



# Debunking the Myth: Do Maternal-Fetal Medicine Fellows Negatively Impact Resident Obstetrical Skills?

Sarah K. Dotters-Katz, MD, MMHPE<sup>1</sup> Matthew Grace, MD<sup>2</sup> R Phillips Heine, MD<sup>3</sup> Katie Propst, MD<sup>4</sup>

<sup>1</sup>Department of Obstetrics and Gynecology, Duke University, Durham, North Carolina

<sup>2</sup>Department of Obstetrics and Gynecology, Vanderbilt University, Nashville, Tennessee

<sup>3</sup>Department of Obstetrics and Gynecology, Wake Forest University, Winston-Salem, North Carolina

<sup>4</sup>Department of Obstetrics and Gynecology, Obstetrics/Gynecology and Women's Health Institute, Cleveland Clinic, Cleveland, Ohio

Address for correspondence Sarah Dotters-Katz, MD, Department of Obstetrics and Gynecology, Duke Maternal Fetal Medicine, 2608 Erwin Road, STE 210, Durham, NC (e-mail: sd132@duke.edu).

Am J Perinatol Rep 2020;10:e319–e323.

## Abstract

**Objective** Residency applicants often express concern that fellows negatively impact surgical opportunities, especially with less common procedures. We sought to describe the impact of maternal-fetal medicine (MFM) fellows on resident surgical opportunities.

**Study Design** Anonymous 27-question e-survey sent to obstetrics and gynecology (OBGYN) residents in the United States and Puerto Rico in March 2018. Questions included experience as primary surgeon, for fourth year residents only, comfort performing procedures postresidency, and demographics. Residents from programs with MFM fellows (pMFM) were compared with those without (nMFM). Descriptive statistics used as appropriate. Regression was performed, controlling for significant variables.

**Results** A total of 417 residents completed the survey; 275 (66%) from nMFM and 142 (33%) from pMFM. PMFM residents were more likely to have >7 residents/year, be from an academic residency, and less likely to be planning to practice obstetrics postresidency (all,  $p < 0.01$ ). Plan to pursue MFM fellowship did not differ. NMFM residents were more likely to have been primary surgeon on a vacuum assisted delivery (77 vs. 63%,  $p < 0.01$ ). No difference in primary surgeon experience was seen for forceps delivery, breech deliveries, third- or fourth-degree repairs, cerclage, or cesarean hysterectomy. With regard to comfort performing procedures postresidency, vacuum-assisted vaginal delivery (VAVD) was more likely among nMFM trainees, no other differences seen. In regression models, no differences in likelihood of comfort performing procedures postresidency for any procedures based on the presence of MFM fellows were seen. Among pMFM residents, 94% stated fellows positively impacted their learning.

**Conclusion** MFM fellows do not appear to impact residents' perceived competency in obstetric procedures and the majority of trainees report that fellows positively impact their education.

## Keywords

- ▶ MFM fellow
- ▶ fellowship
- ▶ medical education
- ▶ complex obstetrics
- ▶ resident education

received  
February 5, 2020  
accepted  
April 24, 2020

DOI <https://doi.org/10.1055/s-0040-1715168>.  
ISSN 2157-6998.

Copyright © 2020 by Thieme Medical Publishers, Inc., 333 Seventh Avenue, New York, NY 10001, USA.  
Tel: +1(212) 760-0888.

License terms



Many factors contribute to a medical student's preferences in selection of obstetrics and gynecology (OBGYN) residency program. One common concern is that the presence of fellows will negatively impact education, specifically related to surgical experiences and procedural skills. Students may be concerned that fellows may "steal" the less common or more complicated procedures, leading to a decrease in their own surgical volume and inhibiting their learning. The literature is limited and mixed on this topic. While some data support these concerns,<sup>1,2</sup> one study suggests that the presence of urogynecology fellows does not impact resident confidence with urogynecology procedures.<sup>3</sup> Similarly, for gynecologic oncology procedures, presence of fellows did not impact self-reported proficiency in radical hysterectomy and lymphadenectomy.<sup>4</sup> No data exist regarding the impact of maternal-fetal medicine (MFM) fellows on resident confidence with obstetrical procedures. However, unlike a radical hysterectomy or a lymphadenectomy, which are only done by a subspecialist, most complex obstetric procedures are performed by general obstetricians.

