National Health Statistics Reports

Number 47 ■ March 1, 2012

Availability of Pediatric Services and Equipment in Emergency Departments: United States, 2006

by Susan M. Schappert, M.A., and Farida Bhuiya, M.P.H.
Division of Health Care Statistics

Abstract

Objectives—This report presents data on the availability of pediatric services, expertise, and supplies for treating pediatric emergencies in U.S. hospitals.

Methods—Data in this report are from the Emergency Pediatric Services and Equipment Supplement (EPSES), a self-administered questionnaire added to the 2006 National Hospital Ambulatory Medical Care Survey (NHAMCS). NHAMCS samples nonfederal short-stay and general hospitals in the United States. Sample data were weighted to produce annual estimates of pediatric services, expertise, and equipment availability in hospital emergency departments (EDs).

Results—In 2006, only 7.2 percent of hospital EDs had all recommended pediatric emergency supplies, and 45.6 percent had at least 85.0 percent of recommended supplies. EDs in children's hospitals and hospitals with pediatric intensive care units (PICUs) were more likely to meet guidelines for pediatric emergency department services, expertise, and supplies. About 74.0 percent of these facilities had at least 85.0 percent of recommended supplies, compared with 42.4 percent of other facilities. Among children's hospitals and hospitals with PICUs, 66.0 percent had 24 hours a day, 7 days a week access to a board-certified pediatric emergency medicine attending physician; such access was uncommon in other types of hospitals. In general, little change was noted in the availability of emergency pediatric supplies between 2002–2003, when the initial EPSES was conducted, and 2006.

Keywords: children • emergency care • medical equipment • National Hospital Ambulatory Medical Care Survey

Introduction

In 1993, the Institute of Medicine recommended that all agencies with jurisdiction over hospitals "require that hospital emergency departments…have available and maintain equipment and supplies appropriate for the emergency care of children" (1). In 2006, the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics released data from the first Emergency Pediatric Services and Equipment Supplement (EPSES) conducted in 2002–2003. It showed that emergency departments (EDs) generally had 82.9 percent of recommended emergency pediatric supplies, but only 5.5 percent of EDs had all recommended supplies (2). A supplement to the 2006 National Hospital Ambulatory Medical Care Survey (NHAMCS) was conducted to assess progress made since that time. It expanded upon the earlier survey by also including a panel of children's hospitals. This report highlights results from the 2006 EPSES on the availability of pediatric services, expertise, and supplies in U.S. hospitals for treating pediatric emergencies.

Methods

Data in this report are from EPSES, a self-administered questionnaire added to the 2006 NHAMCS. NHAMCS samples nonfederal short-stay and general hospitals in the United States. EPSES was also administered as part of the 2002 and 2003 NHAMCS; the 2006 version incorporated some additional data items. The core EPSES content in each year was based on the 2001 guidelines for pediatric services, medical expertise, and small-sized supplies and equipment for EDs developed by the American Academy of Pediatrics (AAP) and the American College of Emergency Physicians (ACEP) (3). The 2006 EPSES response rate was 80.2 percent. Estimates were weighted to produce annual estimates of pediatric services, expertise, and equipment availability in EDs.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Center for Health Statistics

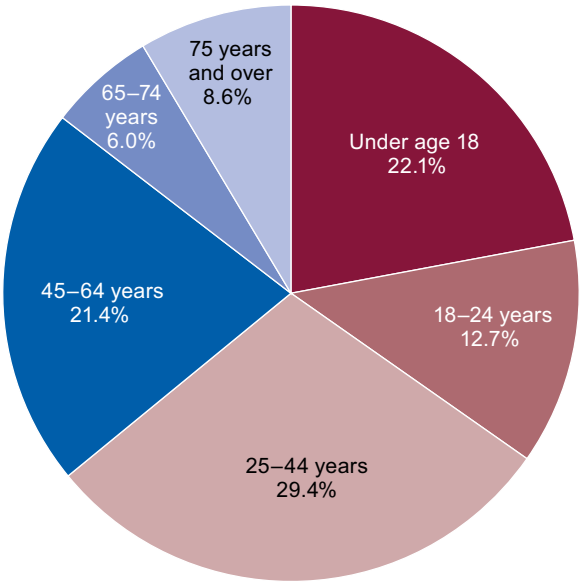
Results

Overview of ED pediatric utilization and inpatient pediatric services

- In 2006, there were an estimated 26.3 million hospital ED visits in the United States by persons under age 18, or 35.7 visits per 100 persons. Pediatric visits accounted for 22.1 percent of all ED visits (Figure 1).
- Of the 4,800 general and short-stay hospitals with 24-hour EDs in the United States during 2006, the majority (87.2 percent) admitted children, but only 10.1 percent were children's hospitals or had pediatric intensive care units (PICUs). (Table 1, Figure 2). Among those that did not admit pediatric patients, 48.5 percent were in counties that had a children's hospital (not shown).
- About one-quarter (28.6 percent of emergency pediatric visits) occurred in children's hospitals and those with PICUs, while 29.0 percent occurred in hospitals that either did not admit children or had no separate pediatric ward (Figure 3).

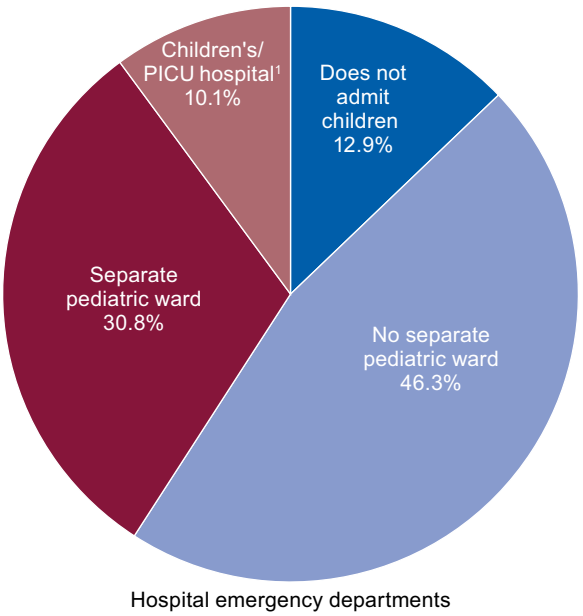
Services for pediatric emergencies by type of hospital

- About one-tenth (10.4 percent) of EDs reported having pediatric 23-hour observation units, but the presence of such units ranged from 39.4 percent for children's hospitals and hospitals with PICUs (Table 2) to 7.1 percent for all other hospitals (Figure 4).
- In general, only 11.0 percent of EDs reported that critically injured pediatric patients would be cared for in their hospital (Table 2).
- About one-fifth (19.3 percent) of EDs reported having pediatric trauma services; for children's hospitals and hospitals with PICUs, this increased to about three-quarters (76.4 percent) (Table 2).
- For hospitals without pediatric trauma services, about one-half had a written transfer agreement with another hospital (49.5 percent). Of those without written transfer agreements, about 8 of 10 (84.7 percent) stated that they would send critically injured pediatric patients to another hospital without such an agreement (Table 2).
- The majority (84.0 percent) of hospitals stated that they would send pediatric patients requiring intensive care to another hospital. About one-half (53.5 percent) of EDs had a written transfer agreement with facilities having a PICU, ranging from 32.6 percent of children's hospitals and hospitals with PICUs to 53.5 percent of all other hospitals (Table 2,



NOTE: Based on 119,191,000 emergency department visits.
SOURCE: CDC/NCHS, National Hospital Ambulatory Medical Care Survey, 2006.

Figure 1. Percent distribution of hospital emergency department visits, by patient age: United States, 2006



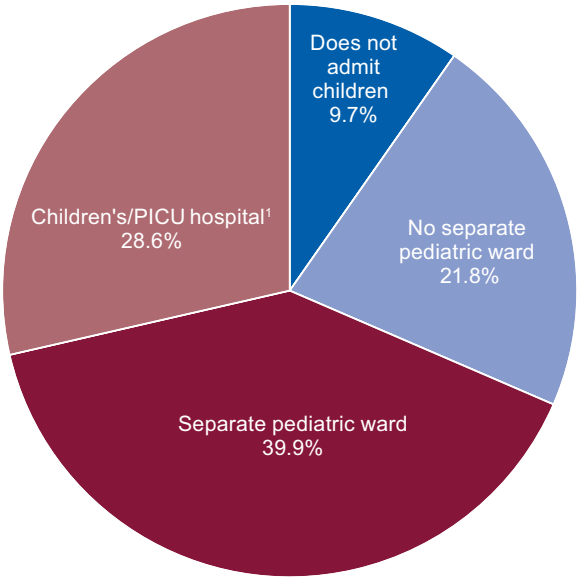
[1]PICU is pediatric intensive care unit. Category includes children's hospitals and hospitals with PICUs.
SOURCE: CDC/NCHS, National Hospital Ambulatory Medical Care Survey, 2006.

Figure 2. Hospital emergency departments, by inpatient pediatric structure: United States, 2006

Figure 4). [Note that hospitals with PICUs may have written transfer agreements to send pediatric patients to other hospitals with PICUs for a variety of reasons. For example, serious trauma may require a different type of care than is available in a regular PICU, some PICUs may be small and not equipped to handle certain types of patients, and some agreements to transfer may be based simply on capacity and the lack of available beds (4).]

