REPORT OF THE
DEPARTMENT OF HEALTH ON

PEDIATRIC EMERGENCY MEDICAL SERVICE CAPABILITIES OF VIRGINIA HOSPITALS

TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA

HOUSE DOCUMENT NO. 57

COMMONWEALTH OF VIRGINIA
RICHMOND
1997

COMMONWEALTH of VIRGINIA

Department of Health
P O BOX 2448
RICHMOND, VA 23218

RANDOLPH L. GORDON, M.D., M.P.H.
COMMISSIONER

TDD 1-800-828-1120

December 16, 1996

To: The Honorable George F. Allen

and

The General Assembly of Virginia

The report contained herein is pursuant to House Joint Resolution 213, agreed to by the 1996 General Assembly.

This report constitutes the response to the Commissioner of Health from the panel of experts he assembled to: (i) study the ability of emergency service hospitals to provide pediatric emergency medical services; and (ii) to include representatives on this panel from the Virginia Hospital and Healthcare Association, the Virginia Chapters of the American Academy of Pediatrics, the American College of Surgeons, the American College of Emergency Physicians, the Virginia Nurse's Association and such other medical professionals and specialists as appropriate.

Respectfully Submitted,

Randolph L. Gordon, M.D., M.P.H.
Commissioner

ACKNOWLEDGMENTS

The following individuals provided information, invaluable assistance and advice to the Virginia Department of Health:

- Michael Altieri, M.D., American Academy of Pediatrics, Virginia Chapter
- Michael Boyle, M.D., Virginia College of Emergency Physicians
- Barbara Brown, Ph.D., Virginia Hospital and Healthcare Association
- Mary Koogler, R.N., Virginia Emergency Nurses Association
- Myra Walker, R.N., Virginia Nurses Association
- Susan Ward, Virginia Hospital and Healthcare Association

This report was staffed by :

- Karen Head, Critical Care Coordinator

The Office of Emergency Medical Services is indebted to Barbara Brown, Ph.D. of the Virginia Hospital and Healthcare Association for data analysis. We also appreciate the input provided by those connected with emergency medical services who offered their expertise, opinions, and support.

TABLE OF CONTENTS

Pediatric Emergency Medical Service Capabilities of Virginia Hospitals

A Report of
The Virginia Department of Health
August 23, 1996

EXECUTIVE SUMMARY

The 1996 General Assembly, through House Joint Resolution 213, charged the Virginia Department of Health (VDH) and the Virginia Hospital and Healthcare Association to study the ability of emergency service hospitals to provide pediatric emergency medical services. To adequately respond to this charge, VDH convened a task force. Under task force guidance, VDH conducted a study which included: a comprehensive resource and capability survey of all Virginia hospitals providing emergency services; entry of survey data into a spreadsheet; analysis of data; and development of conclusions and recommendations.

Analysis of data provided several findings. All Virginia hospitals which provide twenty-four hour emergency services integrated pediatric emergency medical services within their scope of care. All hospital emergency departments had extensive equipment resources essential for emergency care of the pediatric population. The strongest predictor of a hospital having a pediatric emergency department was an affiliation with a pediatric residency program, not the volume of pediatric patient visits or total annual visits.

Analysis of transfer/referral patterns indicated appropriate access to pediatric emergency care in the Commonwealth. Hospitals noted utilization of major pediatric specialty services which are distributed across the state in urban hospitals located in Falls Church, Richmond, Norfolk, Charlottesville, and Roanoke.

It was the conclusion of the task force that pediatric emergency medical services are adequate and available across the state. Pediatric emergency departments are most appropriately located in hospitals with a strong medical education component. Utilization of residents in satellite hospitals affords outlying communities access to a high level of care. In addition, equipment, personnel and staff preparation are adequate for care of the pediatric population. Finally, transfer and referral patterns are adequate and indicate utilization of resources at recognized major pediatric referral centers across the Commonwealth.

The task force recommends that there should be no additional mandates to establish pediatric emergency departments. This recommendation is based on the finding that these dedicated units exist in facilities providing higher medical education, and as such, are distributed across the Commonwealth. The task force further recommends that there should be ongoing support of residency programs which deploy physicians to outlying facilities, thus allowing greater access to a high level of care. Finally, the task force recommends that hospitals invest in a hypothermia thermometer.

PURPOSE

The purpose of this study was to assess the ability of hospitals in the Commonwealth to adequately provide pediatric emergency medical services.

INTRODUCTION AND BACKGROUND

House Joint Resolution 213, patroned by Delegate Harris, requested a survey of "...emergency care hospitals in Virginia to determine the level of care and the ability of such hospitals to adequately and appropriately serve pediatric emergency medical needs." In this assessment, the Department of Health and Virginia Hospital and Healthcare Association were charged to include: "(i) the availability of pediatric emergency medical services & professionally trained specialists; (ii) the availability and accessibility of pediatric emergency rooms and child-sized medical equipment; (iii) pediatric emergency staffing needs, including nurse practitioners, emergency medical technicians, specialists in emergency medicine, surgeons, pediatricians, and other medical professionals and specialists; (iv) adequacy of staff preparation and training to meet pediatric emergency care needs; and (v) such other factors and issues which require consideration and assessment in evaluating pediatric emergency care needs in Virginia." This resolution appeared to be the result of concerns over negative media accounts of available pediatric emergency services.

Emergency care of the pediatric population poses numerous challenges related to inherent uniqueness of their anatomy, physiology, and psychology. Provision of adequate care is directly related to availability of resources such as specialized, age/size-appropriate equipment and medications, as well as specialists (physicians, nurses, others) with pediatric-specific knowledge, skills and experience. "Pediatric" generally refers to persons eighteen years of age and under. However, when asked to include in the survey their higher limit for age of pediatric patients, hospitals supplied a range of 12 - 22 years (mean: 16; mode: 18).

METHODOLOGY

In order to assess pediatric emergency services capabilities of hospitals in the Commonwealth, the Virginia Department of Health's Office of Emergency Medical Services convened a task force with representation from the following: the America Academy of Pediatrics, Virginia Chapter; the American College of Surgeons, Virginia Chapter; the Virginia College of Emergency Physicians; the Virginia Nurses Association; and the Virginia Emergency Nurses Association. The American College of Surgeons, Virginia Chapter was unable to appoint a representative.

The task force developed a 418 item survey (See Appendix A). This survey tool was designed based on a previously utilized statewide pediatric critical care resource and capability survey which served as the basis for designation of pediatric critical care facilities in the Commonwealth. The current tool was constructed in a "checklist" format to enhance ease of use. Once drafted, the survey tool was distributed to task force members for comments and changes. The final

survey tool was forwarded to the Emergency Department Nurse Manager of each Virginia hospital that provides emergency medical services, accompanied by a letter and a copy of the mandate. Hospitals were asked to return the completed survey within four weeks. In addition, each hospital administrator and Emergency Department Medical Director received a letter explaining the survey with a copy of the mandate. Ninety-one hospitals received the survey. All hospitals returned the survey; however, one Virginia hospital submitted their survey in mid-September following data analysis and therefore was not included.

Statistical analysis software, SPSS, was utilized for data analysis. Following data analysis, the task force reconvened to review the results and finalize recommendations as requested in the mandate.

LIMITATIONS

Limitations of the data were a result of partially completed surveys submitted by seventy-five hospitals (83%). Sections of the survey pertaining directly to emergency services were completed by all responding facilities. However, sections pertaining to availability of "professionally trained specialists," as well as ancillary and inpatient resources were frequently incomplete (See Appendix B).

FINDINGS

To systematically review statewide pediatric emergency service resources, the data was compared regionally, based on hospital distribution in the Commonwealth's Emergency Medical Services (EMS) System. Virginia's EMS System originated as a result of the Emergency Medical Services Systems (EMSS) Act of 1973, an amendment to the Federal Public Health Service Act which provided assistance in development of comprehensive emergency medical services systems throughout the country. The goal of the Act was to improve the quality of patient care and reduce morbidity and mortality. A regional EMS system is geographically described by existing natural patient care flow patterns and must be contiguous with adjoining regions and large enough in size and population to provide definitive care services to the majority of general, emergent and critical patients. Integrated EMS systems must address (assess and develop) the following components: manpower; training; communications; transportation; facilities; critical care units; public safety agencies; consumer participation; access to care; patient transfer; coordinated patient record keeping; public information and education; review and evaluation; disaster plan; and mutual aid. Based on these criteria, eight EMS regions were developed in Virginia (See Appendix C).

