



Special Needs: Rural California Pediatric Emergency Care

Developing, producing and distributing an interactive education program for nurses on emergency medical services to children in rural areas

SUMMARY

Harbor-UCLA Medical Center Research and Education Institute implemented model systems of emergency medical services for children in rural and remote communities in northern California and developed curricular and training materials to support the systems.

At the time the first grants were made, emergency medical services (EMS) were often ill equipped to handle the special emergency needs of children, and the problem was especially acute in rural and remote areas.

Key Results

Research and Education Institute accomplished the following:

- Developed and implemented two models: one covering a rural area in northern California (NorCal EMS) and the other covering a more remote area, the North Coast EMS. The counties within the two systems encompass 25 percent of the state's area and as of the 1980 census had an estimated population of more than 165,000 children.
- Assessed the training needs of emergency pediatric personnel and developed educational materials, including nursing modules on respiratory, neurological and cardiovascular assessment of pediatric emergency patients in a self-paced, case-oriented format.
- Established the Pediatric Rural Emergency Systems and Education Project (PRESEP).
- Produced and distributed an interactive, CD-ROM version of these training materials called "The Acutely Ill or Injured Pediatric Patient: An Interactive Educational Program." The CD-ROM was distributed to 680 nursing schools in the United States.

Funding

The Robert Wood Johnson Foundation (RWJF) supported this work with four grants totalling \$497,596. The SEGA Foundation and the Los Angeles Pediatric Society also provided support for the development of curricular materials.

Afterward

The self-learning modules in emergency pediatric care were revised and incorporated into the *Pediatric Emergency Nursing Manual*, which was published in 1994 by the Springer Publishing Company. The book received the Nursing Book of the Year award of the *American Journal of Nursing*.

THE PROBLEM

Emergency medical services (EMS) is defined as an organized system capable of providing a comprehensive and timely response to an individual or community medical emergency. Such a system has 15 components:

- provision of personnel
- training of personnel
- communications
- transportation
- facilities
- critical care units
- use of public safety agencies
- consumer participation
- accessibility of care
- transfer of patients
- consumer information and education
- standard medical record keeping
- independent review and evaluation
- disaster linkage
- mutual aid agreements.

In the 1980s, effective EMS systems were put in place in many parts of the United States, but these systems were usually ill equipped to meet the special emergency needs of children. The problem was especially acute in the nation's rural and remote areas, where available medical resources are limited and distances to appropriate facilities are often great.

In 1986 the Bureau of Maternal and Child Health in the federal Health Resources and Services Administration—in recognition of the need for research and services in the field of emergency medical services for children (EMSC)—awarded four grants, one of which became the California EMSC Project.

Federal funding was sufficient for an overall needs assessment but not to develop systems that would address the needs of children in rural and remote areas.

THE PROJECT

The first two of these grants (ID#s 011804 and 012964) from RWJF supported the development of model systems of emergency medical services for children in rural and remote communities in northern California and the creation of curricular and training materials to support the systems.

Using RWJF funds, the Research and Education Institute of the Harbor-UCLA Medical Center established the Pediatric Rural Emergency Systems and Education Project (PRESEP). The goal was to develop and implement two EMSC models that would, when fully implemented, cover 13 counties in northern California.

The project also developed education and training materials to serve the professional development needs of pediatric emergency personnel in these areas. Together these counties covered approximately one-quarter of the state's area and according to the 1980 census, had a population of more than 165,000 children younger than 18 years of age. The population densities of these counties ranged from 2.3 to 96.4 persons per square mile.

The materials and systems took into account the low population densities, low tax revenues, limited medical resources, and small, isolated community hospitals that characterize such areas. Educational materials were of the self-teaching type and consisted of workbooks, videotapes, and audiotapes. EMSC models build on existing EMS systems, rather than create systems specifically for children, and they involve collaborations with existing groups and organizations in these communities.

To help develop the EMSC models, the Research and Education Institute subcontracted with the Northern Sierra Hospital Council—a council of 20 rural hospitals in northern California—and with two EMS services: one covering a rural area in northern California (NorCal EMS) and the other covering a more remote area, the North Coast EMS. Project staff and the North Sierra Consortium for Health Services, a group of educators from rural health care facilities, handled curriculum development.

The first grant concentrated on the area covered by NorCal EMS. Major goals were to:

- Form local multidisciplinary committees to review proposed Emergency Department Approved for Pediatrics (EDAP) criteria, which include standards for equipment, supplies, and staffing for delivery of emergency care to children.
- Develop guidelines to facilitate air and ground transportation of critically ill and injured children to appropriate care.
- Develop a cooperative purchasing system for pediatric equipment for rural and remote hospitals that would be integrated into the EMSC system.

- Begin the development of self-instructional educational materials on pediatric emergencies.
- Develop primary injury prevention programs.

The second grant supported continued development and implementation of the NorCal EMSC begun under the first-year grant, and of the educational curriculum for staff in rural hospitals. The following goals were added:

- To implement a second model of EMSC appropriate for the remote North Coast region of California and to compare the model with that developed for NorCal EMS.
- To teach the American Heart Association's Pediatric Life Support Instructor's course in rural northern California.
- To develop and implement a program of public outreach that stressed appropriate access to emergency medical services for children.
- To produce a monograph on emergency medical services for children in rural and remote areas.

