

Training In Obstetric Sonography In Family Medicine Residency Programs: Results Of A Nationwide Survey And Suggestions For A Teaching Strategy

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Background: Obstetric sonography is a valuable diagnostic procedure for family physicians who provide obstetrics; however, physicians tend to use technology that was effectively modeled during residency. The purpose of this study was to learn how many family medicine residency program directors had an interest in and a need for training in obstetric sonography, as well as whether they were willing to commit faculty and finances for adding the technology to their programs.

Methods: All program directors listed in the 1989 American Academy of Family Physicians (AAFP) *Directory of Family Practice Residency Programs* (n = 379) received a five-item questionnaire about obstetric services and use of sonograms in their programs and their desire for training in obstetric sonography.

Results: More than 81 percent of respondents said their programs provided obstetrics. Sixty-eight percent of these respondents used sonograms, and 53 percent indicated a need for training in obstetric sonography. Forty-five percent of all respondents, regardless of whether their programs offered obstetrics, indicated a desire for training.

Conclusions: The high level of interest in obstetric sonography can be explained, in part, by the 81 percent of respondents whose programs provided obstetrics. These figures suggest a need to establish a training curriculum in obstetric sonography for family medicine residency programs. Our training program, designed to reach faculty, residents, and practicing physicians, is described. (*J Am Board Fam Pract* 1994; 7:124-9.)

Obstetric sonography is considered an important technological development in modern obstetric care.¹ The ability to see sonographically into the world of the unborn child has changed the fetus from an anxiously awaited stranger to a familiar person whose well-being can be assessed and whose interests can be safeguarded. Most of the major assessments and interventions of modern perinatal care have been made possible by obstetric sonography.

In 1984 the National Institutes of Health Consensus Development Conference² established 28 specific indications for selective sonographic examinations during pregnancy. Since then, technological advances have improved resolution, the equip-

ment has become less expensive, and software improvements have made it easier to use. Findings from ultrasonic scanning, however, do not always improve patient outcomes, particularly in cases of low-risk pregnancy. The prudent physician will take a critical approach to using the technology. A study reported at the 1993 meeting of the Society of Teachers of Family Medicine concluded that sonograms in low-risk pregnancies are unnecessary and only increase costs.³

Other studies have suggested that routine scanning might have five potential benefits⁴⁻⁶: (1) earlier diagnosis of multiple pregnancy, (2) decreased use of induction of labor for pregnancies inaccurately dated by clinical criteria alone, (3) earlier diagnosis of intrauterine growth retardation (IUGR), (4) earlier recognition of certain fetal anomalies, and (5) diagnosis of placenta previa before the occurrence of bleeding. Controlled studies and clinical experience, however, have failed to demonstrate these benefits consistently in routine scanning. First, earlier diagnosis of multiple pregnancies does not

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always improve clinical outcome.⁷ Second, only one study resulted in decreased induction of labor in a routinely scanned group⁸; two studies did not.^{7,9} Third, diagnosing IUGR requires multiple scans comparing growth with an expected rate; one routine scan might suggest but cannot confirm this diagnosis. Fourth, even though routine scanning might detect some fetal anomalies at an earlier stage of gestation, researchers showing reduced perinatal mortality in the scanned group acknowledged that this improvement was the result of therapeutic abortion of defective fetuses (which then never reached the age at which they were counted as perinatal mortalities) rather than the result of some therapy.^{9,10} In addition, a large number of anomalies are still not discovered by routine scans.^{11,12} Fifth, although routine scanning might uncover placenta previa before onset of bleeding, most cases of placenta previa found early in pregnancy resolve spontaneously.¹³ Finding the placenta previa earlier in the pregnancy could create unnecessary concern in both patient and physician and add the expense of more follow-up scans. For these reasons, routine scanning of low-risk patients is not recommended.^{3,14-17} Physicians can decide whether a sonogram, given the benefits and the costs, is warranted for individual patients.

Clinicians who provide perinatal care, including family physicians, might recognize the advantages of doing their own scanning rather than sending patients to a diagnostic imaging center. An obstetric sonogram provides data often needed on an urgent basis, such as placental localization, fetal position, and fetal biometry to resolve size-date discrepancies. Scanning also provides information needed on an emergent basis, such as early fetal viability, ectopic pregnancy, and the evaluation of vaginal bleeding.^{18,19} New technological applications, such as placental and umbilical blood flow assessment by Doppler ultrasonic scanning, allow the physician to detect fetal compromise.²⁰ In addition to providing the physician with important physical information, scanning can strengthen the physician-patient relationship and give the physician an optimal time to encourage positive health attitudes and behaviors.²¹ Physicians who do their own scanning can enhance parent-to-child bonding by verbally describing sonographic findings, albeit some researchers would discredit using the technology for this rea-

son alone.³ Furthermore, the patient's access to services and centralization of care can be improved.²² Finally, in-house obstetric sonography is a cost-effective means of providing patient care.²³

