miscarriage management and abortion are common outpatient services provided to reproductive age women in the United States, with one in five pregnancies ending in miscarriage and one in four ending in abortion.\textsuperscript{1-3} There is a well documented need for additional reproductive health practitioners to provide services, with 89% of counties currently lacking an abortion provider.\textsuperscript{4}

Family physicians are well poised to provide abortion care, as they provide the majority of primary care in this country, and they already provide significant reproductive health services including contraceptive management, prenatal care, and labor and delivery services.\textsuperscript{5} Many family medicine residencies offer abortion training, yet graduates report barriers in integrating these services into practice.\textsuperscript{6,7}

Prior studies have demonstrated patient acceptability of receiving abortion and miscarriage care in outpatient primary care settings.\textsuperscript{8-10} The safety and efficacy of both family physicians and advanced practice clinicians providing these services has been well documented.\textsuperscript{7,11-15} Research has demonstrated significant associations between higher number of abortion procedures performed during residency and future provision of abortion.\textsuperscript{6,16} Over the past decade, a concerted effort has been made to increase opt-out abortion training within family medicine residencies, often supported by the

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RHEDI (Reproductive Health Education in Family Medicine) program (www.rhedi.org). In this model, abortion training rotations are integrated into the standard curriculum, and residents have the option for alternatives to full participation in that training. While there has been a significant increase in the number of opt-out residency programs, from 11 in 2002 to 29 today, this still represents a small fraction (6%) of the 496 US family medicine residency programs throughout the country.

Even among residents receiving opt-out training, both internal and external barriers can prevent graduates from integrating abortion services into their own practice experiences, as well as into the family medicine setting. In a previous study of graduates from family medicine residency programs with opt-out training, residents reported barriers such as lack of authority to set up services, strength of competing interests, clinic/hospital not allowing these services, lack of ultrasound equipment and inadequate facilities. In another recent study, participants identified a need for more training (28%) and a perception that their future practice settings would not allow abortion provision (16%) as the most frequently reported barriers.

To support integration of miscarriage and abortion services into practice by highly motivated residents with a self-identified interest in becoming providers, we developed the Continuing Reproductive Education for Advanced Training Efficacy (CREATE) program. CREATE is an elective advanced training curriculum for senior residents that seeks to address barriers to practice integration through additional procedural training, as well as a structured leadership curriculum. The curriculum focuses on using leadership skills to incorporate reproductive health services into individual graduates’ practice experiences, particularly in the family medicine setting. To our knowledge, this is the first structured advanced abortion training curriculum to be implemented and assessed in a family medicine residency setting.

The objectives of this study were to describe the practice patterns of graduates of the CREATE program related to the provision of miscarriage and abortion care, to evaluate the impact of the CREATE program on these experiences, and to assess facilitators and barriers to integrating miscarriage and abortion provision into practice.

**Methods**

**Curricular Elements**
The TEACH program (Training in Early Abortion for Comprehensive Health Care) partners with five Northern California residency programs to enhance their capacity to provide reproductive health training, networking, and faculty development, and also serves as a liaison with regional training clinics. Participating residency programs receive grant funding for abortion training from RHEDI.

During their PGY-2 year, all residents (other than those who opt out) participate in the standard abortion training curriculum. This includes 4 days at a high-volume abortion training site, as well as one-on-one didactics with faculty using the TEACH Workbook, covering topics including options counseling, aspiration abortion, medication abortion, early pregnancy loss, complications, and contraception. Opt-out residents participate in a version of this curriculum customized for their particular needs.

In 2012, TEACH faculty piloted the CREATE program, an elective for highly motivated third-year residents who have already completed the basic abortion training rotation. The advanced training curriculum consists of three fundamental components: participation in at least four advanced clinical training sessions at high-volume clinics; participation in evening workshops focusing on essential skills for becoming a reproductive health provider and advocate; and completion of an independent reproductive health project with faculty mentorship. The TEACH program assists in organizing most advanced training days at local family planning clinic sites that do not have PGY-2 residents, or on days when PGY-2 residents are not available. Many of these advanced training days are paid for by the RHEDI grant. Additionally, many residents independently arrange advanced clinical training at regional and international family planning clinic sites during their elective time. Through this additional clinical exposure, CREATE residents also gain additional experience in and competence with long-acting reversible contraceptive (LARC) methods.

Evening sessions address: (1) prevention and management of abortion complications, (2) advocacy training, and (3) negotiation skills aimed at overcoming barriers to practice integration. Evening sessions were 3 hours each, including dinner and adequate time provided for didactic material, interactive role-plays, networking, and mentorship. The curriculum has been revised in an iterative manner based on resident feedback.

With the independent project, advanced residents contribute to the broader community through education, advocacy, and/or quality improvement projects. These projects also provide trainees with an opportunity to practice negotiation skills with employers and administration, an essential skill in future reproductive health practice integration. Project examples include developing a strategic guide on provision in conservative regions of the country, integrating medication abortion into residency clinics, teaching simulation workshops for medical students and residents, and engaging in advocacy through writing policy resolutions and editorials.

**Study Participants, Survey Instrument, and Data Collection**
This study provides the first follow-up data on CREATE program graduates. Three consecutive classes of CREATE graduates (n=53) from five
residency programs in Northern California were included in this follow-up study.

At the time of CREATE program completion, participants completed a program evaluation. This baseline survey included items regarding participants’ self-assessed competence in service provision, intention to provide abortions, number of abortion procedures provided during residency, and program evaluation and satisfaction.

A follow-up survey was sent to all CREATE graduates in March 2016. The follow-up survey included items regarding demographic information, reproductive health service provision and desired provision, barriers and facilitators to integrating reproductive health care into practice, and involvement in teaching and advocacy work.

The follow-up survey represented a 6, 18, and 30-month follow-up interval for the classes graduating in 2015, 2014, and 2013, respectively. We used a secure, IRB-approved online survey tool distributed via email to all prior CREATE program graduates.

Measures
For the baseline survey, self-assessed competence in miscarriage and abortion service provision was based on a 5-point Likert scale ranging from Need Additional Training (1) to Competent to Perform Independently (5). Intention to provide miscarriage and abortion services were also based on a Likert scale ranging from Certainly No (1) to Certainly Yes (5). Program satisfaction was measured by rating various elements of the program on a Likert scale ranging from Very Unhelpful (1) to Very Helpful (5). The survey also used open-ended questions about the most and least useful elements of the CREATE program and suggestions for improvement in the curriculum.

For the follow-up survey, demographics included gender, geographic location by state, urban vs rural environment, postresidency training, proportion of patient population that is underserved, type of medical practice, and whether participants had ever worked in religiously-affiliated institutions. Current reproductive health service provision was defined as providing a given service at least once per month in a graduate’s current practice, and previous service provision was described by graduates who had provided services after graduation, but were not doing so at the time of the survey.

Graduates were asked whether they had tried to integrate a range of reproductive health services into their own practice experience. A list of 20 barriers to miscarriage and abortion care integration was compiled based on previous study survey instruments. Survey participants described each barrier as “Able to Overcome”, “Not Able to Overcome”, or “Not at All a Barrier”.

Helpfulness of the program was assessed by asking graduates to retrospectively rate various elements of the program on a Likert scale ranging from Not Helpful (1) to Extremely Helpful (5) in regards to practice integration, advocacy work, and teaching. Several questions on the follow-up survey asked for free-text responses to allow for further elaboration of graduate experiences.

Data Analysis
We descriptively analyzed data related to service provision, barriers, and facilitators. We employed chi-square and t-tests to assess differences in abortion provision by respondent characteristics. The small sample size limited our ability to conduct multivariate analyses. Open-ended questions were reviewed and grouped by common themes.

This project was approved by the UCSF Institutional Review Board.

Results
Respondent Characteristics
In total, 53 third-year residents completed CREATE in the 3 study years (Table 1). All 53 participating residents completed the evaluation at program completion, and 89% (47/53) completed the follow-up survey. The majority of follow-up survey respondents (72%) live in California, 68% work with predominantly underserved populations, and 64% live in urban areas.

<table>
<thead>
<tr>
<th>Characteristic From Follow-up Survey</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>39 (83%)</td>
</tr>
<tr>
<td>Male</td>
<td>8 (17%)</td>
</tr>
<tr>
<td><strong>Place of Residence</strong></td>
<td></td>
</tr>
<tr>
<td>California</td>
<td>34 (72%)</td>
</tr>
<tr>
<td>Outside California</td>
<td>13 (28%)</td>
</tr>
<tr>
<td><strong>% Underserved Patients in Primary Practice Setting where Respondents Work</strong></td>
<td></td>
</tr>
<tr>
<td>76-100%</td>
<td>25 (53%)</td>
</tr>
<tr>
<td>51-75%</td>
<td>7 (15%)</td>
</tr>
<tr>
<td>&lt; 50%</td>
<td>15 (32%)</td>
</tr>
<tr>
<td><strong>Practice Settings (some respondents indicated more than one)</strong></td>
<td></td>
</tr>
<tr>
<td>Community Health Center</td>
<td>30 (64%)</td>
</tr>
<tr>
<td>Academic</td>
<td>16 (34%)</td>
</tr>
<tr>
<td>Family Planning Clinic</td>
<td>10 (21%)</td>
</tr>
<tr>
<td>Large Integrated Service Delivery System</td>
<td>6 (12%)</td>
</tr>
<tr>
<td>Religiously-Affiliated Clinic</td>
<td>4 (9%)</td>
</tr>
</tbody>
</table>
Service Provision Following Graduation

In the follow-up survey, actual and desired provision of reproductive health services varied by specific service type, with more CREATE graduates providing contraceptive services and fewer providing abortion (Figure 1). At the time of follow-up survey completion, 63% of graduates had tried to introduce new contraceptive, miscarriage, or abortion services into their practice environments (Table 2). Forty-two percent of graduates were providing expectant and medication miscarriage services, and 29% were providing abortion services, and 29% were providing aspiration miscarriage services in a variety of settings. However, only 12% of graduates were providing abortion care in the family medicine continuity clinic setting, and the remaining graduates were doing so at high-volume clinic sites (data not shown). In contrast, all graduates who were not providing abortion services (approximately 65%) reported that they would like to be providing abortion services but were unable to do so in their current practice settings (Figure 1).

At follow-up, the majority of graduates were providing highly effective contraceptive methods including IUDs (79%) and contraceptive implants (77%) (Figure 1).

Characteristics Associated With Graduate Miscarriage and Abortion Service Provision at Follow-up

Higher uterine aspiration volume during residency was associated with CREATE graduate abortion provision, with an average of 135 procedures during residency among providers vs 98 procedures among nonproviders, a finding that trended toward significance (Table 3). Additionally, respondents providing abortion care at follow-up had a significantly stronger intention to provide abortion care or miscarriage management at the time of graduation (miscarriage data not shown). All of the residents working in family planning settings at follow-up were providing abortion, while none of the residents working at a large integrated service delivery system with rigid role definitions for medical specialties were providing abortion services, both of which were significant findings.

Factors that were not associated with graduate service provision at follow-up included self-perceived competence at the time of graduation in medication abortion skills, aspiration skills, or complication management. Additionally, practice location (urban vs rural) and patient socioeconomic characteristics at follow-up were not associated with miscarriage

![Figure 1: Desired and Actual Provision of Reproductive Health Services](chart.png)
Facilitators and Barriers to Practice Integration

In trying to integrate miscarriage and abortion services into practice, graduates reported experiencing all of the 20 barriers that we referenced in our survey instrument (Table 4). The most commonly reported internal barriers cited were strength of competing interests and lack of time (33%), while the most commonly reported external barriers were lack of authority to set up services (31%), lack of support staff (31%), administrative obstruction (29%), clinic or hospital policies not allowing service provision (27%), and staff resistance (23%). Fifteen percent of graduates cited market saturation, or a relatively high number of abortion providers in their geographic region, as a primary reason that they were not able to provide abortions where they were working and living. Four

or abortion service provision (data not shown). While a number of graduates continue to do work in reproductive health education (30%) and advocacy (9%), these activities were not associated with abortion service provision at follow-up (data not shown).
graduates reported working at faith-based institutions that did not allow abortion service provision. The barriers most commonly overcome by graduates were administrative obstruction and staff resistance. One graduate wrote:

“I began to feel empowered to engage with the administration… it has now led to overcoming all the barriers we’ve faced in the implementation process.”