Staffing expertise for pediatric emergencies by type of hospital

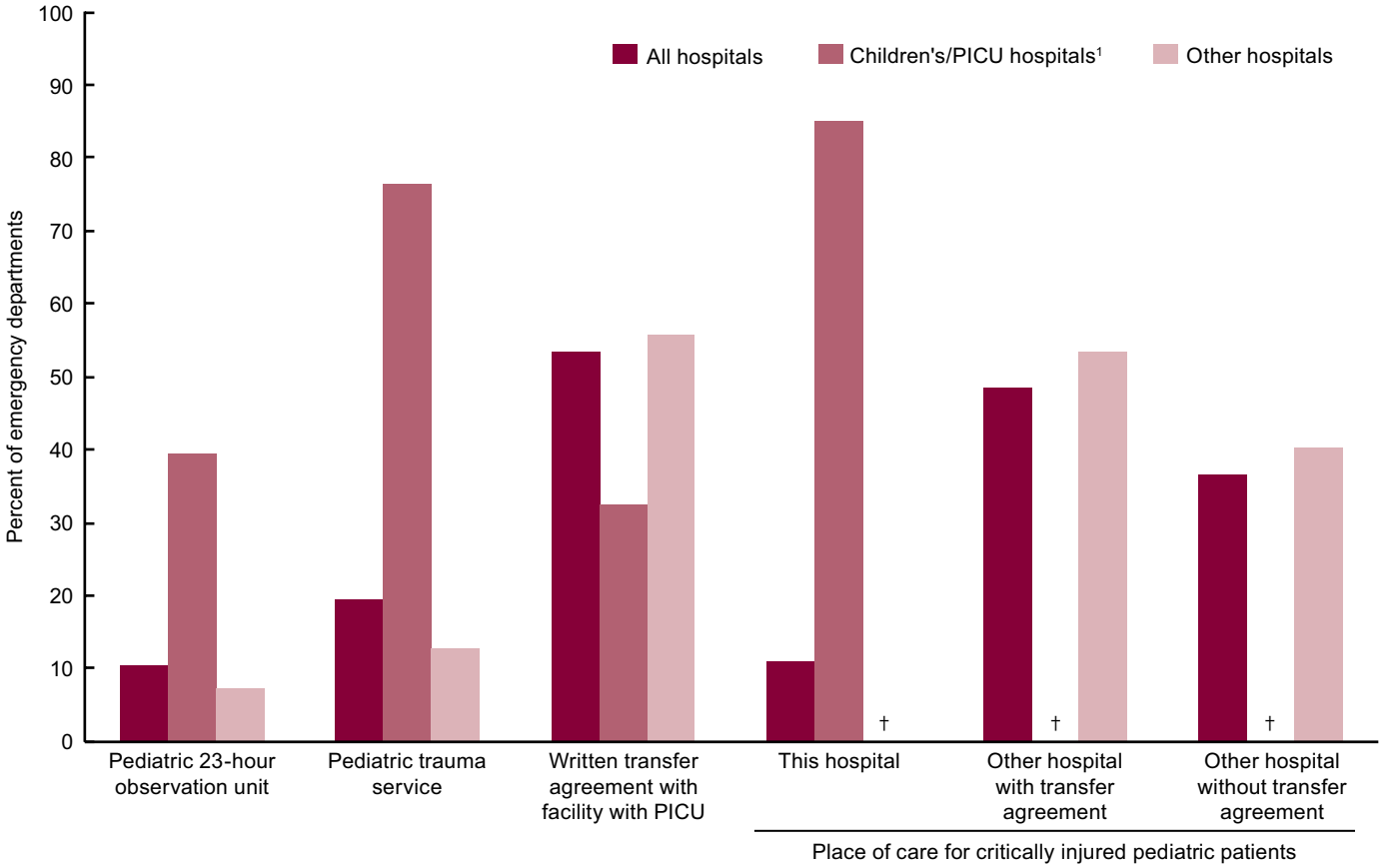
- The majority of hospitals had 24 hours a day, 7 days a week access either in-house or on-call to a board-certified emergency medicine attending physician (72.1 percent) or a board-certified pediatric attending physician



Hospital emergency department visits[2] by persons under age 18

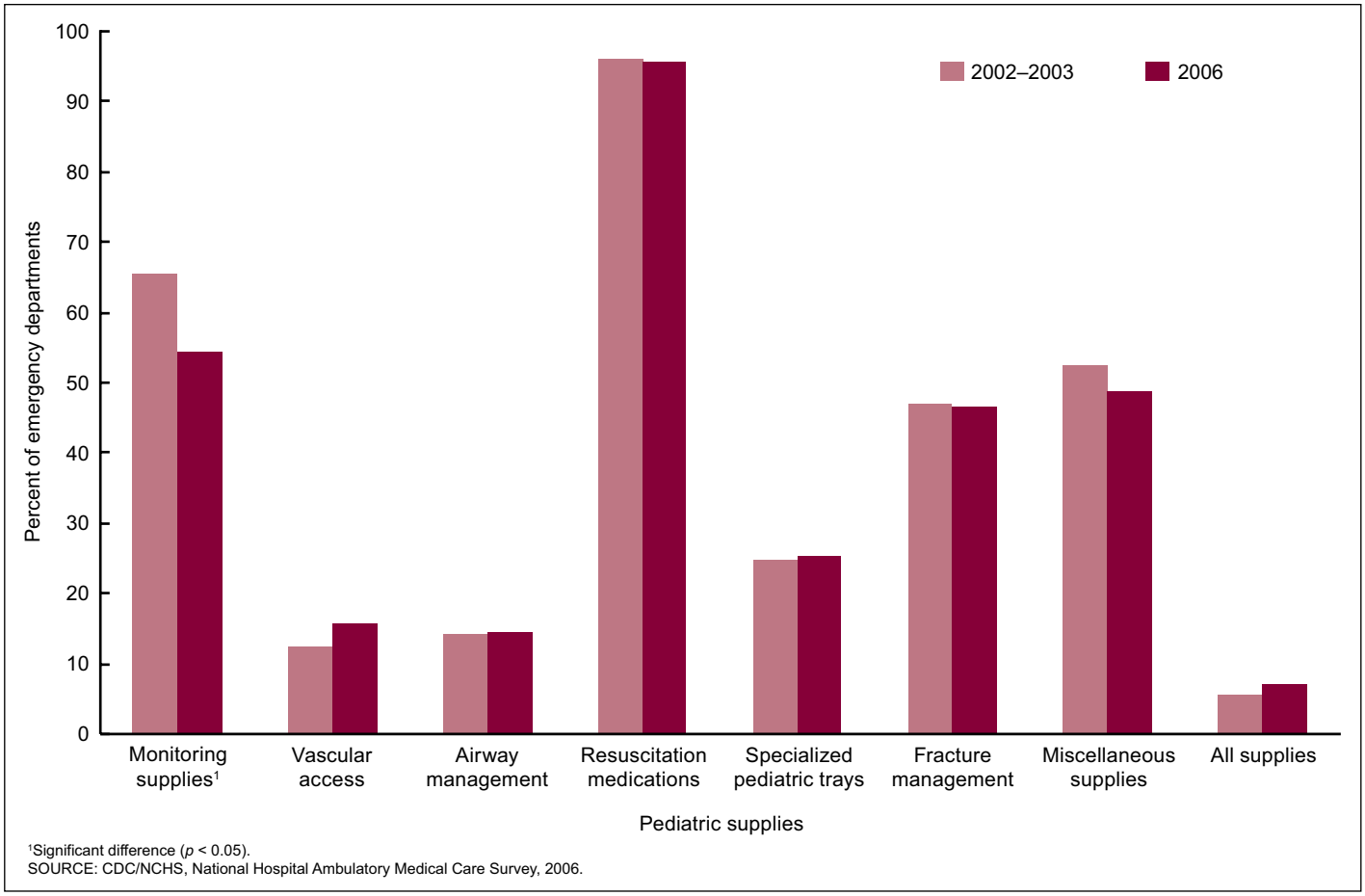
[1]PICU is pediatric intensive care unit. Category includes children's hospitals and hospitals with PICUs.
[2]Excludes data for 2.2 million pediatric visits (8.4% of total pediatric visits) where inpatient pediatric structure was unknown.
SOURCE: CDC/NCHS, National Hospital Ambulatory Medical Care Survey, 2006.

Figure 3. Pediatric visits to hospital emergency departments, by inpatient pediatric structure: United States, 2006



† Estimates for some categories are statistically unreliable and are not shown.
[1]PICU is pediatric intensive care unit. Category includes children's hospitals and hospitals with PICUs.
SOURCE: CDC/NCHS, National Hospital Ambulatory Medical Care Survey, 2006.

Figure 4. Selected pediatric emergency services, by type of hospital: United States, 2006



[1]Significant difference ($p < 0.05$).
SOURCE: CDC/NCHS, National Hospital Ambulatory Medical Care Survey, 2006.

Figure 5. Emergency departments fully supplied with recommended pediatric emergency supplies, by year: United States, 2002–2003 and 2006

(59.4 percent). Such access was reported more frequently for children's hospitals and hospitals with PICUs than for other hospitals (Table 3).

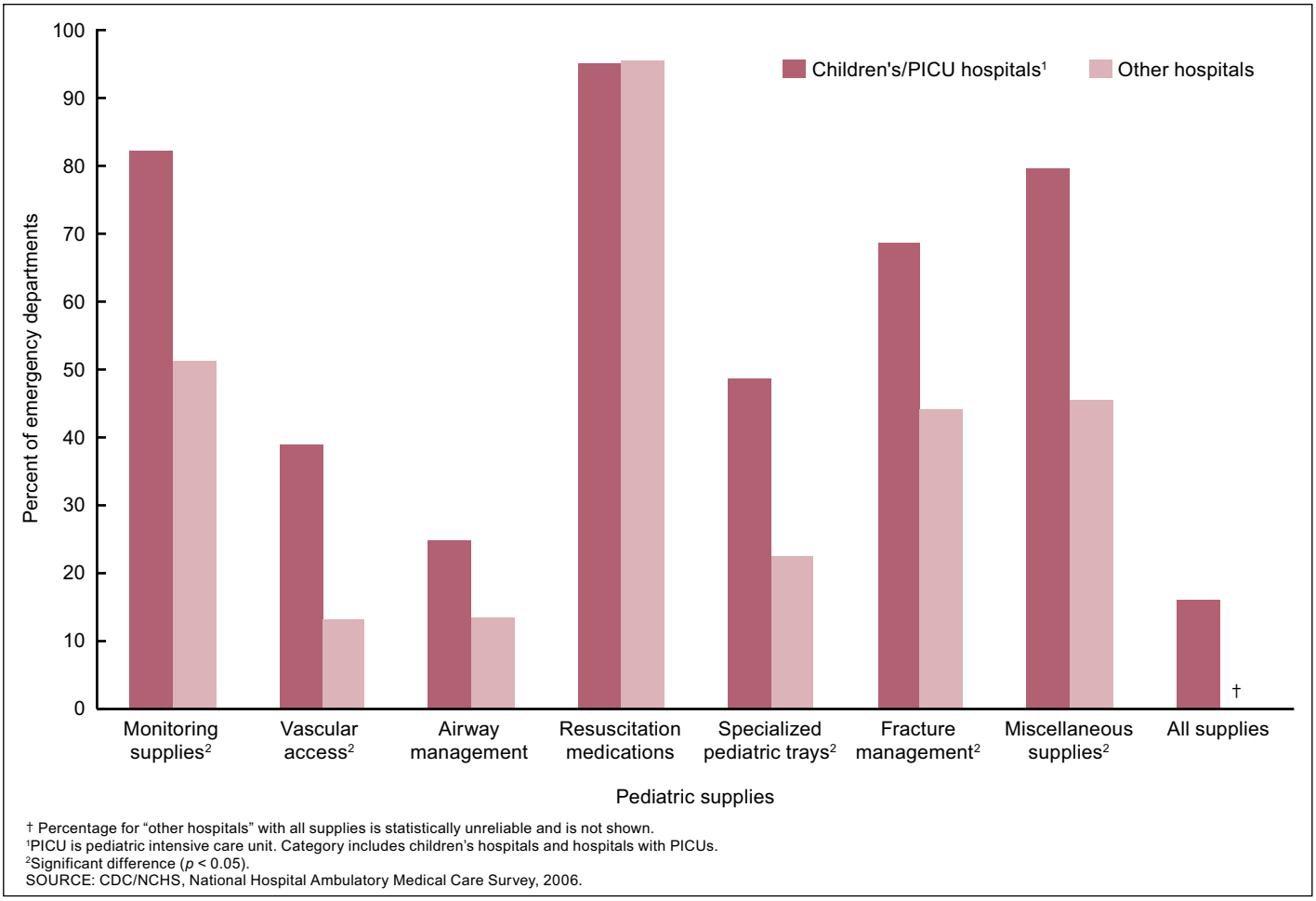
- Among children's hospitals and hospitals with PICUs, 66.0 percent had 24 hours a day, 7 days a week access to a board-certified pediatric emergency medicine attending physician; such access was uncommon in other types of hospitals (Table 3).
- While only 8.5 percent of EDs reported having a pediatrician on duty in the ED 24 hours a day, 7 days a week, 31.8 percent had a written protocol stating when a pediatrician would be called to the ED (Table 3). For definitions of each type of physician, see "Technical Notes."

