Systematic Review

No-Test Medication Abortion

A Systematic Review

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OBJECTIVE: To summarize the effectiveness and safety outcomes of medication abortion performed without prior pelvic examination or ultrasonogram ("no-test medication abortion").

DATA SOURCES: We searched the MEDLINE, Scopus, Web of Science, Cochrane (including ClinicalTrials.gov), CINAHL, Global Index Medicus, and CAB Direct databases to identify relevant studies published before April 2022 using a peer-reviewed search strategy including terms such as "medication abortion" and "ultrasonography." We contacted experts in the field for unpublished data and ongoing studies.

METHODS OF STUDY SELECTION: We reviewed 2,423 studies using Colandr. We included studies if they presented clinical outcomes of medication abortion performed with mifepristone and misoprostol and without prior pelvic examination or ultrasonogram. We excluded studies with duplicate data. We abstracted successful abortion rates overall, as well as rates by gestational age through 63 days, 70 days and past 84 days. We abstracted complication rates, including the need for surgical evacuation, additional medications, blood transfusion, and ectopic pregnancy.

TABULATION, INTEGRATION AND RESULTS: We included 21 studies with a total of 10,693 patients with outcome data reported. The overall efficacy of no-test medication abortion was 96.4%; 93.8% (95% CI 92.8–94.6%) through 63 days of gestation and 95.2% (95% CI 94.7–95.7%) through 70 days of gestation. The overall rate of surgical evacuation was 4.4% (95% CI 4.0–4.9), need for additional misoprostol 2.2% (95% CI 1.8–2.6), blood transfusion 0.5% (95% CI 0.3–0.6), and ectopic pregnancy 0.06% (95% CI 0.02–0.15).

CONCLUSION: Medication abortion performed without prior pelvic examination or ultrasonogram is a safe and effective option for pregnancy termination.

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The use of medication abortion is increasing. In 2018, half of all pregnancy terminations at less than 9 weeks of gestation were medication abortions.[1] This number is likely even higher today, because the coronavirus disease 2019 (COVID-19) pandemic triggered rapid shifts in abortion provision to minimize physical contact between patients and health care professionals and to reduce the time spent in medical facilities. Along with increasing use of telemedicine, health care professionals pivoted toward providing medication abortions without previously routine ultrasonograms or clinical examinations. Leading national professional organizations, including the American College of Obstetricians and Gynecolo-

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gists, Planned Parenthood Federation of America, and the National Abortion Federation, as well as the World Health Organization, published recommendations supporting this practice.[2–4] The practice of providing a medication abortion without a prior pelvic examination or ultrasonogram has been described as "low-test medication abortion" or "medication abortion with history-based screening." In this review, we describe this model as no-test medication abortion.

Abortion care globally is typically provided without a prior ultrasonogram.[5] The two benefits of an ultrasonogram are accurate estimation of gestational age and exclusion of ectopic pregnancy. Research has shown that, with appropriate counseling, a patient's certain last menstrual period can be accurately used for determining gestational age without the use of ultrasonography.[6,7] One study demonstrated that gestational age dating using patient reported estimates of last menstrual period resulted in 0.8% of patients being provided a medication abortion beyond 70 days of gestation, the U.S. Food and Drug Administration–approved limit on the use of mifepristone for medication abortion.[8] Improved accuracy and sensitivity of self-assessment of gestational duration can be achieved by broadening the screening questions, including date of conception and number of weeks pregnant.[9] Another potential concern is a missed diagnosis of ectopic pregnancy. Ectopic pregnancy rates in patients seeking abortions are lower than the general U.S. population. A study of 16,369 patients choosing medication abortion with pregnancies less than 49 days demonstrated an ectopic pregnancy rate of 1.3 per 1,000 pregnancies,[10] lower than the U.S. rate of ectopic pregnancy of 8.3 per 1,000 pregnancies.[11]

The shift to using telemedicine and no-test medication abortion during the initial lockdown for COVID-19 was critical to removing older practices that created barriers to safe early medication abortion. Experts in the field advocated for this approach for several years before the pandemic.[12] The no-test medication abortion approach eliminates significant barriers to abortion access, increases convenience for patients and health care professionals, and reduces cost. No-test medication abortion further promotes different models for patients to access the medications including mailing, pharmacy dispensing, and asynchronous visits. Before the COVID-19 pandemic, the published literature on no-test medication abortion was limited to a few small research studies and abortion provision outside the United States. In the context of changing practices due to COVID-19, increasing numbers of health care professionals worldwide have adopted these innovative practices and published their results. In this systematic review, we summarize the efficacy and safety outcomes of medication abortion performed without prior pelvic examination or ultrasonogram.

