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Optimal Resources for Children's Surgical Care v.1



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Optimal Resources for Children’s Surgical Care

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Executive Summary



Executive Summary

The Task Force for Children’s Surgical Care, an ad hoc multidisciplinary group of invited leaders in relevant disciplines, assembled initially from April 30 to May 1, 2012, in Rosemont, IL, and subsequently in 2013, 2014, and 2015 to consider approaches to optimize the delivery of children’s surgical care in today’s competitive national health care environment. Specifically, a mismatch between individual patient needs and available clinical resources for some infants and children receiving surgical care is recognized as a problem in the United States and elsewhere. Although this phenomenon is apparent to most practitioners involved with children’s surgical care, comprehensive data are not available, and relevant data are imperfect. The scope of this problem is unknown at present. However, the situation does periodically, and possibly systematically, result in suboptimal patient outcomes.

The composition of the task force is detailed in Appendix 4. The Children’s Hospital Association and the American College of Surgeons (ACS) provided support. The group represented key disciplines and perspectives. Published literature and data were used when available, and expert opinion when not, as the basis for these recommendations. The objective was to develop consensus recommendations that would be of use to relevant policymakers and to providers.

Notably, there are a number of excellent children’s specialty hospitals in the United States whose scope of service is more narrow than delineated in this document. A separate process will be used to develop relevant standards for those institutions to achieve the vision of prospectively matching institutional resources with individual patient needs.

Principles regarding resource standards, quality-improvement and safety processes, data collection, and a verification process were initially published in March 2014 [*J Am Coll Surg.* 2014;218(3):479-487]. This document details those principles in a specific manner designed to inform and direct a verification process to be conducted by the ACS and the ACS Children’s Surgery Verification Committee.



A summary of key recommendations follows.

Levels of Care

Table 1: Summary of Children’s Surgical Center Standards with Expected Scope of Practice

Characteristic	Level I	Level II	Level III
Age of patient	Any	Any	>6 months
ASA	1-5	1-3 [*]	1-2 [*]
Multidisciplinary management of comorbidities	Multiple medical and surgical specialties; pediatric anesthesiology	Typically, single surgical specialties; neonatology; pediatric anesthesiology	None
Operations [†]	Procedures for major congenital anomalies and complex diseases, including those that are uncommon or require significant multidisciplinary coordination	Procedures for common anomalies and diseases that are typically treated by most children’s surgical specialists and that do not require significant multispecialty coordination	Common, low-risk procedures typically performed by a single specialty
Ambulatory [‡]	ASA 1-3 Full-term and preterm infants may be cared for as ambulatory patients based on written guidelines established by the pediatric anesthesiologist in charge of perioperative care; institutional guidelines generally require full-term infants <4 weeks or preterm infants <50 weeks’ PMA to be monitored for ≥12 hours postoperatively	ASA 1-3 Full-term and preterm infants may be cared for as ambulatory patients based on written guidelines established by the pediatric anesthesiologist in charge of perioperative care; institutional guidelines generally require full-term infants <4 weeks or preterm infants <50 weeks’ PMA to be monitored for ≥12 hours postoperatively	Otherwise healthy (ASA 1-2) Age >6 months

Abbreviations: ASA, American Society of Anesthesiologists perioperative risk score; PMA, postmenstrual age.

*Emergent procedures in some patients of ASA >3 may be appropriate in neonatal patients, such as those with necrotizing enterocolitis. Infants and children who have emergent or life-threatening surgical needs and cannot be reasonably delayed for transport should receive initial stabilization and necessary care at the site of presentation.

†Types of anomalies and diseases that should have pediatric subspecialty care are further delineated in American Academy of Pediatrics. Levels of neonatal care: Committee on Fetus and Newborn. Pediatrics. 2012;130(3):587-597. Depending on patient age, comorbidities, and need for a multidisciplinary surgical approach, these operations may be appropriate for either Level I or Level II centers.

‡Ambulatory sites of care may be included in these recommended levels of institutional designation when the on-site provider team possesses the same pediatric training and experience as the parent institution. The site of care may be physically attached to, or integrated into, the hospital or may be a component of a demonstrably integrated children’s health care delivery system that provides these defined resources.