Obstetric sonography fails to affect patient care in many areas of the country where patients do not have access to a physician who offers the service. Rural areas in particular face an increasing shortage of obstetricians and obstetric care providers.²⁴⁻²⁷ Obstetricians often find that their ability to sustain a medical practice restricted to a specific patient population is limited in rural areas. Family physicians can meet the need for comprehensive perinatal care, because they can offer obstetric services as one part of a more diverse medical practice. By definition, the specialty of family medicine is founded on the premise of continuity of care for a varied patient population. In Tennessee, 45 of the 95 counties in the state are served by a family physician but no obstetrician; 33 of these counties are federally designated Health Professional Shortage Areas. Consequently, counties such as these have a recognized need for family physicians to offer obstetric care.^{28,29}

Family physicians who include obstetrics in their practice attribute their involvement to positive role models³⁰ and adequate training.^{31,32} Residents need family physician role models who provide patients with comprehensive obstetric care, including such technological procedures as obstetric sonography.³³ Furthermore, family medicine residency programs are required by the American Council on Graduate Medical Education (ACGME)³⁴ to offer residents the preparation to provide obstetric care upon graduation.

Given the need for obstetric services in family medicine and the ability of sonograms to provide information on important clinical questions, residency programs can enhance their graduates' ability to provide comprehensive perinatal care by offering training in obstetric sonography. In reviewing the medical literature, we found no published reports addressing the frequency with which family medicine residency programs offer obstetric sonography or the reasons programs do or do not offer it. The purpose of our study was to find out how many family medicine residency program directors have an interest in and a need for training in obstetric sonography and their willingness to commit faculty and finances for

adding the technology to their programs. This report also describes a strategy for training residents, faculty, and community-based physicians in obstetric sonography.

Methods

A five-item questionnaire was mailed to all residency program directors ($n = 379$) listed in the 1989 American Academy of Family Physicians (AAFP) *Directory of Family Practice Residency Programs*.³⁵ Questions covered provision of obstetric services and the need for training in obstetric sonography in the residency program, as well as a potential commitment of faculty time necessary for the training and the financial resources required to purchase sonography equipment. Responses to all questions were dichotomous (i.e., yes or no).

Results

The overall response rate was 87 percent ($n = 329$), but rates of return differed by geographic region. The East, the region of the country with the highest concentration of residency programs, had the highest response rate (93 percent).

More than 81 percent ($n = 269$) of respondents said their programs provided obstetric services. Of these 269 programs, 184 (68.4 percent) directors indicated that they used sonography in their obstetrics practices, and 143 (53.2 percent) indicated a desire for training in obstetric sonography. While differences between regions in provision of obstetric services were small, the desire for training in sonography ranged widely from 29.3 percent in the East to 75.0 percent in the Northwest (Table 1). In addition to the 143 programs that offered obstetrics and whose directors expressed an interest in sonography training, six other program directors were still interested in the training even though they did not offer obstetric services. Of the 149 program directors with an interest in training, 129 (86.6 percent) were willing to commit faculty to a week-long training course, 130 (87.2 percent) were willing to use sonography on a regular basis in their residency practices, and 81 (54.4 percent) were willing to consider purchasing \$20,000 to \$30,000 sonographic equipment. Seventy-eight respondents indicated a willingness to make all three commitments; 124 respondents could commit to all but the purchase of equipment.

Table 1. Regional Variations in the Number of Responding Family Medicine Residency Programs That Offer Obstetrics Services or Want Training in Obstetric Sonography.

Geographic Region	Programs Responding	Offer Obstetrics	Want Training
	Number (%)	Number (%)	Number (%)
Northwest	8 (2.4)	7 (87.5)	6 (75.0)
West	40 (12.2)	34 (85.0)	21 (52.5)
Midwest	86 (26.1)	77 (89.5)	45 (52.3)
South	79 (24.0)	68 (86.1)	43 (54.4)
East	116 (35.2)	83 (71.6)	34 (29.3)
Total	329 (100.0)	269 (81.8)	149 (45.2)

Conclusions

Forty-five percent ($n = 149$) of the respondents were interested in receiving training in obstetric sonography. That 81 percent of the programs provide obstetric care explains, in part, the high level of interest in obstetric sonography. These figures also suggest a need to establish a curriculum in sonography training for family medicine residency programs. Interpreting the results was impeded by the ambiguous wording of one question, "Do you use ultrasound in your obstetric practice?" This question did not allow us to define the circumstances under which the respondent's program actually performs obstetric sonograms.

More than 43 percent of all respondents (and more than 63 percent of the respondents specifically interested in training) indicated a willingness to commit finances toward purchasing equipment. Residency programs, however, along with other sectors of the health care system, have encountered financial barriers that make purchasing expensive equipment prohibitive. Fortunately, training in obstetric sonography does not require the program to own a scanner, because many vendors will lease or rent such equipment. The survey did not distinguish what level of access residency programs had to obstetric sonography equipment. The most efficient use of time and money would seem to require consistent access to equipment located on the premises of or in close proximity to the residency facility.