SOURCES

This systematic review follows the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, including registration in PROSPERO (registration number CRD42021240739). A health sciences librarian developed the literature search strategy (M.K.-H.). A second librarian outside of our institution peer-reviewed the search strategy. We searched the following electronic databases: PubMed, MEDLINE, EMBASE (Elsevier), Scopus, Web of Science, and CINAHL (EBSCOhost). The search employed a combination of keywords and controlled vocabularies related to abortion ("no test medical abortion," "medication abortion"), abortion medication ("mifepristone", "misoprostol"), and pretreatment methods ("ultrasound", "telemedicine") with no date or language restriction (see Box 1 for the PubMed search strategy and Appendix 1, available online at http://links.lww.com/AOG/C955, for complete search strategy). To identify any ongoing or recent clinical trials, we searched registries through Cochrane Central Register of Controlled Trials, which included ClinicalTrials.gov and the International Clinical Trials Registry Platform. We also searched grey literature databases, Google Scholar, Global Index Medicus, and CAB Direct. We scanned the reference lists of included studies or relevant reviews identified through the search to ensure literature saturation. Additionally, we contacted experts in medication abortion to identify studies currently undergoing peer review. Before publication, we again searched databases to include any relevant studies newly published since the initial search. No terms were added or deleted from the search strategy.

STUDY SELECTION

Only studies discussing the provision of medication abortion without prior pelvic examination or ultrasonogram were eligible for inclusion. We included randomized control trials, as well as prospective and retrospective comparative cohort studies. We excluded case studies, commentaries, letters and editorials, as well as any manuscripts where clinical outcomes were not reported. The included studies employed any abortifacient medication regimen, including mifepristone and misoprostol combined

Box 1. Search Strategy (PubMed)

((("No test medication abortion" [tiab] OR "medical abortion" [tiab] OR "medication abortion" [tiab] OR "no touch abortion" [tiab] OR "telemedicine abortion" [tiab] OR "early medical abortion" [tiab] OR "self managed abortion" [tiab] OR telabortion [tiab] OR "online abortion" [tiab])) OR (("abortion, induced"[MeSH Terms] OR abort* [tiab] OR postabort* [tiab] OR preabort* [tiab]) AND ((mifepristone [tiab] OR "Mifepristone"[Mesh] OR misoprostol [tiab] OR "Misoprostol"[Mesh] OR methotrexate [tiab] OR "Methotrexate"[Mesh] OR abortifacient [tiab] OR "RU-486" [tiab] OR "abortion pill" [tiab])))) AND ("ultrasonography"[MeSH Terms] OR "Diagnostic Imaging"[Mesh] OR ultrasound* [tiab] OR ultrasonograph* [tiab] OR sonograph* [tiab] OR endosonogra* [tiab] OR "pelvic exam*" [tiab] OR "Gynecological Examination"[Mesh] OR telemedicine [tiab] OR "Telemedicine"[Mesh] OR telehealth [tiab])
See Appendix 1 (available online at http://links.lww.com/AOG/C955) for full search strategy.

regimens, as well as misoprostol alone regimens of any dosages.

Two authors (M.P.S. & D.D.) independently screened the results of the search based on titles and abstracts against the inclusion criteria using Colandr. We used EndNote reference management software to assess for duplication of articles. To determine whether multiple reports of the same study were published, we juxtaposed author names and indicated if all reports of the study were considered. We obtained full reports for all titles that appeared to meet the inclusion criteria or where there was uncertainty. The reviewers then screened the full text reports and determined whether they meet the inclusion criteria. Google Translate was used for articles in languages not spoken by the authors and two articles that were unable to be entered into the online translation service were translated by native speakers. If more information was needed, we contacted the study authors to resolve eligibility questions. The reviewers then independently and in duplicate extracted data from the reports. Study information included number of patients enrolled and with follow-up, regimen used, efficacy rates, and complication rates. Any disagreement was resolved through discussion with the full systematic review team.

Our primary outcome was *successful medication abortion*, defined as a complete abortion without the need for surgical management to complete the termination, as per MARE (Medical Abortion Reporting of Efficacy) guidelines.[13] *Failure* was defined as the need for further surgical intervention at either planned or unscheduled follow-up visits to complete the abortion. Adverse events are of primary interest for decision-making on the safety of no-test medication abortion. The following were abstracted, when reported: unscheduled emergency department or urgent care visits, hospital admissions, blood transfusions, additional unplanned medication treatments, additional unplanned surgical treatments, ectopic pregnancies including those requiring emergent surgical treatment, and death. If study results were not presented in these categories, we recalculated the data based on tables and text within the manuscript for no-test medication abortion. If no follow-up was documented, we excluded those patients from our summary statistics to ensure the most conservative estimations. We then combined outcomes across studies to produce summary statistics for efficacy and safety.