Availability of emergency pediatric supplies overall

- In 2006, 7.2 percent of hospitals had all recommended pediatric supplies. This was not statistically different from the 5.5 percent of hospitals in 2002–2003 (Table 4, Figure 5).
- About one-half of EDs (45.6 percent) had at least 85.0 percent of recommended supplies (not shown).
- EDs were most likely to have resuscitation supplies (95.5 percent). Least likely to be in full supply were airway management supplies (14.7 percent) and vascular access supplies (15.8 percent) (Table 4, Figure 5).
- For some supplies, smaller sizes were available less frequently than larger sizes. For example, size 10 French nasopharyngeal airways were available at 59.9 percent of EDs, but the same item in size 28 was available at 75.6 percent of EDs. Similarly, tracheostomy tubes and Foley catheters were found more frequently in larger sizes (Table 4).
- Although supplies may not have been directly available in the ED, several hospitals indicated resources were available from other in-house or "nearby" locations such as: neonatal intensive care unit, obstetrics and newborn nursery, central supply, pharmacy, "sister" pediatric hospitals, or children's hospitals.

Availability of emergency pediatric supplies by type of hospital

- A higher percentage of EDs in children's hospitals and hospitals with PICUs compared with all other hospitals reported the availability of all monitoring supplies (82.2 percent and 51.3 percent), vascular access supplies (39.2 percent and



† Percentage for "other hospitals" with all supplies is statistically unreliable and is not shown.
[1]PICU is pediatric intensive care unit. Category includes children's hospitals and hospitals with PICUs.
[2]Significant difference ($p < 0.05$).
SOURCE: CDC/NCHS, National Hospital Ambulatory Medical Care Survey, 2006.

Figure 6. Percentage of emergency departments with all recommended pediatric emergency supplies, by type of hospital: United States, 2006

13.2 percent), specialized pediatric trays (48.8 percent and 22.7 percent), fracture management supplies (68.5 percent and 44.1 percent), and miscellaneous supplies (79.5 percent and 45.5 percent) (Table 5, Figure 6).

- No statistical differences were noted between hospital types in the percentages of EDs having all airway management supplies or resuscitation medication supplies, although there were differences for some specific items within these categories (Table 5).
- In all, 16.2 percent of EDs in children's hospitals and hospitals with PICUs were fully supplied. The corresponding percentage for other hospitals was statistically unreliable (Table 5).
- EDs in children's hospitals and hospitals with PICUs were more likely to meet the AAP and ACEP guidelines for pediatric emergency department services, expertise, and supplies.

Summary

In 2006, roughly one-half of EDs had 85.0 percent or more of recommended pediatric supplies, but only 7.2 percent of EDs had all recommended pediatric supplies, suggesting that inventories could be improved at most EDs. EDs at children's hospitals and those with PICUs were better prepared to treat pediatric emergencies than other types of hospitals, with 74.0 percent having at least 85.0 percent of recommended supplies. Yet even within these hospitals, many AAP guidelines had not been met.

While the AAP recommended that every ED should have a pediatrician for coverage 24 hours a day, 7 days a week, only 8.5 percent of EDs reported having a pediatrician in the ED 24 hours a day, 7 days a week in 2006. This is not statistically different than the 2002–2003 figure of 9.0 percent. A total of 59.4 percent of EDs had a board-certified pediatric attending physician not directly in the ED, but either in-house (within the hospital) or on-call. However, of those EDs without ED pediatric coverage 24 hours a day, 7 days a week, only 31.8 percent had written protocols stating when to call a pediatrician. This may leave staff without clarity as to when to most appropriately access these services.

The AAP encouraged all EDs to establish transfer agreements with facilities that have higher levels of pediatric care to ensure timely access to care for critically ill and injured children. Overall, 2006 data confirmed 2002–2003 results that showed EDs are usually able to transfer critically injured pediatric

trauma patients and those requiring intensive care when the hospital of the ED is not equipped for such pediatric services. Admission and transfer of emergency pediatric cases, however, is a fairly rare outcome. Unpublished data from the 2006 NHAMCS indicate that only 5.6 percent of ED pediatric cases were either admitted to the hospital from the ED or transferred to another hospital; most patients were treated and released.

Little change was seen when data were compared with results from the 2002–2003 EPSES data. Very few statistically significant changes were noted between the two time periods, but this could be related to the relatively smaller sample size in 2006. The previous EPSES report compared 2002–2003 findings with those from a study conducted in 1998 (5) by the Consumer Product Safety Commission on behalf of the Health Resources and Services Administration's (HRSA) Emergency Medical Services for Children (EMSC) Program. A lack of significant improvement in the ability of hospitals to treat pediatric emergencies was noted between those time periods as well.

Since the 2006 EPSES was conducted, the AAP issued a revised joint policy statement on guidelines for care of children in the ED (6). These guidelines are consistent with those issued by the Institute of Medicine (IOM) in 2006 (7), which called for regionalized systems of care and the appointment of coordinators for pediatric emergency care within hospitals and emergency medical services (EMS) systems. HRSA's EMSC Program partners with states and territories to "fund activities that improve, refine, and integrate pediatric care within the state EMS system" (8). Since 2009, all grantees have been required to report on 10 performance measures that are consistent with IOM and AAP guidelines. The 2006 EPSES data suggest that EDs of children's hospitals and those with PICUs may be better prepared than other types of hospitals to treat pediatric emergencies, yet most hospitals could improve their inventory of supplies to achieve full compliance with recommended guidelines. For additional information on NHAMCS and EPSES, see the Ambulatory Health Care Data website: http://www.cdc.gov/nchs/ahcd.htm.

References

1. Institute of Medicine, Committee on Pediatric Emergency Medical Services. Emergency Medical Services for Children. Durch JS, Lohr KN, eds. Washington, DC: National Academies Press. 1993.
2. Middleton KR, Burt CW. Availability of pediatric services and equipment in emergency departments: United States, 2002–03. Advance data from vital and health statistics; no 367. Hyattsville, MD: National Center for Health Statistics. 2006.
3. American Academy of Pediatrics. Care of children in the emergency department: Guidelines for preparedness. Pediatrics 107(4):777–81. 2001. Available from: http://aappolicy.aappublications.org/cgi/content/full/pediatrics;107/4/777 [Accessed 9/30/11].
4. Pitts S, Simon A, Niska R. Personal communication. 2011.
5. Athey J, Dean JM, Ball J, Wiebe R, Melese-d'Hospital I. Ability of hospitals to care for pediatric emergency patients. Pediatr Emerg Care 17(3):170–4. 2001.
6. American Academy of Pediatrics. Joint policy statement—Guidelines for care of children in the emergency department. Pediatrics 124(4):1233–43. 2009. Available from: http://aappolicy.aappublications.org/cgi/content/abstract/pediatrics;124/4/1233 [Accessed 9/30/11].
7. Institute of Medicine. The future of emergency care: Key findings and recommendations. Fact sheet. 2006. Available from: http://www.nremt.org/nremt/downloads/IOM%20fact%20sheet%20summary.pdf [Accessed 9/30/11].
8. EMSC National Resource Center. Available from: http://www.childrensnational.org/EMSC/ForGrantees/Performance_Measures.aspx [Accessed 9/30/11].

Table 1. Number and percent distribution of emergency departments, by hospital characteristics, according to inpatient pediatric structure: United States, 2006

Hospital characteristic	Number of emergency departments	(Standard error)	Percent distribution	(Standard error of percent)	Total	Does not admit children	No separate pediatric ward	Separate pediatric ward	Children's hospital or has a PICU[1]
						Percent distribution (standard error)			
All EDs[2]	4,800	(263.7)	100.0	…	100.0	12.9 (1.9)	46.3 (3.9)	30.8 (3.4)	10.1 (1.4)
Inpatient pediatric structure:									
Does not admit children	600	(99.2)	12.9	(1.9)	…	…	…	…	…
Admits children, no separate pediatric ward	2,200	(254.9)	46.3	(3.9)	…	…	…	…	…
Admits children, separate pediatric ward	1,500	(151.1)	30.8	(3.4)	…	…	…	…	…
Children's hospital or has a PICU	500	(69.3)	10.1	(1.4)	…	…	…	…	…
ED pediatric visit volume:									
Less than 4,000	2,300	(291.9)	48.8	(4.3)	100.0	*	75.4 (4.5)	*	*
4,000–10,000	1,700	(192.7)	36.2	(4.2)	100.0	*	23.7 (6.1)	55.2 (5.9)	*
More than 10,000	700	(73.6)	15.0	(1.7)	100.0	*	*	46.2 (5.8)	38.4 (5.1)
Ownership:									
Voluntary	3,100	(215.6)	64.2	(4.6)	100.0	15.3 (2.6)	39.5 (4.1)	35.4 (3.9)	9.8 (1.6)
Government	1,200	(247.8)	24.2	(4.5)	100.0	*	64.8 (9.5)	*	*13.4 (4.6)
Proprietary	600	(126.3)	11.7	(2.5)	100.0	*	*	*	*
Geographic region:									
Northeast	600	(75.5)	13.6	(1.6)	100.0	12.9 (1.9)	*	33.2 (7.0)	*
Midwest	1,300	(166.0)	28.3	(2.8)	100.0	*	57.4 (6.2)	21.5 (4.4)	*11.5 (3.8)
South	1,900	(171.6)	40.2	(2.8)	100.0	*	49.3 (6.7)	32.8 (6.3)	8.2 (1.7)
West	900	(88.4)	18.0	(1.8)	100.0	*	*	39.0 (8.5)	*
MSA:									
Metropolitan statistical area	3,300	(245.3)	68.2	(3.6)	100.0	18.8 (2.7)	29.5 (4.3)	36.8 (3.6)	14.8 (2.1)
Not a metropolitan statistical area	1,500	(193.7)	31.8	(3.6)	100.0	–	82.2 (5.6)	*	–
Teaching hospital:									
Yes	1,300	(167.3)	26.3	(3.3)	100.0	23.1 (4.9)	*	31.7 (6.4)	29.5 (4.7)
No	3,500	(259.4)	73.7	(3.3)	100.0	*	57.2 (4.8)	30.4 (4.5)	3.2 (0.7)
Trauma center levels:									
Level 1	400	(81.8)	7.9	(1.7)	100.0	*	*	*	58.4 (11.1)
Level 2	1,000	(129.1)	20.4	(2.7)	100.0	*	*	37.3 (6.9)	15.1 (3.8)
Level 3	900	(172.7)	18.2	(3.6)	100.0	*	63.8 (8.5)	*	*
Other or missing	2,600	(277.4)	53.5	(4.2)	100.0	15.8 (3.4)	50.9 (5.8)	28.9 (4.7)	4.4 (1.2)
Children's hospital in same county:									
Yes	800	(126.6)	17.4	(2.5)	100.0	35.8 (5.5)	21.8 (3.8)	23.4 (4.2)	19.0 (2.9)
No	3,900	(252.9)	82.6	(2.5)	100.0	8.0 (1.6)	51.4 (4.5)	32.3 (4.0)	8.2 (1.7)

