Endometrial Sampling: Analysis of 310 Procedures Performed by Family Physicians

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Endometrial sampling has become an accepted office procedure. Safety and clinical usefulness have been well established but not specifically studied in family practices. To address the safety and clinical usefulness of endometrial sampling, a chart review of 310 endometrial sampling procedures performed by practicing family physicians was undertaken. Cases were identified by billing records and chart auditing to assure complete recording of all procedures performed by study practitioners since the beginning of their practices. A prestudy survey revealed that 26% of rural family physicians and none of the urban family physicians in western New York were doing endometrial sampling. Practitioners were doing an average of 1.2 per month. Of the 310 procedures 14.5% were unsuccessful because of cervical stenosis or inadequate sample. There were no reported complications, and three cases of endometrial carcinoma were discovered. Endometrial sampling is safe and clinically useful when performed by family physicians.

The intrauterine curette was invented in 1843 and shortly thereafter declared too dangerous for practical use.[1] From this dubious beginning, endometrial sampling has become a common office-based procedure with its safety and usefulness well established.[2–4] Outpatient endometrial sampling techniques have been demonstrated to be 92% to 100% sensitive in the diagnosis of endometrial carcinoma.[5–8] This accuracy, combined with evidence that dilation and curettage are not necessarily therapeutic for abnormal vaginal bleeding,[9] has led to greater acceptance of outpatient endometrial sampling. Patients generally find the procedure convenient though moderately uncomfortable.[10,11] Standardization of pathologic descriptions[12] and the confirmation that adenomatous hyperplasia is a precursor of endometrial carcinoma[13] have stimulated the American Cancer Society's interest in endometrial sampling as a potential screening tool in asymptomatic women.[14,15] Though controversy persists, current indications for endometrial sampling may include (1) evaluation of asymptomatic women at high risk for endometrial carcinoma,[16] (2) dysfunctional or irregular uterine bleeding, (3) noncontraceptive hormone therapy, (4) postmenopausal bleeding, (5) infertility, and (6) amenorrhea.[17] Several studies have defined the use and complications of endometrial sampling in gynecologists' offices,[18,19] but no studies of family physicians' practices have been published to date. By establishing comparable standards of success and results, family physicians will be able to evaluate their own experiences and their laboratories.

METHODS

In the spring of 1988, 177 family physicians listed in the Directory of Diplomates of the American Board of Family Practice throughout the eight-county western New York area were contacted by mail and asked whether they performed endometrial sampling. Sixty-two percent (110) responded. Physicians performing endometrial biopsies were then asked to allow a team of one family medicine resident and two medical students to review their records. All physi-

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TABLE 1. PRIMARY INDICATION FOR ENDOMETRIAL SAMPLING BY AGE

Indication	Age (years)				Total
	<39 No. (%)*	40–49 No. (%)	50–59 No. (%)	>60 No. (%)	No. (%)
Irregular menstrual bleeding	56 (70)	74 (90)	5 (6)	0 (0)	135 (43)
Postmenstrual bleeding	0 (0)	11 (10)	48 (62)	31 (69)	90 (29)
Noncontraceptive hormone therapy	0 (0)	14 (13)	19 (24)	10 (22)	43 (14)
Infertility	19 (24)	0 (0)	0 (0)	0 (0)	19 (6)
Other†	5 (6)	8 (7)	6 (8)	4 (9)	23 (7)
Total	80 (100)	107 (100)	78 (100)	45 (100)	310 (100)

** Percentage in age group, rounded*
† Includes abnormal pelvic examination, abnormal Papanicolaou smear, oligomenorrhea, nonspecified

cians doing endometrial sampling consented to participate. Each office was paid $5 per chart to defray office staff expense in locating all procedures performed in that practice. Cases were located by utilizing billing records, computer searches, or manual chart-by-chart search in an attempt to find all endometrial samplings performed by each office.

A total of 310 procedures were performed on patients between the years 1979 and 1988. (These include 37 procedures performed by faculty and residents in a family medicine center serving an urban population; the family physicians at the center, however, are not included in the total of 110 respondents.) Forty procedures were repeat procedures. Once found, each chart was reviewed by the survey team using a data-collection instrument developed by the authors. The instrument standardized the abstraction of demographic data, indications, type of procedures, medications, complications, laboratory results, and follow-up. Interoffice variation in record keeping limited interpretation to data that were universally recorded in all offices.