RESULTS

We identified 2,423 records in the literature search and reviewed 190 full-text articles for eligibility. We contacted 26 authors for additional information about their studies, as well as the primary investigators of seven ongoing studies identified in ClinicalTrials.gov and the Clinical Trial Register at the International Clinical Trial Registry Platform of the World Health Organization. Three unpublished studies were identified by experts in the field, though at the time of publication of this review two were subsequently accepted to peer reviewed journals. After full-text review and discussion with authors, 150 studies were excluded because an ultrasonogram or pelvic examination was obtained before provision of medication abortion. Twelve studies were excluded because of study design. Seven studies were excluded because we did not have adequate information and authors did not respond to queries. We included four studies that published aggregated results for patients who had no-test medication abortion with those who had an ultrasonogram after authors responded to our query and sent disaggregated data sets. The 21 studies in this review include medication abortions performed without prior pelvic examination or ultrasonogram (Tables 1 and 2). The results include no-test medication abortion performed in at least 24 countries. We followed PRISMA guidelines for reporting of study selection (Fig. 1).

We excluded six of the studies from the final summative analysis (Table 2). Three of the studies were published in the 1970s and 1980s and used medication regimens that are not current standard of care for medication abortion, including intramuscular carboprost and sulprostone.[14–16] Two of the studies included participants from the TelAbortion study

Table 1. Summary and Description of Studies Included in the Systematic Review and Summary Statistics

Study Author, Year, Country	Study Design	Gestational Age (d)	Abortifacient Regimen	Method of Follow-up	No. of Participants	No. of Participants With Complete Outcome Data*	Brief Description	Possible Bias From Included Study
Wiebe, 2014,[26] Canada	Retrospective cohort	51 or less	Methotrexate 50 mg/m^2 and misoprostol 800 micrograms vaginally	Serum β-hCG level	11	5	Cohort of patients undergoing medication abortion by telemedicine in British Columbia, Canada	Selection bias
Aiken, 2017,[27] Ireland	Retrospective cohort	63 or less	Mifepristone 200 mg and misoprostol 1,200 micrograms (route not specified)	Self-report (through online evaluation form)	1,023	1,000	Cohort of patients seeking self-sourced medication abortion through Women on Web, an online telemedicine service	Reporting bias
Raymond, 2018,[28] Moldova, Mexico, United States	Prospective cohort	67 or less	Mifepristone 200 mg and misoprostol 400 micrograms sublingual or 800 micrograms buccal	Ultrasonogram, pelvic examination, serial serum or urine hCG testing	406	360	Case series of patients requesting medication abortion without a prior ultrasonogram at 5 study sites	Selection bias
Endler, 2019,[25] Poland	Retrospective cohort	63–100	Mifepristone 200 mg and misoprostol 800, 400, 400 micrograms sublingual	Self-report (through online evaluation form)	627	615 (419 had adverse-event data)	Cohort of patients seeking self-sourced medication abortion through Women on Web, an online telemedicine service	Reporting bias
Marval-Peck, 2019,† multiple countries	Retrospective cohort	35 or less	NR	Self-report	473	473	Cohort of patients at 5 wk of gestation or less seeking medication abortion through Women on Web, an online telemedicine service	Reporting bias
Chong, 2020,[29] 11 countries	Prospective cohort	56 or less	Mifepristone 200 mg and misoprostol 800 micrograms vaginal, sublingual, or buccal	Multilevel urine pregnancy tests	165	117	Cohort of patients seeking medication abortion through safe2choose.org, an online telemedicine service, and their ability to use MLPTs	Reporting bias

(*continued*)

Table 1. Summary and Description of Studies Included in the Systematic Review and Summary Statistics (*continued*)