The findings of the Pediatric Emergency Medical Services survey were addressed in the following categories, as mandated by House Resolution 213:

- Availability of pediatric emergency medical services
- Availability and accessibility of pediatric emergency rooms and child-sized medical equipment
- Pediatric emergency staffing needs, including nurse practitioners, emergency

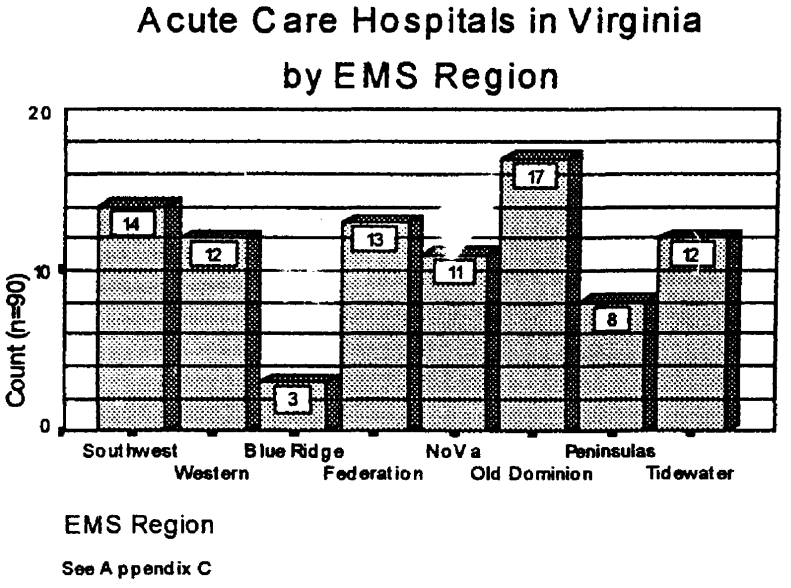
medical technicians, specialists in emergency medicine, surgeons, pediatricians, and other medical professionals and specialists

- Adequacy of staff preparation and training to meet pediatric emergency care needs
- Other such factors and issues which require consideration and assessment in evaluating pediatric emergency care needs in Virginia.

Availability of Pediatric Emergency Medical Services

Virginia has ninety-one acute care hospitals which offer emergency medical services to the pediatric population. These facilities are distributed across the Commonwealth with larger concentration noted in densely populated areas. These acute care hospitals are located within each EMS region (See Figure 1).

Figure 1



Availability/Accessibility of Pediatric Emergency Rooms and Child-sized Medical Equipment

Pediatric Emergency Rooms (Departments)

For the purpose of this study, pediatric emergency departments were defined as "dedicated," physically distinct units which may be free-standing or located within an emergency department yet have resources, including equipment and personnel, dedicated to the pediatric population. Most emergency departments had a "designated" area within the department where pediatric patients are placed for assessment and treatment.

Seven hospitals, located in Falls Church (1), Richmond (3), Norfolk (1), Charlottesville (1), and Roanoke (1), were identified as having a dedicated pediatric emergency department. The task force anticipated that the volume of pediatric visits would be the strongest predictor of a pediatric emergency department. However, based upon a regression analysis, the strongest predictor of a hospital having a pediatric emergency department was an affiliation with a residency program (See Appendix D). These specialized departments were found to be isolated to urban, tertiary care facilities which provide the most specialized pediatric services and are recognized referral centers for medical care in the Commonwealth (See Appendix E). Of hospitals with a dedicated department, six attributed twenty-five to thirty-one percent of all emergency department visits to pediatric patients. The remaining facility was a dedicated pediatric hospital. Hospitals with a dedicated pediatric emergency department handled twenty-nine percent of all pediatric emergency visits in 1995.

Child-sized Medical Equipment

Despite the apparent presence of only seven pediatric emergency departments, all Virginia hospitals were found to be well equipped to serve the pediatric population. An extensive, size-specific equipment list was incorporated into the survey (See Appendix A, pages 18-19). In prior pediatric resource and capability surveys, hospitals lacking pediatric emergency departments failed to complete the equipment survey. This portion was critical in determining an emergency department's ability to care for acutely ill and injured children. Essential equipment resources were identified in all emergency departments for: airway establishment and control; ventilatory support; cardiac and blood pressure monitoring; and peripheral, central and intraosseous line placement. This equipment was available in varying pediatric sizes. Eighty-eight (98%) hospital emergency departments reported having pediatric reference materials for drug dosage and weight estimation. It is interesting to note that eighty-four (93%) Virginia hospitals had invested in a Broselow tape. This tool is similar to a color-coded tape measure which correlates pediatric patient length with estimated weight. The color-coded increments delineate appropriate equipment sizes necessary in critical situations. Most hospitals also reported having size-specific equipment for specialized diagnostic studies, such as lumbar puncture (spinal tap).

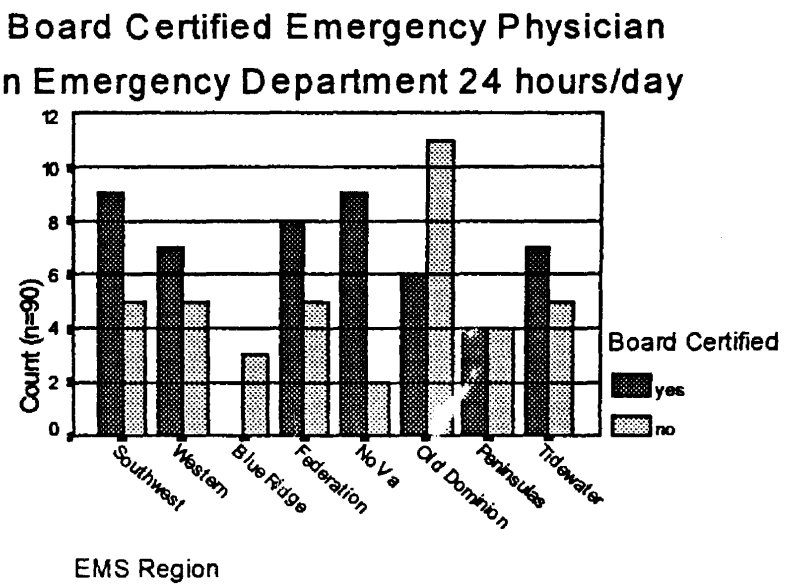
Hospitals were found to be lacking in two areas. Only seventy (77%) emergency departments reported having hypothermia thermometers which allow for the detection of critically low body temperature. Although considered by the task force to be infrequently used, it should be considered basic equipment in all emergency departments. In addition, only thirty-three (37%) emergency departments documented availability of programmable calculators which are used for weight-related medication dosage determination for pediatric patients. Despite this apparent low number, eighty-eight (98%) facilities reported utilizing standardized charts which provide medication infusion rates based on patient weight and drug/fluid concentration. The American Heart Association and the American Academy of Pediatrics, through courses such as Pediatric Advanced Life Support, endorse the use of such charts during pediatric emergencies.

Pediatric Emergency Staffing

Emergency Medicine Specialists

Fifty (56%) Virginia hospitals, located in seven of the eight EMS regions, reported having emergency departments which are staffed twenty-four hours a day by a board certified emergency medicine physician (See Figure 2). Board certification in emergency medicine provides the consumer an assurance that the physician has a high level of knowledge and skills sufficient for evaluation and treatment of all patients seeking emergency care. Physicians practicing emergency medicine are generally graduates of emergency medicine residency programs (but board-eligible), or are board certified in family practice or internal medicine.

Figure 2



Only four hospitals in the Commonwealth, located in Richmond (3) and Norfolk (1), reported having board certified pediatric emergency medicine specialists in the emergency department at all times. Board certification in pediatric emergency medicine adds greater specificity to the body of knowledge of emergency medicine. Considering that level of specialization, it is interesting to note that three of those facilities attributed only twenty-three to thirty percent of all emergency department visits to pediatric patients (a percentage common to eighteen (20%) responding facilities). The fourth facility was dedicated solely to pediatrics.

Physician Assistant

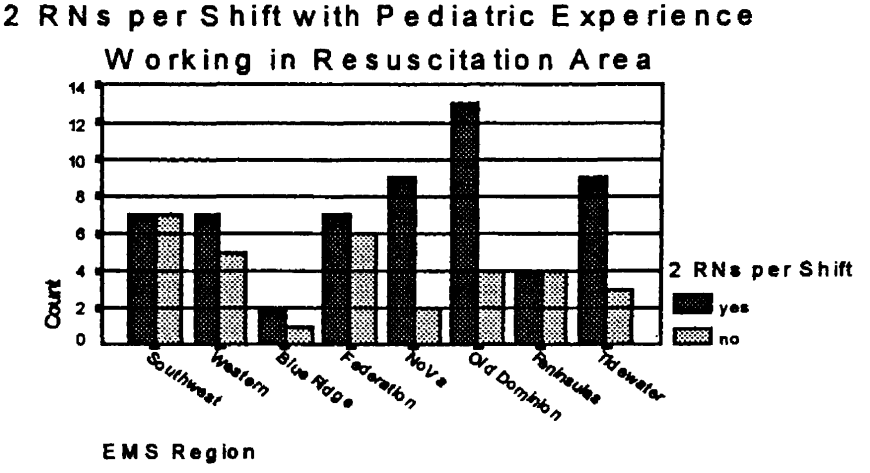
A physician assistant is a highly trained health care provider who works under the auspices of a physician. Thirteen (14%) of ninety hospitals surveyed were found to use a physician assistant (PA) in their emergency department. These facilities are located in Northern Virginia, the Peninsula, and Tidewater. Use of physician assistant was not shown to be related to high patient

volumes in an emergency department or availability of physicians. Based upon a regression analysis, the presence of a physician assistant in an emergency department was influenced by low emergency department patient volume (See Appendix F).

Registered Nurses

Fifty-seven (63%) Virginia hospital emergency departments reported using two registered nurses (with pediatric emergency experience) in their resuscitation areas per shift (See Figure 3). Sixty-two (69%) of emergency departments reported staffing their resuscitation area based on patient acuity (degree of patient illness or injury). In addition, seventy-five (83%) reported having written plans for acquiring additional staff (24 hours/day) when patient census and acuity increase.

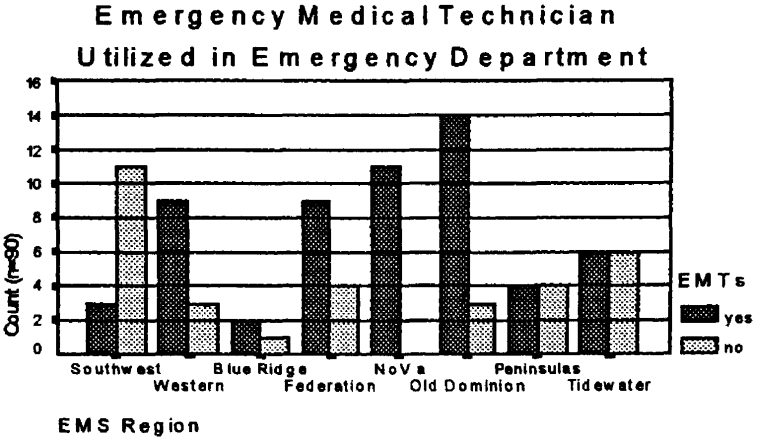
Figure 3



Emergency Medical Technicians

Fifty-eight (64%) responding hospitals reported that they employ Emergency Medical Technicians (EMTs) in their emergency department, and their presence in hospitals was distributed across EMS regions (See Figure 4). In the pre-hospital environment, EMTs function under the license of a physician. In this situation, varying levels of skills and interventions are allowed by protocol. However, in the hospital setting, EMTs generally function under Nursing where their responsibilities and sanctioned skills may vary greatly.

Figure 4



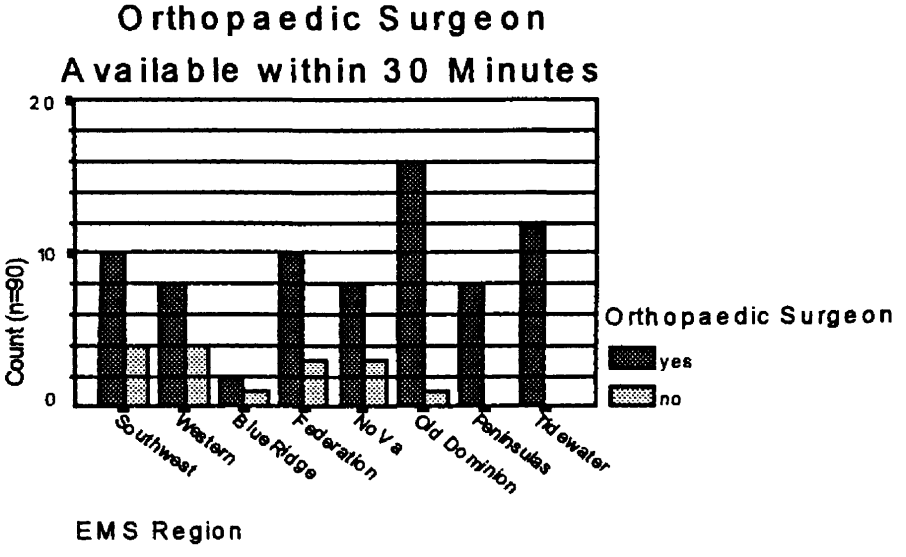
Surgeon
Eighty-one (90%) of ninety responding hospitals failed to complete survey items pertaining to specialty resources. However, as eighty-nine (99%) of ninety hospitals reported under the hospital organization section of the survey that they had a Department of Surgery, it may be inferred that they also had surgeons.

Pediatric Surgeon/Pediatric Anesthesiologist
Eighty-one (90%) of the responding hospitals failed to complete survey items pertaining to specialty resources. However, twenty-five (28%) hospitals organizationally had a Department of Pediatric Surgery. Twenty-eight (31%) reported that they had a Department of Pediatric Anesthesia. In order to determine the driving force behind a facility having pediatric surgeons or pediatric anesthesiologists, a regression analysis was performed. The analysis found the presence of a pediatric surgeon was the strongest predictor for the presence of a pediatric anesthesiologist. The converse was also true. No other variable, such as total pediatric admissions or pediatric emergency department visits, was found to influence this relationship (See Appendix G).

Pediatrician
Seventy-five (83%) responding hospitals reported that a pediatrician could respond to the hospital for consultation within thirty minutes of request.

Orthopaedic Surgeon
Seventy-four (82%) hospitals reported that an orthopaedic surgeon could respond to the hospital within thirty minutes of request (See Figure 5). Orthopaedic surgical resources were limited or unavailable in some rural hospitals.

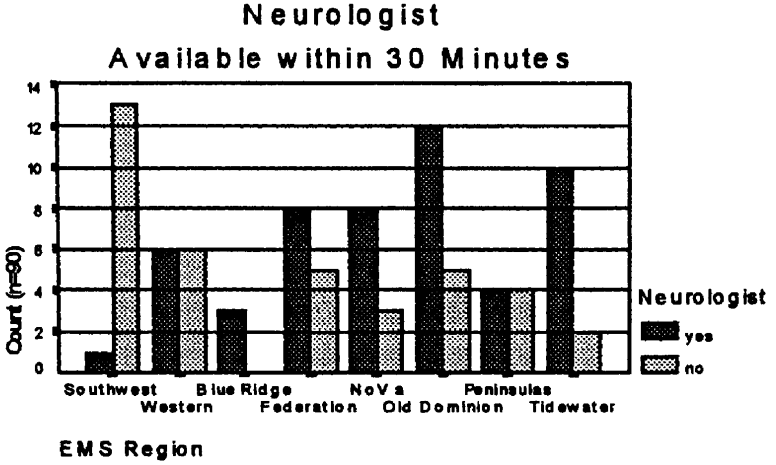
Figure 5



Neurologist
Fifty-two (58%) hospitals reported having services of a neurologist who could respond to the hospital within thirty minutes of request. As four hospitals in southwest Virginia were unable to document the number of pediatric patient visits in their emergency department, only 6.7% of

pediatric emergency visits were documented in that area of the Commonwealth in 1995. The southwest portion of the state was found to be under served (See Figure 6). It was the belief of the task force that this could be explained by the tendency for highly specialized physicians to locate in more densely populated areas which is essential for viability of professional practice.

Figure 6



Radiologist

Eighty-two (91%) hospitals reported having services of a radiologist immediately available (within thirty minutes). This affords hospitals additional diagnostic capabilities. Only eight hospitals (9%) failed to report having a readily available radiologist.

Certified Registered Nurse Practitioner

Data indicated that there were only seventeen certified registered nurse practitioners employed by Virginia hospitals. Of those, four were pediatric nurse practitioners. Data analysis indicated that they are found in settings where board certified pediatric emergency medicine specialists do not exist. Their utilization in the Emergency Department setting could not be determined from the data provided.

Pediatric Clinical Nurse Specialist

Nine (10%) Virginia hospitals employed a pediatric clinical nurse specialist. Their utilization in the Emergency Department setting could not be determined from the data provided.

Pediatric Staff Educator/Resource Nurse

Seventeen (19%) Virginia hospitals reported that they employ a pediatric staff educator/resource nurse. Their role in staff education of emergency departments could not be determined from the data provided.

<u>Adequacy of Staff Preparation and Training</u>

Physicians

As part of their basic curriculum, all medical schools provide course work in pediatric care, including pediatric emergencies. According to a source at Eastern Virginia Medical School,

residency programs (emergency medicine, family practice, pediatrics) provide additional training in pediatric emergencies. Six Virginia hospitals reported having an accredited pediatric residency programs: The Arlington Hospital; Carilion Roanoke Community Hospital; Fairfax Hospital; Medical College of Virginia Hospitals; University of Virginia Medical Center; and Children's Hospital of the King's Daughters. St. Mary's Hospital (Richmond) was noted by the task force as an affiliated training site for residents.

All physicians who are board certified must complete a prescribed number of continuing medical education (CME) units within a given period of time; however, these do not have to be specific to pediatrics. Sixteen (18%) hospitals reported that they provide in-house pediatric specific CMEs for all physicians. Only six (7%) hospitals reported that they provide pediatric critical care CMEs for physicians. The task force believed this number may have be falsely low relative to incomplete information provided by fifty (56%) hospitals. Twenty-one (23%) hospitals reported that their physicians participate in regional and national meetings in areas related to pediatric critical care.

Nurses

Nursing education provides exposure to both pediatric and emergency care. However, fifty-four (60%) Virginia hospitals reported that they require a minimum of twenty-five percent of their emergency nurses to complete the American Heart Association's Pediatric Advanced Life Support (PALS), or their hospital's equivalent, within six months of employment. Data indicated that nursing, not pediatric patient volume, predicted this educational requirement. Annual continuing education is currently not required by the Virginia Board of Nursing. However, sixty-four (71%) of hospitals surveyed indicated that they provide continuing education, both on and off site, for nurses. Seventy-eight (87%) hospitals reported that they provide Cardiopulmonary Resuscitation (CPR) training for staff, while fifty-nine (65%) required periodic resuscitation practice sessions.