Required access to subspecialty surgical and medical providers is defined and detailed subsequently within this document.

Pediatric Surgery

Level I Centers

Two or more pediatric surgeons must be on the medical staff of a Level I children's surgical center. These individuals should serve as the primary operating surgeon for children 5 years or younger who are undergoing relevant general and thoracic procedures (as defined by the Pediatric Surgery Board of the American Board of Surgery). A pediatric surgeon's physical presence is required in the operating room for operative procedures for which he or she is the primary surgeon. A *pediatric surgeon* is defined as an individual certified or eligible for certification in pediatric surgery by the Pediatric Surgery Board of the American Board of Surgery or an equivalent body. A pediatric surgeon must be available and respond to the bedside within 60 minutes 24/7 when required. A relevant published call schedule must be readily available. Local criteria must be established to define conditions requiring the attending surgeon's physical presence, and a performance improvement and patient safety (PIPS) program must verify compliance.

Level II Centers

Level II children's surgical centers are required to have one or more pediatric surgeons available on a consultant basis to provide care within 60 minutes of such a request 24/7 and to provide relevant care for children 5 years or younger, as at a Level I center. A relevant published call schedule must be readily available. Written local criteria must be established to define conditions requiring the attending surgeon's physical presence, and a PIPS program must monitor compliance.

Level III Centers

A Level III children's surgical center must have continuous 24/7 availability within 60 minutes of general surgeons with pediatric expertise; one of these individuals should serve as the primary surgeon for children 5 years or younger with general surgical needs. A *general surgeon with pediatric expertise* is defined as a surgeon either eligible for certification or certified by the American Board of Surgery or an equivalent body in general surgery. In addition, this individual will demonstrate ongoing clinical engagement and expertise in children's surgery as evidenced by the performance of 25 or more procedures annually in patients younger than 18 years, as well as completion of 10 or more pediatric Category 1 Continuing Medical Education (CME) credit hours annually.

Pediatric Anesthesia

Level I Centers

At Level I children's surgical centers, two or more pediatric anesthesiologists must be on the medical staff, and one *must* serve as the primary anesthesiologist for all children 2 years or younger. One pediatric anesthesiologist *should* serve as the primary anesthesiologist for all children 5 years or younger or with an ASA of 3 or higher. A pediatric anesthesiologist's physical presence is required for procedures for which he or she is the primary anesthesiologist. A *pediatric anesthesiologist* is defined as an individual certified or eligible for certification in pediatric anesthesiology by the American Board of Anesthesiology or equivalent body, or who is similarly qualified by demonstrable experience and training by way of the pediatric anesthesia alternative pathway delineated in this document (Appendix 3). A pediatric anesthesiologist must be available to respond to the bedside and provide service within 60 minutes 24/7 when required. A relevant published call schedule must be readily available. Local criteria must be established to define conditions requiring the attending anesthesiologist's physical presence, and a PIPS program must verify compliance.

Level II Centers

At Level II children’s surgical centers, one or more pediatric anesthesiologist must be on the medical staff, must be available 24/7 within 60 minutes, and *must* serve as the primary anesthesiologist for children 2 years or younger, as at a Level I center. A pediatric anesthesiologist *should* serve as the primary anesthesiologist for all children 5 years or younger or with an ASA of 3 or higher. A relevant published call schedule must be readily available. Local criteria must be established to define conditions requiring the attending anesthesiologist’s physical presence, and a PIPS program must verify compliance.

Level III Centers

A Level III children’s surgical center must have continuous 24/7 availability within 60 minutes of anesthesiologists with pediatric expertise. One of these individuals *must* serve as the primary anesthesiologist for patients 2 years or younger, and one of them *should* serve in this capacity for all patients 5 years or younger. An *anesthesiologist with pediatric expertise* is defined as an anesthesiologist either eligible to certify with, or with a current certificate from, the American Board of Anesthesiology or equivalent. He or she must demonstrate continuous experience with children younger than 24 months, defined as 25 patients per anesthesiologist per year. In addition, this individual will demonstrate ongoing pediatric clinical engagement in patients younger than 18 years and complete 10 or more pediatric Category 1 CME credit hours annually.