Study Author, Year, Country	Study Design	Gestational Age (d)	Abortifacient Regimen	Method of Follow-up	No. of Participants	No. of Participants With Complete Outcome Data*	Brief Description	Possible Bias From Included Study
Wiebe, 2020,[30] Canada	Retrospective cohort	70 or less	Mifepristone and misoprostol	Serum β-hCG level	149‡	138	Cohort of patients undergoing medication abortion by telemedicine in British Columbia, Canada	Selection bias
Godfrey, 2021,[31] United States	Retrospective cohort	70 or less	Mifepristone 200 mg and misoprostol 800 micrograms sublingual, buccal, or vaginal	Self-report	479‡	186	Cohort of patients requesting medication abortion from 3 family medicine physicians using Aid Access asynchronous online service	Attrition bias
Kapp, 2021a,[32] multiple countries	Retrospective cohort	91 or more	Mifepristone 200 mg or misoprostol 4–6 doses 400 micrograms sublingual or both	Self-report§	144	131	Cohort of patients requesting self-managed medication abortion at 13 or more wk of gestation from Women on Web, an online telemedicine service	Reporting bias
Reynold-Wright, 2021,[33] Scotland	Prospective cohort	83 or less	Mifepristone 200 mg and misoprostol 800 micrograms sublingual or vaginal or buccal	Urine pregnancy test	529†	529	Cohort of patients requesting medication abortion at home through the National Health Service Lothian telemedicine service	Selection bias
Kapp, 2021b,[34] Nepal	Retrospective cohort	91 or more	Mifepristone and misoprostol	Health care professional visualization of expelled fetus	301	301	Cohort of patients undergoing inpatient medication abortion in 8 hospitals in Nepal	Selection bias
Kapp, 2021c,[35] Cambodia	Prospective cohort	63 or less	Mifepristone and misoprostol	Self-report (mobile phone contact)	1,050‡	910	Cohort of patients purchasing abortion medication independently at a pharmacy or received from a clinic in Cambodia	Reporting bias
Moseson, 2021,[36] Argentina and Nigeria	Prospective cohort	154 or less	Mifepristone or misoprostol sublingual or both	Self-report	851‡	851	Cohort of callers from safe abortion accompaniment groups requesting information on self-managed abortion	Reporting bias

(*continued*)

Table 1. Summary and Description of Studies Included in the Systematic Review and Summary Statistics (*continued*)

Study Author, Year, Country	Study Design	Gestational Age (d)	Abortifacient Regimen	Method of Follow-up	No. of Participants	No. of Participants With Complete Outcome Data*	Brief Description	Possible Bias From Included Study
Aiken, 2022,[37] United States	Retrospective cohort	70 or less‖	Mifepristone 200 mg and misoprostol 800 micrograms sublingual	Self-report (through online evaluation form)	3,186	2,797	Cohort of patients seeking self-managed medication abortion through Aid Access, an online telemedicine service	Reporting bias
Upadhyay, 2022,[19] United States	Retrospective cohort	77 or less	Mifepristone 200 mg and misoprostol up to 1,600 micrograms	Self-report, ultrasonogram, pelvic examination, serial serum or urine hCG testing	3,779	2,397	Cohort of patients obtaining medication abortion without screening ultrasonography at 14 independent, Planned Parenthood, academic-affiliated, and online-only clinics throughout the United States	Attrition bias

hCG, human chorionic gonadotropin; NR, not reported.
* Defined as completed abortion or ongoing pregnancy confirmed at least by patient report.
† Marval-Peck L, Izaguirre S, Yanow S, Jelinska K, Comendant R, Foster AM [abstract]. Self-administration of very early medication abortion provided through a global online telemedicine service. Contraception 2019: 319. doi: 10.1016/j.contraception.2019.07.051
‡ Additional unpublished data provided by authors.
§ Patients reported information to Women on Web; however, 30 confirmed by ultrasonography, 21 observed expelled fetus, 18 had resolution of pregnancy symptoms, eight had a negative pregnancy test result, and four had resumption of normal menses.
‖ Includes 395 patients at more than 10 weeks of gestation but does not give an upper limit.

and University of Hawai'i patients who were potentially included in a third manuscript.[17–19] Although this excludes some participants from the Kerestes et al and Anger et al studies not represented in the larger Upadhyay et al study, we excluded these two studies from the summary statistics to avoid duplicate data and ensure the most conservative estimates. Lastly, clinical outcome data were not available for the majority of the participants in the U.K. national cohort study published by Aiken et al.[20] Although this study included more than 18,000 participants, we excluded these data from the summary statistics.

We determined the remaining 15 studies to be sufficiently homogeneous in terms of design and comparator to create summary statistics for the primary and secondary outcomes. All of the studies reported the number of abortions completed without the need for surgical evacuation for any reason. Studies reported complete abortion through a variety of methods, including patient self-report, physician or nurse report including direct visualization of products of conception, reduction in quantitative serum β-hCG levels, negative urine pregnancy test several weeks after ingesting abortifacient medications or absence of a gestational sac on follow-up ultrasound evaluation.

Several of the studies note that patients may have obtained an ultrasonogram at a different clinic than the one providing the abortifacient medications. We confirmed by direct contact with authors that, for all of these studies, clinicians did not have access to the ultrasonogram reports or images in making management decisions before dispending medications.

The overall efficacy rate of no-test medication abortion is 96.4% (95% CI 96.0–96.7%) in the 10,693 patients included in this systematic review (Table 3). For patients with pregnancies at less than 70 days of gestation (n=8,166), the efficacy rate was 95.2% (95% CI 94.7–95.7%). For patients with pregnancies at more than 84 days of gestation (n=432), the efficacy rate was 83.8% (95% CI 80.0–87.2%).

Table 2. Summary and Description of Studies Included in the Systematic Review Not Included in Summary Statistics

Study Author, Year, Country	Study Design	Gestational Age (d)	Abortifacient Regimen	No. of Participants Without Ultrasonogram	Reason for Exclusion
Fylling, 1977,[14] Norway	Prospective cohort	37–60	Carboprost 0.6 mg IM	60	Did not use mifepristone or misoprostol
Purandare, 1982,[15] global	Prospective cohort	56 or less	Gemeprost 1 mg	358	Did not use mifepristone or misoprostol
Csapo, 1982,[16] Finland and United States	Prospective cohort	45 or less	Sulproston 500 micrograms IM	200	Did not use mifepristone or misoprostol
Aiken, 2021a[20] United Kingdom	Retrospective cohort	69 or less	Mifepristone and misoprostol	18,435	Follow-up data not available for majority of participants; patient-reported outcome data available for 2,453 of 52,142 total abortions performed in the study, including those with ultrasonograms
Kerestes, 2021,[17] United States	Retrospective cohort	77 or less	Mifepristone 200 mg and misoprostol up to 1,600 micrograms	108	Participants overlap with Upadhyay, 2022[19]
Anger, 2021,[18] United States	Prospective cohort	69 or less	Mifepristone 200 mg and misoprostol 800 or 1,600 micrograms	287	Participants overlap with Upadhyay, 2022[19]

IM, intramuscular.

Adverse outcomes after no-test medication abortion are reported in Tables 4–7. The rate of surgical evacuation at less than 70 days of gestation was 3.8% (95% CI 3.3–4.3); for all participants it was 4.4% (95% CI 4.0–4.9). Of 7,987 patients for whom outcome data were available, only five ectopic pregnancies were

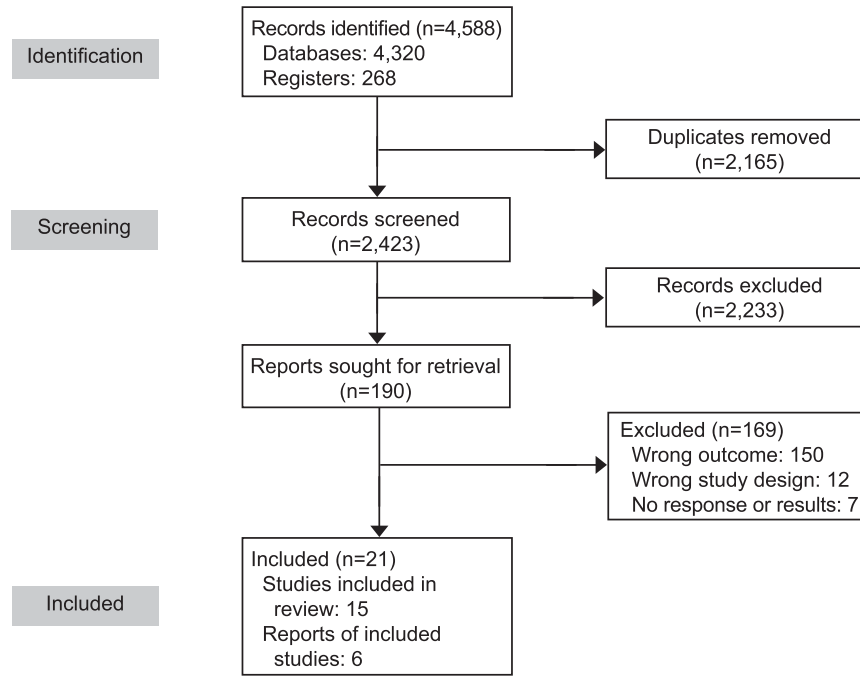

Fig. 1. No-test medication abortion flowchart.
Pearlman Shapiro. No-Test Medication Abortion. Obstet Gynecol 2023.

Table 3. Efficacy Rates for Medication Abortion Without Prior Pelvic Examination or Ultrasonogram*

Gestational Age (d)	No. in Analysis	No. Successful†	% (95% CI)
Through 63	3,043	2,854	93.8 (92.8–94.6)
Through 70	8,166	7,774	95.2 (94.7–95.7)
More than 84	432	362	83.8 (80.0–87.2)
Overall‡	10,693	10,306	96.4 (96.0–96.7)

* Based on patients with known outcomes. Patients without follow-up are not included.
† Expelled pregnancy without need for surgical intervention per MARE (Medical Abortion Reporting of Efficacy) guidelines.[13] The MARE guidelines standardize definitions of medication abortion outcomes, facilitating comparison among studies and data synthesis.
‡ Includes studies not included in the above gestational age categories; therefore, will not add up completely.

identified, for a total ectopic pregnancy rate of 0.06% (95% CI 0.02–0.15). For patients with pregnancies at less than 70 days of gestation (n=4,210), the rate of ectopic pregnancy was 0.02% (95% CI 0.0–0.13). There were no deaths reported. Blood transfusion was uncommon, with rates ranging from 0% to 0.7%.

DISCUSSION

This systematic review of 21 studies, which includes 10,693 patients, shows that no-test medication abortion is effective and safe. The cumulative efficacy rate of no-test medication abortion is 96.4% (95% CI 96.0–96.7%) confirmed completed abortions with only

Table 4. Complication Rates After Medication Abortion Without Prior Pelvic Examination or Ultrasonogram Through 70 Days of Gestation

Study Author, Year, Country	Total No. of Patients	Surgical Evacuation	Additional Misoprostol	Ectopic Pregnancy
Wiebe, 2014,[26] Canada	5	1 (20)	0	0
Aiken, 2017,[27] Ireland	1,000	45 (4.5)	NR	NR
Raymond, 2018,[28] Moldova, Mexico, United States	360	7 (1.9)‡	10 (2.8)	0
Marval-Peck, 2019,§ multiple countries	473	NR	33 (7.0)	NR
Chong, 2020,[29] 11 countries	117	NR	NR	NR
Wiebe, 2020,[30] Canada	138	5 (3.6)	7 (5.1)	0
Godfrey, 2021,[31] United States	186	3 (1.6)	1 (0.5)	NR
Kapp, 2021c,[35] Cambodia	910	71 (7.8)	13 (1.4)	1 (0.1)
Aiken, 2022,[37] United States	2,797	72 (2.6)	NR	0

Study Author, Year, Country	Blood Transfusion	Sought Unscheduled Medical Care*	Hospitalization	Antibiotics	Deaths	Chose to Continue Pregnancy†
Wiebe, 2014,[26] Canada	0	1 (20)	0	0	0	NR
Aiken, 2017,[27] Ireland	7 (0.7)	87 (8.7)	NR	26 (2.6)	0	NR
Raymond, 2018,[28] Moldova, Mexico, United States	0	3 (0.8)	2 (0.6)	NR	0	1 (0.2)
Marval-Peck, 2019,§ multiple countries	NR	51 (10.8)	NR	NR	NR	NR
Chong, 2020,[29] 11 countries	NR	2 (1.7)	NR	NR	NR	NR
Wiebe, 2020,[30] Canada	NR	NR	NR	NR	0	NR
Godfrey, 2021,[31] United States	1 (0.5)	3 (1.6)	0	4 (2.2)	0	NR
Kapp, 2021c,[35] Cambodia	NR	18 (2.0)‖	11 (1.2)	4 (0.4)	0	NR
Aiken, 2022,[37] United States	18 (0.6)	NR	NR	15 (0.5)	0	NR

NR, not reported.
Data are n (%) unless otherwise specified.
* Includes unscheduled visits to clinics, urgent care facilities, and emergency departments.
† Medication abortion initially unsuccessful and patient chose to continue pregnancy rather than take additional medications or undergo a procedure.
‡ Three procedures were performed for reasons other than ongoing pregnancy.
§ Marval-Peck L, Izaguirre S, Yanow S, Jelinska K, Comendant R, Foster AM [abstract]. Self-administration of very early medication abortion provided through a global online telemedicine service. Contraception 2019: 319. doi: 10.1016/j.contraception.2019.07.051
‖ Eighteen patients sought care at a private clinic, and 11 women were hospitalized.

Table 5. Complication Rates After Medication Abortion Without Prior Pelvic Examination or Ultrasonogram, Including Patients at More than 70 Days of Gestation

Study Author, Year, Country	Total No. of Patients	Surgical Evacuation	Additional Misoprostol	Ectopic Pregnancy
Endler, 2019,[25] Poland	419‡	65 (10.5)	12 (2.9)	NR
Kapp, 2021a,[32] global	131	23 (17.6)	NR	NR
Reynold-Wright, 2021,[33] Scotland	529	4 (0.8)	7 (1.3)	0
Kapp, 2021b,[34] Nepal	301	49 (16.3)§	NR	NR
Moseson, 2021,[36] Argentina and Nigeria	851	11 (1.3)	NR	0
Upadhyay, 2022,[19] United States	2,397	88 (3.7)	37 (1.5)	4 (0.2)

Study Author, Year, Country	Blood Transfusion	Sought Unscheduled Medical Care*	Hospitalization	Antibiotics	Deaths	Chose to Continue Pregnancy†
Endler, 2019,[25] Poland	2 (0.3)	230/385 (59.7)	NR	41 (9.8)	NR	5 (1.2)
Kapp, 2021a,[32] global	NR	53 (40)	NR	NR	0	13 (10)
Reynold-Wright, 2021,[33] Scotland	0	3 (0.6)	10 (1.9)	NR	0	NR
Kapp, 2021b,[34] Nepal	0	NA‖	NA‖	0	0	NR
Moseson, 2021,[36] Argentina and Nigeria	4 (0.5)	156 (18.3)	NR	NR	0	NR
Upadhyay, 2022,[19] United States	8 (0.3)	NR	6 (0.2)	NR	0	9 (0.34)

NR, not reported; NA, not applicable.
Data are n (%) unless otherwise specified.
* Includes unscheduled visits to clinics, urgent care facilities, and emergency departments.
† Medication abortion initially unsuccessful and patient chose to continue pregnancy rather than take additional medications or undergo a procedure.
‡ Adverse-event data available for only 419 of the total 615 patients with outcome data available.
§ Forty-nine participants with retained products of conception were treated with either a surgical procedure or additional medications.
‖ Abortions were performed in the hospital.

4.4% (95% CI 4.0–4.9) of patients requiring surgical evacuation. These rates are comparable with rates of medication abortion efficacy with pretreatment ultrasonogram. Complication rates were low, the rate of ectopic pregnancy was 0.06% (95% CI 0.02–0.15) and no deaths were reported. The complication rates we

Table 6. Complication Rates for Medication Abortion Without Prior Pelvic Examination or Ultrasonogram

	Ectopic Pregnancy			Unplanned Surgical Evacuation
Gestational Age (d)	No. in Analysis	No. of Ectopic Pregnancies	% (95% CI)	No. in Analysis
Through 63	1,454	1	0.07 (0.0–0.38)	3,043
Through 70	4,210	1	0.02 (0.0–0.13)	5,396
More than 70	NR	NR	NR	827
Overall†	7,987	5	0.06 (0.02–0.15)	10,024

	Unplanned Surgical Evacuation		Transfusion		
Gestational Age (d)	No. of Unplanned Surgical Evacuations	% (95% CI)	No. in Analysis	No. of Transfusions	% (95% CI)
Through 63	167	5.5 (4.7–6.4)	1,370	7	0.5 (0.2–1.1)
Through 70	204	3.8 (3.3–4.3)	4,348	26	0.6 (0.4–0.9)
More than 70	96	11.6 (9.5–14.0)	NR	NR	NR
Overall†	444	4.4 (4.0–4.9)	8,845	40	0.5 (0.3–0.6)

NR, not reported.
Based on patients with known outcomes. Patients without follow-up are not included.
† Includes studies not included in above gestational age categories; therefore, will not add up completely.

Table 7. Additional Complication Rates for Medication Abortion Without Prior Pelvic Examination or Ultrasonogram

Gestational Age (d)	Additional Misoprostol	Sought Unscheduled Medical Care*	Hospitalization
Through 70	64/2,072 (3.1, 2.4–3.9)	165/3,051 (5.4, 4.6–6.3)	13/1,461 (0.9, 0.5–1.5)
Overall	120/5,417 (2.2, 1.8–2.6)	685/4,869 (14.1, 13.1–15.1)	29/4,387 (0.7, 0.4–1.0)

Gestational Age (d)	Antibiotics	Deaths	Chose to Continue Pregnancy†
Through 70	49/4,898 (1.0, 0.7–1.3)	0/5,396 (0, 0.07)‡	1/360 (0.2, 0.1–1.5)
Overall	90/5,618 (1.6, 1.2–2.0)	0/9,605 (0, 0.04)‡	28/3,307 (0.9, 0.6–1.2)

Data are n/N (%, 95% CI) unless otherwise specified.
* Includes unscheduled visits to clinics, urgent care facilities, and emergency departments.
† Medication abortion initially unsuccessful and patient chose to continue pregnancy rather than take additional medications or undergo a procedure.
‡ One-sided 97.5% CI.

observed are lower than similar complications during delivery in the United States.[21] Further, complication rates are far lower than the rates of complications seen with unsafe methods of abortion.[22] This systematic review further supports the abortion care guidelines from national and international organizations that ultrasonogram should not be a requirement for abortion provision.

