any of the following diagnoses during fellowship (DH, lung masses, SCT, abdominal wall defects, dilated bowel/atresia, abdominal cyst/mass). Response options: >5, 2–5, 1, 0
 - b. Please estimate the number of neonates you operated on with the following diagnoses: (list same as above; answer choices; answer choices 0, 1–3, 4–6, 7–10, 11–15, >15)
 - c. At the end of your fellowship, how comfortable did you feel independently conducting a prenatal consultation for each of the following diagnoses (list same as above; answer choices 1 2 3 4 5 where 1 = extremely comfortable and 5 = not at all comfortable)
8. What proportion of the time, when taking care of a neonate whose mother had been seen prenatally, had you participated in the pre-natal consultation (never, rarely, sometimes, often, almost always)
9. What resources will you turn to during your practice as a pediatric surgeon to help you prepare for prenatal consultation? (textbook, journal articles, colleagues, APSA handbook, other?)
10. How helpful would it be for you to have access to any of the following resources? (1–5 Likert scales where 1 = very helpful and 5 = not at all helpful). (textbook focusing on what should be discussed during prenatal consultation, fellows course in fetal diagnosis and therapy, electronic presentations to be used as a guide in discussions with patients with specific prenatal diagnoses, handouts on specific prenatal diagnoses to provide to patients during prenatal consultation, other — please elaborate).
11. Please answer the following questions about your pediatric surgery fellowship experience:
 - a. Did your pediatric surgery training program have an established, multidisciplinary fetal diagnosis and training program? (No established

program/established fetal diagnosis and counseling program/established fetal diagnosis and treatment program/not sure)

- b. How often was there a multidisciplinary prenatal diagnosis and treatment patient conference? (no conference/monthly/ biweekly/ weekly/less than monthly/not sure)
 - c. How often did you attend this conference? (we didn't have a conference/most of the time/once in a while/never)
 - d. Did your center perform fetal MRI (Yes/No/not sure)
 - e. Did pediatric surgeons review fetal MRI with the pregnant mothers and families? (Yes/no/not sure)
 - f. How many pediatric surgeons did you work with in your training program? (1–5, 6–10, 11–15, >15)
 - g. Do you think your fellowship could have better prepared you to perform prenatal consultation independently? If yes, please elaborate.
12. What is your gender? (male/female)
13. What is your race? (White/Black/Asian/other)

Appendix B. Discussions

Presented by Loren Berman, Providence RI

GEORGE MYCHALISKA (Ann Arbor, MI) Loren, this is a great study and it brings an important matter to our attention. Do you really think that only five consultations is adequate to train someone to do prenatal consultations or what should the requirement be?

LOREN BERMAN I think five is not enough. That happened to be the cut-off point in our study, but it is hard to know what the appropriate number is exactly. I think what might be even more important than that is to create a more structured curriculum so that even if you are not seeing a consult for every single diagnosis you could go through a simulated encounter or just have a way to learn what you need to be talking about. MICHAEL KLEIN (Detroit, MI) How is this different from learning to talk to patients in general, whether it is the family of somebody arresting in the emergency room or somebody who just referred in at five days of life with a CCAM? I mean is there something special to this that requires a new structure or do we just need to teach people how to talk the patients in general?

LOREN BERMAN I think we do get a lot of exposure to those kinds of interactions that you just mentioned in the acute hospital setting because that is where we spend the vast, vast majority of our time during training, so I think the prenatal consultation is very different because you have a very limited amount of time, the patient is right in front of you, there is a lot of anxiety. I think the information is confusing — which parameters you use to predict outcome. We are going to hear later in this session about some of these issues, so I think part of it is not really knowing what content to

discuss and then there is another aspect which is how to talk to patients. I think we all get a lot of exposure to that during our general surgery and our peds surgery training.

GEORGE MYCHALISKA I would just add to that certainly in this particular field there is also a lot of uncertainty with prenatal consultation and I think there is a skill set to learn how to talk to families about an uncertain prognosis. Thank you very much.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Fig. 1.
Number of prenatal consultations participated in during fellowship.

Fig. 2.
Prenatal consult participation and operative case volume.

Fig. 3.
Percent of fellows feeling comfortable independently performing prenatal consultation for each diagnosis.

Table 1

Participant and residency program characteristics.

Characteristics of participants	
Sex	N (%)
Male	28 (57.1)
Female	21 (42.9)
Race	
White	37 (77.1)
Black	2 (4.2)
Asian	7 (14.6)
Other	2 (4.2)
Year graduated from fellowship	
2012	21 (42.9)
2013	28 (57.1)
Current practice setting	
Private practice	7 (14.3)
Academic practice	39 (79.6)
Other	3 (6.1)
Currently participating in prenatal consultation?	
Yes	45 (90.0)
No	5 (10.0)
Characteristics of training programs as described by participants	N (%) answering "Yes"
Established fetal program?	32 (65.2)
Number pediatric surgeons in training program?	
1 to 5	15 (30.6)
6 to 10	23 (46.9)
11 to 15	7 (14.3)
>15	4 (8.2)
Observed fetal surgical procedures?	16 (32.7)
Attended neonatal resuscitation of newborns with pediatric surgical congenital anomalies?	41 (83.7)
Multidisciplinary fetal diagnosis and treatment conference held monthly or more often?	36 (73.4)
Regularly attended this conference?	11 (22.5)
Center performed fetal MRI?	42 (89.4)
Pediatric surgeons reviewed fetal MRI with patients?	33 (67.4)
Fellowship was structured to facilitate prenatal consultation?	23 (46.9)
Fellowship could have better prepared you to perform prenatal consultation?	23 (46.9)

Table 2

Rating of potential prenatal consultation resources.

Which of the following resources would be helpful to you in performing prenatal consultation in the future?	N (%)
Textbook focusing on what should be discussed during prenatal consultation	37 (75.5)
Fellow course on fetal diagnosis and therapy	26 (53.1)
Computer-based diagnosis-specific presentations to be used as a guide in discussions with patients	35 (74.4)
Patient handouts	40 (83.3)

Table 3

Associations between survey variables and feeling prepared for prenatal consultation.

	N (%) feeling prepared	p-value
Gender		
Female	14 (66.7)	0.1
Male	12 (42.9)	
Graduating class		
2012	9 (42.9)	0.22
2013	17 (60.7)	
Frequency of prenatal consult participation		
>5 prenatal consults	17 (77.3)	0.002
0–5 prenatal consults	9 (33.3)	
Fellowship structured to facilitate participation in prenatal consults		
Yes	19 (82.6)	<0.0001
No	7 (26.9)	
Large program (>5 attendings)		
Yes	15 (44.1)	0.06
No	11 (73.3)	
Structured fetal diagnosis and therapy/diagnosis program		
Yes	14 (43.8)	0.07
No	12 (70.6)	
Multidisciplinary prenatal diagnosis and treatment conference at least monthly		
Yes	21 (52.5)	0.28
No	5 (55.6)	
Attended this conference regularly		
Yes	8 (72.7)	0.14
No	18 (47.4)	

Table 4

Themes for open-ended responses.

1	Wide range in fellowship programs' approach to the planning, prioritization, and evaluation of fellow participation in prenatal consultation
2	Culture of program leadership plays an important role in enabling fellow participation
3	Need for a formal requirement for fellow participation in prenatal consultation
4	Fellow participation in multidisciplinary conferences augments the prenatal consultation experience
5	Post-fellowship learning is important

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript