Research Letter | Obstetrics and Gynecology

Medication Abortion Provision by Advance Practice Clinicians and Abortion Completeness

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Introduction

In 2016, the US FDA Risk Evaluation and Mitigation Strategy for mifepristone changed, permitting advance practice clinicians (APCs; ie, nurse practitioners [NPs], certified nurse midwives [CNMs], and physician as-

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ness and safety of MABs provided by APCs, hypothesizing that MABs provided by APCs are similarly effective and safe compared with MABs provided by physicians.

Methods

This retrospective noninferiority cohort study included all MABs less than 77 days' gestation provided at Planned Parenthood of the Pacific Southwest across Imperial, Riverside, and San Diego counties in California from December 2021 to December 2025. Ultrasonography was used to confirm pregnancy dating. Patients were dispensed mifepristone and misoprostol (eMethods in **Supplement 1**). Approximately 1 to 2 weeks later, they were seen for transvaginal ultrasonography to assess for continuing pregnancy or retained products of conception for which they were offered an additional dose of misoprostol or an aspiration. The primary exposure was clinician type (APCs vs physicians). The primary outcome was estimated effectiveness defined by MARE guidelines[4] ; secondary outcomes included adverse events (AEs; eMethods in **Supplement 1**). This study was deemed exempt from review and informed consent by the institutional review board of the University of California San Diego due to use of deidentified data. Reporting follows the STROBE guideline.

We compared estimated effectiveness of MABs provided by APCs with physicians assuming a noninferiority margin of 2% with a 1-sided α. We used multilevel multivariable logistic regression to assess the association of clinician type and compete abortion, including demographic covariates chosen a priori. Sensitivity analyses estimated complete abortion using multiple imputation of missing data with 10 imputations based on factors potentially associated with follow-up and/or abortion completeness. Analysis were conducted using Stata version 19.0 (StataCorp).

Results

Of 59 150 MABs, 58 473 were provided by APCs (NPs: 32 008; PAs: 23 012; CNMs: 2553) and 618 were provided by physicians; of all MABs, 59 were missing practitioner type and were excluded from the final analytic sample of 59 091 MABs. Patients who received MABs had a mean (SD) age of 26.8 (6.2) years with a mean (SD) of 2.8 (2.2) pregnancies. Most MABs (38 379 [65.0%]) were 49 days' gestation or less (50-56 days: 8316 MABs [14.1%]; 57-63 days: 4489 MABs [7.6%]; 64-70 days: 2497 MABs [4.2%]; 71-77 days: 841 MABs [1.4%]; missing days: 4569 MABs [7.7%]). Among all patients who underwent a MAB, 2338 (4.0%) traveled from another state, 36 676 (62.1%) paid with Medicaid, 13 149 (22.2%) paid with private insurance, and 9266 (15.7%) self-paid. There were 36 609 MABs included in follow-up (62.0%), which not differ between physicians and APCs.

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among MABs provided by physicians, a between group difference of −2.8% (95% CI, −5.7% to 0.1%) (Table 1), indicating that APC provision was noninferior to physician provision. In the adjusted model, APC vs physician clinician type was not significantly associated with complete abortion (Table 2). Using multiple imputation, overall estimated effectiveness was 92.9% (95% CI, 92.6% to 93.1%), with attenuated differences across clinician type (CNM: 91.9%; 95% CI, 90.8% to 93.0%; NP: 92.9%; 95% CI, 92.5% to 93.2%; PA: 93.1%; 95% CI, 92.7% to 93.5%; physician: 91.0%; 95% CI, 88.7% to 93.4%).

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Table 1. Number of MABs, Follow-Up, and Estimated Effectiveness Among MABs With Follow-Up, Overall and by Clinician Type Among 15 Clinics in California, 2021-2025

Table 1. Number of MABs, Follow-Up, and Estimated Effectiveness Among MABs With Follow-Up, Overall and by Clinician Type Among 15 Clinics in California, 2021-2025

