

Payer Cost Savings with Endometrial Ablation Therapy

Robert London, MD; Martin Holzman, MBA; Darin Rubin, MBA; and Brian Moffitt, BS

Abstract

Context: Dysfunctional uterine bleeding (DUB) is a significant cost burden for payers in the US health-care system because hysterectomy, the common curative treatment, is associated with high hospitalization costs.

Objective: To determine the potential economic benefit to payers of endometrial ablation as an alternate treatment for the benign DUB disorder.

Study Design: A retrospective analysis of health-care claims including the total direct costs to the payer (reimbursement) and patient (copayment). The study was designed to capture all DUB-related claims costs for the entire episode of care from initial diagnosis through follow-up care for 12 months postprocedure.

Patients and Methods: Twenty-four months of claims data from premenopausal women aged 25 to 50 years enrolled in a large managed care organization were screened based on relevant diagnostic and procedural codes. Incidence and costs of hysterectomy and ablation were determined, and potential payer savings were calculated based on hypothetical hysterectomy-to-ablation conversion rates of 25% to 50%.

Results: By performing ablation in lieu of hysterectomy for DUB, an average per-case savings of approximately \$4,300 is possible. Potential annual

payer savings are approximately \$515,000 and \$1.03 million for a 1-million-member plan, based on the 25% and 50% conversion rates, respectively. The recently approved uterine balloon therapy ablation technique could be instrumental in overcoming current barriers to wider utilization of ablation surgery.

Conclusion: If ablation is used in lieu of hysterectomy when medically appropriate, a payer organization could reduce the cost of treating patients with DUB who are not responsive to drug therapy or dilation and curettage alone. Our data suggest that hysterectomy is the most common surgical therapy for this disorder, even though the less invasive endometrial ablation approach is more consistent with accepted DUB treatment guidelines. Payers therefore have an economic incentive to adopt guidelines and reimbursement policies that promote ablation therapy for DUB.

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Dysfunctional uterine bleeding (DUB) is a common condition that affects approximately 22% of all healthy menstruating women¹ and more than 10 million American women annually.² Exact definitions of DUB vary due to the subjective perception of "normal" uterine bleeding; however, menses continuing for more than 7 days or blood loss of more than 60 to 80 milliliters in one menstrual cycle pose a high risk of anemia³⁻⁴ and can be considered dysfunctional. DUB is distinct from other abnormal uterine bleeding because it is attributed to benign causes and is unrelated to lesions such as fibroids or carcinoma.

From CNA Health Partners, Chicago, IL (R.L.), CSC Healthcare Group, Inc., Berwyn, PA (M.H., D.R.), and United Payers and Providers, Baltimore, MD (B.M.).

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Address correspondence to: Martin Holzman, Partner, CSC Healthcare Group, 1160 W. Swedesford Road, Berwyn, PA 19312.

National and regional best-practice guidelines for the treatment of DUB,⁵⁻¹⁰ including those issued by the American College of Obstetricians and Gynecologists (ACOG), generally agree on an accepted treatment path that starts with the least invasive and ends with the most invasive treatment options. Generally, the guidelines begin with diagno-

sis that may include a minimally invasive endometrial biopsy, followed by drug therapy if appropriate. If medication is ineffective or inappropriate, treatment options progress to dilation and curettage (D&C) with or without hysteroscopy, followed by endometrial ablation or surgical removal of the uterus via hysterectomy.^{3,7,10}

Currently, an estimated 120,000 of the 600,000 hysterectomies performed annually in the United States (20%) are for the treatment of DUB.^{11,12} Risks associated with hysterectomy are significant. Hysterectomy mortality ranges from 6 to 11 per 10,000 cases for patients without malignant or obstetric etiologies,¹³ while morbidity rates range from 3% to as high as 50%.¹⁴⁻¹⁷ In addition, US payers spend approximately \$1.8 billion annually for DUB-associated claims, and most of these costs are attributed to hospitalization.² The diagnostic related group (DRG) "nonmalignant diseases and disorders of the female reproductive system," which includes DUB, ranks 11th among surgical DRGs in terms of number of hospital discharges and represents 1.34% of all DRGs.¹⁸

Patient claims data and the existing literature indicate that hysterectomy as a primary curative surgical therapy is more expensive than other surgical alternatives such as endometrial ablation and may be overutilized.¹⁹ Since the 1970s, treatment of DUB with hysteroscopic endometrial ablation has been reported as a suitable alternative to hysterectomy in terms of cost effectiveness and patient acceptance.²⁰⁻²² There is a multitude of endometrial ablation techniques. Techniques that employ electrosurgical sources (ie, loop resection, rollerball, rollerbarrel), high-frequency coagulating current (ie, resectoscope), and laser energy sources (eg, Nd:Yag) are most common.^{1,21,23} These traditional hysteroscopic endometrial ablation techniques that use electrosurgical or laser ablative sources can

Table 1. DUB-related Diagnostic and Procedural Codes Used in the Study.