Some operational definitions were necessary for the analysis of the data. Unless otherwise charted, (1) women up to 50 years of age were considered premenopausal or perimenopausal; (2) women 51 years of age or older were considered menopausal; and (3) the primary indication for endometrial sampling noted in the patient's chart was used as the indication in the analysis even if more than one indication was recorded. The first two assumptions were necessary because some charts lacked a clear documentation of the menstrual history.

Once the data were abstracted from the medical record, they were coded and entered into a personal computer using Dbase III and transferred into Statistical Package for the Social Sciences (SPSSX)[20] for analysis. Univariate description statistics were generated using SPSSX.

RESULTS

Of the 110 western New York family physicians who responded to the preliminary survey, none of the urban or suburban physicians in private practice (63) were performing in-office endometrial sampling; 26% (12 out of 47) of the rural physicians were performing the procedure. Family physicians not doing endometrial sampling referred patients to a gynecologist for the procedure. Reasons for not performing in-office sampling included lack of training, disruption of office routine, and discomfort with managing the problem without referral even after results were known. Several of the study physicians started performing endometrial samplings after 1979. Eighty-five percent of the procedures were performed after 1984. Physicians doing endometrial sampling were performing an average of 1.2 per month (range, 1 to 5 per month). All procedures were performed in ambulatory settings. Vacuum curettage with a disposable flexible plastic curette and tissue trap (Vabra method and others) was used in 88% of the procedures and a rigid metal curette (Novak) was used in 12% of the remaining. Both of these methods are histologic sampling techniques.

Analgesia was used in 40 of the procedures studied. Topical agents such as cocaine were applied to the cervix in 19 procedures to decrease the discomfort of applying the tenaculum. In 17 procedures the patient was given intravenous diazepam, and in 4 procedures a paracervical block was performed. Type of analgesia seemed to be dependent on the practitioner's personal choices and on the patient's preprocedure anxiety. There were no reported complications from analgesia.

The patient population was 91% white. The youngest patient was 17 years and the oldest was 93 years with a

TABLE 2. LABORATORY RESULTS BY INDICATION

Laboratory Results	Irregular Menstrual Uterine Bleeding No. (%)†	Postmenopausal Uterine Bleeding No. (%)	Noncontraceptive Hormone Use No. (%)	Other* No. (%)	Total No. (%)
Proliferative endometrium	54 (42)	31 (38)	17 (46)	20 (5)	104 (36)
Secretory endometrium	41 (32)	7 (9)	7 (10)	22 (52)	77 (26)
Hyperplasia	12 (9)	10 (12)	1 (3)	4 (9)	27 (9)
Adenocarcinoma	2 (15)	1 (1)	0 (0)	0 (0)	3 (1)
Atrophic	2 (15)	11 (13)	1 (3)	5 (12)	19 (7)
Normal tissue	3 (2)	3 (4)	2 (5)	9 (0)	8 (3)
Miscellaneous‡	11 (9)	11 (13)	4 (11)	2 (5)	28 (10)
Inadequate sample	4 (3)	8 (10)	5 (13)	7 (17)	24 (8)
Total	129 (100)	81 (100)	37 (100)	42 (100)	290 (100)

** Includes infertility, not specified, abnormal pelvic examination, etc.*
† Includes endometritis, endometrium with irregular maturation, lower uterine segment, endometrial polyps, nonspecific inflammation, results not recorded
‡ Percent for indication (rounded)

mean age of 47 years. The greatest number of procedures were done for patients in the 40- to 49-year age range (Figure 1). Forty-eight percent of the patients were obese (greater than 170 lb). Obesity may be a predisposing risk for abnormal uterine bleeding.[21]

Table 1 shows a summary of the indications for endometrial sampling used by the physicians performing the procedure. Abnormal uterine bleeding was the most common indication. For patients under the age of 50 years, the most common indication was irregular menstrual bleeding and noncontraceptive hormone therapy. For patients over 50 years old, postmenopausal bleeding became the most common indication and noncontraceptive hormone therapy the second most common.