… Category not applicable.
* Figure does not meet standards of reliability or precision.
– Quantity zero.
[1]PICU is pediatric intensive care unit.
[2]ED is emergency department.
NOTE: Numbers may not add to totals because of rounding.

Table 2. Percentages of emergency departments with pediatric services, by inpatient pediatric structure: United States, 2006

Pediatric services	All EDs[1]	Inpatient pediatric structure			
		Does not admit children[2]	No separate pediatric ward[3]	Separate pediatric ward[4]	Children's hospital or has a PICU[5]
	Percent (standard error)				
Hospital has pediatric 23-hour observation unit	10.4 (1.6)	–	*	18.3 (3.7)	39.4 (8.2)
Place of care for critically injured pediatric patients:					
In this hospital	11.0 (2.0)	–	*	*	85.1 (3.6)
In another hospital, with transfer agreement	48.5 (4.4)	63.3 (7.7)	50.8 (7.7)	52.9 (5.9)	*
In another hospital, without transfer agreement	36.7 (4.8)	*	46.7 (7.7)	35.0 (6.4)	*
Hospital has pediatric trauma service	19.3 (3.0)	*	*	*	76.4 (5.2)
Hospital has no pediatric trauma service	80.6 (3.0)	98.5 (1.4)	90.9 (4.0)	76.3 (6.4)	23.7 (5.2)
For hospitals with pediatric trauma service:					
Critically injured pediatric trauma patients requiring hospitalization would be cared for:					
In this hospital	42.0 (7.3)	*	*	*	99.2 (0.5)
In another hospital	57.2 (7.4)	*	*	*	*
For hospitals without pediatric trauma service:					
Written transfer agreement with a facility with pediatric trauma service	49.5 (5.1)	54.5 (8.0)	41.1 (8.5)	62.0 (7.5)	*
No written transfer agreement with a facility with pediatric trauma service	44.3 (5.4)	*	53.3 99.3)	34.7 (7.7)	*
For hospitals without pediatric trauma service but transfer agreement:					
Critically injured pediatric trauma patients requiring hospitalization would be cared for:					
In another hospital, per written transfer agreement	88.5 (3.7)	100.0	96.6 (2.6)	76.6 (8.2)	*
For hospitals without pediatric trauma service and no transfer agreement:					
Critically injured pediatric trauma patients requiring hospitalization would be cared for:					
In another hospital, without written transfer agreement	84.7 (6.2)	*	88.7 (6.8)	79.0 (16.2)	*
Pediatric patients requiring intensive care would be cared for:					
In pediatric ICU of this hospital	10.1 (1.4)	–	–	–	100.0
In adult ICU of this hospital	*	–	*	*	–
In another hospital	84.0 (2.5)	100.0	92.7 (3.8)	91.9 (3.2)	–
Hospital has written transfer agreement with facility that has a pediatric intensive care unit	53.5 (4.0)	60.7 (7.8)	51.6 (5.9)	60.2 (7.0)	32.6 (7.0)

– Quantity zero.
* Figure does not meet standards of reliability or precision.
[1]ED is emergency department. Percentages are based on an estimated 4,800 EDs.
[2]Percentages are based on an estimated 600 EDs.
[3]Percentages are based on an estimated 2,200 EDs.
[4]Percentages are based on an estimated 1,500 EDs.
[5]PICU is pediatric intensive care unit. Percentages are based on an estimated 500 EDs.

Table 3. Percentages of emergency departments with pediatric expertise, by inpatient pediatric structure: United States, 2006

Pediatric expertise	All EDs[1]	Inpatient pediatric structure			
		Does not admit children[2]	No separate pediatric ward[3]	Separate pediatric ward[4]	Children's hospital or has a PICU[5]
	Percent (standard error)				
Hospital has pediatrician on duty in the ED 24 hours a day, 7 days a week (24/7)	8.5 (1.4)	*	*	*	42.7 (7.2)
If pediatrician is not on duty 24/7, hospital has written protocol stating when a pediatrician will be called to the ED	31.8 (4.2)	*	21.3 (5.4)	37.4 (6.7)	78.6 (10.3)
ED has 24/7 access either in-house or on call to:					
Board-certified emergency medicine attending physician	72.1 (3.8)	94.5 (4.0)	57.2 (7.4)	77.5 (6.9)	96.1 (1.2)
Board-certified pediatric attending physician	59.4 (3.9)	*	46.0 (6.0)	77.9 (5.4)	92.5 (4.8)
Board-certified pediatric emergency medicine (PEM) attending physician	20.1 (2.5)	*	*	14.8 (2.7)	66.0 (8.9)
For EDs without 24/7 access to board-certified PEM attending physician:					
ED has 24/7 access to board-certified EM attending physician	64.0 (4.9)	92.5 (5.2)	51.0 (8.4)	72.2 (8.1)	*
ED has 24/7 access to board-certified pediatric attending physician	48.3 (4.6)	*	38.2 (6.6)	72.9 (6.2)	*

* Figure does not meet standards of reliability or precision.
[1]ED is emergency department. Percentages are based on an estimated 4,800 EDs.
[2]Percentages are based on an estimated 600 EDs.
[3]Percentages are based on an estimated 2,200 EDs.
[4]Percentages are based on an estimated 1,500 EDs.
[5]PICU is pediatric intensive care unit. Percentages are based on an estimated 500 EDs.

Table 4. Percentages of emergency departments with pediatric supplies: United States, 2002–2003 and 2006

Pediatric supplies	2002–2003 All EDs[1]		2006 All EDs	
	Percent of EDs[2]	(Standard error of percent)	Percent of EDs	(Standard error of percent)
Monitoring				
Have all monitoring supplies**	65.3	(3.3)	54.4	(4.2)
Cardiorespiratory monitor	95.7	(4.4)	96.3	(1.9)
Defibrillator	97.5	(0.9)	95.1	(2.0)
Pediatric monitor electrodes	94.6	(1.9)	92.5	(3.0)
Pulse oximeter with newborn sensor	91.7	(2.0)	87.2	(3.6)
Pulse oximeter with child sensor	93.8	(1.8)	93.4	(2.4)
Thermometer/rectal probe	90.8	(1.7)	92.6	(2.8)
Doppler blood pressure device	84.6	(2.5)	80.5	(4.2)
Blood pressure cuff: neonatal size	90.6	(1.7)	86.6	(3.2)
Blood pressure cuff: infant size	96.2	(1.5)	93.3	(2.9)
Blood pressure cuff: child size	98.0	(1.0)	97.9	(1.3)
Blood pressure cuff: small adult size	97.5	(1.0)	97.0	(1.6)
Monitor for ET[3] tube and placement	88.4	(2.2)	92.8	(2.2)
Sphygmomanometer[4]	…	…	88.6	(2.3)
Stethoscope[4]	…	…	90.0	(2.3)
Vascular access				
Have all vascular access supplies	12.4	(1.5)	15.8	(2.8)
Butterfly needles: 19g**	72.0	(2.9)	60.5	(3.7)
Butterfly needles: 21g	83.7	(2.8)	79.7	(3.6)
Butterfly needles: 23g**	62.6	(2.7)	81.5	(3.2)
Butterfly needles: 25g**	84.0	(2.0)	72.3	(4.0)
Catheter over needle: 16g	92.8	(2.1)	94.0	(2.8)
Catheter over needle: 18g	96.7	(1.3)	97.8	(1.6)
Catheter over needle: 20g**	69.6	(2.7)	97.8	(1.6)
Catheter over needle: 22g	96.6	(1.3)	97.8	(1.6)
Catheter over needle: 24g short	92.3	(2.3)	88.8	(3.1)
Catheter over needle: 24g long	53.4	(2.9)	52.4	(4.1)
Infusion device	97.6	(1.0)	98.0	(1.6)
Tubing for infusion device	97.4	(1.1)	96.7	(1.0)
Intraosseous needles: 16g	83.4	(2.2)	76.2	(3.6)
Intraosseous needles: 18g	80.5	(2.4)	81.6	(4.1)
Umbilical vein catheters: 3.5 Fr	60.9	(3.3)	57.9	(4.6)
Umbilical vein catheters: 5 Fr	64.9	(3.0)	62.5	(4.0)
Seldinger vascular access kit: 3 Fr catheter	24.7	(2.4)	26.6	(3.5)
Seldinger vascular access kit: 4 Fr catheter	29.6	(2.3)	31.6	(3.9)
Seldinger vascular access kit: 5 Fr catheter	28.1	(2.3)	34.5	(3.9)
Intravenous fluid and blood warmers[4]	…	…	84.1	(2.5)
Portable oxygen regulators and canisters[4]	…	…	90.0	(2.3)
Airway management				
Have all airway management supplies	14.2	(1.5)	14.7	(2.7)
Preterm/neonatal oxygen masks**	83.6	(2.5)	70.3	(4.0)
Infant oxygen masks	95.3	(1.0)	90.4	(3.4)
Child oxygen masks	98.1	(0.5)	96.0	(2.6)
Infant non-rebreathing masks	75.9	(2.1)	75.0	(4.3)
Child non-rebreathing masks	86.3	(1.8)	89.2	(3.4)
Oralpharyngeal airway: size 00	67.7	(3.0)	68.5	(3.9)
Oralpharyngeal airway: size 0	84.9	(3.2)	79.3	(3.5)
Oralpharyngeal airway: size 1	86.7	(3.0)	81.8	(3.8)
Oralpharyngeal airway: size 2	87.7	(2.4)	83.3	(3.4)
Oralpharyngeal airway: size 3	86.4	(2.4)	80.3	(3.6)
Nasopharyngeal airways: size 10 Fr	53.6	(2.6)	59.9	(4.8)
Nasopharyngeal airways: size 12 Fr	60.3	(2.9)	63.8	(5.0)
Nasopharyngeal airways: size 14 Fr	61.1	(2.9)	65.2	(4.8)
Nasopharyngeal airways: size 16 Fr	62.5	(2.9)	68.4	(4.8)
Nasopharyngeal airways: size 20 Fr	67.2	(3.5)	67.7	(4.8)
Nasopharyngeal airways: size 24 Fr	67.9	(3.1)	72.9	(4.1)
Nasopharyngeal airways: size 28 Fr	73.3	(3.2)	75.6	(3.5)
Bag-valve-mask-resuscitator	92.6	(1.5)	94.0	(2.2)

See footnotes at end of table.