Diagnostic/Procedure/Treatment Method	Relevant Codes	
	CPT	ICD-9
Disorders of menstruation and other abnormal bleeding		
excessive or frequent menstruation		626.2
irregular menstrual cycle		626.4
metrorrhagia		626.6
other		626.8
unspecified		626.9
Diagnosis		
endometrial biopsy (any method)	58100	
endoscopic biopsy	56351	
pelvic sonography (complete)	76856	
(limited or follow up)	76857	
diagnostic hysteroscopy	56350	
cervix uteri biopsy	57500	
hysteroscopy with biopsy	56363	
endocervical curettage (not part of D & C)	57505	
dilation and curettage ([D & C] corpus uteri)	58120	
D & C (cervix)	57800-57820	
D & C with hysteroscopy	56351	
endometrial ablation (any method)	56356	
(ambulatory or outpatient)	56356-26	
(inpatient)	56356-51	
rollerball ablation with electric current	57510	
loop resection with electric current	57522	
laser ablation	57513	
cryocautery	57511	
hysterectomy (abdominal)	58180	
radical (abdominal)	58210	
total (abdominal)	58150	
total (abdominal)	58200	
resection of ovarian malignancy	58951	
total with colpo-urethrocystopexy	58152	
total with partial vaginectomy	58200	
	58260-58270	
laproscopic vaginal hysterectomy	56308	
endoscopy with surgery	56351-56356	
hysterectomy (lesion removal)	59100	

effectively control abnormal bleeding in 85% to 90% of DUB cases.²³⁻²⁵

Based on prevailing safety, efficacy, and economic literature, it is conceivable that a significant number of the 120,000 US patients undergoing DUB hysterectomy may instead be treated by endometrial ablation. The purpose of this study is to test the hypothesis that payers (eg, insurers, health maintenance organizations [HMOs], and managed care organizations [MCOs]) stand to realize significant savings through the use of endometrial ablation as an alternative to hysterectomy for DUB.

... METHODS ...

Patient Selection

We used patient claims records from a mid-Atlantic US independent provider association (IPA)-based MCO to directly compare the costs of DUB hysterectomy with those of DUB ablation. This payer organization advocated ablation prior to hysterectomy for DUB treatment.

Between January 1996 and January 1998 the claims database contained records for approximately 335,000 members. Patient claims records included primary and secondary diagnostic codes, procedural codes, provider type and specialty, member gender and age, date of service, allowable claims costs (including copay), drugs prescribed (including units or days of supply), and hospital and/or emergency room admission and discharge dates.

We first selected from the 335,000 members only women who were between the ages of 25 and 50 years at any point during the study period. These records were then rescreened according to the International Classification of Diseases (ninth revision) (ICD-9) codes²⁶ and Current Procedural Terminology (CPT) codes²⁷ outlined in Table 1. We required the presence of CPT codes for ablation or hysterectomy and ICD-9 codes for "disorders of menstruation and other abnormal bleeding." When the primary diagnostic ICD-9 code deviated from the benign clinical manifestation of DUB, we included the patient provided there was an acceptable secondary code that indicated the presence of DUB as a second diagnosis, on the basis of appropriate codes listed in Table 1 (as determined by author). In addition, there were no uterine balloon therapy (UBT) ablation procedures, which employ a thermal energy source,²¹ included in the study because the procedure was not approved in the United States during the study period.

We applied the following exclusion criteria to our screening process:

- The presence of any etiologic factors documented prior to the ablation or hysterectomy that resembled but did not clinically constitute DUB based on nationally accepted practice guidelines. These etiologic factors included uterine leiomyoma, cervical dysplasia, endometrial lesions, uterine prolapse, uterine malignancy, ovarian cyst, problems associated with pregnancy, benign neoplasm, polyp of corpus uteri, and postcoital bleeding.
- Members who were prescribed drugs that, although potentially indicated for DUB, were not prescribed by an obstetrician or gynecologist.
- Incomplete pathways as indicated by an invasive procedure (D&C, ablation, or hysterectomy) without a diagnostic step or drug therapy documented before the procedure.