Core procedures, as outlined by the 11th edition of the Council of Resident Education in Obstetrics and Gynecology (CREOG) objectives, are those procedures which an individual who is graduating from OBGYN training should understand and be able to perform independently, regardless of postresidency plan.<sup>5</sup> These procedures include, but are not limited to, forceps-assisted vaginal delivery (FAVD), vacuum-assisted vaginal delivery (VAVD), vaginal cerclage, repair of third-degree lacerations, repair of fourth-degree lacerations, breech extraction of a second twin, breech vaginal delivery, and cesarean hysterectomy. The Accreditation Council for Graduate Medical Education (ACGME) also lists these procedures as level 4 in the obstetric technical skills in the OBGYN milestones from.<sup>6</sup>

Thus, in contrast to many urogynecology and gynecologic oncology procedures, resident experience and skills in complex obstetrics is critical for future practice. As noted, limited data exist regarding impact of fellows on resident opportunities with these procedures. Thus, we sought assess the impact of MFM fellows on resident opportunities and resultant perceived confidence among residents with complex obstetric procedures.

## Methods

We performed a cross-sectional study of OBGYN residents in the United States and Puerto Rico during the 2017 to 2018 academic year. This study was deemed exempt by the institutional review board (IRB: Pro00090727). An anonymous electronic survey was developed based on a prior analogous survey used by Propst et al and Schimpf et al to describe resident experience in urogynecology but was adapted for obstetrics.<sup>3,7</sup> The survey was then edited for clarity and content by a team of subject matter experts in MFM, as well as a team of subject matter experts, in medical education. After edits, a pilot survey was sent to local MFM fellows and local residents, to obtain feedback on question clarity and necessity. The final survey contained of 27 questions, including demographic data, future career trajectory, and experiences with complex obstetrics.

An anonymous survey link was sent in March 2018, via the CREOG coordinator listserv, with a request for distribution to their OBGYN residents. A reminder e-mail was resent through the CREOG coordinator listserv 2 weeks later. All current residents in the United States and Puerto Rico were eligible to participate. Participants who completed the survey could elect to submit their e-mail through a separate survey link (that was not connected to the primary survey) to enter a drawing for an Amazon Gift card. March was specifically selected due to the late time in the year, to ensure adequate time for participation in obstetric procedures.

The presence of MFM fellows was delineated by resident report within the survey. The CREOG 11th edition objectives and the ACGME milestones were used to define the complex obstetric procedures. Based on these two documents, complex obstetric procedures were defined as FAVD, VAVD, vaginal cerclage, breech second twin, breech vaginal delivery, third and 4th degree perineal repairs and cesarean hysterectomy. Also, we were interested in comfort level with cesarean delivery for a patient with body mass index (BMI) >50 kg/m<sup>2</sup>. Respondents were asked in a yes/no manner if they had been the primary surgeon on the above procedures and if they were comfortable performing these procedures independently. Respondents in their fourth year of training were also asked if they would feel comfortable performing these procedures postresidency. Information about program type, program size, number and type of fellowships present, residency year, and gender was also ascertained.

Comfort performing complex obstetric procedures after graduation from residency was the primary outcome. Experiences as primary surgeon and comfort performing independently were also assessed. Given the complexity of these procedures (milestone level 4), it would be uncommon for an intern (postgraduate year [PGY] 1) or second year (PGY2) resident to feel comfortable to perform these independently. Thus, when analyzing comfort while performing independently, only third (PGY3) and fourth year (PGY4) respondents were included. As noted above, only PGY4 residents were asked about comfort performing postresidency; thus only PGY4s were included in this analysis. Residents who self-identified as having MFM fellows present at their training program (pMFM) were compared with those who did not have MFM fellows present (nMFM).

Operative vaginal delivery was defined as either FAVD or VAVD. A large residency program size was defined as eight or more residents a year. Long-MFM exposure was defined as 6 or more months of specific-MFM time in residency, which was at or above the 75% for the study population. Survey completion rate was defined as total complete responses/total number of surveys started. Noncompleted surveys were excluded.

Data were analyzed using simple statistics as appropriate with Fisher's exact, Chi-square tests for categorical variables, and Kruskal-Wallis or *t*-test for continuous variables. STATA (version 14.0, College Station, TX) was used. Significance was defined as *p*-value of <0.05 for the primary analysis. Regression performed to assess adjusted odds of outcomes and control for confounders.

**Table 1** Demographic data

Demographic	MFM fellows present <i>n</i> = 142 (%)	No MFM fellows <i>n</i> = 275 (%)	<i>p</i> -Value
Age 26–30 (y)	97 (68)	198 (72)	0.61
Female gender	125 (88)	242 (88)	0.99
Upper level resident (PGY3 and 4)	60 (42)	142 (55)	0.07
Big program (>7 residents/year)	95 (67)	72 (26)	<0.01
Academic residency	124 (87)	184 (67)	<0.01
Dedicated MFM rotation	129 (91)	259 (9)	0.09
Median months of MFM (IQR)	3 (2–6)	4 (3–6)	<0.01
Plan to practice OB	75 (53)	183 (67)	<0.01
Plan MFM fellowship	18 (13)	24 (9)	0.20

Abbreviations: IQR, interquartile range; MFM, maternal-fetal medicine; OB, obstetrics; PGY, postgraduation year.