Data Collection

Every verified children’s surgical center must collect and analyze its surgical outcome data and contribute those data to the national collaborative effort. For centers to be verified Level I or Level II, this standard will be fulfilled by participation in the American College of Surgeons National Quality Improvement

Program Pediatric (ACS NSQIP Pediatric). For Level III centers and ambulatory surgical centers, this requirement will be fulfilled by the reporting of specific adverse events detailed in Appendix 2 (Children’s Surgical Safety Report).

Performance Improvement and Patient Safety (PIPS)

A children’s surgery PIPS program is an essential component of a high-quality clinical surgical program. The unique elements of the perioperative care of children with surgical diseases require a focused quality and safety construct that supplements existing hospital quality-improvement activities. The PIPS program for a Level I or Level II center must include both peer and multidisciplinary review and be a specific element of the children’s surgical program; Level III and ambulatory centers may use discrete processes integrated within existing institution-wide efforts to achieve these stated objectives.

The PIPS program for a Level I or Level II center must include the following elements:

- Shall be a confidential quality-improvement activity that is protected by all pertinent state and federal statutes.
- Must be integrated with all appropriate hospital quality-improvement and safety programs and with the board of trustees quality committee or equivalent.
- May be a dedicated subcommittee of a hospital’s existing PIPS program but must be focused on improving children’s surgical care within the institution.

- Must be chaired or co-chaired by the medical director of children's surgery (MDCS) or his or her designee.
- Must include representatives of all surgical and procedural disciplines that provide care to children in the participating center, as well as pediatric anesthesiology and radiology. When within the scope of hospital surgical services, representatives of neonatology, pediatric intensive care, and emergency medicine must also participate. The committee must also include appropriate members of hospital administration. At a minimum, the committee should include nursing and surgical services administrative leadership.
- Must meet at least quarterly.
- Must have members or designees who attend at least 50 percent of the PIPS meetings.
- Must review criteria for care delivery by providers in each specialty, including individual providers' credentials that document their validity as pediatric specialists in the respective disciplines.
- Must establish criteria for conditions that require the physical presence of specific specialty providers.
- Must monitor the compliance of providers and the program with all criteria, including the physical presence of providers when indicated.
- Must review all surgical deaths, a significant cohort of surgical complications, and any serious safety events related to children's surgical care.
- Should review the program's quality performance metrics compared with national benchmarks and develop plans to address any significant outlying metrics.
- Must review all transfers to Level I and Level II programs for appropriateness, timeliness, and outcome (that is, transfers out and transfers to higher-level care). Appropriate feedback (loop closure) should be provided where there are opportunities for education and/or improvement following transfers of care.
- Must disseminate the PIPS reviews to all pertinent participants in the children's surgical care program and to the hospital leadership.

Verification

The American College of Surgeons has a long history of activities directed toward the improvement of surgical care. This new program defines the resources believed necessary to achieve optimal patient outcomes for children's surgical care at certain centers and offers institutional verification. The program is administered by the ACS and the ACS Children's

Surgery Verification Committee. This document, *Optimal Resources for Children's Surgical Care*, is to be used as a guide for the development and verification of centers throughout the United States and Canada. It is the basis upon which centers will be evaluated by ACS-approved site surveyors.

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Introduction



Introduction

The American College of Surgeons (ACS) was founded in 1913 on the basic principles of improving the care of surgical patients and strengthening the education of surgeons. With these principles in mind, the ACS Children’s Surgery Verification Committee was created in 2015 to continue, on a permanent basis within the ACS, the work of the ad hoc Task Force for Children’s Surgical Care. This group was first convened in 2012 and has worked continuously since that time, including assemblage as an entire group on four occasions for in-person discussion. The recommendations of this task force have been disseminated [*J Am Coll Surg.* 2014;218(3):479–487]. The ACS Children’s Surgery Verification Committee was established with the goal of improving the care of children with surgical needs. This process includes defining optimal resource standards and matching them prospectively to an individual child’s needs. Achievement of this goal requires an appropriately designed system of care and includes verification that these standards are met in individual children’s surgical centers. We intend to continuously review and improve this document as new information and more data are developed that can be applied to its content. Our intent is to use evidence-based scientific methods to support recommendations. We have used existing data, where possible, combined with expert opinion to establish consensus and formulate these current standards. Multiple research efforts are under way to strengthen the evidence base as well.

