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OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

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Pediatrics 2003;111;1120

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AMERICAN ACADEMY OF PEDIATRICS

CLINICAL REPORT

Guidance for the Clinician in Rendering Pediatric Care

Ted D. Sigrest, MD, and the Committee on Hospital Care

Facilities and Equipment for the Care of Pediatric Patients in a Community Hospital

ABSTRACT. Many children who require hospitalization are admitted to community hospitals that are more accessible for families and their primary care physicians but vary substantially in their pediatric resources. The intent of this clinical report is to provide basic guidelines for furnishing and equipping a pediatric area in a community hospital.

ABBREVIATIONS. AAP, American Academy of Pediatrics; JCAHO, Joint Commission on Accreditation of Healthcare Organizations.

BACKGROUND

Of the 6.4 million admissions of children to hospitals in the United States in 1997, approximately 24% were to children's hospitals. Another 35% were admissions to large, primarily urban pediatric units in municipal or regional medical centers. The remaining 41% of pediatric admissions were to community hospitals that are more accessible and convenient for patients' families and physicians.¹ These smaller hospitals vary in their equipment, staffing, diagnostic resources, and treatment capabilities for pediatric patients. Some smaller hospitals may have no permanently designated pediatric beds and few, if any, staff dedicated exclusively to the care of children. In these smaller facilities, services may be provided by physicians and health care professionals with widely varying levels of expertise in children's health care.

As the number of hospitalized children and average length of stay have decreased, hospitals have been compelled to reassess their commitment to the maintenance of pediatric inpatient units. Some have elected to discontinue their pediatric programs. Others have decreased their services to children, but to remain competitive, continue to attempt to meet patient and community needs. The purpose of this clinical report is to provide guidelines for the basic facilities and equipment needed to adequately care for children in community hospitals with the realization that there are significant budgetary constraints to be acknowledged in the provision of these ser-

vices. Detailed information on the facilities and equipment needed to care for newborns can be found in the American Academy of Pediatrics (AAP) *Guidelines for Perinatal Care* (see "Resources" section).

THE FACILITY

In addition to recommendations of the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) for facilities used in the provision of care to hospitalized patients, the following is a list of basic facility needs for the care of children from birth to 18 years of age:

- Single- or double-occupancy rooms that comply with guidelines for prevention of nosocomial infections² and that are large enough to accommodate parents who stay with their children.
- Patient room configuration and bed positioning that allow convenient observation and supervision of patients by nursing staff, especially if parents are not available.
- Covered electrical outlets, childproof window locks and door latches, padding of sharp edges, and nonslip, easily maintained floor surfaces.
- Age-appropriate furniture, including cribs equipped with safe overhead restraints and beds with covered mechanical or electrical controls.
—Beds, cribs, and other furniture should meet Consumer Product Safety Commission standards (<http://www.cpsc.gov>).
- Area set aside for play, entertainment, education, and other child life activities.
- Separate treatment room for patient assessment and procedures.

Interior design and decor are not addressed in this statement. Information about child-friendly, developmentally appropriate environments may be obtained from the Institute for Family-Centered Care (see "Resources" section).

EQUIPMENT

Essential medical equipment for pediatric care is included in the following list. Additional information on pediatric resuscitation equipment is included in the AAP policy statement "Guidelines for Pediatric Emergency Care Facilities"³ and in standard pediatric emergency care textbooks.⁴

The guidance in this report does not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

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- Resuscitation cart containing pediatric-specific supplies
 - Common pediatric emergency drugs should be readily accessible and plainly labeled. Drug dosing by weight or length should be easily referenced.
 - The resuscitation cart should also have an appropriate assortment of the various sizes of pediatric oxygen masks, endotracheal tubes, laryngoscope blades, oropharyngeal and nasopharyngeal airways, and self-inflating bags (ie, Ambu bags [Ambu International, Linthicum, MD]) with various sizes of masks. A size-appropriate backboard for resuscitation should be available.
 - A cardiac defibrillator designed for pediatric use with paddles for infants and children.
 - A chart for appropriate joule dosages for weight should be readily available.
 - Cardiorespiratory monitors appropriate for the level of pediatric care provided.
 - Respiratory equipment in appropriate sizes for infants and children.
 - Necessary items include oxygen masks, nasal cannulas, tubing, self-inflating (Ambu) bags and masks, oropharyngeal and nasopharyngeal airways, suctioning equipment and catheters, nebulizers with pediatric-sized face masks, spacer devices and masks for metered-dose inhalers, pulse oximeters with appropriate infant and pediatric probes, and infant and pediatric tracheostomy supplies.
 - Intravenous catheters, phlebotomy equipment, and lumbar puncture trays that are size appropriate; extremity warmers, such as chemical packs that warm via exothermic reaction, for improving peripheral blood flow and facilitating blood sampling in infants; papoose boards, adequately padded, of at least 2 sizes for immobilization of infants and children.
 - Common neonatal and pediatric intravenous solutions, such as small vials of 10% dextrose, 100 and 250 mL bags of common pediatric intravenous solutions such as 5% dextrose with one-half normal saline or lactated Ringer's solution, 5% dextrose with one-quarter normal saline or lactated Ringer's solution, and intravenous infusion pumps designed for pediatric use with precise administration of small infusion rates.
 - Scales and stadiometers for infants and older children.
 - Pediatric-appropriate dietary supplies, such as common newborn formulas, pediatric nutritional supplements, and dietary choices that appeal to children; appropriately sized assortment of orogastric and nasogastric feeding tubes and enteral feeding pumps designed for precise administration of small infusion rates.
 - Pediatric urine collection devices and appropriately sized urinary catheters.
 - Mercury-free thermometers and blood pressure devices (various sizes of blood pressure cuffs).
 - Pediatric orthopedic equipment, including wheelchairs, crutches, splints, and splints.
- Infant incubators for small infants with temperature control problems.
- Portable lamps for bedside procedures.
- Developmentally appropriate books, toys, games, and when economically feasible, electronic media such as videocassette players and computers.
 - Toys and equipment should be safe for use by children with impaired mobility.
 - Infection control should be a priority, with all toys, equipment, and play surfaces regularly cleaned with appropriate germicidal solutions.
 - Computers that are available for pediatric patient use should have Internet access limited to child-appropriate sites.