We then reevaluated the sample and included only patients who were health plan members continuously from January 1996 through January 1998. Continuous enrollment was necessary to capture preprocedure costs and 12 months of follow-up data. The sample size totaled 705.

The MCO did not use any women's health "carve-outs" during the study period; thus, it is reasonable to assume that records of all women in the MCO that received DUB hysterectomy or DUB ablation were captured in the database.

Cost/Incidence Determinations

Cost data were collected by identifying patients who had undergone ablation or hysterectomy procedures in 1996, and whose disease progression was tracked from diagnosis through drug therapy to curative procedure (ablation or hysterectomy). We also included costs associated with complications or recurrence that occurred during the 12 postprocedure months.

Direct costs were categorized by ablation therapy or hysterectomy and separated into component costs comprised of the professional fee, technical fee, anesthesiology costs, diagnostic costs (office visits, biopsies, and any diagnostic procedure such as hysteroscopy), and routine-care costs (regularly scheduled visits). The professional fee included physician fees on the day of procedure. The technical fee included all hospital or facility claims on the treatment date. The anesthesiology cost included all anesthesia claims on the day of hysterectomy or ablation procedure. Diagnostic costs included claims filed prior to hysterectomy or ablation, in addition to claims for diagnostic hysteroscopy and D&C.

Table 2. Age Distribution of Patients by Procedure

	Average Age (Years)	Standard Deviation
Endometrial Ablations (n=22)	42.07	± 5.59
Hysterectomies Total (n=97)	39.57	± 6.61
Abdominal Hysterectomies (n=54)	43.25	± 5.35
LAVHs (n=43)	41.56	± 5.83

Table 3. Cost Category Distribution of Direct Costs (\$) Reimbursed (Including Deductible and Copay) by Procedure*

Cost Category	Ablation	All Hysterectomy	Abdominal Hysterectomy	LAVH
Anesthesiology	452.65	788.95	756.19	830.10
Complication	107.57	499.25	767.26	162.68
Diagnosis	1324.73	1314.13	1257.82	1384.85
Drug	336.34	164.75	122.12	218.29
Facility Fee	1854.62	4772.36	4617.21	4967.20
Home Care		2.01	3.61	
Pathology/Laboratory	85.65	132.55	151.56	108.67
Phys Fee	721.79	1506.69	1518.16	1492.28
Routine Care	44.32	41.99	37.22	47.98
Total	4927.67	9,222.69	9231.15	9212.06

*Based on payor medical claims records tracked over 12 months pre- and 12 months post-procedure (1/96 through 1/98).
LAVH = laparoscopically assisted vaginal hysterectomy.

Complication costs included post-operative outpatient gynecologic claims or inpatient claims related to a completed procedure. Pathology and laboratory costs were comprised of claims for pre- and postoperative tests related to relevant procedures. Medication costs included any procedure-related medications, either pre- or postprocedure. Home-care claims related to DUB procedures were also included. Capital expenses likely incurred by provider organizations for ablation equipment were not included in our calculations, as they did not represent direct costs incurred by payers. We then averaged each component cost for DUB hysterectomies, laparoscopically-assisted vaginal hysterectomies (LAVH), abdominal hysterectomies, and ablation procedures. For each procedure, we then added cost components to generate an average direct cost per procedure. In the case of ablation treatment failure, additional costs were not categorized as complications. Rather, costs of subsequent treatments were categorized by the cost component breakdown described in Table 3, and these costs were ultimately added to failed treatment costs to generate a total direct cost per case. All statistical calculations such as stan-

Table 4. Distribution of Direct Costs (\$) Reimbursed (Including Deductible and Copay) by Procedure*

	Average Cost	Standard Deviation	Minimum	Maximum	Median
Endometrial Ablations (n=22)	4927.67	2900.85	1286.92	13,921.86	4245.67
Hysterectomies Total (n=97)	9222.69	4032.76	1902.84	26,617.41	8692.07
Abdominal Hysterectomies (n=54)	9231.15	3958.93	2421.41	22,248.05	8257.82
LAVHs (n=43)	9212.06	4170.66	1902.84	26,617.41	9174.60

*Based on payor medical claims records tracked over 12 months pre- and 12 months post-procedure (1/96 through 1/98).
LAVH = laparoscopically assisted vaginal hysterectomy.

dard deviations and *P* values for between-group comparisons (paired Student's *t* test) were generated using Microsoft Excel version 7 software.