We believe that these standards reflect a realistic assessment of our current resource capability while emphasizing the goal of providing the highest-quality patient care. We recognize that these standards will certainly challenge our existing models of children’s surgical care. We are confident that the objective of improving children’s surgical care is correct and that it is a collective professional responsibility. It is also an expectation of the public. These standards are meant to be positive and constructive. We believe they will improve clinical outcomes for children at a population level. This effort is envisioned to provide impetus for a broad-based initiative that includes process improvement of systems of care, as well as research and provider education. It is a multidisciplinary effort undertaken with specialty societies and representatives who speak for individuals across the entire continuum of children’s surgical care. This initial standards document will be subject to evolution and revision as practice continues to change and improve.

Few individual facilities can provide all resources to all children in all situations. Ultimately, all patients who require the resources of the Level I center should have that access. This reality requires the development of systems of care for children with surgical needs, not simply the development of children’s surgical centers.

An ideal children’s system includes all the components identified to be optimal for children’s surgical care. Elements include considerations such as appropriate access; high-quality, developmentally appropriate acute hospital care and ambulatory care; rehabilitation; and relevant research and education activities. Although the focus of this document is children’s surgical center verification, it also emphasizes the need for various levels of children’s surgical centers to cooperate to meet children’s surgical needs in order to avoid poor use of precious medical resources. In an era in which value is a public demand, we must not only strive for optimal care but also provide this care in a cost-effective manner.

Emphasis has been placed on identifying criteria that are judged essential for each level of children’s surgical center designation. These criteria are referenced in each chapter by terms such as *must*, *essential*, *required*, and so forth and are delineated by numbers identifying the chapter and criterion; for example, “CD 5-2” is the second criterion in Chapter 5. The authors recognize that some criteria will change or be added or deleted as more knowledge is obtained based on data that become available. These current standards represent expert consensus on resource standards judged most likely to yield optimal clinical outcomes for patients. We are hopeful that they will supplement, rather than supplant, various state and other existing administrative processes such as Certificate of Need (CON) regulations.

Definitive-Care Facilities

Essential to the development of a children’s surgical care system is the designation of definitive children’s surgical care facilities. The children’s surgical care system is ideally a network of definitive-care facilities that provides the spectrum of care necessary for all children with surgical needs. Ideally, every center that provides surgical services to children would define its scope of practice and provide appropriate resources as defined by the level designations described in this document. Some population-dense areas may have multiple Level I centers, as well as Level II and Level III centers. A Level I facility will provide support for centers with less robust children’s resources. This need should be determined locally to ensure appropriate use of available resources. In less densely populated and rural areas, Level II and Level III hospitals will be essential. Likewise, cooperative relationships with other centers are needed. Because a large proportion of children with surgical needs receive care in an outpatient environment, ambulatory surgery must also be considered in this discussion. In any such system, determining the anticipated number and character of children with surgical needs and assessing available resources to determine the optimal number and level of children’s surgical centers in a given area are essential.

In most children’s health care systems, a combination of levels of centers will coexist with other facilities. The children’s surgical care system must establish relevant facility and personnel standards. This document is the initial effort to establish these standards. We have attempted to emphasize resource differentiation between centers. We do not view this classification scheme as a ranking of medical quality. We expect the commitment to quality care to be the same regardless of resources.

We hope that one of the outcomes of this initiative will be that all children who require health care services, including surgical care, will receive the appropriate care regardless of ability to pay. The Emergency Medicine Treatment and Labor Act imposes obligations on Medicare-participating hospitals that offer emergency services to provide medical-screening examination or treatment for an emergency medical condition, regardless of ability to pay. Hospitals are required legally and ethically to provide stabilizing treatment for a child, as well as appropriate transfer when required.

Level I

The Level I children’s surgical center is a regional resource that is a tertiary-care facility central to the children’s health care system. This facility must have the capability of providing leadership and comprehensive care for all aspects of children’s surgical needs. In this central role, the Level I center must have adequate depth of resources and personnel.