No-test medication abortion is becoming increasingly common, as evidenced by the large increase in the number of studies on the subject published within the past few years. Eleven of the studies included in our analysis were published in 2021 or 2022. With legal restrictions on abortion, more patients will find themselves without access to abortion with considerable, unfeasible travel distances and expenses to the nearest abortion clinic. With the COVID-19 pandemic, telemedicine abortion care is already dramatically increasing, and no-test protocols will be crucial for the provision of abortion care to these patients. No-test protocols can be used to provide safe abortion care without a pretreatment ultrasonogram and, thus, with no in-person requirement for the vast majority of patients. There is ample evidence regarding the safety and acceptability of remote or telemedicine follow-up for medication abortion.[23]

One strength of our study is the size and makeup of patients included with documented efficacy and safety outcomes. Methodologically, we sought to include as many studies as possible. We did not impose a language limitation on study inclusion. We extensively corresponded with authors to clarify any questions about studies with the potential for inclusion and to inquire about de-aggregated data for studies in which patients who underwent no-test medication abortion were combined with patients with pretreatment ultrasonograms, and we included grey literature. More than 10,000 patients were included from countries across the world and in a variety of health care systems. Some patients from countries such as the United Kingdom sought care through the National Health Service, whereas others from the United States were from university hospitals or smaller abortion clinics. Some patients in Cambodia received care from pharmacies. Many sought care through online platforms outside traditional health care systems. The diversity of patients and variety of methods of abortion provision in these studies suggests our conclusions are generalizable to most populations.

Each individual study has the potential for bias, as described in Table 1. As in all pooled estimates, there is potential selection bias, particularly as not all of the included studies reported rates of all adverse events. Studies with a paucity of outcome data possibly have attrition bias, though this reflects evidence-based routine clinical practice of patients determining whether a medication abortion is successful rather than a true loss to follow-up. Many of the outcomes included in this review are self-reported by patients, introducing reporting bias, though research has shown that patients are very reliable at assessing the efficacy of medication abortions.[24]

In our analysis, efficacy and safety rates remained high despite using the most conservative estimates in our analysis. We only included patients in our analysis that had documented complete follow-up data. We deliberately made this decision to get the highest rate of known complications, and the lowest rate of complete medication abortion. Our rates likely underestimate the efficacy and safety of medication abortion as many patients who have a successful medication abortion forgo further follow-up as they understand they are no longer pregnant and do not require

further medical care. Many studies included were from countries with national health care systems or in places with shared medical record systems. However, patients lost to follow-up may have experienced complications that were not captured within the medical records used for these studies. The success rate of 96.4% is potentially an underestimate of completion, and this analysis may even overestimate complication rates, further supporting the safety and efficacy of no-test medication abortion.

Although the studies lack uniformity in methods of reporting completed abortion, this reflects the current medical practice and expands the generalizability of our outcomes. Patients often do not return to the clinic or are lost to follow-up after medication abortions. Further, with increasing legal restrictions on abortion, we anticipate increasing numbers of abortions outside the formal health care setting. Self-assessment of the outcome of medication abortion completed at home has been shown to be noninferior to routine clinic follow-up.[24]

There are several limitations to our analysis. We excluded Aiken's 2021 study with the largest cohort of more than 18,000 patients from the British Pregnancy Advisory Service given the minimal number of confirmed patient outcomes available.[20] The study relied on data from a public, universal health system and offers a compelling case for not requiring follow-up for medication abortion. However, for this systematic review we included only cases in which the outcome data were available to avoid any underestimation of adverse events. Another limitation is that some patients may have had ultrasonograms or physical examinations performed by health care professionals other than those they were seeing for abortion care and that patients used this to inform their stated gestational age. However, in these cases, we confirmed with the study authors that the health care professional providing the abortion did not have access to the ultrasonogram report or use it to inform their management.

Another important limitation is the inability to determine whether the treatments patients received were necessary or appropriate for potential adverse events. Rates of surgical intervention after medication abortion are variable depending on clinical setting and regional differences in practice. Most of the studies, particularly those using self-report for follow-up, were unable to determine whether a surgical procedure was performed for an ongoing pregnancy or for adverse events relating to the abortion itself, such as retained products of conception, or if further complications resulted from the surgical management rather than the abortifacient medications themselves. Additionally, there are notable practice differences in medicine between countries that may have contributed to higher rates of interventions. For example, Endler's 2019 study suggests that the high rates of surgical evacuation found in Poland reflected either clinical practice or perhaps, "financial incentives to performing surgical procedures, rather than clinical indications."[25]

Directions for future research include finding ways to remove the last in-person requirement of blood typing for patients at more than 70 days of gestation and exploring the safety and efficacy of asynchronous medication abortion provision. Based on the available data presented in this review, health care professionals can feel confident in the safety and efficacy of no-test medication abortion. This large body of evidence should empower physicians to incorporate no-test medication abortion into their practices. Policies that mandate an in-person visit for abortion care stand in direct opposition to evidenced-based medicine. This review affirms our responsibility as physicians to advocate for the availability of this service to ensure access to basic reproductive health care for our patients.

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