Emergency Medical Technicians

Emergency Medical Technicians complete training which incorporates pediatric emergencies at both the basic and paramedic levels. Initial written and skills testing is required at each level of EMT certification. However, through action of the General Assembly, EMTs are no longer test at the end of a four-year certification period. Recertification can be completed through a prescribed number of continuing education units (CEUs). Prerequisites for advanced life support (ALS) EMT course work are a General Equivalency Diploma (GED) and a minimum age of eighteen.

Eighty-two (91%) Virginia hospitals reported that their Emergency Department was available for clinical rotations for pre-hospital care providers. Seventy (78%) hospitals reported that they have physicians and nurses who function as educators in the curriculum and continuing education of pre-hospital care providers. Sixty-four (71%) hospitals reported that they encourage pre-hospital personnel to participate in multidisciplinary hospital education programs. Fifty-one (57%) hospitals surveyed included the pre-hospital personnel in the ongoing emergency care of the pediatric patient after delivery to the Emergency Department. This can provide opportunity for continued patient assessment and skills enhancement.

Other Factors or Issues for Consideration

Ancillary Services - *Radiology*

In assessing the capability of hospitals to provide pediatric emergency medical services, availability of other resources must be considered. This includes: ancillary services (radiology, laboratory, blood bank, and respiratory therapy); pharmacy, and, surgical services availability. All reporting hospitals had radiology technicians immediately available and capable of performing portable X-rays. More specialized radiologic procedures, such as invasive vascular procedures, gastrointestinal (GI) procedures, ultrasound and computerized tomography (CT) were found to be more readily available during the daytime, but required specialists and technicians be called in during later hours. Much to their credit, eighty (89%) hospitals reported availability of CT scan within twenty to thirty minutes.

Laboratory

Only one out of ninety hospitals failed to note immediate availability of a laboratory technician on a twenty-four hour a day basis. However, it is not uncommon in many systems for nurses and other personnel to be trained in phlebotomy. Eighty-nine (99%) facilities reported that they can perform essential laboratory studies. In addition, eighty-eight (98%) hospitals reported that they had fully functional blood bank capabilities at all times.

Respiratory Therapy

All facilities reported that they had respiratory therapists immediately available. These individuals have advanced knowledge and skills critical for independent and interdependent patient care intervention. Respiratory therapists are vital team members when dealing with any patient with respiratory system pathology. This is particularly important when applied to the pediatric population where anatomic and physiologic differences pose the greatest challenges.

Pharmacy

Pharmacy services are critical in the hospital setting. Pharmacists collaborate with medical staff in appropriate medications as well as dosages and medication concentrations. Pediatric medication infusion regimens may require consultation with the pharmacist. Only twenty-seven (30%) hospitals reported having a pharmacist in-house (on site) 24 hours/day. However, hospitals have policies which direct pharmacy or medication access on shifts not covered by the pharmacist. In addition, facilities may access the pharmacist for assistance during off shifts.

Surgical Services

Surgical services were documented as available by eighty-nine (99%) hospitals. Seventeen (19%) reported that they fully staff their operating room 24 hours/day. Furthermore, twenty-six (29%) reported that they can have a second surgical team physically present within twenty minutes if the primary team was participating in an operative case. Although only sixty-one (68%) hospitals reported that they have materials available in sizes compatible with pediatric care, many facilities limit pediatric surgical services to elective cases (such as tonsillectomies). Many hospitals reported that pediatric surgical cases are transferred to a larger referral center for operative intervention.

Hospital Policies

One final area explored were hospital policies established to protect the best interest of patients. Sixty-nine (77%) hospitals reported that they have protocols and policies for pediatric patient "triage." Triage refers to sorting of patients, not on the basis of 'first-come, first-served' but on the basis of "acuity" which means severity of illness or injury. In addition, forty-six (51%) hospitals reported that they have written standards of care for critically ill or injured pediatric patients who arrive in their emergency department. Finally, thirty-two (36%) hospitals had written protocols for responsibilities and expectations of the nurse during resuscitation (timely, critical intervention during acute cases) of the pediatric patient. It was the belief of the task force that in smaller emergency departments, the pediatric patient acuity and volume may be too low to warrant development of written protocols.

CONCLUSION

It was the conclusion of the task force that pediatric emergency medical services are adequate and available across the state. Pediatric emergency departments are most appropriately located in hospitals with a strong medical education component. Utilization of residents in satellite hospitals affords outlying communities access to a high level of care. In addition, equipment, personnel and staff preparation are adequate for care of the pediatric population. Finally, transfer and referral patterns are adequate and indicate utilization of resources at recognized major pediatric referral centers across the Commonwealth.

RECOMMENDATIONS

Based on review of the data, the following are recommendations of the Pediatric Emergency Medical Services Task Force:

- There should be no additional mandates to establish pediatric emergency departments.

Pediatric emergency departments exist in hospitals where higher medical education is provided through medical school affiliation and/or residency programs. These departments and programs are distributed across the Commonwealth. It would not benefit the consumer to arbitrarily establish specialized departments within hospital emergency departments where this supporting resource could not be provided.

- There should be support of residency programs which deploy physicians to outlying facilities to allow greater access to care.

Hospitals that serve as training sites for residency programs should be encouraged to continue with that support. Pediatric residents bring a high level of skills and knowledge of current treatment modalities to satellite facilities. This affords an outlying community access to a high level of care.

- Hospitals lacking hypothermia thermometers (inexpensive basic glass variety) should be encouraged to purchase them.

Although infrequently used, hypothermia thermometers allow detection of critically low body temperature. Hospitals should also be encouraged to maintain adequate and appropriate pediatric emergency care resources (equipment and supplies).

Hospitals should be applauded for providing staff continuing education and should be encouraged to continue that practice. In addition, hospitals should be encouraged to utilize those resources available at the existing major pediatric referral facilities.

REFERENCE

Pediatric Critical Care Designation Resource Manual. Virginia Department of Health Office of Emergency Medical Services, 1992.

APPENDIX A

PEDIATRIC EMERGENCY MEDICAL SERVICES
CHECKLIST FOR VIRGINIA HOSPITALS

Name of Hospital:_____
Individual completing checklist:_____
Title:_____
Date:_____

Return completed checklist no later than June 20, 1996 to:

Karen Head, Critical Care Coordinator
Virginia Department of Health
Office of Emergency Medical Services
1538 East Parham Road
Richmond, VA 23228

Mark an "**X**" in the box beside each resource currently available in your hospital

HOSPITAL ORGANIZATION

	Pediatric Emergency Department
	Department of Pediatrics
	Department of Anesthesia
	Pediatric Anesthesia
	Department of Surgery
	Pediatric Surgery
	Pediatric Trauma Service
	Radiology Department
	Pediatric Radiology
	Department of Nursing
	Director of Nursing
	Pediatric Nurse Manager/Director
	Pediatric Clinical Nurse Specialist
	Pediatric Nurse Educator
	Trauma Nurse Coordinator

EMERGENCY DEPARTMENT

Total annual Emergency Department visits _____
Total annual pediatric admissions (inpatient) _____
Total annual pediatric patients (0-19) seen in ED _____
Age range your facility considers as "pediatric" _____
Total number pediatric patients received in transfer _____
Total number pediatric patients transferred out _____
Closest pediatric referral facility _____
Distance (land miles) to closest pediatric referral facility _____

PHYSICAL FACILITY

	Adult ED only
	Dedicated pediatric ED (distinct physical unit)
	Designated pediatric emergency area
	Designated resuscitation area equipped for resuscitation/stabilization of neonatal, pediatric, adolescent patient of adequate size to accommodate full resuscitation team
	Access to major treatment room that excludes observation from waiting room
	Reasonable access to helipad

EMERGENCY PHYSICIAN RESOURCES

	Designated physician director
	Attending level pediatric emergency physician in ED 24 hours a day
	Attending level emergency physician (boarded) in ED 24 hours a day
	Physicians Assistant
	Pediatric Trauma Team

IMMEDIATELY AVAILABLE (Within 30 minutes)

	Trauma team leader as designated by director of trauma service
	Two additional physician members of trauma team
	Anesthesiologist (M.D.)
	Emergency Nurses
	Pediatrician (consultant)
	Neurologist
	Orthopaedic Surgeon
	Radiologist
	Respiratory Therapist
	Laboratory Technician
	Radiologic Technician

PROMPTLY AVAILABLE

	Licensed Clinical Social Worker for crisis intervention
	Clergy

NURSING RESOURCES

	ED Nursing Director
	Nurse Practitioner
	Pediatric Nurse Practitioner
	Pediatric ED Nursing Director

	Clinical Nurse Specialist
	Pediatric Clinical Nurse Specialist
	Pediatric Staff Educator/Resource Nurse

NON-LICENSED STAFF

	Emergency Medical Technician

PEDIATRIC ED NURSING CARE

	Pediatric triage protocols and policies
	Nurse staffing in initial resuscitation area based on patient acuity and trauma team composition
	Minimum of two(2) RNs per shift in the resuscitation area who have education and experience in pediatric trauma/emergency nursing
	Written plan for acquiring additional staff on a 24-hour basis to support units with increased patient acuity, multiple emergency procedures and admissions
	Written protocol for expectation and responsibilities of pediatric nurse during resuscitation
	Written nursing documentation for resuscitation of pediatric patients
	100% nursing staff completes PALS/Emergency Nurse Pediatrics Course (ENPC)/hospital equivalent within 6 months of employment
	50% nursing staff completes PALS/ENPC/hospital equivalent within 6 months of employment
	25% nursing staff completes PALS/ENPC/hospital equivalent within 6 months of employment
	Written standards of care for critically ill or injured pediatric patient in ED

QUALITY IMPROVEMENT

	Planned systematic quality improvement evaluation
	QI program that addresses level of care delivered and system interaction
	Follow-up to identified strengths and weaknesses, i.e., continuing education programs
	Hospital liaison (staff person) assigned to EMS for quality improvement initiatives

EQUIPMENT

	Airway control and ventilation devices
	Laryngoscopes - sizes 0, 1, 2, 3 STRAIGHT
	Laryngoscopes - sizes 0, 1, 2, 3 CURVED
	Bag-valve mask resuscitators for infant
	Bag-valve mask resuscitator for child
	Bag-valve mask resuscitator for adult
	Endotracheal tubes 2.5 - 9.0 CUFFED
	Endotracheal tubes 2.5 - 6.0 UNCUFFED
	Suction and appropriate size catheter, 5 - 12 Fr, Yankauer
	Airways
	Oxygen
	Cricothyroidotomy tray
	Tracheostomy trays with tracheostomy tubes size 0 - 3
	Tracheostomy trays with tracheostomy tubes size 10 - 28 Fr
	Cardiopulmonary monitors with pediatric capability
	Monitors with at least two pressure capability
	Catheters for intravenous and intra-arterial lines (2.5 - 8 Fr, 16 - 24 gauge)
	Intraosseous needles
	Monitor-defibrillator with pediatric paddles, 0 - 4 watt/sec per kilogram capability
	Trays for cutdown, suturing, plastics, and intraosseous infusion
	Pediatric splints, casts, traction, including equipment for cervical spine stabilization
	NG tubes 10 - 36 Fr
	Feeding tubes 3 & 5 Fr
	Bladder catheters for infants and children
	Foley catheters 6 - 14 Fr
	Uricath set 5 Fr
	Diagnostic peritoneal lavage catheters for infants and children
	Medications in pediatric concentrations
	IV solutions with both micro-drip and high volume infusion sets
	Pediatric LP tray

	Burr-hole/ICP monitor tray
■	Blood pressure cuffs
	preemie
	infant
	child
	adult
	thigh
	Doppler for blood pressure monitor
	Non-invasive blood pressure monitor
	Pulse oximeter
■	MAST suits
	child
	adolescent
	adult
	Infusion pumps with fractional cc capability
	Pediatric scales for weight measurement
	Temperature control devices for patient, IV fluids, and blood
	Printed pediatric drug dosage and weight estimation reference material
	Broselow Tape
	Emergi-Dose, *First Five Minutes*, etc.
	Programmable calculator for drug calculations
	Thermometer with range 28 - 42 C
	Hypothermia thermometer
	OB Tray
	Equipment and linens to receive burned child

SUPPORT SERVICES

	Radiologic services available 24 hours a day, capable of performing all necessary X-ray procedures on children, including:
	Portable films
	GI procedures
	Vascular invasive procedures
	Ultrasound
	CT scan of head, chest, and abdomen available within 20 minutes
	Laboratory capability on 24 hour basis to perform **STAT**:
	ABGs
	blood glucose
	electrolytes
	CBC-platelet count
	coagulation studies
	serum ammonia
	complete CSF analysis
	urinalysis
	pregnancy test
	bacteriologic plating
	salicylate level
	acetaminophen level
	serum iron level
	theophylline level
	phenobarbital level
	qualitative urine drug screen
	Full service blood bank able to provide diagnostic services and blood component therapy 24 hours a day

INTEGRATION WITH PREHOSPITAL CARE PROVIDERS

COMMUNICATION

	2-way radio communication equipment in ED for on-line medical direction with pre-hospital care providers
	24-hour per day radio/emergency communication capability
	Copy of regional pre-hospital medical/trauma protocols located within communication center
	Orientation for hospital personnel to pre-hospital protocols
	Centralized communications in hospital
	Notification & response by specialty personnel to communication center for any necessary consultation with pre-hospital care providers
	Communication link with Poison Control Center

DIVERSION

	Written policy and protocols for diversion of patients when hospital does not have adequate/appropriate resources (i.e., ED 'overload,' lack of available pediatric unit/PICU beds)
	Written policy for ground transport
	Written policy for air transport

EDUCATIONAL PROGRAMS FOR PRE-HOSPITAL PROVIDERS

	Continuing education program for pre-hospital care providers
	Participation by physicians and nurses as educators in the training curriculum and in continuing education
	Pre-hospital personnel able to participate in multidisciplinary hospital education programs
	Availability of the Emergency Department for clinical rotations for pre-hospital care providers
	Availability of critical care units for clinical rotations for pre-hospital care providers
	Inclusion of pre-hospital personnel in the ongoing emergency care provided pediatric patients after EMS delivery to the Emergency Department
	Availability of follow-up information to pre-hospital personnel on pediatric patients they deliver to the facility (even when patient is transferred to another facility)

INTER-HOSPITAL TRANSPORTS

	Written transfer agreements with referral hospitals
	Consult with pre-hospital personnel about their capabilities and limitations for handling pediatric patients
	Training of pre-hospital personnel in the use of equipment that the hospital will be utilizing with transports, i.e., isolettes, ventilators,etc.
	Orientation for hospital personnel to pre-hospital policies and procedures governing inter-facility transports, specifically the hospital personnel role in the event of emergency during transport
	Specially trained personnel for specific age groups
	neonatal
	pediatric
	Policy specific for type of personnel (ALS, BLS, R.N., etc) required for inter-hospital transports

PEDIATRIC INTENSIVE CARE UNIT

GENERAL/ORGANIZATION

	PICU Committee
	Privileges delineated in writing - M.D. and non-M.D.
	Pediatric critical care consultation for all admissions

	Written policies on:		
	Safety		Discharge criteria
	Nosocomial infection		Patient Monitoring
	Isolation		Equipment maintenance
	Visitation		Equipment breakdown/repair
	Traffic control		Patient record keeping
	Admission criteria		Orientation

PHYSICAL FACILITY

	Distinct,separate Unit
	Controlled access, no through traffic

	Close proximity to:		
	Elevators		MD on-call room
	Operating room		Head nurse office
	Emergency Department		Medical director's office
	Recovery Room/PACU		Waiting room

	Area provided for:		
	Family counseling/conference		Staff conference center
	Staff lounge		Staff toilet
	Staff locker room		Counter cabinet space
	Patient personal effect storage (may be internal)		Clocks
	Clean utility (linen) room		Television, radio
	Soiled utility (linen) room		Access to head of bed
	Laboratory - Urine S.G., hematocrit centrifuge		14 - 20 electrical outlets/bed
	Nourishment station		2 oxygen outlets/bed
	Patient isolation		2 or more compressed air outlets/bed
	Patient privacy provision		2 vacuum outlets/bed
	Central station with direct patient visualization		3 or more vacuum outlets/bed
	Medication station (includes refrigerator, locked narcotics)		Adherence to appropriate codes for heat, ventilation, air conditioning, fire safety, electrical grounding, plumbing, illuminatior
	Computerized lab reporting or equivalent		

PERSONNEL

MEDICAL DIRECTOR

	Appointment by appropriate hospital authority for specified term; acknowledged in writing
	Written job description; Board certified/eligible in pediatric critical care medicine with appropriate experience and/or training
	Has input and oversight for all activities pertinent to the Unit

STAFF PHYSICIANS

	Licensed physician in-house 24 hours/day, PL-2 level of above
	Pediatric ICU physician available immediately within 30 minutes, 24hours/day
	Anesthesiologist (in-house)
	Pediatric anesthesiologist
	General surgeon (in-house) - minimum of PGY 4
	Pediatric surgeon (30 minute call)
	Surgeon - neurosurgery (30 minute call)
	Pediatric neurosurgeon
	Surgeon - ENT (one hour call)
	Surgeon - orthopaedic (one hour call)
	Surgeon - craniofacial
	Surgeon - cardiovascular
	Pediatric cardiovascular surgeon

PEDIATRIC SUB-SPECIALTY SUPPORT

	Pediatric intensivist
	Pediatric cardiologist
	Nephrologist (pediatric experience)
	Pediatric neurologist
	Hematologist (pediatric experience)
	Radiologist
	Pathologist

	Psychiatrist/psychologist
	Neonatologist
	Pediatric pulmonologist
	Pediatric endocrinologist
	Pediatric gastroenterologist
	Allergist

NURSING

	Written policies, procedures and protocols
	Written orientation and clinical standards
	Written standards of care for the critically ill or injured PICU patient
■	Organization
	Director of Pediatric Nursing
	Unit head nurse with training in pediatric critical care
	Staff nurses --ratio 2:1 to 1:3 (staff:patients)
	Nurse educator responsible for pediatric critical care inservice education