We determined the incidence of DUB hysterectomy and DUB ablation for calendar year 1996 in an effort to estimate the annual financial impact of these procedures. We included all occurrences of DUB hysterectomy and DUB ablation, regardless of preceding or subsequent claims.

... RESULTS ...

The age of the study population averaged 42.07 years for DUB ablation and 39.57 years for DUB hysterectomy subjects (Table 2). Ultimately, 100 DUB hysterectomies (55 abdominal and 45 LAVH), and 22 DUB ablations met the inclusion criteria for cost determination purposes. Three cases of ablations followed by hysterectomies (1 abdominal and 2 LAVH) were included, but only in the ablation cost calculation. This allowed us to integrate the direct costs associated with failed ablations into the average ablation cost and thereby represent the true direct cost of DUB ablation. Therefore, data for 97 hysterectomies were included the hysterectomy cost calculation (100 hysterectomies less 3 combination procedures), and data for 22 DUB ablations were included in the ablation cost calculation (19 ablations plus 3 ablations followed by hysterectomy). These 22 ablations also included one case of assumed failed ablation followed by a repeat ablation. No mortalities were identified in the claims data.

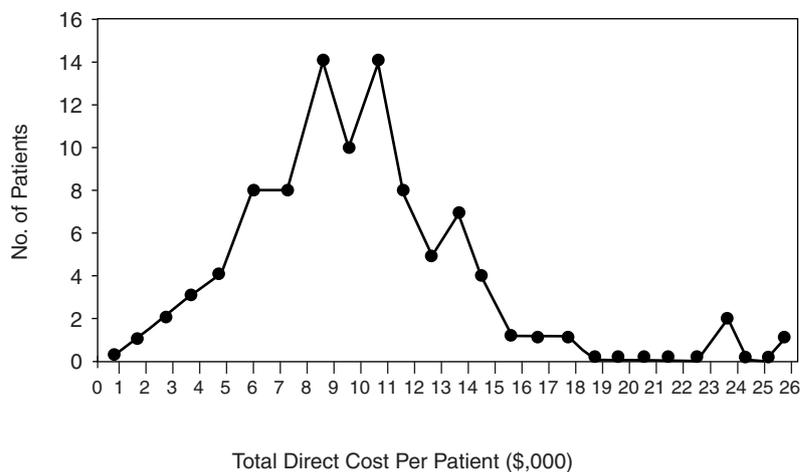
The average cost of a hysterectomy for DUB was \$9222.69 (standard deviation [SD]: ± \$4032.76) (Tables 3 and 4). The average cost of traditional ablation for DUB was \$4927.67 (SD: ± \$2900.85) (Tables 3 and 4). Two of the assumed ablation failures did not have a record indicating administration of a GnRH analogue medication such as luprolide acetate prior to the procedure, which may have contributed to procedure failure. The average cost difference between

these 2 groups was considered statistically significant at the *P* = .10 level.

Of the 97 DUB hysterectomies analyzed, 54 abdominal and 43 laparoscopically assisted vaginal hysterectomies were performed, with average costs of \$9231.15 (SD: ± \$3958.93) and \$9212.06 (SD: ± \$4170.66), respectively (Tables 3 and 4). This cost difference between hysterectomy procedures was not statistically significant (*P*=.8).

When we evaluated the individual direct costs for each DUB hysterectomy case, we noted several cases that developed serious complications requiring expensive hospitalization (Figure 1). In the DUB ablation group, there were also several cases involving high direct costs (Figure 2). These cases, which were the previously noted ablation failures that led to the repeat ablation and 3 hysterectomies, increased the average DUB ablation cost by \$857.63. These costs were primarily due to hospitalization required for the 3 hysterectomy patients. Had we included these hysterectomies in the DUB hysterectomy group, the increase in the average DUB hysterectomy cost would have been relatively immaterial (\$34.10).

Figure 1. Distribution of Direct Costs for DUB Hysterectomy Episode of Care (n=97)*



*Outliers to right of principal distribution represent several cases involving serious complications requiring hospitalization.