In addition to acute-care responsibilities, Level I children’s centers have the major responsibility of providing leadership in education, research, and system planning. This responsibility includes the expectation of cooperation and prospective planning with all hospitals caring for children with surgical needs in the region. Recognizing that they will need to provide care for young families with few resources who may be far from home and local support systems, Level I centers also have responsibility for assisting the families with managing their travel burden, as well as providing psychological, spiritual, and social support.

Research and education programs, as defined in this document, are part of Level I children’s surgical center verification. Medical education programs benefit from relevant residency program support and postgraduate training in children’s surgical care for physicians, nurses, and other providers. Education can be accomplished through a variety of mechanisms, including related fellowship training programs, CME, preceptorships, personnel exchanges, and other approaches appropriate to the local situation.

Level II

The Level II children's surgical center is a hospital that is expected to provide initial children's surgical care regardless of the complexity of the need and definitive care when appropriate. Depending on geographic location, patient volume, personnel, and resources, the Level II center will not be able to provide the same comprehensive care as a Level I children's surgical center. Therefore, patients with more complex, particularly multidisciplinary, needs may require transfer to a Level I center. In some areas where a Level I center does not exist, the Level II center will take on the responsibility for education and regional leadership.

Level III

The Level III children's surgical center serves communities that do not have immediate access to a Level I or Level II institution. These Level III children's surgical centers can provide prompt assessment, resuscitation, emergency operations, and stabilization and also can arrange for possible transfer to a facility that can provide definitive surgical care. Additionally, Level III children's surgical centers may provide a limited scope of services in areas where there is a Level I or Level II institution. Procedures that are less complex for patients who are generally low risk may be definitively performed in this environment. General surgeons with pediatric expertise and anesthesiologists with pediatric expertise are required at a Level III children's surgical center. Ideally, these centers provide their services as part of an organized system of care in coordination with Level I or Level II centers. Planning for care of children with surgical needs at these hospitals requires transfer agreements and standardized treatment protocols. Level I and Level II children's surgical centers have an obligation to extend their educational activities to rural areas in the form of professional education, consultation, or community outreach. A process should exist to provide feedback about individual patient care and outcome analysis to the referring hospital.

Children's Ambulatory Surgical Centers

The ambulatory surgery standards were developed because a large proportion of children's surgical needs today are managed on an outpatient basis; the number of children involved may be half or more of all children who undergo surgical procedures. Although these children are generally healthy and do well, the uncommon consequences of perioperative problems, particularly related to anesthesia, may be life threatening. These standards have been developed in an effort to minimize this risk.

Children's ambulatory surgical centers must have treatment protocols for resuscitation, transfer protocols, and data reporting and must participate in systems for performance improvement. Children's ambulatory centers must have good working relationships and be fully integrated with a Level I, II, or III inpatient children's surgical center to be verified in this program. This relationship is vital to the development of a children's surgical system in which realistic standards are based on available resources. Optimal ambulatory children's surgical care in rural areas can be provided by skillful use of existing professional and institutional resources supplemented by guidelines that result in enhanced education, resource allocation, and appropriate characterization for all levels of providers. It is essential for the children's ambulatory surgical center to have the involvement of one or more committed

and appropriately trained pediatric health care providers to provide leadership and sustain the integration with other relevant components of an integrated children's health care system.

No ambulatory children's surgical facility without a defined relationship demonstrating integration with a Level I, II, or III children's surgical center will be verified by the ACS. This relationship requires a plan to facilitate the expeditious transfer of seriously ill children who require a higher level of care. Exchange of medical personnel among Level I, II, and III inpatient and ambulatory surgical centers is an excellent way to develop this relationship. Personnel and providers must meet the experience and training standards consistent with the verification level of the parent center.

Verification Process

An obvious corollary for this type of document defining resource standards for children's surgical needs is the development of a verification process whereby a hospital or health care system can be evaluated to determine whether ACS criteria are being met. This verification process for children's surgical centers is now available through the American College

of Surgeons. This document was developed to guide the process of verification of children's surgical centers. Attention is given to defining resources available within an inclusive system for children's surgical care. As this verification process matures, it will yield better definitions and new standards for many of the assessed areas within the hospital.