Table 2 presents laboratory results according to indication. Proliferative endometrium was most common in the irregular menstrual group and the noncontraceptive hormone group. Hyperplasia accounted for 9% of the results with three cases of endometrial cancer identified. It should be noted that women using noncontraceptive hormones had mostly proliferative endometrium, only one case of hyperplasia, no cancer, and 13% inadequate samples. Inadequate samples would be expected to be more common in a postmenopausal woman without vaginal bleeding on low-dose hormone replacement.

Table 3 presents pathology results by age. Hyperplasia occurred most commonly in the 50- to 69-year age group. Cancer cases were distributed widely according to age.

Unsuccessful attempts totaled 21 for an overall rate of 7%. Cervical stenosis accounted for 10 (3.2% of total procedures) of the failures, marked uterine flexion accounted for one failure, and in 10 cases the reason for failure was not documented. In 24 (8%) procedures, even though the cervix was successfully negotiated, an inadequate sample was obtained. Procedures using the rigid metal curette accounted for eight (33%) of the inadequate samples. Inadequate samples occurred in 23% of older patients (Table 3). There were no cases for which pain or anxiety was documented as the reason to discontinue the procedure.

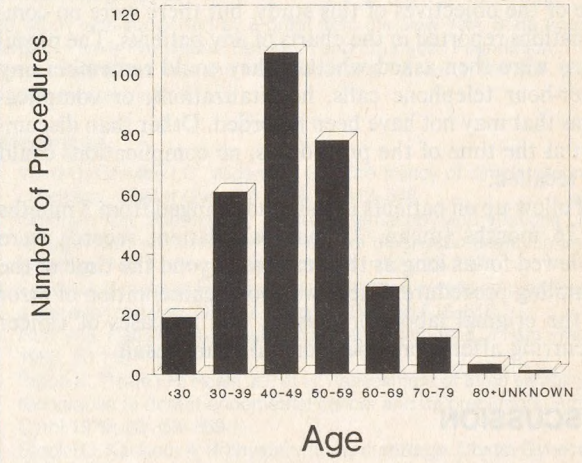

Figure 1. Age distribution of women on whom procedures were performed

TABLE 3. LABORATORY RESULTS BY AGE

Results	Age (years) <39 No. (%)*	40–49 No. (%)	50–59 No. (%)	>60 No. (%)	Total No. (%)
Proliferative endometrium	26 (33)	45 (42)	28 (40)	5 (15)	104 (36)
Secretory endometrium	41 (52)	26 (25)	10 (14)	0 (0)	77 (26)
Hyperplasia	3 (4)	10 (9)	10 (14)	4 (12)	27 (9)
Adenoma carcinoma	0 (0)	2 (2)	1 (1)	0 (0)	3 (1)
Atrophic	1 (1)	5 (5)	6 (8)	7 (21)	19 (7)
Normal tissue	0 (0)	2 (2)	4 (6)	2 (6)	8 (3)
Miscellaneous†	5 (6)	9 (8)	5 (7)	8 (23)	28 (10)
Inadequate sample	3 (4)	7 (7)	6 (8)	8 (23)	24 (8)
Total	79‡ (100)	106‡ (100)	71‡ (100)	34‡ (100)	290‡ (100)

** Percent for ages (rounded)*
† Includes endometritis, endometrium with irregular maturation, lower uterine segment, endometrial polyps, nonspecific inflammation, results not recorded
‡ One procedure resulted in more than one diagnosis; failed attempts are not included

Table 4 displays the distribution of the repeat samples. The indications for repeat sampling were continued noncontraceptive estrogen use (34%), excessive menstrual bleeding (recurrent) (34%), postmenopausal bleeding (recurrent) (18%), inadequate sample (6%), hyperplasia (6%), and cervical stenosis on previous attempt (2%). When the first procedure resulted in an inadequate sample, the second was adequate in the three cases attempted. In one patient with cervical stenosis, a successful attempt was achieved on the second try. In most cases the laboratory results were the same on repeat examination (87%). There was an average of 17.4 months between procedures.

Defining the complications of endometrial sampling was one of the objectives of this study, but there were no complications reported in the charts of any patients. The physicians were then asked whether they could remember any after-hour telephone calls, hospitalizations, or complications that may not have been recorded. Other than discomfort at the time of the procedures, no complications could be recalled.