Table 4. Percentages of emergency departments with pediatric supplies: United States, 2002–2003 and 2006—Con.

Pediatric supplies	2002–2003 All EDs[1]		2006 All EDs	
	Percent of EDs[2]	(Standard error of percent)	Percent of EDs	(Standard error of percent)
Nasal cannulae: infant	81.1	(3.4)	82.4	(4.4)
Nasal cannulae: child	89.8	(1.8)	89.5	(4.3)
Uncuffed endotracheal tubes: size 2.5	90.0	(2.4)	86.4	(3.7)
Uncuffed endotracheal tubes: size 3.0	95.1	(1.3)	89.8	(3.2)
Uncuffed endotracheal tubes: size 3.5	93.7	(1.8)	91.8	(3.1)
Uncuffed endotracheal tubes: size 4.0	96.5	(1.2)	92.6	(2.6)
Uncuffed endotracheal tubes: size 4.5	90.6	(1.9)	92.0	(2.5)
Uncuffed endotracheal tubes: size 5.5	86.3	(2.6)	87.3	(3.0)
Uncuffed endotracheal tubes: size 5.5	78.9	(2.4)	78.5	(3.7)
Uncuffed endotracheal tubes: size 6.0	63.8	(2.5)	61.6	(4.1)
Uncuffed endotracheal tubes: size 6.5	57.9	(2.4)	57.9	(3.8)
Uncuffed endotracheal tubes: size 7.0	55.4	(2.6)	55.6	(4.2)
Uncuffed endotracheal tubes: size 7.5	53.8	(2.5)	54.7	(4.0)
Cuffed endotracheal tubes: size 5.5	81.8	(1.8)	84.9	(3.1)
Cuffed endotracheal tubes: size 6.0	93.9	(1.4)	94.7	(2.1)
Cuffed endotracheal tubes: size 6.5	92.1	(1.5)	95.2	(2.2)
Cuffed endotracheal tubes: size 7.0	94.7	(1.5)	95.2	(2.1)
Cuffed endotracheal tubes: size 7.5	93.5	(1.6)	94.4	(2.3)
Stylets: infant	83.3	(2.0)	84.5	(3.8)
Stylets: child	92.1	(1.9)	92.1	(2.8)
Laryngoscope handle, pediatric	92.1	(1.6)	91.8	(2.4)
Curved laryngoscope blades: size 2	94.0	(1.7)	95.1	(1.9)
Curved laryngoscope blades: size 3	91.2	(1.5)	89.1	(2.8)
Straight laryngoscope blades: size 0	86.8	(2.8)	88.0	(3.3)
Straight laryngoscope blades: size 1	94.8	(1.5)	95.1	(2.6)
Straight laryngoscope blades: size 2	92.1	(2.2)	91.3	(3.0)
Straight laryngoscope blades: size 3	86.6	(2.0)	86.1	(3.2)
Magil forceps, pediatric	76.0	(2.7)	73.1	(5.0)
Nasogastric tubes: size 5 Fr	77.7	(2.2)	77.4	(3.8)
Nasogastric tubes: size 6 Fr	57.2	(2.9)	65.2	(5.5)
Nasogastric tubes: size 8 Fr	87.1	(2.0)	85.2	(3.6)
Nasogastric tubes: size 10 Fr	81.5	(2.6)	85.6	(4.3)
Nasogastric tubes: size 12 Fr	87.3	(1.8)	87.8	(3.5)
Nasogastric tubes: size 14 Fr	86.4	(1.7)	89.1	(3.7)
Flexible suction catheters: size 5/6 Fr	77.4	(2.7)	73.7	(4.7)
Flexible suction catheters: size 8 Fr	90.8	(2.4)	88.1	(4.3)
Flexible suction catheters: size 10 Fr	92.2	(1.6)	90.5	(3.0)
Flexible suction catheters: size 12 Fr	80.2	(2.3)	87.2	(3.3)
Chest tubes: size 8 Fr	40.8	(2.6)	47.2	(4.8)
Chest tubes: size 10 Fr	63.9	(2.9)	58.4	(4.9)
Chest tubes: size 12 Fr	63.5	(3.7)	63.1	(5.3)
Chest tubes: size 14 Fr	48.9	(2.4)	49.5	(4.3)
Chest tubes: size 16 Fr	78.3	(2.7)	69.2	(4.3)
Chest tubes: size 18 Fr	54.4	(2.4)	54.2	(4.6)
Chest tubes: size 20 Fr	80.2	(2.9)	75.0	(4.7)
Chest tubes: size 22 Fr	59.5	(2.8)	58.5	(3.8)
Chest tubes: size 24 Fr	82.6	(2.6)	80.4	(3.5)
Chest tubes: size 26 Fr	64.9	(2.4)	64.9	(3.4)
Tracheostomy tubes: size 00	33.7	(2.5)	39.1	(4.5)
Tracheostomy tubes: size 0	40.7	(2.6)	43.3	(4.7)
Tracheostomy tubes: size 1	46.8	(3.1)	43.6	(4.4)
Tracheostomy tubes: size 2	51.6	(2.5)	48.5	(4.6)
Tracheostomy tubes: size 3	53.8	(2.5)	64.3	(5.2)
Tracheostomy tubes: size 4**	64.1	(2.8)	74.6	(4.6)
Tracheostomy tubes: size 5	53.7	(2.2)	61.3	(4.9)
Tracheostomy tubes: size 6	68.6	(2.9)	67.1	(4.6)
Yankauer suction tip[4]	…	…	88.2	(2.6)
Bulb syringe[4]	…	…	90.3	(2.3)

See footnotes at end of table.

Table 4. Percentages of emergency departments with pediatric supplies: United States, 2002–2003 and 2006—Con.

Pediatric supplies	2002–2003 All EDs[1] Percent of EDs[2]	2002–2003 All EDs[1] (Standard error of percent)	2006 All EDs Percent of EDs	2006 All EDs (Standard error of percent)
Resuscitation medications				
Medication chart, tape, or other dose estimation system	95.8	(1.1)	95.5	(1.9)
Specialized pediatric trays				
Have all specialized pediatric trays	24.6	(1.9)	25.3	(3.5)
Thoracotomy tube with water seal	65.9	(2.7)	62.1	(4.1)
Lumbar puncture with size 20g needle	83.1	(3.2)	85.6	(4.1)
Lumbar puncture with size 22g needle	88.7	(2.2)	88.5	(4.2)
Lumbar puncture with size 25g needle	69.6	(2.8)	68.3	(4.2)
Pediatric foley catheter: size 5/6 Fr	57.2	(2.7)	62.4	(4.9)
Pediatric foley catheter: size 8 Fr	81.6	(2.5)	86.1	(3.5)
Pediatric foley catheter: size 10 Fr	83.7	(2.8)	83.2	(4.0)
Pediatric foley catheter: size 12 Fr	83.6	(2.8)	84.5	(3.8)
Obstetric pack	91.1	(1.7)	88.8	(3.0)
Umbilical vessel cannulation supplies	71.1	(3.1)	72.7	(4.2)
Meconium aspirator	88.0	(1.6)	82.7	(3.3)
Venous cutdown	77.4	(2.1)	71.2	(4.3)
Surgical airway	76.5	(3.4)	77.5	(4.4)
Needle cricothyrotomy tray[4]	…	…	84.7	(2.9)
Fracture management				
Have all fracture management supplies	46.8	(2.8)	46.6	(4.2)
Cervical immobilization: infant size	61.9	(2.7)	63.8	(4.5)
Cervical immobilization: child size	86.4	(1.9)	86.4	(3.3)
Extremity splints	88.6	(1.7)	91.5	(3.0)
Femur splint: child size	70.5	(1.9)	66.6	(3.8)
Miscellaneous				
Have all miscellaneous supplies	52.4	(3.4)	48.9	(4.9)
Infant scales	95.3	(2.1)	94.7	(2.6)
Infant formula	87.3	(2.7)	82.3	(4.1)
Oral rehydrating solutions	95.0	(2.0)	94.9	(2.6)
Heating source, isolette	77.8	(3.2)	77.0	(3.6)
Pediatric restraining devices	85.4	(2.9)	81.5	(4.4)
Resuscitation board	89.8	(1.7)	89.9	(3.6)
Sterile linen for burn care	91.6	(1.7)	83.4	(4.4)
Medical photography capability	79.5	(2.8)	79.7	(4.1)
Supplies				
Percent of EDs fully supplied[5]	5.5	(1.1)	7.2	(1.7)

** Difference is significant ($p < 0.05$).
… Category not applicable.
[1]ED is emergency department.
[2]Percentages are based on an estimated 4,800 EDs in both 2002–2003 and 2006.
[3]ET is endotracheal.
[4]New item in 2006.
[5]Percentage of EDs having all recommended supplies.
NOTES: Fr is French, a scale used to indicate the outer diameter of catheters; g is gauge, a standard of measurement for needles.