Note: all data are *n* (%), unless otherwise noted.

## Results

Four hundred and seventeen residents completed the survey; with a completion rate of 96.5% (417/432). There was approximately equal distribution among all four residency years (data not shown). Sixty-six percent (*n* = 275) of respondents were from nMFM and 33% (*n* = 142) from pMFM. PMFM respondents were more likely to have > 7 residents/year, be from an academic residency, and less likely to be planning to practice obstetrics postresidency (► **Table 1**, all *p* < 0.01). Plan to pursue MFM fellowship did not differ (► **Table 1**).

When considering all residents, PGY1–4, nMFM residents were more likely to have been primary surgeon on a VAVD (77 vs. 63%, *p* < 0.01). No difference in primary surgeon experience was seen for FAVD, (48 vs. 57%, *p* = 0.09), breech deliveries, third- or fourth-degree laceration repairs, cerclage, or cesarean hysterectomy (► **Table 2**). Among residents in PGY3 and 4, pMFM residents were more likely to feel comfortable with breech extraction of a second twin (48 vs. 33%, *p* = 0.04). Comfort levels with other procedures did not differ (► **Table 3**).

With regard to comfort performing procedures postresidency, those from nMFM were more likely to feel comfortable with VAVD compared with pMFM (100 vs. 87%, *p* = 0.01). There was no difference in comfort performing FAVD postresidency based on presence of MFM fellows. All graduating PGY4s felt comfortable performing at least one form of operative vaginal delivery (either VAVD or FAVD; ► **Table 4**). No differences in postresidency comfort was seen for any other procedures (► **Table 4**). After controlling for program size, plan to practice obstetrics postresidency, and academic programs, no differences existed in likelihood of comfort performing procedures postresidency for any procedures based on the presence of MFM fellows (► **Table 5**). Because all nMFM respondents were comfortable with VAVD postresidency, regression models could not be run. Of note, among pMFM residents, 94% stated fellows positively impacted their learning.

**Table 2** Resident as primary surgeon by presence of MFM fellows (includes PGY1–4)

Procedure	MFM fellows present <i>n</i> = 142 (%)	No MFM fellows <i>n</i> = 275 (%)	<i>p</i> -Value
VAVD	85 (63)	201 (77)	<0.01
FAVD	76 (57)	125 (48)	0.09
Any OVD	95 (67)	204 (74)	0.12
Cerclage	79 (59)	166 (63)	0.39
Breech extraction	50 (37)	86 (33)	0.37
Breech vaginal delivery	22 (16)	59 (23)	0.14
4th-degree perineal repair	47 (36)	97 (37)	0.78
3rd-degree perineal repair	34 (25)	65 (25)	0.90
Cesarean delivery on BMI > 50 kg/m <sup>2</sup>	116 (8)	234 (89)	0.42
Cesarean hysterectomy	25 (19)	60 (23)	0.33

Abbreviations: BMI, body mass index; FAVD, forceps-assisted vaginal delivery; MFM, maternal-fetal medicine; OVD, operative vaginal delivery; PGY, postgraduation year; VAVD, vacuum-assisted vaginal delivery.

**Table 3** Comfortable performing independently (among PGY3 + 4)

Procedure	MFM fellows present <i>n</i> = 60 (%)	No MFM fellows <i>n</i> = 142 (%)	<i>p</i> -Value
VAVD	49 (82)	120 (85)	0.62
FAVD	25 (42)	43 (30)	0.12
Any OVD	55 (95)	120 (85)	0.17
Cerclage	38 (63)	91 (64)	0.92
Breech extraction	29 (48)	47 (33)	0.04
Breech vaginal delivery	8 (13)	19 (13)	0.99
4th-degree perineal repair	28 (47)	53 (37)	0.22
3th-degree perineal repair	54 (90)	115 (81)	0.11
Cesarean delivery on BMI > 50 kg/m <sup>2</sup>	57 (9)	126 (89)	0.16
Cesarean hysterectomy	13 (22)	35 (25)	0.65

Abbreviations: BMI, body mass index; FAVD, forceps-assisted vaginal delivery; MFM, maternal-fetal medicine; OVD, operative vaginal delivery; PGY, postgraduation year; VAVD, vacuum-assisted vaginal delivery.