SUPPORT SERVICES

The following therapeutic and diagnostic facilities should be available on a 24-hour basis:

- Routine radiograph imaging, with a radiologist available for reading of emergency films.
 - Availability of computed tomography is strongly recommended.
- Clinical laboratory services appropriate for neonatal and pediatric needs, including hematologic profiles, blood chemistries, blood gas studies, microbiologic profiles, and standard urine studies.
 - Equipment should be available to process all commonly ordered tests such as complete blood cell counts and renal and hepatic function tests using samples of less than 1 mL ("micro" samples).
 - Minimum amounts of blood, urine, and cerebrospinal fluid required for tests should be obtained and posted in the hospital laboratory and pediatric areas.
 - Response times should be appropriate for timely diagnosis and treatment of the child's condition.
 - Topical anesthetics should be available and used before obtaining blood samples whenever possible.
- Pharmacy services providing age- and size-appropriate drug administration and dosing.
 - Commonly used oral suspensions should be immediately available. The equipment necessary to create pediatric liquid formulations, including pill crushers, suspension agents, and flavoring solutions, should be available. Pediatric oral suspension delivery devices, such as oral medication syringes and pacifiers that deliver liquid medications, should be available.
 - Doses of antibiotics that are known to cause ototoxicity or nephrotoxicity, such as vancomycin, tobramycin, and gentamycin, should be calculated using computer programs or calculations based on appropriate neonatal or pediatric pharmacokinetic models. Serum drug concentrations should be obtained to optimize dosage amounts and intervals. Clinical judgment should be used before ordering multiple serum concentrations if the antibiotic is to be discontinued with negative cultures or oral antibiotics.

are to be started as soon as the patient is afebrile. —Current references for pediatric drug dosing and drug interactions should be easily available. A liaison with a tertiary care children's hospital pharmacy is advised to help minimize the possibility of adverse consequences in off-label use of drugs and drug dosing.

The following services should be available as needed: social work services; pastoral services; sign and foreign language interpretation; and respiratory, physical, occupational, and speech therapy. Professionals providing these services should have adequate training and continuing education provided in the pediatric applications of their respective fields. If a child is hospitalized for more than 2 school days, a designated hospital employee, such as nurse, social worker, or child life specialist, should serve as a liaison with the child's school to assist the parents in providing for the child's educational needs. Child life services are recommended whenever feasible.⁵ These specialists provide a valuable service in addressing the psychosocial concerns of children and families during hospitalization and provide support for the concept of family-centered care in the medical setting.

CONTINUING EDUCATION

All health care professionals in a pediatric area should be familiar with the unique and changing physical and psychosocial needs of children. Continuing education should be provided to reinforce these concepts. Nurses and physicians should have current certification in pediatric life support techniques. All should know the location of carts and equipment for cardiopulmonary resuscitation and mock codes should be conducted on a regular basis. Instruction on the use of cardiorespiratory monitors and their alarms should be provided on an ongoing basis. If patients are provided with monitors that feature electrocardiogram readouts, appropriate training should be provided. Education sessions and mock codes should be documented for review by hospital quality assurance committees and the JCAHO.

REFERRAL NETWORKS

Community hospitals and physicians providing care for children must have well-established referral networks for timely consultation by pediatric subspecialists and, when necessary, for transfer of patients to a pediatric center that offers more advanced levels of care. This includes access to an air and ground transportation system that is responsive and appropriately equipped and staffed to care for children of all ages. Guidelines for regionalization of care and transfer of injured patients have been published by the AAP⁶ and the American College of Surgeons.⁷

ADMISSION AND TRANSFER CRITERIA

Because community hospitals vary significantly in their resources for providing pediatric care, there is no single set of criteria for admission and transfer of

pediatric patients that has universal applicability. Each institution must assess its own capabilities and limitations in light of its mission and then formulate guidelines. Once guidelines for transfer of patients have been established, those for admission become less difficult to define. This challenging process requires input from all members of the health care team, including hospital administration. The goal is to ensure that each patient in the facility receives the optimal care that is most appropriate for his or her medical and psychosocial needs.

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