The third grant (ID# 034288), made 10 years after the first two, supplemented funding from the SEGA Foundation and the Los Angeles Pediatric Society to convert a pediatric assessment curriculum for nurses—a product of the earlier grants—into an interactive CD-ROM format that would make the information readily available to nurses across the country.

The fourth grant (ID# 045086) funded final production of the CD-ROM, "The Acutely Ill or Injured Pediatric Patient: An Interactive Educational Program," and its distribution to 680 nursing schools in the U.S. (accompanied by questionnaires with which to evaluate the product).

RESULTS

- **During the first year, a model EMSC system was implemented within 4 of the 11 northern California counties covered by NorCal EMS.** Three levels of emergency pediatric certification were developed:
 - Emergency Department Approved for Pediatrics (EDAP)—for a larger hospital with in-house emergency physicians and nurses available 24 hours a day.
 - Rural Emergency Department Approved for Pediatrics (Rural EDAP)—for a smaller rural hospital with in-house physician coverage but with less equipment and whose nurses may float from other areas of the hospital.

- Standby Emergency Department Approved for Pediatrics (Standby EDAP)—for a small hospital with a physician on call and available to the emergency department but not in-house.
- **In the first year of the project, six hospitals applied for some level of emergency pediatric certification and were found to meet the criteria.** Each hospital designated a pediatric liaison nurse who was responsible for monitoring the system, providing education for the staff, and playing a role in pediatric quality-assurance activities. By the end of the second year, 19 of 25 hospitals in the NorCal region were participating in the voluntary EDAP certification program.
- **The project developed maps and a grid to facilitate transportation of patients from rural hospitals to secondary and tertiary care centers.** It also developed an agreement for transfers that addressed the needs of pediatric patients.
- **A cooperative buying system was devised to help smaller hospitals purchase the supplies needed to meet Rural EDAP and Standby EDAP criteria.**
- **Three modules of a self-learning curriculum for nurses were developed.** The first, *Pediatric Respiratory Assessment*, had been identified as the highest-priority need by health care providers in the region. Two additional nursing education modules—*Pediatric Neurologic Assessment* and *Pediatric Cardiovascular Assessment*—were subsequently developed in the same self-learning case-study format.
- **In the second year, EDAP standards were developed for the North Coast EMS region, including standards for hospitals that did not have pediatricians immediately available.** By the end of the second year, all eight hospitals in the North Coast region were participating in the voluntary system or had indicated their intention to apply.
- **The transport patterns and costs of transport in the model systems developed in the NorCal and North Coast regions were compared.** The results of the study indicated that many critically ill and injured pediatric patients in both systems were treated initially at the local hospital, were referred to a regional referral center or trauma center, and were ultimately referred to a tertiary care center. The investigators thought this finding merited further examination to determine whether field triage patterns should be altered when there was high likelihood of patient transfer.
- **The American Heart Association Pediatric Advanced Life Support Instructors' course was offered in Eureka, Calif., in the fall of 1989.** Some 20 physician and nurse instructors were trained.
- **A CD-ROM, "The Acutely Ill or Injured Pediatric Patient: An Interactive Education Program" was produced.** After the first two grants ended, the SEGA Foundation provided funds for a CD-ROM containing the nursing educational modules. As a result of technical problems, the funding was exhausted before a workable CD-ROM was produced and Research and Education Institute turned to

RWJF for additional support. Under the third grant, a vendor was hired to complete the work, but by the close of the grant, a CD-ROM still had not been completed. RWJF then funded a fourth grant to cover the final production and distribution of the CD-ROM. It was mailed free of charge to the deans of the 680 U.S. nursing schools, accompanied by questionnaires with which to evaluate it. Initial responses to the CD-ROM have been favorable.

Communications

Project staff wrote a journal article for the *Maternal and Child Nursing Journal* about EMSC in rural and remote areas and have made presentations about the project. North Coast EMS developed a 20-minute videotape, *Safety for Kids*, in collaboration with a local television program on parenting. (See the [Bibliography](#) for further details.)

LESSONS LEARNED

1. **A community-systems approach proved successful in implementing a project that involved numerous and varied interests: hospitals, EMS providers, physicians from various specialties, nurses, and consumer groups.** Project staff proceeded from the assumption that the communities within the grant area were the best judges of their own needs and that the role of the project was to facilitate interaction among community components. According to the grantee, subcontracting with local agencies made it possible to avoid the conflicts that sometimes arise in implementing regionalized systems of care.
2. **Health care providers may be unwilling to pay fees to implement a system, even when they agree that the system will improve care.** A small number of hospitals in the first area did not participate in the EDAP certification system, largely because NorCal EMS insisted on a fee for certification. Had the Research and Education Institute recognized that during the design stage of the project, it might have been able to work with the Northern Sierra Hospital Council to change this component.

AFTERWARD

The self-learning modules in emergency pediatric care were revised and incorporated into the *Pediatric Emergency Nursing Manual*, which was published in 1994 by the Springer Publishing Company. The book received the Nursing Book of the Year award of the *American Journal of Nursing*.

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