# Enhancing the Family Medicine Curriculum in Deliveries and Emergency Medicine as a Way of Developing a Rural Teaching Site

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Background: *The urban family practice residencies of Memphis were not providing sufficient training or encouragement to young physicians for practice in rural communities.* Methods: *In 1990, the Department of Family Medicine, in partnership with the State of Tennessee Health Access Act and the Baptist Health Care System, developed a teaching practice in a rural county of western Tennessee. The family practice curriculum included special skills in advanced women's health care and emergency medicine so that uniformly trained physicians could provide around-the-clock coverage in the hospital, including the delivery of babies and first-hour emergency care.* Results: *After 7 years, the group now includes six full-time, board-certified, OB-capable family physicians. In addition, faculty members from the department's urban program in Memphis are required to contribute a "mini locum tenens" of 2–3 days of rural coverage per month. Since 1992, the practice has provided care for more than 54,000 continuity office visits, 81,000 emergency department visits, more than 3,500 hospital admissions, and 621 obstetrical deliveries. Since 1994, residents have been assigned to the site full time, with growth to 12 (4-4-4) residents assigned to this location as of 1997. Several graduates from the initial group of residents have remained in the community after graduation, and three others have established practices in rural areas. Most recently, control of the practice is being transferred from the family medicine department to the university's corporate group practice. This may result in fundamental changes in the practice's operation.* Conclusions: *The approach described in this report may be useful for the expansion of urban departments of family medicine into rural and underserved communities.*

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There is a shortage of physicians in many rural areas of the United States. Nationally, two thirds of all counties (approximately 2,500) are designated as Physician Shortage Areas (PSAs).[1] In these PSAs, about 30,000 physicians serve a population of 43,700,000. Underserved rural areas are not the first-choice practice sites of most medical students and residents. It was reported in 1990 that fewer than 1.5% of graduating physicians planned to practice in rural areas. A further contribution to the shortage of rural physicians is the fact that 25% of the physicians in rural practice are at or near retirement age.[2]

In addition to an absolute shortage of physicians, rural communities find it more difficult to retain physicians once they have been recruited.[3] National Health Service Corps (NHSC) physicians frequently leave underserved practice sites once they have paid back their NHSC scholarship obligation.[4,5] Obstetrical care is a particular problem, since obstetricians tend not to practice long-term in rural underserved areas.[6] Verby suggests that recruitment and retention of physicians into rural underserved areas could be assisted by structured educational programs.[7,8]

Problems with physician recruitment and retention also occur in rural areas of our state, Tennessee. While the US physician-to-population ratio approaches 1:300, the 10 west Tennessee counties designated as

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PSAs have a ratio well over 1:3,000.[9] Forty-one percent of the state's counties are listed as PSAs, and 30% of the state's population is served by only about 10% of the state's physicians. Most of these physicians are family physicians.[9] Seventy-six percent of Tennessee's PSAs are also designated as obstetric shortage areas. In 36 of 95 counties, no physicians are providing maternity care.[9,10]

In response to the maldistribution of physicians in our state, the University of Tennessee (UT) Department of Family Medicine established a rural demonstration program that emphasized comprehensive family practice. This comprehensive family practice program included traditional hospital care, as well as the care of children, the delivery of babies, urgent care, mental health care, and full-time responsibility for the rural emergency medicine department.[11,12] While continuing to emphasize continuity of care, this family practice program also incorporated a variety of procedural skills such as diagnostic prenatal ultrasound, colposcopy, gastrointestinal endoscopy, and advanced training in labor and delivery skills.[13-18]

In this paper, we report the process by which our urban department of family medicine dramatically expanded its clinical activities to serve a rural community. Although other studies have described decreases in infant mortality or comparisons between family physicians and obstetricians,[19-21] we studied the growth of a teaching practice and the development of services within it.[22]

## Setting

A rural county location, Baptist Memorial Hospital-Tipton County (BMH-T), was chosen as the initial demonstration practice. The practice site is located in an agricultural county of 458 square miles, 85% of which is devoted to farming and livestock, with a population of 60,000. There are 25 industries employing almost 2,000 people. Community hospital statistics from 1990 indicated that there were about 3,000 hospital admissions, 10,000 outpatient visits, and 11,000 emergency visits annually. Due to a shortage of continuity providers, the majority of primary care practice was acute. Urgent and episodic emergency care was provided by a variety of physicians in the hospital and emergency department (ED). Before developing this program, active medical staff at BMH-T consisted of 18 physicians: four family physicians, four internists, three surgeons, and one physician in each of the following specialties: OB-GYN, pediatrics, orthopedics, urology, ophthalmology, otolaryngology, and anesthesiology.