Considering the 4 ablation failures among the 22 total DUB ablations, the DUB ablation success rate was approximately 82%. The annual (1996) incidences of DUB ablation and hysterectomy were 5.1 per 100,000 and 47.8 per 100,000, respectively.

... DISCUSSION ...

DUB hysterectomies cost approximately \$4.4 million²⁸ annually for a 1-million member plan in the United States. The results of this study support the hypothesis that performing DUB ablation in lieu of certain DUB hysterectomies can result in significant cost savings for MCOs. While variables such as patient preference, physician preference, and adoption rate of new technology make it difficult to estimate how many hysterectomies could be avoided, we estimate that conversion of 25% of DUB hysterectomy patients to DUB ablation would produce an annual cost savings of \$515,000 per 1-million-member plan (Figure 3). Using a conversion rate of 50%, the cost savings would increase to \$1.03 million (Figure 3). These estimates are based on an incidence of 47.8 DUB hysterectomies per 100,000 members and an average cost difference between

hysterectomy and ablation of approximately \$4,300. We also recalculated these figures after hypothetically raising the ablation claims costs by \$500 over the direct average cost. The resulting savings were slightly lower, at approximately \$455,000 and \$910,000 based on the 25% and 50% conversion rates, respectively (Figure 4).

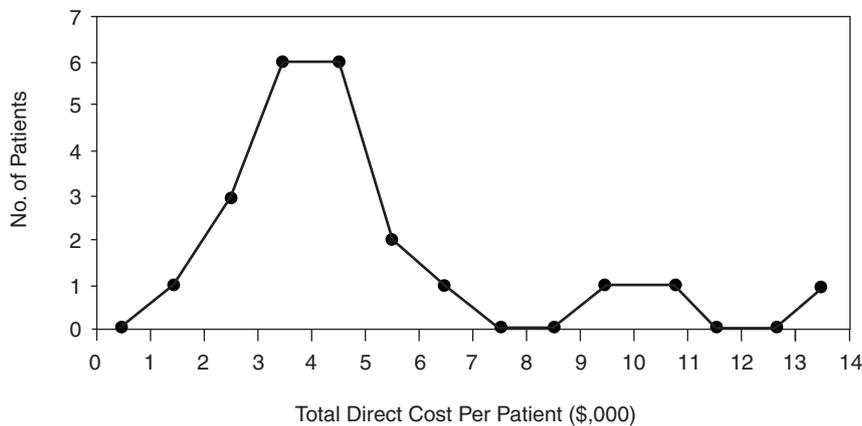
Our mean direct costs per case for ablation and hysterectomy are consistent with previously reported findings.²³ These findings also agree with previously reported reports that the total direct cost of endometrial ablation was considerably less than either vaginal or abdominal hysterectomy.²³ Hysterectomy poses a greater cost burden than ablation to payers, providers, and patients because approximately 4 days of hospitalization are needed, higher rates of surgical risk and complications are encountered, and a 3- to 6-week recovery period ensues.²⁹ Alternately, ablation procedures require an average length of stay of less than 1 day, and recovery can take potentially as little as 1 day.

In addition, invasive DUB hysterectomy can result in serious morbidity, and traditional hysteroscopic endometrial ablation has been reported to be safer and more cost effective than hysterectomy even when failed ablations followed by repeat ablation or hysterectomy are considered.^{17,30-32} In our study, cost outliers in the DUB hysterectomy group resulted primarily from hospitalization due to complications as well as diagnostic-related facility fees.

In one case, the patient required a 14-day hospitalization stay due to severe complications after DUB hysterectomy. The cost outliers in the DUB ablation group resulted primarily from the failed ablations.

Use of DUB ablation therapy in lieu of DUB hysterectomy may also reduce indirect costs to payers and to society that are associated with hysterectomy, through improved overall health status of the membership (less pain and suffering) and reduced work absenteeism. A recent survey of DUB

Figure 2. Distribution of Direct Costs for DUB Ablation Episode of Care.