Follow-up on patients in this study ranged from 3 months to 76 months (mean, 23 months). Patient records were reviewed for as long as they existed beyond the time of the sampling procedure. There was no documentation of error in the original laboratory results and no cases of cancer occurring after a previous nonmalignant result.

DISCUSSION

Limitations to the interpretation of this study include the retrospective chart review format. Even though billing records and a chart-by-chart review of all charts in an office were used to find cases for this study, it is possible some procedures were missed. Because physician participation was voluntary, one would expect the more open, confident physician would be more likely to participate. Fortunately all physicians in this study area who reported performing endometrial sampling agreed to participate. Although the study was regional, limited to western New York, it is likely that results can be generalized. It is also possible that patient follow-up was more limited with the dissatisfied patient, thus decreasing the report of complications or errors in pathology reports. This study presents descriptive information on the experience family physicians are having with endometrial sampling in multiple centers.

It appears that the physicians in this study are using the indications of irregular menstrual bleeding, postmenopausal bleeding, and noncontraceptive hormone therapy in about the same ratio reported in the gynecologic literature.[18,19,22] The literature would predict the incidence of adenocarcinoma to be between 0.7% and 2.4%.[23,24] This study revealed an incidence of 1%, although the patients were somewhat younger than those reported in the other large series.[18,19] There was a higher incidence of proliferative, secretory, or "normal" endometrium than found in other studies, which suggests a more normal patient population or a lower threshold for performing endometrial sampling. The frequency of failed attempts because of inadequate sample (8%) is a concern. In a large percentage of these inadequate procedures, a rigid metal curette was used instead of a flexible plastic curette. Others have reported inadequate samples in 7% of procedures.[24] Inade-

quate samples from patients with persistent risk factors or symptoms generally were referred to gynecologists for further workup including dilation and curettage or hysteroscopy. The incidence of inability to negotiate a stenotic cervix reflects appropriate caution to avoid pain or further complications on the part of family physicians. The frequency of cervical stenosis (3%) is within the experience of others, who have reported rates of 5%.[17,25] For the most part, study physicians referred these patients to a gynecologist for further workup.

Complications reported in the literature include uterine perforation, prolonged or profuse bleeding, infection, syncope, and sensitivity to analgesic medication.[4] For most, however, the pain subsides in a few minutes after the procedure. Virtually all studies reviewed by the authors reported either no complications or an incidence of less than 1% when using a flexible pipette.[14,15] In spite of aggressive chart review and practitioner inquiry, no complications were discovered in this series. No doubt this indicates thoughtful patient selection and caution while performing procedures.

Many different pathologists were used by the study physicians. There was no attempt to standardize pathologists' interpretations, and in some offices some clustering of certain descriptive pathology terminology was noted. Reliable pathologist's interpretation is critical to endometrial sampling. A previously reported study reviewed the material from 100 consecutive endometrial slides and demonstrated that pathologists tended to err on the side of a more malignant diagnosis than did the reviewer.[12] It is important for all physicians performing endometrial sampling to be assured of the pathologist's skill at interpretation.

CONCLUSIONS

This study demonstrates that family physicians can find office endometrial sampling a safe procedure that yields significant diagnostic information. It is convenient for both physician and patient. It avoids the risk of general anesthesia as well as the logistical problems of reserving the surgical suite for a dilation and curettage. Endometrial sampling in the office allows a diagnostic test to be done at the time of patient presentation, with immediate treatment following, a reassuring sequence for a patient with abnormal uterine bleeding.

Failure to obtain an adequate sample, discovery of atypical cells, hyperplasia, or persistence of abnormal uterine bleeding are indications for dilation and curettage or gynecologic referral. Readers desiring more details on techniques are referred to articles by Hurt and Hall,[4] Jaber,[15] and Brown and Kammeyer.[16] Insurance renumeration for endometrial sampling is generally reasonable but not excessive. Motivation for including it in a family practice should be directed to the goal of enhanced patient care. Many of the physicians in the original survey have found it convenient to refer women for endometrial sampling. This study does not examine whether patient outcomes are compromised by the need for referral.