Principles for This First Edition

This is the first edition of the American College of Surgeons' document entitled *Optimal Resources for Children's Surgical Care*. It is intended to establish resource standards that ensure that individual patient needs are matched prospectively with available institutional resources in an effort to provide the safest and highest quality care possible. This document, over time, will undergo substantial change. Many individuals volunteered a significant amount of their time, energy, experience, and knowledge in drafting this document. The individuals involved

include those delineated as task force members and additional participants from all the surgical disciplines represented within the American College of Surgeons, with much multidisciplinary input from other individuals and professional organizations relevant to children's surgical care. This document attempts to define the resources needed at various types of facilities to provide optimal care. The authors were guided by a number of principles that are worth mentioning.

Emphasis on a Children's Health System Rather Than the Children's Surgical Center

We recognize that surgical care is provided to children in urban and rural environments that are often very different. Rural environments often, but not always, have fewer clinicians and less complex facilities and technology. Although a perfect definition cannot be found for these environments, an attempt is made to recognize the needs of these different settings. In either environment, however, the matrix is predicated on the fact that children with the most complex needs must be treated at more resource-intensive facilities. Facilities must interact with one another to optimize care within and across both environments.

Difference in External Environment

Optimal care of children with surgical needs requires a systems approach. No one children's center can do everything alone. Thus, a systems approach is necessary within a community, regardless of its size. In some cases, the system may encompass a region or even an entire state. If resources for optimal care of children's surgical needs are to be used wisely, some concentration of resources should occur. This type of resource distribution should allow patients to move to the appropriate level of available care and, ideally, should match to a child's individual perioperative needs. This distribution should avoid excessive, inadequate, or inappropriate resource expenditure in a time of limited resources.

Differentiation between Levels of Care

A sincere attempt was made to clearly differentiate resource needs among the defined levels of care. Although the quality of care is expected to be similar and excellent at all levels of care, the complexity and volume of children with surgical needs are accepted as the drivers of resource needs and level delineation. As complexity and volume increase, more human and capital resources are required to ensure optimal care. It is hoped that the differences in resource requirements will allow each facility at each level to allocate acceptable resources based on the needs of the patient population served. We aspire for these resource standards to be pragmatic, given the current medical and economic environment.

Human Resource Commitment

The capacities and skill sets of pediatric surgeons, specialty children's surgeons, pediatric anesthesiologists, and others with specialized pediatric training have been defined elsewhere. This document emphasizes defining their roles in teams related to systems of children's surgical care. Individuals from these specialties who intend to care for children must take an active role in the children's surgical program in any system providing care to children. As the level of care increases, these physicians must become more involved and be part of the resource commitment for a successful children's surgical program. This document also defines the role of the administrative support team.

Involvement of Surgeons and Physicians

Resources necessary for optimal children's surgical care include human capital, facilities, technology, and the organization of care. The optimal-care goal assumes that the human resources include the most highly trained and qualified medical professionals available to treat our children. For the purpose of this document, *pediatric surgeon* refers specifically to general and thoracic pediatric surgeons. Surgeons in other surgical disciplines who have specialized pediatric training and where subspecialists limit practice to children are referred to as children's surgeons. This document establishes the level of responsibility for surgeons, anesthesiologists, and others involved in the perioperative care of children with surgical needs. These individuals must be readily available 24 hours a day in facilities providing the highest level of care.

Neonatology and Critical-Care Services

The need for access to perioperative critical care services for infants and children undergoing surgery is evident. Resource requirements defining and delineating these services are provided in this document. It is required that critically ill children of any age have appropriate and immediate collaborative pediatric physician and nursing coverage when needed.

Anesthesia

Available data emphasize the critical role of specialty-trained pediatric anesthesiology providers for infants and young children undergoing surgical procedures. For several decades it has been apparent that the highest perioperative risk for anesthesia is in neonates and infants and, furthermore, that this risk can be diminished by the deployment of individuals with the unique skills acquired in pediatric anesthesiology specialty training. In October 2013, the American Board of Anesthesiology administered for the first time a certifying examination leading to a certificate of added qualification in pediatric anesthesiology. That standard is incorporated into this document.