MAB practitioner type	MABs, No. (%)	MABs with follow-up, No. (column %) [row %]	MAB estimated effectiveness among those with follow-up, % (95% CI)	MABS with ED visits, No. (row %)	MABs with adverse events, No. (row %)
Overall	59 091 (100)	36 609 (100) [62.0]	92.9 (92.6-93.1)	130 (0.2)	45 (0.1)
Advance practice clinician	58 473 (99.0)	36 206 (98.9) [61.9]	92.9 (92.6-93.2)	132 (0.2)	45 (0.1)
Certified nurse midwife	2553 (4.3)	1671 (4.6) [65.5]	91.4 (90.0-92.7)	4 (0.2)	0
Nurse practitioner	32 008 (54.2)	19 663 (53.7) [61.4]	92.8 (92.4-93.1)	70 (0.2)	25 (0.1)
Physician associate	23 912 (40.5)	14 872 (40.6) [62.2]	93.2 (92.8-93.6)	55 (0.2)	20 (0.1)
Physician[a]	618 (1.0)	403 (1.1) [65.2]	90.1 (87.1-93.0)	1 (0.2)	0

Abbreviation: MAB, medication abortion.

[a] Doctor of Medicine (MD) or Doctor of Osteopathic Medicine (DO).

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Table 2. Unadjusted and Adjusted Logistic Regression Models of Complete Abortion, Among 36 609 Medication Abortions With Follow-Up

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Practitioner type	OR (95% CI)	*P* value	Adjusted OR (95% CI)	*P* value
Physician[a]	1 [Reference]	NA	1 [Reference]	NA
Advance practice clinician	1.43 (1.04-2.00)	.03	1.40 (0.99-1.98)	.05

Abbreviations: NA, not applicable; OR, odds ratio.

[a] Doctor of Medicine (MD) or Doctor of Osteopathic Medicine (DO).

The 130 MABs (0.2%) that had an ED visit and the 45 AEs (0.1%) did not differ by clinician type. There were 53 ED visits for bleeding, 25 for pain, 39 for incomplete abortion or ongoing pregnancy, 4 for fainting

minor AEs (0.1%), 26 were hemorrhages and 15 were infections; the 4 severe AEs (<0.1%) were all blood transfusions. Rates were less than 0.1% and equivalent across clinician types.

Discussion

This cohort study found that estimated MAB effectiveness when provided by APCs was noninferior to MABs provided by physicians. Our estimates of abortion completeness when provided by APCs are similar to published estimates provided with ultrasonography dating and follow-up to 70 days by a variety of clinicians (93.3%), and to 77 days when provided by physicians (88.4%).[5,6] Strengths include a large cohort of MABs provided by all types of APCs using current medication regimens, optimizing generalizability. Limitations include unbalanced group sizes and loss to follow-up, which we attempted to overcome through imputation. Loss to follow-up is a known challenge in MAB studies[7] and may be explained by the ubiquity of pregnancy tests, allowing for self-assessment of complete abortion. We lacked power a priori to detect the prespecified 2% noninferiority margin, but we were still able to demonstrate noninferiority in analysis. These data affirm the safety and effectiveness of MABs provided by APCs.

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Author Contributions: Ms Johns and Dr Patwardhan had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Concept and design: Averbach, Mody.

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Data Sharing Statement: See Supplement 2.

References

1. US Food and Drug Administration. Mifeprex label: US FDA label for mifepristone. Updated January 2023. Accessed March 28, 2024. https://www.accessdata.fda.gov/drugsatfda_docs/label/2023/020687Orig1s025Lbl.pdf
2. Jung C, Oviedo J, Nippita S. Abortion care in the United States—current evidence and future directions. *NEJM Evid*. 2023;2(4):a2200300. doi:10.1056/EVIDra2200300 PubMed | Google Scholar | Crossref
3. State laws and policies: medication abortion. Guttmacher. Updated April 17, 2026. Accessed April 26, 2026. https://www.guttmacher.org/state-policy/explore/medication-abortion

PubMed | Google Scholar | Crossref

5. Ralph LJ, Baba CF, Biggs MA, McNicholas C, Hagstrom Miller A, Grossman D. Comparison of no-test telehealth and in-person medication abortion. *JAMA*. 2024;332(11):898-905. doi:10.1001/jama.2024.10680
Article | PubMed | Google Scholar | Crossref

6. Patil R, Woofter R, Sudhinaraset M, Gipson JD. Comparing efficacy of medication abortion by health care system modality at a California health system. *Obstet Gynecol*. 2026;147(5):716-724. doi:10.1097/AOG.0000000000006174
PubMed | Google Scholar | Crossref

7. Rosenberg JD, Raymond E, Shochet T. An examination of loss to follow-up and potential bias in outcome ascertainment in a study of direct-to-patient telemedicine abortion in the United States. *Contraception*. 2023;122(109996):109996. doi:10.1016/j.contraception.2023.109996
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