Prior to the initiation of the project, only one family physician in the community was residency trained in family practice, and none were delivering babies. The one obstetrician in town had stopped delivering babies except for previous patients. Part-time subspecialty support was available from Memphis, located 37 miles away, and required most patients to travel to the city for care. A pathologist was available part-time. A radiological group provided on-site interpretative services at the location Monday through Friday in the mornings. Backup interpretative services were available on call during the evenings. A certified nurse anesthetist and approximately 10 dentists, five optometrists, and a visiting podiatrist were also available. Two nursing homes existed in the community and consisted of 200 non-skilled nursing beds and 50 skilled nursing beds.

## Program Development

The department's long-range plan was to establish a rural teaching practice where family physicians could provide and teach comprehensive health care. Family physicians at the site were to share call responsibility; cover the ED; offer maternal/fetal medical care; perform procedures including diagnostic OB ultrasound, colonoscopy, colposcopy, and minor office surgery; and teach students, residents, fellows, and peers. A requisite of the plan was support from the sponsoring hospital in granting privileges to family physicians for critical care, maternity care, nursery, and outpatient surgery. For qualified faculty, these services would include emergency C-section, tubal ligation, gastrointestinal endoscopy, uterine dilation and curettage, and other procedures as needed in the community.

The departmental plan consisted of seven phases over 5 years: 1) recruiting recent family practice graduates, 2) staffing the ED, 3) establishing residency rotations, 4) establishing a rural family/emergency medicine practice, 5) establishing an accredited rural residency satellite teaching program as a satellite to the urban program, 6) hiring a full-time program director, and 7) recruiting four residents each year for a total residency complement of 12.

## Phase I

Phase I was initiated in September 1990 (Table 1) with the recruitment of two UT-Baptist family practice residency graduates to BMH-T via the 1989 State of Tennessee Health Access Act.

In exchange for a 2-year commitment, the state program provided $50,000 in loan forgiveness and $25,000 in practice management support for each of the two physicians. When the state subsidies for rural practice ran out in 1992, the two recruited family physicians transferred their practice activities to an urban hospital. At that point, the physicians discontinued performing deliveries and no longer admitted patients to the hospital.

Table 1

Phases of Development for Rural Demonstration Site

| *Phase—Initiation Date* | *Plans/Requirements* | *Results* |
|---|---|---|
| Phase I—September 1990 | Recruit two family practice graduates into private practice. | Two residents from the urban family practice program were recruited and granted clinical faculty appointments; Memphis residents rotated to office site. |
| Phase II—August 1991 | Staff the ED. | Recruited family practice staff full time and part time for ED coverage. Residents rotated in ED. |
| Phase III—1992–1993 | Establish residency rotations. | Private family physicians departed. Rotating residents assigned to site via the ED. |
| Phase IV—1993–1994 | Establish combined family/ emergency medicine practice. | Established UT office and teaching practice. Revised hospital privileging document. |
| Phase V—September 1994 | Establish an accredited rural satellite residency practice. | Gained RRC approval. Assigned full-time residents, recruited OB-capable family physicians, expanded office. Established full academic calendar and student rotations on-site. |
| Phase VI—June 1995 | Recruit and develop a full-time program director; construct a 10,000 sq ft family practice center. | A full-time program director starts. Developed C-section capabilities by family physician faculty. Established basic rotations onsite. Built a freestanding center. |
| Phase VII—July 1997 | Complete target goals of 12 residents in a new facility. | Achieved critical mass of six family physician faculty with advanced clinical skills; graduated rural physicians. |

ED—emergency department
UT—University of Tennessee, Memphis
RRC—Residency Review Committee

**Phase II**

Phase II was initiated in August 1991 via the staffing of the BMH-T ED by family medicine faculty and residents. During the average 24-hour period, there were approximately five medical/surgical admissions, typically including at least one trauma case. Approximately 50% of trauma cases were transported to various urban hospitals by ambulance or helicopter, but, overall, fewer than 5% of all patients were transferred to the metropolitan hospitals.