TABLE 4. REPEAT ENDOMETRIAL SAMPLING: NUMBER OF PROCEDURES PERFORMED ON PATIENTS (N=40) WHO HAD REPEAT PROCEDURES

Number of Procedures	Number of Patients
2	29
3	10
4	1

This case review adds to the growing literature that shows outpatient endometrial sampling using a flexible curette is well tolerated by most patients and carries a very low incidence of complications. It is an accurate screening tool for endometrial carcinoma and useful in the follow-up and treatment of abnormal uterine bleeding, though specifics of its role will need to be defined by further studies. Yields are similar for family physicians and gynecologists. Given the utility, safety, and diagnostic potential for endometrial sampling, the procedure should be an important part of the family medicine residency curriculum. That only 11% of responding family physicians presently perform endometrial sampling suggests that continuing education programs to aid the practicing physician in gaining this skill are needed.

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Commentary

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In the preceding paper Rosenthal and his colleagues provide a useful description of the use of endometrial biopsy techniques by family physicians in their offices in western New York State. While we agree that the technique of endometrial biopsy is well within the expertise of the family physician and that its diagnostic effectiveness compares favorably with other methods of endometrial sampling, including dilation and curettage, we believe that the many unanswered questions about the management of disorders of the endometrium should temper the enthusiasm with which this procedure is embraced and promulgated. Further, we think that the above article raises some basic questions about the cost, value, implications, and effect of screening and diagnostic procedures currently being promoted for primary care practice.

One is struck by the fact that only 11% of the practitioners surveyed in western New York State reported using this technique. Clearly, lack of expertise in this simple and widely prescribed procedure is neither the only, nor likely the principal, reason that its use is not more widespread. We would interpret this finding as evidence that most family physicians have found that including this procedure in their practices does not add materially to the quality of the care their patients receive. It seems safe to assume that practical wisdom, which might not always be reflected in the research and academic literature, to some extent determines the practice of family physicians. This is not an absolute judgment, and to embrace it unreflectively would result in supporting the status quo. Still, it seems that practical considerations are either unmentioned or summarily discounted in most research work and should not be so treated in the family practice literature. Whether no procedures or 1.2 per month during the study period is appropriate cannot be discerned from either the study data presented or the literature relevant to the procedure. A report of the variation in frequency with which physicians performed this procedure would have been a useful addition to this study.

Indications for Endometrial Biopsy

To determine the appropriateness of this procedure, indications must be established. Such factors as prevalence and significance of the conditions that might be diagnosed (described in the Canadian Task Force Report[1] as the "burden of suffering" imposed by the condition), the sensitivity and specificity of the test proposed, the utility of early diagnosis, and the place of the procedure in the evaluation of abnormal findings must be considered in developing indications.

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The use of endometrial biopsy as a universal screening test for endometrial cancer in menopausal women has been considered but has not been embraced by the American Cancer Society, the Canadian Task Force, or Frame.[3] The prevalence of symptomatic vaginal bleeding early in the course of the disease, the relatively low yield and high cost for such a screening test, and the high cure rate of endometrial cancer if treated when detected at the time symptoms develop all result in the recommendation that women be taught to report abnormal vaginal bleeding as the only screening intervention for this disease.

Irregular menstrual bleeding in women over the age of 35 years is extremely common; few women experience menopause as regular menstrual cycles followed by complete cessation of bleeding. Embracing the use of endometrial biopsy for irregular menstrual or perimenopausal bleeding could result in universal screening. Again, practical wisdom on the part of practitioners must have long played a role in guiding women to appropriate care during this physiologic transition. Still, clear criteria for sampling must be established and tested before this procedure can be evaluated for such an indication.

Endometrial hyperplasia and cancer in women who take estrogen after menopause are problems that have been intensively researched over the past decade. An increasing body of literature[3–6] suggests that progesterone administration may eliminate adenomatous hyperplasia and that the addition of progesterone to an estrogen-replacement regimen may remove from high-risk status those women receiving estrogen therapy, thus eliminating the need for special monitoring. In this case, an ounce of progesterone may be worth a pound of curettage.