**CREATE Program Evaluation and Graduate Reflections**

The curriculum features that follow-up survey respondents found to be “very” or “extremely” helpful in integrating reproductive health services into graduate practice were additional procedural training (89%), networking opportunities (74%), and complication simulations (67%). In the follow-up survey, one graduate stated that the program was “great at preparing you for practice, anticipating problems and working through solutions to bring this work to your future practice.”

At the time of graduation, program participants desired more training in complication management (23%) and medication abortion (20%). At the follow-up survey, when asked which additional postgraduate opportunities would help enable practice integration, the most common responses were additional clinical training opportunities (80%), and help navigating administrative barriers (48%). Four respondents wrote that they would like access to additional ultrasound training following graduation.

**Discussion**

**Conclusions**

While almost two-thirds of CREATE graduates have tried incorporating one or more of the assessed reproductive health care services into the primary care setting, only one third of program graduates are providing abortion services following graduation, and only a small number are doing so within the family medicine setting. All of those not providing abortion services wish that they could do so in their current practice environments. Among this highly motivated group of graduates, almost 80% are providing long-acting reversible contraceptive (LARC) services—the fact that this is less than 100% speaks to the difficulty of integrating any new reproductive health services into clinic settings.

Among program graduates, miscarriage management and medication abortion were more commonly integrated into practice than aspiration abortion services, consistent with previous studies. The service that graduates most commonly wanted to provide (aspiration abortion), was the one that they were least often able to provide, highlighting the significant barriers around practice integration for that service in particular. We found a number of enabling factors associated with successful integration of abortion care into practice, including procedural volume during residency, a stronger intention to provide, and current work in a family planning setting, all consistent with previous study findings.

Interestingly, self-perceived competence with procedural skills and complication management were not associated with future service provision in this sample. Of these factors, the ones that trended most towards significance were self-assessed competence in performing medication abortion and self-assessed confidence in abortion complication management.

<table>
<thead>
<tr>
<th>External Barriers</th>
<th>% (n)</th>
<th>Internal Barriers</th>
<th>% (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of authority to set up</td>
<td>31% (15)</td>
<td>Strength of competing interests</td>
<td>33% (16)</td>
</tr>
<tr>
<td>Lack of support staff</td>
<td>31% (15)</td>
<td>Lack of time to set up services</td>
<td>33% (16)</td>
</tr>
<tr>
<td>Administrative obstruction</td>
<td>29% (14)</td>
<td>Time since training</td>
<td>13% (6)</td>
</tr>
<tr>
<td>Clinic/hospital doesn’t allow it</td>
<td>27% (13)</td>
<td>Insufficient clinical training or skills</td>
<td>13% (6)</td>
</tr>
<tr>
<td>Staff resistance</td>
<td>23% (11)</td>
<td>Concerns of family or friends</td>
<td>10% (5)</td>
</tr>
<tr>
<td>Reimbursement issues</td>
<td>21% (10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inadequate clinical tools or resources</td>
<td>17% (8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical liability coverage</td>
<td>15% (7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of clinical back-up for complications</td>
<td>15% (7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inadequate financial resources</td>
<td>15% (7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services not needed in your area/provider market saturation</td>
<td>15% (7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No ultrasound</td>
<td>10% (5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of adequate facilities</td>
<td>10% (5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colleague resistance</td>
<td>10% (5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anti-abortion harassment</td>
<td>4% (2)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
management. These factors may in fact be associated with future service provision, but our sample size was too small to detect this. Or it is also possible that self-assessed competence and confidence are not valid measures, and a more useful measure in the future may be a faculty-based assessment of resident competence.

Many graduates reported being able to overcome external barriers such as staff and administrative resistance, and infrastructure needs such as obtaining ultrasound machines. The CREATE program emphasized negotiation skills that may have assisted graduates in overcoming these barriers.

Conversely, the most frequently insurmountable barriers were the internal ones: strength of competing interests, and insufficient time or energy to devote to the process of integrating reproductive health care into practice. Since integrating abortion services involves skill maintenance, timing, institutional buy-in, and overcoming stigma, we see that graduates need to prioritize abortion service integration if they want to be successful. Screening for this level of dedication and commitment prior to starting the program is an important aspect of the advanced training curriculum.

Additionally, given that many graduates cited market saturation as a reason for a lack of practice integration, advanced trainees need to be realistic about the need for services in the areas where they plan to work following graduation, or may need to intentionally seek out areas in need of providers. Providing abortions in shortage areas, however, is very difficult given associated stigma and personal safety concerns for providers. Several program graduates have started to travel to provide services in these shortage areas.

Graduates found that the advanced training and leadership curriculum was helpful in motivating them towards offering comprehensive reproductive health care, including abortion services. CREATE provided necessary procedural training and vital negotiation and advocacy skills. Interestingly, the areas where graduates felt they needed more training at the time of graduation (complication management and medication abortion), were different from what graduates reported desiring once they were actually in practice (procedural experience and help navigating administrative barriers). This may suggest that the complication management curriculum in CREATE was adequate for practice integration, but that some graduates underestimated the amount of procedural volume and negotiation experience necessary to integrate services into practice successfully.

Strengths and Limitations
An excellent response rate to the curriculum evaluation and follow-up survey was a strength of this study. Limitations included a small sample size and limited power to detect a difference in abortion service provision among graduates. Small sample size limits our ability for multivariate analyses, such that the association of procedural volume during residency with future abortion provision may be confounded by personal resident interest and intention to provide.

Additionally, limited and variable time since graduation may have affected our results, since approximately one third of respondents were only 6 months out of residency at the time of survey completion. These graduates may not have had adequate time or opportunity to integrate reproductive health services into practice.

Finally, the generalizability of these results may be limited by the geographic distribution of participating programs, as California has a relative market saturation, and has among the lowest percentage of counties without a provider in the United States. Graduates in California likely encounter less stigma and therefore fewer barriers than in provider shortage areas, however our sample size was too small and geographic distribution too narrow to detect these differences.

Implications
Given these findings, it may be helpful to offer additional training resources to those considering work in provider shortage areas. These could include targeted mentorship for junior physicians by local supportive senior physicians, as well as matching programs that connect residency graduates interested in providing abortion with clinics in need of services. Because graduates often continue to work in the geographic region in which they train, it would likely be beneficial to implement this type of advanced training curriculum at residency programs in more conservative and rural parts of the country in order to address provider shortages more effectively.

The training curriculum could be enhanced by providing graduates with more ultrasound training, as well as structured support and mentorship in overcoming administrative barriers at the clinic level. Graduate skill maintenance and retraining have significant challenges in most regions of the country due to difficulties of obtaining individual credentialing and malpractice coverage outside of the residency environment. Given the breadth of family medicine services, some of the lessons of this model of an advanced curriculum for a particular skill set may be applicable to other training in the family medicine context.

Graduates have shown us that overcoming challenges to incorporating reproductive health into primary care goes beyond procedural training. For family physicians to provide comprehensive reproductive health care to their patients, clinic systems need to reduce external barriers by prioritizing provision through strengthening administrative support, helping to build appropriate infrastructure, and addressing stigma. Family medicine training programs can help equip graduates with the negotiation and procedural skills they need by providing highly
motivated residents with additional advocacy skills, mentorship, and procedural training both during and after residency.

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Presentations: Preliminary findings from this research project were presented in a poster format at both the North American Forum on November 13, 2015 in Chicago, Illinois, and also at the UCSF Family and Community Medicine Rodnick Colloquium on Thursday, June 2nd 2016 in San Francisco, California.

Research findings were also presented in poster format at the STFM Annual Spring Conference in San Diego, CA, on May 6, 2017.

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References