Although radiological services were available on call 24 hours daily, prior to Phase I, on-site interpretation skills by physicians were variable. Much of the ED coverage had been done previously by a corporation that provided licensed physicians with variable training. Few of those physicians had any long-term commitment to rural primary care. Ultrasound services were difficult to obtain. None of the previous covering physicians were capable of performing ultrasound, and most deliveries were referred directly to Memphis, thereby bypassing the community. All family medicine faculty and residents were provided with upgraded skills in X ray interpretation and ultrasound imaging for common ED problems.[23,24]

Initially, emergency coverage was provided by one full-time UT faculty member qualified in family medicine and emergency medicine. The remainder of the coverage was provided by UT family medicine faculty who rotated on a regular basis. Selected moonlighting senior residents also provided some of the weekend and holiday coverage as needed. Residents could provide this coverage only if they had a valid Tennessee medical license, had malpractice insurance as required by hospital bylaws, and were judged by department faculty to have requisite clinical skills. In addition, the department provided special skills sessions for these faculty and residents. Skills sessions included, but were not limited to, training for basic fracture management, X ray interpretation, EKG interpretation, advanced cardiac life support, advanced trauma life support, and diagnostic OB-GYN ultrasound technique. All physicians received additional structured workshops in casting, splinting, suturing, wound management, and arterial blood gas interpretation. This training was combined with the regular curriculum of the urban residency training program.

The ED coverage contract provided more than $650,000 (initial rate was $75/hour) per year to support the educational program and provide emergency services in rural Tipton county. As of 1997, this rate had increased to $788,400 ($90/hour).

**Phase III**

Phase III, the most important part of the plan, was initiated in 1992 with the assignment of the first resident rotation to the site now known as the UT/Baptist-Tipton Teaching Practice. Initially, medical students and residents were assigned to the rural dem-

onstration site for structured emergency medicine rotations. Students praised the variety of clinical material, which included shock, trauma, cardiac, pediatric, maternal, psychiatric, and routine general medical care. All faculty in the ED were residency-trained, board-certified family physicians. There was a positive difference in evaluations when compared with the previous ED rotations in urban Memphis.

At the medical center in Memphis, emergency medicine rotations had been compartmentalized according to traditional specialties. The internal medicine department ran the urban ED for non-pregnant adults. The obstetrics department handled all pregnancy-related and gynecological emergencies. Pediatric emergencies were routinely sent to the children's hospital. The department of surgery handled all trauma, and behavioral disorders were triaged to the psychiatric center.

In contrast, emergency care rotation at BMH-T provided an integrated educational experience involving both ED and in-hospital emergencies. Trainees dealt with a variety of emergencies, ranging from trauma to childbirth and acute medical illnesses. Continuity was encouraged, and patients seen in the ED were tracked through the course of their illness. Continuity had never been part of previous emergency medicine rotations.[25]

### Phase IV

Phase IV was initiated in 1993 with the hiring of a second full-time faculty member and the opening of a 2,200 sq ft satellite office in the hospital's professional building. Patients from the office practice were admitted to the hospital on the family medicine teaching service. Both faculty members were responsible for supervising resident rotations at the demonstration site, whether in the ED, office, or hospital service areas. Other faculty members from the UT-Memphis programs spent segments of time in the supervision of office procedures, and weekly half-day segments were protected for other educational and clinical experiences, eg, a mood disorders clinic and a nutrition clinic (Table 2).

In this phase, residents from Memphis were chosen to spend time at the demonstration site for selected emergency medicine and family medicine rotations. Two additional board-certified, residency-trained family physicians joined the rural practice as the first UT/Baptist family practice/OB fellows in August 1994, bringing to four the total number of physicians available to supervise residents.

### Phase V

The Residency Review Committee (RRC) granted approval for a rural satellite residency as an extension of the UT-Baptist HealthPlex (downtown Memphis) residency in September 1994. Four residents were then assigned to the rural location as their clinical home base in 1994. Additional clinical faculty were recruited from the local physician population. Clinical faculty included an internist, two surgeons, one OB-GYN, and one pediatrician. The obstetricians and the surgeons provided emergency C-section backup, as well as educational support for the demonstration site.