Endometrial Biopsy in the Evaluation of Abnormal Bleeding

Consideration of this procedure for general or focused screening raises one series of questions; adopting endometrial biopsy as a diagnostic office procedure in cases of abnormal signs and symptoms raises others. In the 60-year-old woman, bleeding 10 years after menopause, there is little doubt that histologic evaluation of the endometrium is needed and that outpatient endometrial biopsy most often provides adequate diagnostic information more safely and conveniently and at a much lower cost than the traditional dilation and curettage. With more than 90% of such biopsies likely to be negative,[7] application of this procedure by the family physician within the context of an appropriate continuing evaluation protocol could decrease the rate of referral for this problem.

Other issues need to be considered, however, before advocating that this procedure be performed widely for postmenopausal bleeding by family physicians. From the findings of Rosenthal and colleagues, we estimate that each practitioner would average three biopsies per year for this indication. Presumably the majority of physicians surveyed feel that referral is preferable. Local standards of care and the level of communication between the family physician and the gynecologic consultant must likewise influence decisions with regard to the care of patients requiring endometrial sampling for postmenopausal bleeding.

Procedures in Family Practice

We have outlined above the areas to be addressed before the procedure of endometrial biopsy should be endorsed. Clearly, the rational consideration of the value of a procedure in the course of the primary care of patients should be the paramount concern when adopting a clinical protocol or policy. The proliferation of diagnostic and therapeutic modalities that might be applied in the family physician's office make this analysis increasingly important.

Flexible sigmoidoscopy, colposcopy, mammography, Holter monitoring, and obstetric ultrasound are highly remunerative procedures that can be offered or franchised through the family physician's office. These procedures are aggressively promoted by instrument manufacturers and providers of interpretation. Furthermore, patients consider these procedures to be important, and rarely is insurance reimbursement a problem, making the purchase of the instruments financially appealing.

We should squarely face the question of whether and why we should be influenced by such issues as rational and efficient provision of health care while many of our colleagues in both primary care and the subspecialties profit financially through the wholesale application of these procedures and while these procedures are adopted as standards of practice, either overtly or de facto, without consideration of their real value to the patient. Perhaps more clearly than any other single issue, decisions about the application of these sorts of procedures illuminate the dilemma that places into opposition optimal personal health care and rational health policy.

As a parallel, current trends in the evaluation and management of pathology of the uterine cervix illustrate even more clearly how this dilemma is approached in contemporary American medicine. Cervical colposcopy is increasingly recommended for the immediate evaluation of any abnormalities found on the Papanicolaou smear. (One particularly unreflective suggestion was that colposcopy might be appropriate for universal screening as an adjunct to the Papanicolaou smear.[8]) Biopsies of any questionable areas follow. In the absence of invasive cervical cancer, treatment by electrocautery, cryocautery, and, increasingly, laser cautery is performed. A program of frequent

Papanicolaou smear testing and colposcopy follows this initial diagnostic evaluation. An aggressive and similar approach to human papilloma virus or condyloma—problems of uncertain significance and doubtful treatability[10]—is increasingly described.

On the one hand, invasive cervical cancer could be eliminated in women who underwent such intensive screening. On the other hand, widespread application would be enormously expensive, and dependence on colposcopy and laser cautery would remove from the family physician the evaluation and treatment of the even minimally abnormal Papanicolaou smear (if not the screening itself) to the specialist, who is supported by this more expensive technology. Poor women already bear a disproportionate "burden of suffering" from genital cancers in the form of a higher incidence and mortality[10,11] and lower curability.[12] Adopting such an aggressive program would make invasive cervical cancer even more a disease of the poor, uneducated, and unscreened—an accentuation of perhaps the greatest injustice in the contemporary practice of medicine. It is possible, even likely, that increasing the intensity of screening by adding colposcopy would decrease availability of resources in needier areas, where simpler and less expensive health monitoring could result in improved community health.

How should these issues affect the family physician in a middle class or affluent area as he or she decides upon indications for endometrial biopsy, whether to perform sigmoidoscopic examinations on all patients, whether to buy a colposcope or an interest in a laser cautery device? Increasingly the response seems to be that adopting these procedures is accepted practice, good patient care, and good business. More rational and less extensive care is rejected by specialty colleagues and increasingly by patients, who are "informed" by the press and direct advertising as to what care they should get.

We offer no solution to this dilemma other than the belief that the specialty most interested in the comprehensive and continuing primary care of all patients has a responsibility to monitor these issues, to bear witness to appropriate and just applications of technology, and to provide guidance to society in the most effective use of limited medical resources.

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