

Pediatric Care in Rural Hospital Emergency Departments

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OVERVIEW

Optimal emergency care for children may be difficult for rural hospitals to provide. Rural hospitals have less access to pediatric and emergency medicine trained physicians and a low volume of pediatric ED patients makes it difficult for staff to maintain pediatric care skills. In addition, rural hospitals may be far from a hospital that admits critically ill children, requiring that the rural hospital receive and stabilize pediatric emergency cases prior to transfer. Previous studies have only partially investigated potential rural disparities in pediatric emergency care.

In this study, we analyzed data from the Emergency Pediatric Services and Equipment Supplement (EPSES) to the National Hospital Ambulatory Medical Care Survey (NHAMCS) to compare rural and urban hospitals' responses on various dimensions of pediatric ED care. We also surveyed 65 ED directors at rural hospitals in a separate process to explore rural pediatric ED care in more detail and to obtain the opinion of rural ED administrators regarding ways to assure quality emergency care for children.

KEY FINDINGS

Analysis of the EPSES data using a comprehensive definition of rural and urban found the following:

- Rural hospitals had a lower ED visit volume and were less likely to be teaching hospitals or to have a children's hospital in their county. They were also less likely to be Level I (highest) or Level II Trauma Centers.
- All rural hospitals reported that they admit pediatric patients, but few had an inpatient unit specifically for children.
- Almost all rural hospitals would send children needing intensive care to another hospital compared to three-quarters of urban hospitals. A written transfer agreement for care was available at only one-half of hospitals regardless of geography.
- Rural hospitals had less access to physicians trained in emergency medicine, in pediatrics, or in pediatric emergency medicine.

- Rural hospitals had a lower overall score than urban hospitals on an inventory of 131 pediatric emergency supplies and equipment. However, the percent of all supplies that were available in rural hospitals was only 5.1 percentage points less than the percent available in urban hospitals.
- Rural hospitals also had lower scores in four of six specific categories of supplies queried: vascular access (8% difference), airway management (12% difference), pediatric trays (9.5% difference), and miscellaneous supplies (7% difference).

Hospitals in our survey of rural hospital ED directors were similar to those in the EPSES rural panel.

Findings include the following:

- Almost all hospitals admit pediatric patients, but few have a separate pediatric inpatient unit.
- ED staff in every hospital had access to a medication chart for pediatric dosages and most had a special pediatric emergency cart. Few, however, had a special room in their ED for pediatric care.
- The availability of board-certified pediatricians and emergency medicine physicians was higher than in the EPSES rural sample. Most ED physicians or mid-level providers had Advanced Cardiac Life Support (ACLS) training and most hospitals reported that all of their ED physicians or mid-levels had Pediatric Advanced Life Support (PALS) training.
- Most rural hospitals reported that some or all ED nurses had PALS training. Many reported that some or all nurses had completed the Emergency Nursing Pediatric Course and most had some nurses with Trauma Nursing Core Curriculum training.
- Staff training was the most common need reported. Money to pay for training was the biggest barrier. Also cited was lack of training opportunities and staffing to cover when others were at training.
- One in five of those without a special pediatric emergency cart would like to get one.

DISCUSSION

The organization of pediatric care, including emergency care, and the availability of pediatric emergency expertise differs between rural and urban hospitals. Several areas merit further discussion.

Trauma System Development - Most rural hospitals would not qualify as a Level III or higher trauma center. However, in states with official trauma designations that include Level IV (ability to provide advanced trauma life support before a patient is transferred) some rural hospitals could meet these qualifications. Obtaining a trauma level designation requires a good working relationship with a Level I, II, or III trauma center and the preparation and cooperation required to obtain and maintain this status could, in turn, strengthen inter-hospital relationships in addition to strengthening trauma care overall.

Pediatric and Trauma Care Expertise - Training of clinical staff in emergency procedures, both initial training and skill refreshers, was a concern identified by respondents. An emergency medicine trained physician in every rural hospital may not be a realistic goal. Emergency medicine training in the form of special courses or certification is important for family medicine and internal medicine physicians and for mid-level providers who often staff rural hospitals.

Completion of the Rural Trauma Team Development Course (RTTDC) was reported by few respondents. The RTTDC, taught at the rural hospital by instructors from Level I or Level II trauma centers, can strengthen the relationships between rural hospitals and the larger hospitals to which they transfer critically ill or injured patients.

Continuing Education - Low patient volume challenges retention of skills. Creative solutions to improve staff training are needed, including a funding mechanism to support the costs of out-of-town training and temporary replacement staff. Medical simulation allows repetition of skills but medical simulation suites are more likely to be available in teaching hospitals and require taking rural providers to the training hospital or taking the technology to rural areas. Videoconference instruction is another valuable technology to provide education with minimal disruption of staff availability in rural areas. ED Learning Units, self-directed instructional packets developed at one hospital, promote on-site learning and continuing education.

Supplies and Equipment - Rural hospitals had a higher percent of pediatric supply/equipment items than might be expected given the few pediatric emergencies they are likely to treat. All hospitals in our interview survey of rural EDs had a medication chart or tape for pediatric dosages and most had a special emergency cart for pediatric care, frequently a Broselow or other color-coded pediatric cart. The availability of the supplies that are included in such carts may be a reasonable compromise for specific categories of supplies recommended by the AAP/ACEP when funding limits the ability of an ED to stock all supplies.

CONCLUSIONS

Rural hospital ED administrators are aware of the special concerns for pediatric care in the ED and have taken steps to assure optimal care. Some needs, such as better availability of pediatricians, emergency medicine physicians, and physicians trained in both specialties, will be difficult to meet given the pediatric patient volume in rural areas and competing incentives for practice in larger areas.

Emergency and trauma training is available for physicians, mid-level providers and nurses but requires resources. Programs to support training in the form of funding for stipends or temporary staff to fill in for trainees would be valuable. Innovative educational programs exist but ED administrators in isolated rural areas may not be aware of them. Collecting, cataloguing, and disseminating information to rural areas combined with funding sources to allow hospitals to take advantage of the opportunities, could improve the pediatric skills of rural ED providers.

Programs to support acquisition of pediatric sized equipment including a specialized pediatric emergency cart such as a Broselow cart would require only limited, short-term investment but would improve the likelihood of appropriate care in pediatric emergencies.

METHODS

Analysis of EPSES Data - Data from the 2002 and 2003 EPSES survey were analyzed to assess the availability of pediatric emergency expertise and equipment in rural hospitals compared to urban hospitals. Details about NHAMCS and EPSES survey design can be found at <http://www.cdc.gov/nchs/achd.htm>. For our study, EPSES sample hospitals were classified as rural if they were located in a nonmetropolitan county or in an area of a metropolitan county with a Rural-Urban Commuting Area (RUCA) code of four or higher. RUCA classification captures hospitals located outside of urbanized areas of metropolitan counties, hospitals whose characteristics more likely resemble those of other rural hospitals than those of urban hospitals.

Data were weighted and analyzed using SUDAAN to account for the complex survey design. The total weighted sample represents 4,672 hospitals (2,091 rural and 2,581 urban). Differences between rural and urban responses for categorical variables were compared using the chi-square test. The test for trends was used for summary supply scores created for each of six categories of pediatric supplies. Differences between rural and urban hospitals were considered statistically significant if $p \leq 0.01$.

Survey of Rural Hospital ED Directors - Additional data were collected from a sample of rural hospital ED administrators who we surveyed. One hundred and forty-four (144) hospitals were chosen randomly from the Online Survey, Certification, and Reporting (OSCAR) Provider of Services (POS) system database for the 1st Quarter of 2007. Hospitals were considered to be rural if they met the RUCA code definition described above. The survey instrument was developed in-house and included some questions from the EPSES survey and others written to capture more information about rural ED care. Fielding of the survey was completed in 2008, by telephone when possible, with the majority of respondents mailing in responses. Sixty-five (65) usable surveys were received for a response rate of 45.5% (one hospital was ineligible). Surveys were received from 31 states and all US Census Divisions. Closed-ended questions focused on training of ED personnel, physical structure of the ED, and availability of a pediatric crash cart. In open-ended questions, ED Directors discussed how they could better serve children in their ED and their perceived barriers to changes in care.

*More detailed study results can be found in the final report
“Pediatric Care in Rural Hospital Emergency Departments”
located at http://www.shepscenter.unc.edu/research_programs/rural_program/.*



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