ADJUNCT CAPABILITIES

ANCILLARY SERVICE

	Respiratory therapy
	Supervisor - responsible for training RRT staff; maintenance of equipment and quality improvement review
	In-house 24 hours/day, assigned primarily to Unit
	CRT as ED standard
	Advanced certification (PALS)
	Biomedical technicians - 24 hours/day in-house or promptly (one hour call)
	Unit clerk (available 24 hours/day; written job description)
	Child Life Service
	Clergy
	Social worker
	Nutritionist/clinical dietician
	Physical therapist
	Occupational therapist
	Pharmacist - 24 hours/day

EQUIPMENT

PORTABLE EQUIPMENT

	emergency (code) cart
	procedure lamp
	doppler ultrasound device
	ventilators
	infusion pumps
	defibrillator/cardioverter
	suction machine (in addition to bedside)
	thermometers (hypothermia)
	automated BP apparatus
	refractometer
	oto/opthalmoscope
	automatic (metabolic) bed scale
	patient weighing scales (all weights)
	bag-valve-mask resuscitation devices

	cribs (with head access)
	beds (with head access)
	infant warmers/incubators
	oxygen masks
	heating/cooling blankets
	bilirubin lights
	respired gas humidifiers
	air compressor
	air-oxygen monitor
	transport monitor
	rocking chair
	EEG
	isolation cart
	blood warmer

SMALL EQUIPMENT

	emergency drugs
	tracheal intubation equipment
	endotracheal tubes
	oral/nasal airways
	vascular access equipment
	cut-down trays
	tracheostomy trays

MONITORING CAPABILITY

Capability to be continuous for:

	ECG, heart rate
	respiration
	temperature
	arterial blood pressure
	central venous pressure
	pulmonary artery pressure
	intracranial pressure
	esophageal pressure
	2 simultaneous pressures
	3 simultaneous pressures
	4 simultaneous pressures
	5 simultaneous pressures
	arrhythmia detection/alarm

MONITORING CHARACTERISTICS

	high/low alarms for heart rate, respiratory rate and all pressure audible and visible
	hard copy capability
	routine maintenance and testing
	patient isolation-electrical

PEDIATRIC SURGICAL CARE

TRAUMA SERVICE

	Readily identifiable call schedule of surgeons responsible for pediatric care.
	PALS/APLS certified

SURGICAL SPECIALTIES AVAILABILITY

In-hospital 24 hours/day:

	General surgery (attending)
	General surgeon with pediatric or pediatric trauma privileges
	General surgeon with demonstrated ongoing involvement in trauma service
	General surgeon with demonstrated ongoing CME in pediatric specific care (i.e., 10 credits/3 years)
	General surgery resident (PGY 4 or PGY 5)
	Neurosurgeon (attending)
	Neurosurgery resident (PGY 4 or PGY 5)
	Orthopaedic surgeon (attending)
	Orthopaedic surgery resident

ON CALL AND PROMPTLY AVAILABLE FROM IN/OUT OF HOSPITAL
(Within 30 minutes)

	Cardiac surgery
	Microsurgery capabilities
	Gynecologic surgery
	Hand surgery
	Ophthalmic surgery
	Oral surgery
	ENT surgery
	Plastic and maxillofacial surgery
	Thoracic surgery
	Urologic surgery

OPERATING SUITE SPECIAL REQUIREMENTS

EQUIPMENT - INSTRUMENTATION

	Operating room adequately staffed in-house 24 hours/day
	Second on-call team available within 20 minutes and physically present when primary team is participating in an operative case
	Cardiopulmonary bypass capability
	Operating microscope
	Thermal control equipment for patient and blood
	X-ray capability
	Endoscopes, all varieties
	Craniotome
	Monitoring
	Materials available in size compatible with pediatric care and personnel familiar with their use

Non-Surgical Specialties Availability

In-hospital 24 hours/day:

	Anesthesiology: full-time, board certified
	Pediatric anesthesia back-up within 30 minutes
	Anesthesia residents
	Post-anesthesia recovery room (ICU acceptable)
	RNs, other essential personnel with pediatric experience 24 hours/day

REHABILITATIVE SERVICES

REHABILITATION PROCESS

	Rehabilitation activities from admission to discharge
	Interdisciplinary discharge process initiated within 24 hours of admission
	Long term follow-up with identification and modification of care needs as necessary
	Documentation of primary physician after discharge from rehabilitation
■	Multidisciplinary Involvement
	Early referral of every appropriate patient for evaluation by rehabilitation personnel
■	Advanced and Continuing Rehabilitation
	Transfer agreements with rehabilitation hospitals, rehabilitation agencies and home health providers

STAFFING

	Rehabilitation medicine
	Full-time associated pediatric rehabilitation faculty with OT/PT/neuropsychiatric support
	Physical therapy
	Therapist experienced in the management of the pediatric patient
	Therapist with certification in neurodevelopmental treatment
	Occupational therapy
	Occupational therapist experienced in the management of the pediatric patient
	Therapist with certification in neurodevelopmental treatment
	Demonstrated expertise in splint fabrication
	Speech and language pathology
	Speech and language pathologist with experience in the treatment of the pediatric patient
	Expertise in swallowing techniques
	Expertise in alternative forms of communication
	Education - Child Life Services
	Specialist with experience in the education and recreation of the pediatric patient

AVAILABILITY OF SERVICES

	Physical therapy available on scheduled basis, BID
	Occupational therapy available on scheduled basis, BID
	Speech and language pathology available on scheduled basis, daily
	Child Life Services available on scheduled basis, daily

QUALITY IMPROVEMENT

■	Patient Care
	Audit of patient charts
	Review of procedures
■	Continuing Education
	CE education programs for all rehabilitation personnel

EDUCATION, RESEARCH AND TRAINING

PHYSICIAN TRAINING

	Hospital has accredited pediatric residency program
	Hospital provides rotation for pediatric residents in pediatric critical care
	Hospital provides clinical rotations for prehospital personnel
	Fellowship program in pediatric critical care
	In-house CME for all M.D.s specific to pediatric care
	In-house CME for all M.D.s specific to pediatric critical care
	Staff M.D.s to attend/participate in regional/national meetings in areas related to pediatric critical care

UNIT PERSONNEL TRAINING

	CPR certification for all nurses and respiratory therapists
	Resuscitation practice sessions
	Ongoing CE on site and on/off site for nurses and respiratory therapists

MEDICAL EDUCATION

	BLS in-house
	APLS or PALS in-house
	Program in undergraduate medical education (medical school affiliation)
	Program in postgraduate education - residency (i.e., pediatric, emergency medicine, family practice, general surgery and surgical sub-specialties)
	Monthly inservice presentation on emergency and critical care conditions of childhood to all involved groups
	Participation in the community's education of allied health personnel
	Prevention education

REGIONAL EDUCATION

	Participation in regional pediatric emergency care education
	Participation in regional pediatric critical care education
	Serve as educational resource center for public education in pediatric emergency care
	Serve as educational resource center for public education in pediatric critical care

RESEARCH

	Provides opportunities for clinical research (includes IRB)
	Staff involved in clinical and/or basic science research
	Evidence of pediatric nursing research and/or publications in area of pediatric emergency care
	Evidence of pediatric nursing research and/or publications in area of pediatric trauma/critical care

OUTREACH PROGRAM

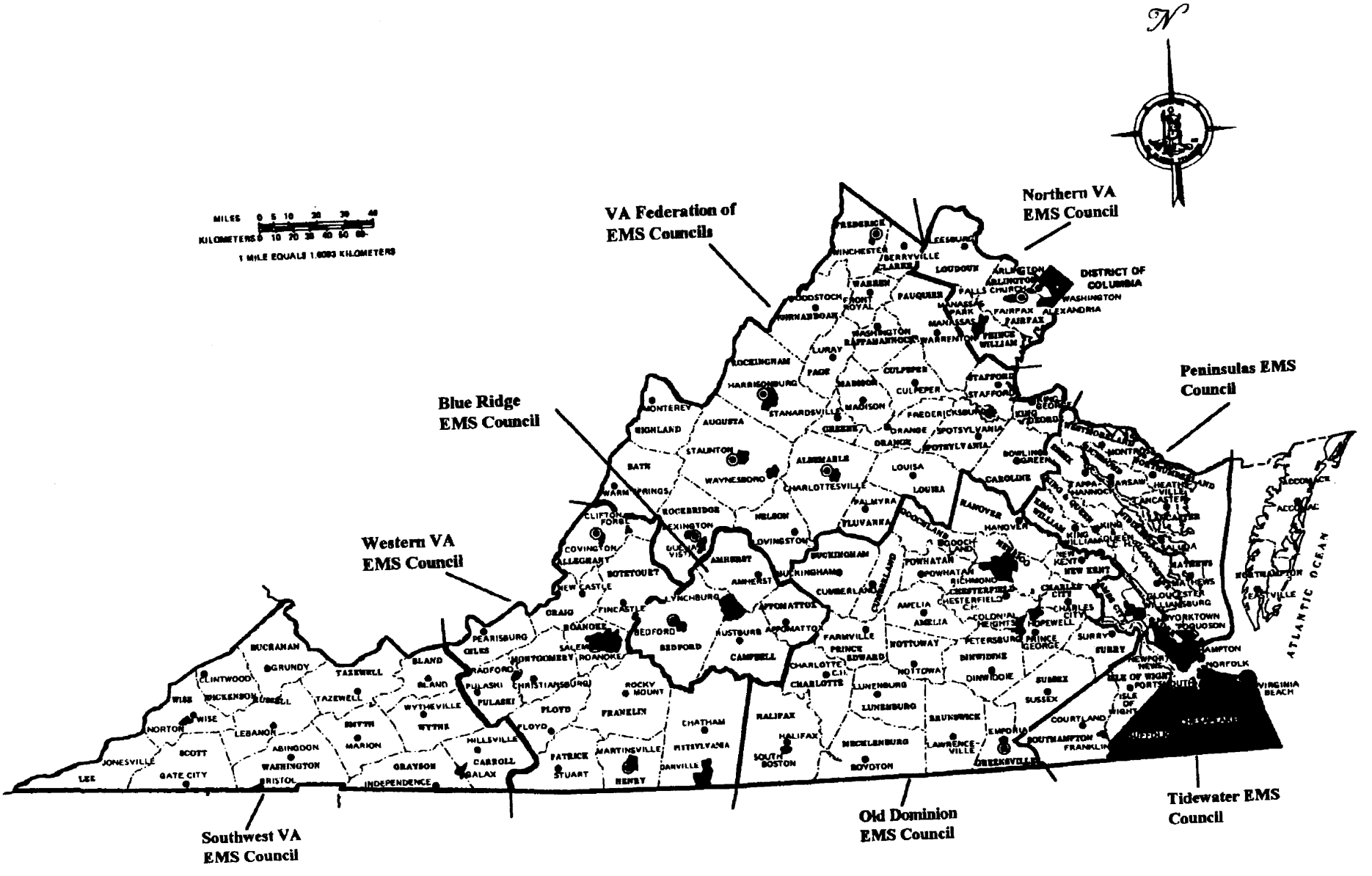
	Outreach program, including telephone and on-site consultation with physicians in the community and outlying areas
	Evidence of nursing participation in community outreach programs
	Nursing coordinator for regional continuing education