Up until this point, the hospital's medical staff structure had no distinct credentialing and privileging procedures for family physicians.[26,27] Thus, we encountered difficulty with definition of appropriate education, experience, and training for the granting of C-section privileges to family physicians.[16,17] A process of study and discussion ensued. The minimum number of required operative experiences was 25–50; exact judgment was left to the discretion of the committee. This allowed appropriately trained family physicians to attain provisional privileges. These provisional staff privileges were evaluated at the end of the year and, given satisfactory performance, full privileges were subsequently granted.

By January 1995, four residents and one nurse practitioner had been recruited. The facility at this point included six examination rooms and dedicated procedure and ultrasound suites. A full academic conference calendar was implemented and used the local clinical faculty, visiting Memphis faculty, consultants/practitioners, and the UT-Tipton faculty. Four procedural teaching sessions (eg, minor surgery/ultrasound/endoscopy) were scheduled in the office each week. Residents rotated to the medical center in Memphis for subspecialty training not available in Covington. All third-year medical students in their family medicine clerkship were given some exposure to the practice by working several 8- to 12-hour shifts at the rural hospital. Six times a year, three third-year students spent an additional 6 weeks at the rural location as their major clinical site. Fourth-year students

Table 2

Services Provided by University of Tennessee-Memphis Department of Family Medicine Faculty

*Services*

- Supervision of students and fellows in the emergency department, office, and hospital, including inpatient services, labor and delivery, nursery, ultrasound, and surgical assisting
- Supervision of office procedures (colposcopy, cryosurgery, endoscopy, ultrasound, and office surgery)
- Supervision of mood disorders clinic
- Supervision of nutrition clinic
- Supervision of office and practice management
- Delivery of inservice and community education
- Liaison with university administration and Accreditation Council for Graduate Medical Education

were offered a junior internship elective month at the site.

In collaboration with the academic departments of OB-GYN and emergency medicine in Memphis, advanced training for residency-trained family physicians was offered in both rural obstetrics and emergency medicine. Using Tipton County as the clinical base, post-residency fellowships in rural family practice/OB and family practice/emergency medicine were developed.

At this point, the department had developed a trained cadre of family physicians who supervised trainees, shared call, covered the emergency room, and provided maternal-fetal medicine services for the community.[28,29] Combined delivery volume by the private practice OB-GYN physicians working with the family physicians and the family practice group was more than 300 a year.

Table 3

Summary of Patient Care Volume: University of Tennessee/Baptist-Tipton Teaching Practice

| *Type of Patient Care* | *1993–1994** | *1994–1995* | *1995–1996* | *1996–1997* | *1997–1998*** |
|---|---|---|---|---|---|
| Total office visits | 2,876 | 9,292 | 10,873 | 14,615 | 22,214 |
| Hospital admissions | 347 | 631 | 830 | 851 | 948 |
| Newborns | 117 | 129 | 154 | 235 | 290 |
| Vaginal deliveries | 4 | 96 | 102 | 183 | 170 |
| C-sections | 8 | 15 | 14 | 35 | 38 |
| Total ED visits | 15,359 | 15,976 | 16,500 | 17,143 | 20,642 |
| Transfers to Memphis from ED | 481 | 535 | 523 | 560 | 722 |
| Deaths in ED (not DOA) | 30 | 40 | 37 | 29 | 41 |

ED—emergency department
DOA—dead on arrival

Fiscal year—July 1–June 30, except 1993–1994, which represents 10 months of activity in the office (August–June)

* University of Tennessee/Baptist-Tipton Teaching Practice opened in August 1993.
** 1997–1998 totals are projected on data from the first 8 months.

Note: Newborns exceed deliveries, since obstetricians refer newborns to the family practice service.

### Phase VI

Phase VI was initiated in June 1995 with the hiring of a full-time, on-site program director and an additional full-time faculty member, which expanded the staff to four full-time faculty, five clinical faculty from the community, two family practice/OB fellows, one rural emergency medicine fellow, and eight residents. C-section privileges were granted to the program director. As a result, a shared OB backup schedule was implemented with the remaining solo obstetrician. During 1996, one additional fellowship-trained family physician obtained C-section privileges.

The hospital voluntarily constructed a 10,000 sq ft facility for the family practice program. This was completed in April 1997 and leased to the program at $10 per sq ft per year. Resident rotations available at the site grew to include internal medicine, cardiology, critical care, pediatrics, ambulatory and general surgery, ambulatory gynecology, emergency medicine, otolaryngology, ophthalmology, gastroenterology, and urology.

### Phase VII

Effective July 1, 1997, the program enrolled four new first-year residents, bringing the residency group to a target goal of 12. Total patient care volume had increased substantially (Table 3). In addition, the ED mortality rate had dropped 50%, compared with baseline rates of more than 70 ED deaths per year. Total revenue from hospital, education, ED contracts, and patient care doubled from 1993 to 1997 (Table 4).

A small satellite office at a second rural hospital 15 miles from the demonstration site opened in late 1997. Telemedicine grant proposals were developed and funded to support maternity care and diagnostic OB ultrasound curricula for rural fellows and residents.[15,17,21] Currently, we are considering submitting an application to the RRC to designate the site as a freestanding residency program separate from the Memphis programs.

### Results—Recruitment and Retention

Of the first eight graduates, two physicians have remained to practice in the community. Both have accepted clinical faculty appointments. Seventy-five percent of eight graduates are practicing full-service family practice with OB in other rural communities. There has been an effect on the urban residency, where an all-time high of 63% of eight 1997 graduates went on to deliver babies in their family practice activities.

### Conclusions

The most important outcome of this demonstration project was the successful development of a locally funded, self-sustaining family practice center that simultaneously provided high-quality comprehensive health care and an accredited educational experience for residents and medical students. External validity is suggested by a similar project now in Phase III at Avalon Community Hospital, under the auspices of the University of Southern California Department of Family Medicine.

described in Table 5 There is internal resistance by family medicine faculty who perceive themselves to be overworked, undertrained, and underpaid. There is external resistance by those in other academic departments who view some of this curriculum as intrusion into their turf. Support from the dean was essential in allowing resuscitation of C-section skills and ED revenue for family practice. On the other hand, the rural practice was not allowed to hire a much-needed orthopedic surgeon because this impinged on the territory of another department.

A faculty practice plan that allowed extra payment for each ED night shift (11–13 hours) worked was essential. Urban and rural faculty were still required to cover the regular family practice hospital service four–six nights per month in addition to their two–three ED shifts.

Some faculty responded to this challenge with efforts above and beyond the call of duty. One faculty member took C-section backup call for 180 nights during 1 year. At the start of the program, departmental leaders (the chair and two vice chairs—average age 50) took two–three nights of ED each month in addition to their regular hospital call.

Threats to the program have evolved as the founding departmental leadership attempted to maintain fiscal control of the program. Academic leadership changed, and a different management strategy emerged. With more than $2 million/year in clinical revenue at the rural program, the university practice plan is now reallocating what they perceive to be "university practice plan profits." This reallocation is not driven by family practice priorities and is affecting several key elements of the program.

First, the rural practice is now seen as a corporate asset, and control of the rural practice is being transferred from family physician faculty to non-physician managers of the university corporate practice, resulting in a loss in physician morale.

Second, the corporate practice leaders decided to eliminate salaries for local rural community faculty ($90,000 per year). This weakens local political support for the program.

Third, family medicine faculty are being told that their extra night shifts in the ED may no longer be paid because the budget requires tightening. Without this incentive pay, involvement of urban faculty in rural work and departmental unity is likely to erode. Without a broad base of rural and urban family medicine faculty, the ED contract may eventually require the support of ED specialists who will not have an allegiance to the teaching mission of family medicine.

Fourth, now viewed as a corporate asset of the urban academic health center, transfer of practice ownership to the community is now unlikely.

Fifth, the university practice plan, by demanding a traditional academic set of specialty boundaries, is preventing the growth of this family practice group into its planned regional network [illegible] involving an orthopedist, a general surgeon, and an obstetrician [illegible]. ^ a dentist

## Conclusions

In one sense, this project has exemplified the rural saying that "Success breeds a thousand fathers." However, for rural and underserved small-town hospitals, this plan points the way to building an integrated rural health system based on a critical mass of four–five qualified family physicians, who follow the traditional family physician footsteps with a cheerful willingness to 1) provide newborn and lifelong care, including preventive care, 2) provide competent women's health care, 3) be effective in responding to emergencies, 4) manage most patients' hospital care, 5) deliver a baby, 6) be a trusted friend and confidant, and, when all else is done, 7) comfort the dying.[32,33] The end result, however, as evolving under the control of the faculty practice plan, raises questions about whether such rural teaching practices can be sustained and prosper as affiliates of urban university medical centers.

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