## Discussion

In this study, over 400 OBGYN residents experienced as a primary surgeon with VAVD and comfortable in performing VAVD independently were higher among nMFM residents. Otherwise, no differences were noted between trainees' comfort levels with complex obstetric procedures between nMFM and pMFM programs. In other words, the presence of

**Table 4** Procedures that residents would feel comfortable performing in practice (after graduation, includes only PGY4)

Procedure	MFM fellows present n = 31 (%)	No MFM fellows n = 64 (%)	p-Value
VAVD	27 (87)	64 (100)	0.01
FAVD	21 (68)	35 (56)	0.28
Any OVD	31 (100)	64 (100)	>0.99
Cerclage	24 (80)	51 (81)	>0.99
Breech extraction	24 (80)	44 (69)	0.47
Breech vaginal delivery	7 (23)	17 (27)	0.80
4th-degree perineal repair	27 (87)	50 (81)	0.57
3 <sup>rd</sup> -degree perineal repair	31 (100)	61 (95)	0.55
Cesarean delivery on BMI > 50 kg/m <sup>2</sup>	31 (100)	63 (98)	>0.99
Cesarean hysterectomy	20 (67)	42 (67)	>0.99

Abbreviations: BMI, body mass index; FAVD, forceps-assisted vaginal delivery; MFM, maternal-fetal medicine; OVD, operative vaginal delivery; PGY, postgraduation year; VAVD, vacuum-assisted vaginal delivery.

**Table 5** Odds and adjusted odds ratios for procedures that residents would feel comfortable performing in practice after graduation (includes only PGY4, no fellows as referent group)<sup>a</sup>

Procedure	Odds ratio (95% CI)	aOR (95% CI)
FAVD	1.68 (0.68–4.14)	2.69 (0.33–21.9)
Cerclage	0.96 (0.32–2.86)	1.39 (0.23–8.49)
Breech extraction	1.56 (0.58–4.21)	2.17 (0.31–15.1)
Breech vaginal delivery	0.89 (0.33–2.35)	1.04 (0.24–4.51)
4th-degree perineal repair	1.56 (0.46–5.29)	2.41 (0.37–15.8)
Cesarean hysterectomy	1.02 (0.41–2.56)	1.30 (0.281–5.97)

Abbreviations: aOR, adjusted odds ratio; CI, confidence interval; FAVD, forceps-assisted vaginal delivery; PGY, postgraduation year

<sup>a</sup>Controlled for program size > 7 residents/year, plan to practice obstetric postresidency, total months of maternal-fetal medicine and academic programs.

MFM fellows does not appear to impact residents' anticipated comfort level in performing complex obstetric procedures after graduation, even after controlling for confounders.

Declining surgical volume in training programs is well documented and obstetrics is no exception. Nationally, the number of twin vaginal deliveries and operative vaginal deliveries is decreasing.<sup>8</sup> Thus, concerns from undergraduate medical learners and OBGYN trainees regarding exposure and experiences with these and other obstetric procedures are warranted. These concerns are also faced outside of OBGYN. However, it is reassuring that among urology and general surgery trainees, the presence of fellows has been shown to have minimal impact on resident

surgical experiences.<sup>9,10</sup> In emergency medicine, programs with fellowship have actually increased resident procedural numbers.<sup>11</sup> Within our own field, Propst et al also noted this to be true when urogynecology fellows were present.<sup>3</sup> Data from this study suggest similarly that obstetric surgical experiences are also not impacted by presence of MFM fellows.

The impact of fellows on resident education also is important. Fellows are closest in age and training to medical learners and are often quite clinically active, thus their frequent interactions with learners are in a unique position to have an important and immediate impact on our trainees. In a study on the impact neonatology fellows, 87.5% of resident respondents described fellows as a very important part of their education.<sup>12</sup> Schimpf et al, in a survey of urogynecology education, noted that approximately 50% of resident respondents felt that urogynecology fellows positively impacted their education.<sup>7</sup> More recently, Propst et al performed a similar study, noting that nearly 80% of resident respondents felt that urogynecology fellows positively influenced their education.<sup>3</sup> In our study, residents from pMFM programs related an overwhelmingly positive impact of fellows in their training (>90%).

Strengths of this study include that the subject matter is novel for our field and is critically important as we move forward with the responsibility of adequately training both residents and fellows. Additionally, the use of CREOG objectives and ACGME milestones are effective anchors to help identify the appropriate resident skills levels. Additionally, though no validated tool in obstetric skills exists, survey itself was derived from survey used by two separate authors in the urogynecology literature.<sup>3,7</sup> Also, the makeup of our respondent group diverse, from a large variety of residency sizes, a mix of academic and nonacademic, and represented all ACOG regions.

## Limitations

However, our study is not without limitations. First, responses are all self-reported and we have no way to corroborate resident statements of experience as primary surgeon. Similarly, we asked about resident comfort performing these procedures independently, as well as comfort performing postresidency; there is no way to assess actual surgical skills or competency based on these responses. We also cannot comment on the experiences and skills of residents at both nMFM and pMFM programs who did not respond to the survey. Similarly, impact of obstetric volume is another factor that we did not assess in our survey that might impact resident experience. However, residency size is based somewhat by obstetric volume, thus this variable could serve as a sort of proxy for obstetric volume, as we controlled for this in the analysis. It is important to recognize that there is no way to accurately estimate response rate. It is difficult to know how many coordinators who received the e-mail actually opened it. Similarly, we cannot know how many sent to their residents. Assuming that every OBGYN resident in the United States and Puerto Rico received the survey, the

overall response rate was 8.1% (417/5,148). However, though our sample size is relatively small, it does represent the largest sample to date. It should also be noted that other published studies of the impact of OBGYN fellows in other subspecialties are all smaller in size.<sup>3,7</sup>

## Conclusion

In conclusion, this study found that the presence of MFM fellows does not appear to impact the comfort levels of graduating residents in performing complex obstetric procedures. Though experiences with VAVD may come earlier when MFM fellows are not present, by graduation, residents report no differences comfort performing some form of operative vaginal delivery, or with any other complex obstetric procedure after graduation, based on the presence of MFM fellows during their residency training. Also importantly, MFM fellows were overwhelmingly noted to have a positive impact on resident learning. Maybe it is time to consider the positives of training in programs with fellows! The narrative that fellows “steal” is somewhat based in fear and anecdote. Maybe the opposite is true!

### Prior Presentation

This research was presented as a poster presentation at the 2019 ACOG national meeting in Nashville, TN.

### Funding

None.

### Conflict of Interest

None declared.

## References

- 1 Grober ED, Elterman DS, Jewett MA. Fellow or foe: the impact of fellowship training programs on the education of Canadian urology residents. *Can Urol Assoc J* 2008;2(01):33–37
- 2 Potts JR III. Effect of new fellowship programs on resident case volume in pediatric surgery. *J Am Coll Surg* 2019;229(01):126–133
- 3 Propst K, Steinberg AC, O'Sullivan DM, Schimpf MO, LaSala C. Resident education in female pelvic medicine and reconstructive surgery. *Female Pelvic Med Reconstr Surg* 2017;23(04):263–266
- 4 Cohn DE, Roney JD, O'Malley DM, Valmadre S. Residents' perspectives on surgical training and the resident-fellow relationship: comparing residency programs with and without gynecological oncology fellowships. *Int J Gynecol Cancer* 2008;18(01):199–204
- 5 CREOG. Educational objectives: core curriculum in obstetrics and gynecology, 11th ed. Washington, DC: American College of Obstetricians and Gynecologists; 2016:48
- 6 The Obstetrics and Gynecology Milestone Project. The obstetrics and gynecology milestone project. *J Grad Med Educ* 2014;6(01, Suppl 1):129–143
- 7 Schimpf MO, Feldman DM, O'Sullivan DM, LaSala CA. Resident education and training in urogynecology and pelvic reconstructive surgery: a survey. *Int Urogynecol J Pelvic Floor Dysfunct* 2007;18(06):613–617
- 8 Gupta N, Dragovic K, Trester R, Blankstein J. The changing scenario of obstetrics and gynecology residency training. *J Grad Med Educ* 2015;7(03):401–406
- 9 Duffy JW III, Thomas JC, Makari JH, et al. The impact of a fellowship on resident training in an academic pediatric urology practice. *J Urol* 2008;179(02):720–723, discussion 723
- 10 Zyromski NJ, Torbeck L, Canal DF, Lillemoe KD, Pitt HA. Incorporating an HPB fellowship does not diminish surgical residents' HPB experience in a high-volume training centre. *HPB (Oxford)* 2010;12(02):123–128
- 11 Adhikari S, Raio C, Morrison D, et al. Do emergency ultrasound fellowship programs impact emergency medicine residents' ultrasound education? *J Ultrasound Med* 2014;33(06):999–1004
- 12 Backes CH, Reber KM, Trittman JK, et al. Fellows as teachers: a model to enhance pediatric resident education. *Med Educ Online* 2011;16:16