APPENDIX B

Completion Rates of Survey by Section

Survey Section	Percent Completed by Hospitals
Hospital Organization	100
Emergency Department	100
Emergency Medical Services	100
Pediatric Intensive Care Unit (PICU)	40
PICU - Personnel	39
PICU - Nursing	40
Adjunct Services	68
Equipment	71
Monitoring	69
Pediatric Surgical Care	80
Operating Room	82
Rehabilitation	68
Quality Improvement	60
Education	86

APPENDIX C


N
MILES 0 5 10 20 30 40
KILOMETERS 0 10 20 30 40 50 60
1 MILE EQUALS 1.6093 KILOMETERS
VA Federation of EMS Councils
Northern VA EMS Council
DISTRICT OF COLUMBIA
Peninsulas EMS Council
Blue Ridge EMS Council
Western VA EMS Council
Southwest VA EMS Council
Old Dominion EMS Council
Tidewater EMS Council
ATLANTIC OCEAN

APPENDIX D

**** MULTIPLE REGRESSION ****

Listwise Deletion of Missing Data
Equation Number 1 Dependent Variable.. PEDS_ED Pediatric Emergency Department

Block Number 1. Method: Enter
PA RESUS_RN TRANS_IN TRAN_OUT FACEP PED_DOC DEPT_PED MED_SCH
PICU_SEP PEDS_ADM PEDS_NUM ROTATION VISIT_ED POSTGRAD FELLOWS

Variable(s) Entered on Step Number

1..	FELLOWS	Pediatric Critical Care Fellowship Program
2..	FACEP	Board Certified Emergency Physician in ED 24 hours/day
3..	TRAN_OUT	Pediatric Transfers Out
4..	PA	Physician's Assistant
5..	DEPT_PED	Department of Pediatrics
6..	RESUS_RN	Minimum of 2 RNs/shift with Pediatric Emergency Nursing Experience in Resuscitation Area
7..	MED_SCH	Program in Undergraduate Medical Education
8..	PICU_SEP	PICU Distinct Unit
9..	PED_DOC	Pediatric Attending in ED 24 hours/day
10..	PEDS_ADM	Annual Pediatric Admissions
11..	VISIT_ED	Annual ED Visits
12..	ROTATION	Pediatric Critical Care Rotation for Pediatric Residents
13..	POSTGRAD	Program in Postgraduate Education - Residency
14..	TRANS_IN	Pediatric Transfers In
15..	PEDS_NUM	Annual Pediatric ED Visits

Multiple R	.99426
R Square	.98855
Adjusted R Square	.98415
Standard Error	.03961

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	15	5.28426	.35228
Residual	39	.06119	.00157

F = 224.51308 Signif F = .0000

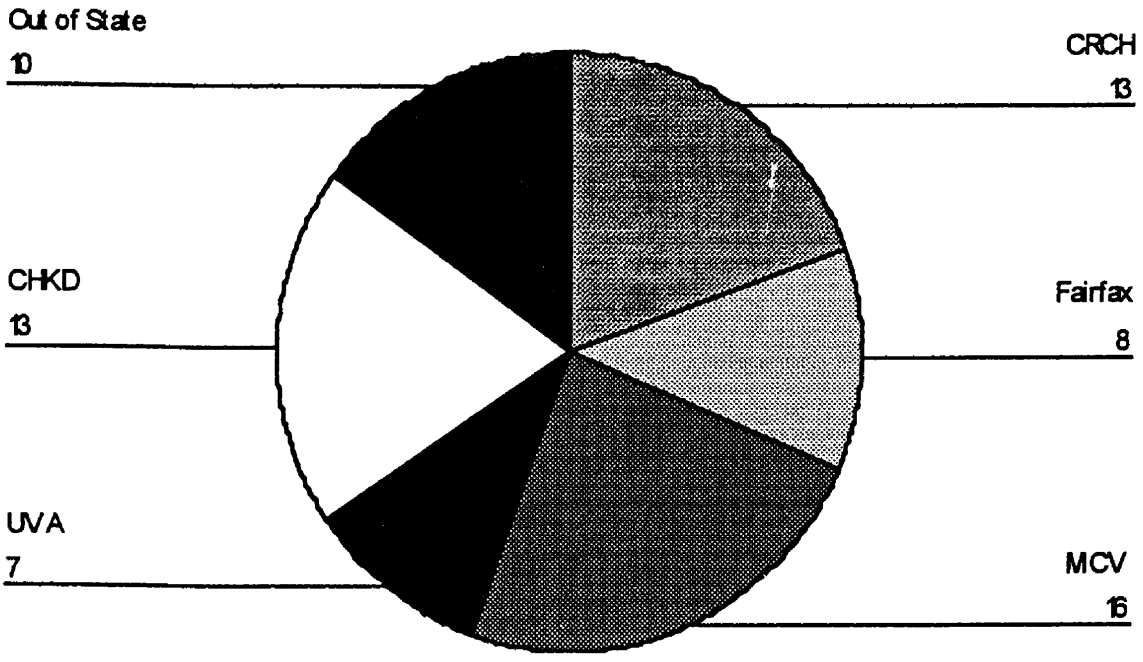
---------- Variables in the Equation ----------

Variable	B	SE B	Beta	T	Sig T
PA	-.033841	.022560	-.031206	-1.500	.1417
RESUS_RN	-.010803	.013914	-.016477	- .776	.4422
TRANS_IN	-6.40728E-04	5.0373E-05	-.562710	-12.720	.0000
TRAN_OUT	9.36740E-05	7.3862E-05	.030101	1.268	.2122
FACEP	-.002548	.013085	-.004085	-.195	.8466
PED_DOC	.908604	.046090	.661856	19.714	.0000
DEPT_PED	-.015363	.015118	-.024636	-1.016	.3158
MED_SCH	-.001025	.030524	-.001315	-.034	.9734
PICU_SEP	-.021964	.026290	-.026064	-.835	.4085
PEDS_ADM	2.04441E-05	1.2877E-05	.052677	1.588	.1204
PEDS_NUM	3.99174E-06	2.2824E-06	.081488	1.749	.0882
ROTATION	1.014160	.039831	.925196	25.462	.0000
VISIT_ED	-3.24835E-06	5.8441E-07	-.196619	-5.558	.0000
POSTGRAD	-.006737	.035804	-.007995	-.188	.8517
FELLOWS	-1.255214	.082468	-.914337	-15.221	.0000
(Constant)	.868099	.203785		4.260	.0001

End Block Number 1 All requested variables entered.