Table 5. Percentages of emergency departments with pediatric supplies, by type of hospital: United States, 2006

Pediatric supplies	Children's hospital or has a pediatric intensive care unit		All other hospitals	
	Percent of EDs[1,2]	(Standard error of percent)	Percent of EDs[3]	(Standard error of percent)
Monitoring				
Have all monitoring supplies**	82.2	(4.6)	51.3	(4.4)
Cardiorespiratory monitor	98.8	(1.2)	96.0	(2.1)
Defibrillator	97.9	(2.1)	94.7	(2.3)
Pediatric monitor electrodes**	100.0	…	91.7	(3.3)
Pulse oximeter with newborn sensor**	99.6	(0.4)	85.8	(3.9)
Pulse oximeter with child sensor**	100.0	…	92.7	(2.7)
Thermometer/rectal probe**	100.0	…	91.7	(3.1)
Doppler blood pressure device**	99.2	(0.7)	78.4	(4.7)
Blood pressure cuff: neonatal size**	100.0	…	85.1	(3.5)
Blood pressure cuff: infant size**	100.0	…	92.5	(3.2)
Blood pressure cuff: child size	100.0	…	97.7	(1.4)
Blood pressure cuff: small adult size	100.0	…	96.6	(1.8)
Monitor for ET[4] tube and placement	96.5	(2.3)	92.4	(2.4)
Sphygmomanometer[5]	85.5	(4.2)	88.9	(2.6)
Stethoscope[5]	85.9	(4.2)	90.5	(2.7)
Vascular access				
Have all vascular access supplies**	39.2	(7.2)	13.2	(2.9)
Butterfly needles: 19g**	88.8	(3.6)	57.3	(4.0)
Butterfly needles: 21g**	95.4	(2.9)	78.0	(4.0)
Butterfly needles: 23g**	99.2	(0.9)	79.6	(3.5)
Butterfly needles: 25g**	93.4	(4.6)	69.9	(4.4)
Catheter over needle: 16g	98.8	(0.9)	93.5	(3.0)
Catheter over needle: 18g	100.0	…	97.5	(1.8)
Catheter over needle: 20g	100.0	…	97.5	(1.8)
Catheter over needle: 22g	100.0	…	97.5	(1.8)
Catheter over needle: 24g short**	97.5	(1.5)	87.8	(3.4)
Catheter over needle: 24g long**	77.6	(9.5)	49.5	(4.3)
Infusion device	100.0	…	97.8	(1.7)
Tubing for infusion device**	100.0	…	96.4	(1.2)
Intraosseous needles: 16g**	94.8	(2.5)	74.1	(4.0)
Intraosseous needles: 18g**	94.2	(2.7)	80.1	(4.5)
Umbilical vein catheters: 3.5 Fr**	83.4	(9.8)	55.0	(4.8)
Umbilical vein catheters: 5 Fr**	84.0	(9.8)	60.1	(4.2)
Seldinger vascular access kit: 3 Fr catheter**	65.4	(8.6)	22.2	(3.6)
Seldinger vascular access kit: 4 Fr catheter**	73.0	(9.1)	26.9	(3.9)
Seldinger vascular access kit: 5 Fr catheter**	71.6	(9.0)	30.4	(4.1)
Intravenous fluid and blood warmers[5]	83.2	(4.4)	84.2	(3.0)
Portable oxygen regulators and canisters[5]	85.9	(4.2)	90.5	(2.7)
Airway management				
Have all airway management supplies	24.9	(5.7)	13.6	(2.9)
Preterm/neonatal oxygen masks**	95.2	(2.4)	67.5	(4.4)
Infant oxygen masks**	98.5	(1.1)	89.5	(3.7)
Child oxygen masks	99.6	(0.4)	95.5	(2.9)
Infant non-rebreathing masks	81.3	(9.8)	74.3	(4.8)
Child non-rebreathing masks	88.8	(10.1)	89.3	(3.7)
Oralpharyngeal airway: size 00	73.7	(9.3)	67.9	(4.4)
Oralpharyngeal airway: size 0	85.1	(10.3)	78.6	(3.9)
Oralpharyngeal airway: size 1	85.5	(10.3)	81.4	(4.2)
Oralpharyngeal airway: size 2	85.5	(10.3)	83.0	(3.8)
Oralpharyngeal airway: size 3	83.8	(10.2)	79.9	(4.0)
Nasopharyngeal airways: size 10 Fr	75.1	(9.4)	58.2	(5.2)
Nasopharyngeal airways: size 12 Fr	74.1	(9.8)	62.6	(5.3)
Nasopharyngeal airways: size 14 Fr	74.3	(9.8)	64.2	(5.2)
Nasopharyngeal airways: size 16 Fr	74.7	(9.8)	67.7	(5.2)
Nasopharyngeal airways: size 20 Fr	67.2	(9.5)	67.7	(5.2)
Nasopharyngeal airways: size 24 Fr	77.8	(6.4)	72.4	(4.6)
Nasopharyngeal airways: size 28 Fr	81.7	(5.9)	74.9	(3.9)
Bag-valve-mask-resuscitator	98.3	(1.2)	93.5	(2.5)

See footnotes at end of table.

Table 5. Percentages of emergency departments with pediatric supplies, by type of hospital: United States, 2006—Con.

Pediatric supplies	Children's hospital or has a pediatric intensive care unit		All other hospitals	
	Percent of EDs[1,2]	(Standard error of percent)	Percent of EDs[3]	(Standard error of percent)
Nasal cannulae: infant**	97.9	(2.1)	80.6	(4.8)
Nasal cannulae: child**	98.5	(1.5)	88.4	(4.7)
Uncuffed endotracheal tubes: size 2.5**	95.9	(2.6)	85.4	(4.1)
Uncuffed endotracheal tubes: size 3.0**	97.9	(2.1)	88.9	(3.5)
Uncuffed endotracheal tubes: size 3.5**	99.6	(0.4)	90.9	(3.4)
Uncuffed endotracheal tubes: size 4.0**	100.0	…	91.7	(2.8)
Uncuffed endotracheal tubes: size 4.5	97.5	(2.1)	91.3	(2.7)
Uncuffed endotracheal tubes: size 5.0**	100.0	…	85.9	(3.2)
Uncuffed endotracheal tubes: size 5.5**	98.1	(1.1)	76.3	(4.0)
Uncuffed endotracheal tubes: size 6.0**	81.1	(9.6)	59.5	(4.5)
Uncuffed endotracheal tubes: size 6.5	70.3	(8.7)	56.5	(4.3)
Uncuffed endotracheal tubes: size 7.0	63.7	(9.0)	54.7	(4.6)
Uncuffed endotracheal tubes: size 7.5	63.3	(9.0)	53.7	(4.3)
Cuffed endotracheal tubes: size 5.5**	94.2	(1.2)	83.9	(3.5)
Cuffed endotracheal tubes: size 6.0**	99.6	(0.4)	94.1	(2.3)
Cuffed endotracheal tubes: size 6.5	98.8	(0.9)	94.8	(2.4)
Cuffed endotracheal tubes: size 7.0**	100.0	…	94.7	(2.3)
Cuffed endotracheal tubes: size 7.5	98.8	(0.9)	93.9	(2.5)
Stylets: infant**	96.7	(1.2)	83.1	(4.2)
Stylets: child**	99.6	(0.4)	91.3	(3.1)
Laryngoscope handle, pediatric	93.8	(2.6)	91.5	(2.7)
Curved laryngoscope blades: size 2**	100.0	…	94.5	(2.1)
Curved laryngoscope blades: size 3**	99.6	(0.4)	87.9	(3.1)
Straight laryngoscope blades: size 0**	97.1	(2.2)	87.0	(3.7)
Straight laryngoscope blades: size 1	100.0	…	94.6	(2.8)
Straight laryngoscope blades: size 2**	100.0	…	90.3	(3.3)
Straight laryngoscope blades: size 3**	100.0	…	84.5	(3.5)
Magil forceps, pediatric**	92.1	(4.2)	70.9	(5.4)
Nasogastric tubes: size 5 Fr	84.2	(4.8)	76.7	(4.1)
Nasogastric tubes: size 6 Fr	79.0	(9.4)	63.7	(6.0)
Nasogastric tubes: size 8 Fr	85.7	(9.9)	85.1	(4.0)
Nasogastric tubes: size 10 Fr	88.8	(10.1)	85.3	(4.8)
Nasogastric tubes: size 12 Fr	97.9	(2.1)	86.7	(3.8)
Nasogastric tubes: size 14 Fr	95.2	(3.0)	88.4	(4.0)
Flexible suction catheters: size 5/6 Fr	83.8	(9.4)	72.6	(5.0)
Flexible suction catheters: size 8 Fr**	100.0	…	86.8	(4.7)
Flexible suction catheters: size 10 Fr**	100.0	…	89.4	(3.3)
Flexible suction catheters: size 12 Fr**	97.9	(1.2)	86.0	(3.6)
Chest tubes: size 8 Fr**	74.3	(9.5)	44.1	(5.2)
Chest tubes: size 10 Fr**	91.7	(3.1)	54.7	(5.3)
Chest tubes: size 12 Fr**	90.5	(3.2)	60.0	(5.7)
Chest tubes: size 14 Fr**	73.9	(9.2)	46.8	(4.6)
Chest tubes: size 16 Fr**	93.6	(2.6)	66.5	(4.7)
Chest tubes: size 18 Fr**	75.9	(9.3)	51.7	(5.0)
Chest tubes: size 20 Fr**	96.9	(1.7)	72.5	(5.1)
Chest tubes: size 22 Fr	73.9	(9.3)	56.8	(4.1)
Chest tubes: size 24 Fr**	94.8	(2.8)	78.8	(3.8)
Chest tubes: size 26 Fr	74.1	(9.2)	63.8	(3.9)
Tracheostomy tubes: size 00	51.9	(8.2)	37.7	(4.9)
Tracheostomy tubes: size 0	59.5	(8.8)	41.5	(5.1)
Tracheostomy tubes: size 1**	62.0	(9.3)	41.5	(4.7)
Tracheostomy tubes: size 2**	71.4	(9.0)	45.9	(5.0)
Tracheostomy tubes: size 3**	89.4	(2.7)	61.4	(5.7)
Tracheostomy tubes: size 4**	96.7	(2.3)	72.1	(5.0)
Tracheostomy tubes: size 5**	90.9	(2.6)	58.0	(5.3)
Tracheostomy tubes: size 6**	91.1	(4.2)	64.4	(5.0)
Yankauer suction tip[5]	85.5	(4.2)	88.5	(3.0)
Bulb syringe[5]	85.9	(4.2)	90.7	(2.7)

See footnotes at end of table.

Table 5. Percentages of emergency departments with pediatric supplies, by type of hospital: United States, 2006—Con.

Pediatric supplies	Children's hospital or has a pediatric intensive care unit		All other hospitals	
	Percent of EDs[1,2]	(Standard error of percent)	Percent of EDs[3]	(Standard error of percent)
Resuscitation medications				
Medication chart, tape or other dose estimation system	95.2	(4.7)	95.5	(2.1)
Specialized pediatric trays				
Have all specialized pediatric trays**	48.8	(8.1)	22.7	(3.7)
Thoracotomy tube with water seal	76.3	(9.3)	60.6	(4.5)
Lumbar puncture with size 20g needle**	96.1	(2.5)	84.4	(4.5)
Lumbar puncture with size 22g needle	96.5	(2.1)	87.6	(4.6)
Lumbar puncture with size 25g needle	72.4	(9.5)	67.9	(4.4)
Pediatric foley catheter: size 5/6 Fr**	82.6	(5.2)	60.1	(5.4)
Pediatric foley catheter: size 8 Fr**	96.9	(2.5)	84.9	(3.9)
Pediatric foley catheter: size 10 Fr	90.2	(5.1)	82.4	(4.5)
Pediatric foley catheter: size 12 Fr	92.3	(4.7)	83.6	(4.1)
Obstetric pack	93.2	(4.3)	88.4	(3.3)
Umbilical vessel cannulation supplies	85.1	(10.0)	71.3	(4.6)
Meconium aspirator**	96.1	(1.1)	81.2	(3.6)
Venous cutdown**	96.7	(3.3)	68.4	(4.7)
Surgical airway**	94.0	(4.0)	75.7	(4.8)
Needle cricothyrotomy tray	85.3	(4.3)	84.6	(3.3)
Fracture management				
Have all fracture management supplies**	68.5	(8.6)	44.1	(4.5)
Cervical immobilization: infant size**	91.9	(3.6)	60.6	(4.9)
Cervical immobilization: child size**	96.9	(2.3)	85.3	(3.6)
Extremity splints**	98.3	(1.2)	90.7	(3.3)
Femur splint: child size	73.4	(9.1)	65.8	(4.2)
Miscellaneous				
Have all miscellaneous supplies**	79.5	(9.6)	45.5	(5.2)
Infant scales**	100.0	…	94.1	(2.9)
Infant formula**	100.0	…	80.3	(4.6)
Oral rehydrating solutions	99.6	(0.4)	94.3	(2.9)
Heating source, isolette**	100.0	…	74.4	(3.9)
Pediatric restraining devices**	97.1	(2.1)	79.7	(4.8)
Resuscitation board	97.3	(2.1)	89.1	(4.0)
Sterile linen for burn care**	97.9	(1.3)	81.8	(4.8)
Medical photography capability	82.2	(9.7)	79.4	(4.5)
Supplies				
Percent of EDs fully supplied[6]	16.2	(4.7)	*	…

** Difference is significant ($p < 0.05$).
… Category not applicable.
* Figure does not meet standards of reliability or precision.
[1]ED is emergency department.
[2]Based on an estimated 500 EDs.
[3]Based on an estimated 4,300 EDs.
[4]ET is endotracheal.
[5]New item in 2006.
[6]Percentage of EDs having all recommended supplies. The percentage for fully supplied EDs that were not in children's hospitals or hospitals with a pediatric intensive care unit could not be shown because of insufficent sample size. However, 32 percent of these hospitals did report that at least 90 percent of the recommended supplies were available.
NOTES: Fr is french, a scale used to indicate the outer diameter of catheters; g is gauge, a standard of measurement for needles.

Technical Notes

The Emergency Pediatric Services and Equipment Supplement (EPSES) was conducted in conjunction with the 2002–2003 and 2006 National Hospital Ambulatory Medical Care Survey (NHAMCS). NHAMCS is an annual national probability sample survey of nonfederal short-stay and general hospitals and is designed to produce national estimates of visits to emergency departments (EDs) and outpatient departments, including facility, patient, and visit characteristics.

NHAMCS utilizes a multistage sampling design including geographic primary sampling units (PSUs), hospitals within PSUs, clinics within hospitals, and patient visits within emergency services areas and selected outpatient clinics. For 2006, an additional panel of 25 children's hospitals was added to the sample design to improve the resulting estimates for this group. The four-stage probability sample was combined with a supplemental three-stage probability sample of children's general hospitals. The three-stage children's hospital supplement sampled children's hospitals regardless of PSU, but the design of the sample within hospitals was identical to that of the rest of the panel.

The 2006 NHAMCS was conducted from January 2, 2006 through December 31, 2006 and consisted of a sample of 486 hospitals, of which 414 had eligible EDs. Of the eligible EDs, EPSES data were completed for 332 facilities resulting in an 80.2 percent response rate. As with the first EPSES data collection in 2002–2003, the 2006 data were collected as a brief (30-minute) self-report supplement to the 2006 NHAMCS. The form consists of 10 questions regarding hospital pediatric inpatient services and pediatric expertise, and a list of 131 emergency pediatric supplies grouped into seven categories: monitoring, vascular access, airway management, resuscitation medication, specialized pediatric trays, fracture management, and miscellaneous. For each supply category, respondents were asked to indicate the presence or absence of specific equipment. An additional checklist of seven items not included in the 2002–2003 EPSES was administered during postsurvey phone interviews with hospital staff (see Figure 7).

Data analyses were performed using the statistical packages SAS version 9.2 (SAS Institute, Cary, N.C.) and SUDAAN version 9.0 (RTI International, Research Triangle Park, N.C.). Comparisons were made between estimates from 2002–2003 and 2006 using the two-tailed *t* test. The Bonferroni procedure was used to establish the critical value for statistically significant differences (0.05 level of significance) based on the number of possible comparisons within a particular variable (or combination of variables) of interest. All differences noted in the report were statistically significant. Differences not mentioned in the text may or may not be statistically significant.

Definition of terms

Board-certified emergency medicine physician—A physician who has completed medical school plus a 3-year residency focusing on adults, usually with 3–4 months of pediatrics rotations.

Board-certified pediatric attending physician—A physician who has completed medical school plus 3 years of general pediatrics residency. Many of these specialize for 2 or more years in a subspecialty, such as hematology.

Board-certified pediatric emergency medicine attending physician—A physician who has completed medical school plus 3 years of general pediatrics residence and 3 years of pediatric emergency medicine residency (and which may include a few rotations on adult emergency medicine services). Such physicians are often employed by dedicated pediatric hospitals.

Pediatric patient—A patient under age 18 who is treated in the emergency department or admitted to the hospital.

Pediatric ward or department—A hospital inpatient unit exclusively for pediatric patients.

Pediatric trauma service—An organized multidisciplinary team that provides coordinated care of severely injured children from the ED, through care in the operating room, intensive care unit, inpatient unit of the hospital, and rehabilitation.

Transfer agreement—A written guideline for the transfer of pediatric patients from one specified hospital facility to another specified hospital facility, often to get the child moved from a community hospital to a tertiary hospital with pediatric intensive care capability or specialty physician expertise.

Critical injury—An injury that is potentially or actually life-threatening without rapid resuscitation and surgical or intensive care intervention.

Intensive care—A hospital unit that provides high-technology monitoring and medical intervention for life-threatening illnesses and injuries or the postsurgical care of such children.

Form Approved OMB No. 0920-0278 Exp. Date 05/31/2007

NOTICE – Public reporting burden of this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to CDC/ATSDR Reports Clearance Officer; 1600 Clifton Road, MS E-11, Atlanta, GA 30333, ATTN: PRA (0920-0278).

1. Label

FORM **NHAMCS-901** (7-13-2005)

U.S. DEPARTMENT OF COMMERCE
Economics and Statistics Administration
U.S. CENSUS BUREAU
ACTING AS DATA COLLECTION AGENT FOR THE
NATIONAL CENTER FOR HEALTH STATISTICS
CENTERS FOR DISEASE CONTROL AND PREVENTION

NATIONAL HOSPITAL AMBULATORY MEDICAL CARE SURVEY

2006 Panel

Emergency Pediatric Services and Equipment Supplement

Disposition — *To be completed by Census Field Representative*

1 ☐ Hospital HAS an eligible ED – *Complete Supplement*
2 ☐ Hospital does NOT have an eligible ED – ***STOP!*** *Return to RO*

2a. Hospital contact information			**b.** ED contact information		
Name			Name		
Title			Title		
Telephone	Area code	Number	Telephone	Area code	Number

A message from the National Center for Health Statistics . . .

Children requiring care for serious and life-threatening emergencies have unique and special needs. Over the past ten years, guidelines for pediatric preparedness have been developed by various pediatric and emergency medicine associations, most recently in April of 2001. In order to gather current information on hospital emergency department readiness for the care of children, based in part on the April 2001 guidelines, this supplement has been reintroduced to the 2006 National Hospital Ambulatory Medical Care Survey (NHAMCS). The form will take about 30 minutes to complete.

INSTRUCTIONS FOR COMPLETING THE FORM

The form consists of a short set of questions related to hospital characteristics and services, followed by a list of pediatric equipment from the 2001 guidelines. If you have any questions or need assistance completing this form, you may contact

_____ at _____

- **Questions**

  Please answer only the questions that apply based on the "skip instructions" next to specific check boxes. If there is no skip instruction following a check box, proceed to the next question.

- **Equipment List**

  Please mark (X) "Yes" **only** for the equipment and supplies that are actually present in the emergency department in your hospital, otherwise mark (X) "No." If you have a separate pediatric emergency department, please answer these questions for that location only. If possible, you are encouraged to physically verify the presence of each of these items when you complete the list.

DEFINITIONS OF TERMS

- **Pediatric patient –** A person less than 18 years old who is treated in the emergency department or admitted to the hospital.
- **Pediatric ward/department –** A hospital inpatient unit exclusively for pediatric patients.
- **Pediatric trauma service –** An organized multidisciplinary team that provides coordinated care of severely injured children from the emergency department, through care in the operating room, intensive care unit, inpatient unit of the hospital, and rehabilitation.
- **Transfer agreement –** A written guideline for the transfer of pediatric patients from one specified hospital facility to another specified hospital facility, often to get the child moved from a community hospital to a tertiary hospital with pediatric intensive care capability or specialty physician expertise.
- **Critical injury –** An injury that is potentially or actually life threatening without rapid resuscitation and surgical or intensive care intervention.
- **Intensive care –** A hospital unit that provides high technology monitoring and medical intervention for life-threatening illnesses and injuries or the post-surgical care of such children.

Thank you . . . . . .

. . .for taking time from your busy schedule to contribute to this important study. The success of this survey depends on the cooperation of people like you.

Figure 7. 2006 National Hospital Ambulatory Medical Care Survey: Emergency Pediatric Services and Equipment Supplement

Section I YOUR HOSPITAL

These first questions are about hospital procedures and services related to treating and caring for children.

1. Does your hospital admit pediatric patients ("Admit" means for an overnight stay in the hospital of at least 24 hours)?

1 ☐ Yes
2 ☐ No – *SKIP to question 3*

2. Does your hospital have a separate pediatric ward or department, that is, one intended for exclusively treating children?

1 ☐ Yes
2 ☐ No

3. Does your hospital have a 23 hour observation area exclusively for pediatric patients, that is, an area for pediatric patients who are not admitted to the hospital but whose condition following treatment may warrant further assessment before being admitted or discharged?

1 ☐ Yes
2 ☐ No

4. Does your hospital have a pediatric trauma service, that is, coordinated trauma care for a pediatric patient from admittance to discharge?

1 ☐ Yes – *SKIP to question 6*
2 ☐ No

5. Does your hospital have a written transfer agreement with a facility that has a pediatric trauma service?

1 ☐ Yes
2 ☐ No

6. Generally, critically injured pediatric trauma patients requiring hospitalization would be cared for:
Mark (X) one

1 ☐ In your hospital
2 ☐ In another hospital, per written transfer agreement
3 ☐ In another hospital, but no written transfer agreement exists
4 ☐ Other – *Explain* ↙

7. Pediatric patients requiring intensive care (such as brain injury, multiple severe traumatic injuries, meningitis, and respiratory failure requiring intubation) would be cared for:
Mark (X) one

1 ☐ In the pediatric ICU in your hospital
2 ☐ In the adult ICU in your hospital
3 ☐ In another hospital
4 ☐ Other – *Explain* ↙

8. Does your hospital have a written transfer agreement with a facility that has a pediatric intensive care unit?

1 ☐ Yes
2 ☐ No

9. Do you have written protocols stating under what conditions a pediatrician will be called to the emergency department?

1 ☐ Yes
2 ☐ No
3 ☐ NA – Have a pediatrician on duty in Emergency Department 24 hours, 7 days per week.

10. Does your emergency department have 24 hour 7 day a week access to the following attending physicians (either in-house or on call)?

a. Board certified emergency medicine attending physician

1 ☐ Yes
2 ☐ No

b. Board certified pediatric emergency medicine attending physician

1 ☐ Yes
2 ☐ No

c. Board certified pediatric attending physician

1 ☐ Yes
2 ☐ No

PLEASE CONTINUE WITH SECTION II ON NEXT PAGE.

Page 2 FORM NHAMCS-901 (7-13-2005)

Figure 7. 2006 National Hospital Ambulatory Medical Care Survey: Emergency Pediatric Services and Equipment Supplement—Con.

Section II YOUR HOSPITAL EMERGENCY DEPARTMENT

Please check the equipment and supplies listed below that are actually present in the emergency department in your hospital. If you have a separate pediatric emergency department, please answer these questions for that location only. It is anticipated that most facilities will NOT have all of the items listed in this table. You are also encouraged to physically verify the presence of each of these items in your emergency department when you complete this checklist.

EMERGENCY SUPPLIES

	YES	NO
A. Monitoring		
1. Cardiorespiratory monitor with strip recorder		
2. Defibrilator (0-400 J capability) with 4.5 cm paddles		
3. Pediatric monitor electrodes		
4. Pulse oximeter with –		
a. Newborn sensor size		
b. Child sensor size		
5. Thermometer/rectal probe with capability 25°C to 44°C		
6. Doppler blood pressure device		
7. Blood pressure cuffs –		
a. Neonatal size		
b. Infant size		
c. Child size		
d. Small adult size		
8. Method to monitor ET tube and placement[1]		
B. Vascular Access		
1. Butterfly needles –		
a. 19-gauge		
b. 21-gauge		
c. 23-gauge		
d. 25-gauge		
2. Catheter-over-needle devices –		
a. 16-gauge		
b. 18-gauge		
c. 20-gauge		
d. 22-gauge		
e. 24-gauge short		
f. 24-gauge long		
3. Infusion device to regulate rate and volume		
4. Tubing for infusion device		
5. Intraosseous needles[2]		
a. 16-gauge		
b. 18-gauge		
6. Umbilical vein catheters[3]		
a. Size 3.5 Fr		
b. Size 5 Fr		
7. Seldinger technique vascular access kit –		
a. Size 3 Fr catheters		
b. Size 4 Fr catheters		
c. Size 5 Fr catheters		
C. Airway Management		
1. Clear oxygen masks –		
a. Preterm/neonatal size		
b. Infant size		
c. Child size		
2. Non-rebreathing masks –		
a. Infant size		
b. Child size		

Please continue in next column

	YES	NO
3. Oralpharyngeal airways–		
a. Sizes 00		
b. Size 0		
c. Size 1		
d. Size 2		
e. Size 3		
4. Nasopharyngeal airways –		
a. Size 10 Fr		
b. Size 12 Fr		
c. Size 14 Fr		
d. Size 16 Fr		
e. Size 20 Fr		
f. Size 24 Fr		
g. Size 28 Fr		
5. Bag-valve-mask resuscitator, self-inflating, 450 mL size		
6. Nasal cannulae –		
a. Infant size		
b. Child size		
7. Uncuffed endotracheal tubes –		
a. Size 2.5		
b. Size 3.0		
c. Size 3.5		
d. Size 4.0		
e. Size 4.5		
f. Size 5.0		
g. Size 5.5		
h. Size 6.0		
i. Size 6.5		
j. Size 7.0		
k. Size 7.5		
8. Cuffed endotracheal tubes –		
a. Size 5.5		
b. Size 6.0		
c. Size 6.5		
d. Size 7.0		
e. Size 7.5		
9. Stylets –		
a. Infant size		
b. Pediatric size		
10. Laryngoscope handle, pediatric		
11. Curved laryngoscope blades –		
a. Size 2		
b. Size 3		
12. Straight laryngoscope blades –		
a. Size 0		
b. Size 1		
c. Size 2		
d. Size 3		

[1] May be satisfied by a disposable $ETCO_2$ detector, bulb, or feeding tube methods for endotracheal tube placement.
[2] May be satisfied by standard bone marrow aspiration needles, 13- or 15-gauge.
[3] Available within the hospital

FORM NHAMCS-901 (7-13-2005)

Page 3

Figure 7. 2006 National Hospital Ambulatory Medical Care Survey: Emergency Pediatric Services and Equipment Supplement—Con.

Section II YOUR HOSPITAL EMERGENCY DEPARTMENT Continued

EMERGENCY SUPPLIES – Continued

C. Airway Management – Continued	YES	NO
13. Magil forceps, pediatric		
14. Nasogastric tubes –		
a. Size 5 Fr ["smaller sizes"]		
b. Size 6 Fr		
c. Size 8 Fr		
d. Size 10 Fr		
e. Size 12 Fr		
f. Size 14 Fr		
15. Flexible suction catheters –		
a. Size 5/6 Fr		
b. Size 8 Fr		
c. Size 10 Fr		
d. Size 12 Fr		
16. Chest tubes –		
a. Size 8 Fr ["smaller sizes"]		
b. Size 10 Fr		
c. Size 12 Fr		
d. Size 14 Fr		
e. Size 16 Fr		
f. Size 18 Fr		
g. Size 20 Fr		
h. Size 22 Fr		
i. Size 24 Fr		
j. Size 26 Fr		
17. Tracheostomy tubes –		
a. Size 00 ["smaller sizes"]		
b. Size 0		
c. Size 1		
d. Size 2		
e. Size 3		
f. Size 4		
g. Size 5		
h. Size 6		

Please continue in next column ↗

D. Resuscitation medications Medication chart, tape, or other system for dose estimations	YES	NO
E. Specialized pediatric trays		
1. Tube thoracotomy with water seal drainage capability		
2. Lumbar puncture –		
a. Spinal needle size 20-gauge		
b. Spinal needle size 22-gauge		
c. Spinal needle size 25-gauge		
3. Urinary catheterization w/pediatric Foley catheters		
a. Size 5/6 Fr		
b. Size 8 Fr		
c. Size 10 Fr		
d. Size 12 Fr		
4. Obstetric pack		
5. Newborn kit –		
a. Umbilical vessel cannulation supplies		
b. Meconium aspirator		
6. Venous cutdown		
7. Surgical airway kit[4]		
F. Fracture management		
1. Cervical immobilization equipment –		
a. Infant size[5]		
b. Child size		
2. Extremity splints		
3. Femur splints: child size		
G. Miscellaneous		
1. Infant scales		
2. Infant formula		
3. Oral rehydrating solutions		
4. Heating source (infrared lamps or overhead warmer), Isolette		
5. Pediatric restraining devices		
6. Resuscitation board		
7. Sterile linen (available within hospital for burn care)		
8. Medical photography capability		

[4] May include any of the following items: tracheostomy tray, cricothyreotomy tray, ETJV (needle jet).

[5] Many types of cervical immobilization devices are available. These include wedges and collars. The type of device chosen depends on local preference and policies and procedures. Whatever device is chosen should be stocked in sizes to fit infants, children, adolescents and adults. The use of sandbags to meet this requirement is discouraged because they may cause injury if the patient has to be turned.

Remarks

Page 4 FORM NHAMCS-901 (7-13-2005)

Figure 7. 2006 National Hospital Ambulatory Medical Care Survey: Emergency Pediatric Services and Equipment Supplement—Con.

NHAMCS-90 I (ADD!N) (8/1 5106)
Form Approved OMB No. 0920-0278 Exp. Date 0513112007

Section II - YOUR HOSPITAL EMERGENCY DEPARTMENT - Continuation Sheet

Instructions: Please complete this continuation sheet for the supplies/equipment specified.

Item	Yes	No
1. Sphygmomanometer		
2. Stethoscope		
3. Intravenous fluid and blood warmers *		
4. Portable oxygen regulators and canisters		
5. Yankauer suction tip		
6. Bulb syringe		
7. Needle cricothyrotomy tray		

* This includes essential equipment that may be shared with the nursery, pediatric ward, or other inpatient service but is readily available to the ED.

THANK YOU!

Reason For Continuation Sheet: The National Center For Health Statistics identified these additional supplies/equipment after the supplement had gone to print.

Remarks:

Hospital ID Number:

Figure 7. 2006 National Hospital Ambulatory Medical Care Survey: Emergency Pediatric Services and Equipment Supplement—Con.

U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES

Centers for Disease Control and Prevention
National Center for Health Statistics
3311 Toledo Road
Hyattsville, MD 20782

Acknowledgments

The authors acknowledge Kathi Huddleston, Alan Simon, and Catharine Burt for their comments on earlier drafts of this report, and Stephen Pitts and Richard Niska for providing definitions of the types of ED physicians and other technical assistance.

Suggested citation

Schappert SM, Bhuiya F. Availability of pediatric services and equipment in emergency departments: United States, 2006. National health statistics reports; no 47. Hyattsville, MD: National Center for Health Statistics. 2012.

For e-mail updates on NCHS publication releases, subscribe online at: http://www.cdc.gov/nchs/govdelivery.htm.
For questions or general information about NCHS: Tel: 1–800–232–4636 • E-mail: cdcinfo@cdc.gov • Internet: http://www.cdc.gov/nchs
DHHS Publication No. (PHS) 2012–1250 • CS228851