Almost 90 percent of respondents interested in training were willing to commit faculty to a week-long workshop. Although this finding might appear irrelevant to the practicing physician who

has finished graduate education, we believe that increasing the number of teaching faculty in residency centers who are trained in obstetric sonography will increase the number of practicing physicians who can offer sonograms to patients. Residency program faculty are in an optimal position not only to teach but also to model comprehensive family medicine.^{30,36} Furthermore, as faculty learn obstetric sonography or other technological procedures, they are able to pass these skills along to other faculty, residents, and practicing physicians in ever-widening circles of influence. In our program, we routinely invite our volunteer preceptors to participate in skill-oriented workshops that teach procedures such as sonography.

Discussion

As a result of this study, we developed a course in obstetric sonography, training approximately 170 family physicians from across the country. These physicians have come from residency programs and private practice. Faculty in our own department also continue to learn and to perfect their skills so that they will be able to train residents on procedural techniques.^{21,22,33,37} Our training model incorporates both didactic education (reading assignments, lectures, and video tapes) and modeling (hands-on workshops and scanning). Several other models for training in sonography in a residency program have been used.^{1,21,22,37} These models ranged from a combination of lectures followed by supervised scanning to supervised scanning alone. Although no absolute training standard exists for competency in ultrasonic techniques, several recommendations have been made. The earliest program supervised trainees for approximately 80 scans.²³ A later report found that residents developed competency after about 50 scans.³⁸ Each of these training programs judged competence on an individual basis. Guidelines developed in 1993 by a task force from the American Institute of Ultrasound in Medicine (AIUM), the American College of Obstetricians and Gynecologists (ACOG), and the American College of Radiology suggest that a physician participate in evaluating and interpreting at least 200 diagnostic examinations within a 3-year period under the supervision of a qualified physician.³⁹ The great number of scans required to be judged competent in sonography,

however, is controversial. The task force guidelines were not supported by outcome and performance studies; the studies conducted by family physicians did include outcome and performance measures.^{1,22,37,38} For us, the end measure of success is that the learner is able to perform fetal biometry and anatomic surveys comparable with those of an experienced examiner.

We have designated two levels of skill acquisition in obstetric sonography. The basic level is taught to all faculty, residents, and medical students. These skills consist of being able to describe fetal presentation and fetal number, as well as to assess the condition of the amniotic fluid, all of which are useful in the office and in the hospital labor-and-delivery unit. Instruction in these skills takes place in a single half-day workshop consisting of lectures and supervised scanning or during one-on-one teaching in the office or hospital labor-and-delivery unit.⁴⁰ The advanced level of skill acquisition is targeted toward faculty, fellows, selected residents, and community-based physicians. This level of skill consists of performing standard sonographic examinations as described by AIUM⁴¹ and ACOG.⁴² Training for this skill level consists of a 4-day course, followed by continual quality assurance overview by experienced faculty until competence is reached. This course is taught annually in our residency facility and is composed of about one-half didactic lectures and one-half closely supervised hands-on scanning. Faculty oversee those learning the skills on an ongoing basis with gradually increased independence and decreased supervision.

Our research left us with several unanswered concerns. First, family medicine residency programs are required by the ACGME³⁴ to prepare residents to provide obstetrics upon graduation, but almost 19 percent of responding residency directors indicated that their programs do not offer obstetric services. How do residents in these programs receive training in obstetric care; who are their role models for their obstetric training, and what long-term consequences does this type of training have on their future practices?

Second, we believe that small-group workshops, which combine lectures and hands-on training for residency program faculty, are the most effective means for adding obstetric sonography (and other technological procedures) to family practice. Faculty who acquire new skills

are in the best position to pass these skills on to other physicians. Faculty from our department have presented several such workshops in conjunction with AAFP, with Advanced Life Support Obstetrics meetings, and in our own residency facilities.

Finally, our concern is not to add another procedure to family practice simply for technology's sake. Sonography can be an important part of a family physician's obstetrics practice. Family physicians can offer obstetrics as part of a comprehensive practice, especially in those areas where obstetricians and other providers of obstetric care are in short supply. In these areas a family physician who offers obstetrics, including sonography, can improve access to care and thereby improve patient outcomes.

Family medicine residency programs can provide graduates with training that will then enable them to choose the services, such as obstetrics, they will offer upon graduation. Family physicians who choose to include obstetrics in their practices can offer more comprehensive services if they have opportunities to learn sonography. The increasing use of sonograms in obstetrics and the need for obstetric care from family physicians combine to make obstetric sonography training in family medicine residency programs an important part of the curriculum. Residency programs are an appropriate place to offer not only training in sonography to residents, but also continuing education in this procedure to physicians in practice.

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