Outliers to right of principal distribution represent cases of assumed failed ablations later treated via hysterectomy during relevant episode of care.

patient preferences ranked avoidance of major surgery, fast recovery time, and short hospitalization as the most important advantages of ablation over hysterectomy.²⁰ Further, other published literature has established that lost productivity and health-related quality of life associated with traditional ablation are significantly less than that associated with abdominal or vaginal hysterectomy for the treatment of DUB.²³

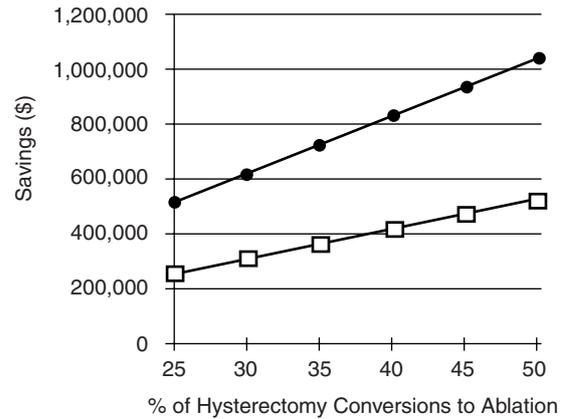
Currently, however, there are several barriers to adaptation of DUB ablation techniques. First, significant surgical skill and training are required.^{17,21} Second, hysteroscopic ablation risks uterine perforation and requires general anesthesia, both factors that may limit its utilization.^{31,33} Third, compensation for hysterectomy is significantly higher than that for ablation. Under the current reimbursement scenario, payers are likely to benefit from adaptation of DUB ablation techniques, but there is no economic incentive for providers to acquire the equipment and supplies needed to perform the ablation procedures. Finally, patients may not be sufficiently educated about effective treatment alternatives, and consequently, they may accept hysterectomy as the only effective option.³

It is conceivable that new ablation technologies will overcome these barriers.

The recently approved UBT technique obviates the need for hysteroscopy and thereby requires less training and poses less risk of intraoperative complications.^{11,21} UBT can also be performed under local anesthesia and in less time than traditional hysteroscopic ablation techniques, and this may enable this procedure to be performed in an office setting.^{11,21,30} Studies performed to date suggest that UBT technology is as effective as commonly employed electrosurgical rollerball ablation (which is hysteroscopic) and that it may be safer.²¹ Projections based on similar resource requirements, outcomes, and complications of traditional ablation procedures also suggest that the direct costs of UBT will be similar to those of conventional procedures.^{11,21} There is also evidence that further cost reductions may result from a lower complication rate, reduced physician training requirements, and the possibility that UBT can be performed in the office setting.³⁰

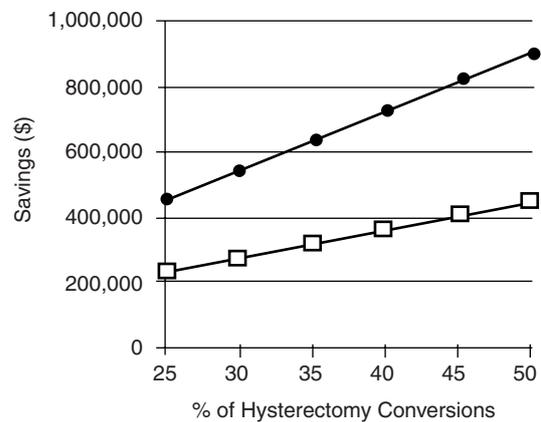
There are several possible limitations to this study. Claims coding records can be inaccurate, and inaccuracies would affect the direct cost calculations. It could also be argued that, under the current system, providers may have a financial incentive to

Figure 3. Potential Plan Level Savings to Payor Based on \$4,300 Per-Patient Cost Reduction for Ablation vs Hysterectomy



Circled line = million member plan, squared line = 500,000 member plan

Figure 4. Potential Plan Level Savings to Payor Based on \$3,800 Per-Patient Cost Reduction for Ablation vs Hysterectomy



Circled line = million member plan, squared line = 500,000 member plan

'upcode' and thereby overstate medical costs. We were unable to account for any effect that may have resulted from physicians providing medication samples, as this was undocumented. Further, we could not compare different hysteroscopic ablation techniques because the claims data records reported only CPT code 56356, which covers all hysteroscopic endometrial ablation procedures.

In sum, our data suggest that hysterectomy is the mainstay of therapy for DUB, despite clinical practice guidelines that endorse less invasive procedures before hysterectomy. It is understandable that providers may disregard D&C as a stand-alone curative treatment for DUB, since it is generally acknowledged that this approach is ineffective.³ However, DUB ablation may avoid major surgical intervention in an estimated 85% of cases²⁴⁻²⁶ and thereby reduce payer costs. Payers therefore have an economic incentive to adopt provider guidelines and reimbursement policies that promote endometrial ablation for the treatment of DUB when medically appropriate.

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