APPENDIX E

Major Referral Facilities
for Specialized Pediatric Services



CRCH - Carilion Roanoke Community Hospital, Roanoke, Virginia
Fairfax - Fairfax Hospital, Falls Church, Virginia
MCV - Medical College of Virginia Hospitals, Richmond, Virginia
UVA - University of Virginia Medical Center, Charlottesville, Virginia
CHKD - Children's Hospital of the King's Daughters, Norfolk, Virginia
Out of State - facilities in Washington, D.C., North Carolina, Tennessee

APPENDIX F

**** MULTIPLE REGRESSION ****

Listwise Deletion of Missing Data

Equation Number 1 Dependent Variable.. PA Physician's Assistant

Block Number 1. Method: Enter
VISIT_ED PEDS_NUM PEDS_ADM TRANS_IN TRAN_OUT FACEP MED_SCH POSTGRAD FELLOWS

Variable(s) Entered on Step Number

1..	FELLOWS	Pediatric Critical Care Fellowship Program
2..	FACEP	Board Certified Emergency Physician
3..	TRAN_OUT	Pediatric Transfers Out
4..	MED_SCH	Program in Undergraduate Medical Education
5..	VISIT_ED	Annual ED Visits
6..	PEDS_ADM	Annual Pediatric Admissions
7..	TRANS_IN	Pediatric Transfers In
8..	PEDS_NUM	Annual Pediatric ED Visits
9..	POSTGRAD	Program in Postgraduate Education - Residency

Multiple R	.44623
R Square	.19912
Adjusted R Square	.03895
Standard Error	.28442

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	9	.90511	.10057
Residual	45	3.64035	.08090

F = 1.24316 Signif F = .2939

---------- Variables in the Equation ----------

Variable	B	SE B	Beta	T	Sig T
VISIT_ED	-6.06771E-06	3.2748E-06	-.398282	-1.853	.0705
PEDS_NUM	-9.60900E-06	1.3571E-05	-.212722	-.708	.4826
PEDS_ADM	2.30977E-05	7.8899E-05	.064540	.293	.7711
TRANS_IN	-2.27373E-04	2.7779E-04	-.216548	-.819	.4174
TRAN_OUT	6.65999E-05	5.0440E-04	.023208	.132	.8955
FACEP	.051815	.084712	.090104	.612	.5438
MED_SCH	-.180249	.207947	-.250799	-.867	.3906
POSTGRAD	-.025681	.235471	-.033047	-.109	.9136
FELLOWS	-.563616	.420254	-.445221	-1.341	.1866
(Constant)	3.510361	.924992		3.795	.0004

End Block Number 1 All requested variables entered.

APENDIX G

**** MULTIPLE REGRESSION ****

Listwise Deletion of Missing Data

Equation Number 1 Dependent Variable.. PEDS_SUR Pediatric Surgery

Block Number 1. Method: Enter
PEDIATRI SURGRES PEDS_CV ORTH_RES PEDS_NUM PEDS_ADM ANES_RES PEDS_ED
PICU_SEP PED_NEUR PEDS_ANE PED_SURG

Variable(s) Entered on Step Number

1..	PED_SURG	Pediatric Surgeon (30min call)
2..	PEDIATRI	Pediatrician (Consultant)
3..	PEDS_ANE	Pediatric Anesthesia
4..	ANES_RES	Anesthesia Residents
5..	ORTH_RES	Orthopaedic Surgery Resident
6..	PEDS_ADM	Annual Pediatric Admissions
7..	SURGRES	General Surgery Resident (PGY4 or PGY5)
8..	PEDS_NUM	Annual Pediatric ED Visits
9..	PEDS_ED	Pediatric Emergency Department
10..	PICU_SEP	PICU Distinct Unit
11..	PED_NEUR	Pediatric Neurosurgeon
12..	PEDS_CV	Pediatric Cardiovascular Surgeon

Multiple R	.84819
R Square	.71943
Adjusted R Square	.65342
Standard Error	.27503

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	12	9.89219	.82435
Residual	51	3.85781	.07564

F = 10.89784 Signif F = .0000

---------- Variables in the Equation ----------

Variable	B	SE B	Beta	T	Sig T
PEDIATRI	.135270	.100163	.113908	1.350	.1828
SURGRES	-.175820	.182668	-.110564	-.963	.3403
PEDS_CV	.040250	.346519	.025312	.116	.9080
ORTH_RES	.045583	.351583	.017111	.130	.8974
PEDS_NUM	-1.36463E-06	1.0304E-05	-.018022	-.132	.8952
PEDS_ADM	-3.50275E-05	8.4042E-05	-.058971	-.417	.6786
ANES_RES	-.029700	.317315	-.011149	-.094	.9258
PEDS_ED	.165309	.208954	.103955	.791	.4325
PICU_SEP	-.244466	.197340	-.191502	-1.239	.2211
PED_NEUR	.293482	.340261	.184557	.863	.3924
PEDS_ANE	.657433	.085654	.686666	7.675	.0000
PED_SURG	.108860	.156485	.088606	.696	.4898
(Constant)	.087719	.769464		.114	.9097

End Block Number 1 All requested variables entered.

**** MULTIPLE REGRESSION ****

Listwise Deletion of Missing Data

Equation Number 1 Dependent Variable.. PEDS_ANE Pediatric Anesthesia

Block Number 1. Method: Enter
PEDIATRI SURGRES PEDS_CV ORTH_RES PEDS_NUM PEDS_ADM PEDS_SUR ANES_RES
PED_SURG PEDS_ED PICU_SEP PED_NEUR

Variable(s) Entered on Step Number

1..	PED_NEUR	Pediatric Neurosurgeon
2..	PEDIATRI	Pediatrician (Consultant)
3..	PEDS_ADM	Annual Pediatric Admissions
4..	SURGRES	General Surgery Resident (PGY4 or PGY5)
5..	PEDS_SUR	Pediatric Surgery
6..	ORTH_RES	Orthopaedic Surgery Resident
7..	ANES_RES	Anesthesia Residents
8..	PEDS_NUM	Annual Pediatric ED Visits
9..	PED_SURG	Pediatric Surgeon (30min call)
10..	PEDS_ED	Pediatric Emergency Department
11..	PICU_SEP	PICU Distinct Unit
12..	PEDS_CV	Pediatric Cardiovascular Surgeon

Multiple R	.82526
R Square	.68106
Adjusted R Square	.60602
Standard Error	.30628

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	12	10.21592	.85133
Residual	51	4.78408	.09381

F = 9.07544 Signif F = .0000

---------- Variables in the Equation ----------

Variable	B	SE B	Beta	T	Sig T
PEDIATRI	-.081188	.112948	-.065456	-.719	.4755
SURGRES	.123113	.204533	.074124	.602	.5499
PEDS_CV	-.067920	.385818	-.040893	-.176	.8610
ORTH_RES	-.196098	.390623	-.070477	-.502	.6178
PEDS_NUM	-1.50048E-05	1.1282E-05	-.189727	-1.330	.1895
PEDS_ADM	1.08227E-04	9.2516E-05	.174449	1.170	.2475
PEDS_SUR	.815284	.106220	.780575	7.675	.0000
ANES_RES	-.046153	.353333	-.016587	-.131	.8966
PED_SURG	-.098036	.174547	-.076399	-.562	.5768
PEDS_ED	-.022901	.234092	-.013788	-.098	.9225
PICU_SEP	.304731	.218920	.228548	1.392	.1700
PED_NEUR	-.002766	.381668	-.001665	-.007	.9942
(Constant)	.428827	.854877		.502	.6181

End Block Number 1 All requested variables entered.

RESOLUTION

HOUSE JOINT RESOLUTION NO. 213

Requesting the State Department of Health and the Virginia Hospital Association to study the ability of emergency service hospitals to provide pediatric emergency medical services.

Agreed to by the House of Delegates, February 1, 1996
Agreed to by the Senate, February 29, 1996

WHEREAS, children are seen daily in emergency rooms across the nation and the Commonwealth for a myriad of afflictions, from ear infections and stomach aches to broken bones, violence-inflicted trauma, and life-threatening diseases and conditions; and

WHEREAS, in critical care cases, many children may be rushed to hospital emergency rooms that are not fully equipped to handle the needs of children; and

WHEREAS, recent news accounts reveal known deficiencies in the provision of pediatric emergency medical services, and unfortunately, without proper and immediate care, the outcome for many children is poor; and

WHEREAS, the needs of children in pediatric emergency care situations are receiving increased attention, and some hospitals have begun to address the issue through specially equipped pediatric emergency rooms with child-sized equipment and highly trained specialists; and

WHEREAS, there is a need to ensure that appropriate pediatric emergency medical services are available to Virginia's children; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That the State Department of Health and the Virginia Hospital Association be requested to study the ability of emergency service hospitals to provide pediatric emergency care services. The State Department of Health and the Virginia Hospital Association are requested to survey the emergency care hospitals in Virginia to determine the level of care and the ability of such hospitals to adequately and appropriately serve pediatric emergency medical needs. The Department and the Association shall include in the survey and their deliberations (i) the availability of pediatric emergency medical services and professionally trained specialists; (ii) the availability and accessibility of pediatric emergency rooms and child-sized medical equipment; (iii) pediatric emergency staffing needs, including nurse practitioners, emergency medical technicians, specialists in emergency medicine, surgeons, pediatricians, and other medical professionals and specialists; (iv) adequacy of staff preparation and training to meet pediatric emergency care needs; and (v) such other factors and issues which require consideration and assessment in evaluating pediatric emergency care needs in Virginia.

The Department and the Association shall provide opportunities for the participation of representatives of the Virginia Chapters of the American Academy of Pediatrics, the American College of Surgeons, the American College of Emergency Physicians, the Virginia Nurses Association, and such other medical professionals and specialists as are appropriate to ensure an adequate assessment of pediatric emergency medical services needs in Virginia.

The State Department of Health shall provide staff support for the study. All agencies of the Commonwealth shall provide assistance to the Department, upon request.

The State Department of Health and the Virginia Hospital Association shall complete their work in time to submit their findings and recommendations jointly to the Governor and the 1997 Session of the General Assembly as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents.