INTRODUCTION

One-third of patients who visit a gynecologist are there because of abnormal uterine bleeding (AUB), which is believed to account for more than 70% of gynecologic consults in perimenopausal and postmenopausal women. Endometrial evaluation has evolved since the introduction of suction piston biopsy instruments in the 1980s. Once adequate for evaluation of women with AUB or postmenopausal bleeding, the American College of Obstetricians and Gynecologists (ACOG) Practice Bulletin on AUB now states that a negative blind endometrial biopsy is not a stopping point in persistent bleeding. Previously, many health care providers avoided in-office “point of care” direct visualization of the endometrial cavity with hysteroscopy for a variety of reasons. However, newer disposable equipment has resulted in a changing landscape that will allow many gynecologists to add such evaluation to their in-office procedures.

CAUSES OF ABNORMAL UTERINE BLEEDING

In postmenopausal patients, any bleeding is “uterine cancer until proven otherwise,” although the incidence of malignancy will range from 1% to 14%. Indeed, the majority of such bleeding actually will be from atrophic changes. In perimenopausal women aged 40 years or older, AUB mandates evaluation. In fact, in a study of 433 women aged 40 years to menopause, 79% had no anatomic reason for their bleeding, thus making ovulatory dysfunction the most likely final diagnosis.

It therefore becomes obvious that the great divide for clinicians is to distinguish between those patients with no...
anatomic abnormality (best treated hormonally or expectantly) versus those with anatomic pathology (who will often be in need of more definitive diagnosis and therapeutic intervention).

**SHORTCOMINGS OF BLIND BIOPSY**

After a single study by Stovall et al, blind endometrial sampling with disposable suction piston devices became the standard approach for patients with AUB. Stovall performed such outpatient biopsy on 40 patients with known carcinoma the week prior to scheduled hysterectomy and obtained endometrial carcinoma in 39 of the 40 samples; he reported a 97.5% accuracy. This was widely publicized, marketed, and promoted, and was rapidly accepted as standard of care. In a similar study by Guido et al, researchers performed blind endometrial sampling in 65 patients with known carcinoma in the operating room just prior to hysterectomy. These blind biopsies missed 11 of 65 cancers (a sensitivity of only 83%). Importantly, upon opening the removed uterus for visual inspection of the endometrium it was determined that, when the cancers occupied at least 50% of the endometrial surface, the biopsy was 100% accurate. In similar studies of women with known carcinomas, the sensitivities of blind sampling were only 84% and 68%, yielding false negative rates of 16% and 32%, respectively. Again, these were blind biopsies performed on women with known carcinoma.

In 2012, the ACOG Practice Bulletin acknowledged, “the primary role of endometrial sampling in patients with AUB is to determine if carcinoma or pre-malignant lesions are present.” The bulletin also states that endometrial biopsy has “high overall accuracy in diagnosing endometrial cancer when an adequate specimen is obtained and when the endometrial process is global.” In trying to understand why such biopsies failed in nonglobal pathology, one need look no further than Guido’s studies demonstrating that blind biopsy can miss cancers that occupy less than 50% of the surface area. Further, a prehysterectomy study by Rodriguez et al demonstrated that Pipelle endometrial biopsy sampled an average of only 4% (range, 0%-12%) of the endometrial surface area. Therefore, these tests only can be considered an endpoint when they reveal cancer or atypical complex hyperplasia.

These findings have tremendous ramifications for clinical practice. Certainly health care providers, especially in low resource areas, can begin the evaluation with a blind biopsy. But if the results do not indicate cancer or atypical hyperplasia, the evaluation cannot be considered adequate, much less definitive, especially if bleeding persists. Thus, the concept of distinguishing “global” from “focal” pathologies is becoming increasingly understood and important. Providing patients who have no anatomic abnormality with a diagnosis is best done in an office setting, especially in a point-of-care fashion—where the patient is initially examined—rather than at a separate time (and possibly separate location) with additional personnel.

**IMAGING TECHNIQUES**

Transvaginal ultrasound (TV U/S) has become integral to virtually all gynecologic practice. However, it is all too often performed by other personnel (sonographers, radiologists) and at a different time and location than when the patient has presented to the gynecologic provider. The limitations of TV U/S in distinguishing global from focal pathologies is well established. The addition of fluid enhancement, known as saline infusion sonohysterography (SIS), improves the sensitivity and specificity of unenhanced TV U/S to approach that of diagnostic hysteroscopy. It has been our observation, however, that the majority of SIS is not done by the clinician at the time of patient presentation, but rather all too often, as mentioned, at another time, in another location, and with additional personnel. Thus, it has not evolved into the satisfactory point-of-care option that would allow the majority of patients with AUB to be evaluated at the time of presentation. In the setting of AUB, TV U/S has not allowed gynecologists or their patients to optimize economy of time, effort, and finances.

Furthermore, many gynecologists have not added office hysteroscopy to their armamentarium of evaluation tools because of the complex and expensive equipment involved, the space required, the need for sterilization and maintenance of equipment, and concerns about issues of patient discomfort. Newer disposable office hysteroscopes have the ability to completely change that aspect of practice and truly make the evaluation “point of care.”

**ADVANTAGES OF HYSTEROSCOPY**

Clearly hysteroscopy can distinguish no pathology from global pathology from focal abnormalities. It can determine which patients may need to go to the operating room as well as optimize preoperative surgical planning. Ideally this would be done in an office setting when the patient first presents (point of care). The cost-effectiveness of office hysteroscopy in identifying patients who do not need to go to the operating room for operative hysteroscopy interventions has been well established. Moawad et al reported that almost 60% of women who underwent diagnostic office hysteroscopy for AUB were able to avoid the need for intervention in the operative suite, saving almost $1500 per patient. Given the incidence of AUB in reproductive age and postmenopausal women, as described above, the cost savings of this strategy to overall health care expenditures is staggering. Even in those cases in which there is a known or suspected anatomic abnormality (eg, polyps or fibroids),
diagnostic hysteroscopy can help the physician make a more accurate diagnosis, which is valuable for optimizing operative planning.12

**POINT-OF-CARE OFFICE HYSTEROSCOPY**
Office hysteroscopy remains grossly underutilized because of the complexity and expense of acquiring and maintaining the necessary equipment. Additionally, traditional systems require a dedicated cart and are not typically small enough or mobile enough to transport among examination rooms. Thus, the space requirement is not insignificant. Further, there are issues of cleaning, sterile processing, and storage, as well as training of staff to aid in these tasks. Accordingly, the thought of incorporating office hysteroscopy into the typical practice can be a bit overwhelming.

Handheld systems like the Wireless Digital Endoscope Camera (WiCAM, The Prometheus Group, Dover, NH) and the EndoSee hysteroscope (Cooper Surgical, Trumbull, CT) can radically change direct intrauterine evaluation in the office. Each has its own distinct advantages.

The WiCam battery powered 4.7 x 2.2 inch wireless camera connects to any standard hysteroscope and transmits images to your laptop using HIPAA-compliant software. A rechargeable LED light source connects to the light post of the hysteroscope. This gives a high-quality image without the need for a tower or the multiple wired connections it entails, but you still need a hysteroscope to connect (not included).

The EndoSee hysteroscope (FIGURE 1) is a self-contained system approximately the size of an iPhone, attached to a single-use disposable cannula containing both camera and light source at the tip. Sterile single-use cannulas are approximately 11 in long and 4 mm in diameter, have a slightly curved tip (25°), and contain a miniature camera and a LED light source. The cannula snaps securely onto a receptacle on the hand-held monitor and contains a channel for infusion of saline distension medium. The cannula can be inserted in a similar fashion as an endometrial biopsy device. The cannula can then be attached to a 3.7 x 3.5 in LCD screen.

A base unit allows battery recharging (full battery gives about 2 hours of continuous use) and USB transfer of images or videos to a laptop. Such a system eliminates the need for a tower with separate cameras, light sources, and monitors and cords to assemble. It also eliminates the
need for cleaning and sterile processing of equipment between uses. In addition, it does not require a dedicated procedure room or storage space. Its use draws many parallels to office endometrial biopsy.

Minimal patient preparation is necessary with the portable video hysteroscope devices. If the procedure is scheduled, such as timing a cycling patient to just after the bleeding ends, the operator might consider misoprostol preparation of the cervix, but cervical dilation is almost never required. After connecting the sterile cannula, the fluid distension medium is delivered via intravenous extension tubing. Distension fluid can aid in cervical dilation and passage of the catheter into the uterine cavity under visualization. The contours of the uterine cavity can be explored by gentle turning, taking advantage of the curved tip for optimal visualization. Multiple reports have described the portable video hysteroscope to be easy to use and well tolerated by patients while providing excellent evaluation of the uterine cavity and producing high quality images and videos.13,14

SUMMARY
AUB in women aged 40 years and older with any postmenopausal bleeding requires evaluation. The utilization of TV U/S, often needing fluid enhancement (with SIS), has a role but is too often sent for evaluation by imaging specialists. Blind endometrial sampling, which has previously been the mainstay of diagnosis, is only a stopping point when cancer or atypical hyperplasia is found. Office hysteroscopy, previously underutilized, is now increasingly possible because of the introduction of small devices containing disposable camera-holding cannulas. For the many providers who never were able to do office-based, point-of-care hysteroscopy, these small devices now offer the ability to do so. This will have tremendous advantages for patients and providers in terms of cost and time.

REFERENCES