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Chapter 1

Responsibilities of Regional Systems of Care



CHAPTER 1

More than 5 million infants and children undergo a surgical procedure in the United States annually. Some procedures are relatively simple; others are quite complex. Patient risk factors that influence outcome include a host of medical and surgical comorbidities; young age is an important one of these risk factors. Optimal anesthesia and airway management in infants and children require specific training and skills; infrequently encountered problems may be life threatening. Neonatal and other pediatric critical care capacity may be necessary to provide appropriate perioperative care. The volume of surgical care and the potential complexity are enormous. Because such a large number of infants and children is involved, uncommon negative events are certain to occur. Given the potential consequences to an individual patient, optimal care of a population requires a planned system of care for children's surgical services. All verified children's surgical centers must participate in state and/or regional system planning/development or operation (CD 1-1).

Role of Designated Children's Surgical Centers in the Development of Regional Systems

As the scope of activity for the provision of children's surgical care expands from single centers to multifaceted systems, it becomes increasingly important that designated centers be effectively engaged in all aspects of system planning, implementation, and evaluation within their regions. Designated centers are a key element in a system and the focal point for treatment. Centers typically contribute administrative leadership, medical leadership, and academic expertise to a state or regional system. Lead facilities in a given region (Level I or Level II) have the additional challenge of engaging all other acute-care facilities, designated centers, and nonspecialty hospitals in the performance improvement process for an inclusive children's surgical system.

Meaningful participation in state and regional system planning, development, or operation is essential for all verified children's surgical centers. This participation will be dependent on local administrative structures, history, vision, and the state of system development. Examples of participation by center staff include the following:

- Participation in state and regional advisory committees
- Leadership in state and regional medical committees responsible for children's medical and surgical care
- Regular collaboration with regional committees or other relevant entities to promote the development of state and regional systems
- Participation in media and legislative education to promote and develop children's care systems
- Participation in state and regional needs assessment or surveillance
- Participation in the development of a state or regional plan or registry
- Provision of technical assistance and education to regional hospitals and providers for the purpose of improving system performance
- Leadership in the development of regional transport systems for infants and children

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Chapter 2

Children's Surgical Center Levels and Their Roles in a System of Care



CHAPTER 2

An ideal children's health system provides all the elements of optimal care, including prompt and appropriate access, high-quality acute hospital and ambulatory care, rehabilitation, health maintenance, and relevant research and education activities. Our focus is children's surgical care, and central to an ideal system is a relatively large, resource-rich center. The need for resources is based primarily on the patient-centered concept of being able to provide the right medical care to an individual patient at the right time.

Optimal resources at a Level I children's surgical center include immediate availability of board-certified or board-eligible pediatric specialty anesthesiologists, pediatric surgeons, subspecialty children's surgeons, neonatologists, pediatric intensivists, and pediatric emergency physicians. Other board-certified pediatric specialists would be similarly available, within a short time, to all patients who required their expertise. To ensure adequate experience, this center would require a certain volume of patients to be admitted each year and would include the most complex and high-risk patients from the system. In addition, patients with certain needs that occur infrequently should be concentrated in this special center to ensure that these patients are properly treated and studied. Research activities are necessary to enhance our knowledge of the care of children with complex surgical needs. Research in areas relevant to children's surgical care should occur. The center must have an integrated, concurrent performance improvement and patient safety (PIPS) program to ensure optimal care and continuous improvement in care. The center would be responsible not only for assessing care provided within its surgical program but also for helping to organize the assessment of care within the entire system or region. This center should serve as a comprehensive resource for all entities dealing with children who are surgical patients in the system and, potentially, the region. Verified centers should demonstrate commitment toward reaching this ideal.

Surgeon commitment is essential for a properly functioning children's surgical center (CD 2-1). In fact, without surgical leadership, the program will not be able to meet all the requirements outlined in *Optimal Resources for Children's Surgical Care*. Although this commitment may be difficult to measure objectively, it can be recognized in a number of ways, including the presence of a children's surgeon who is the medical director of the program, surgeons who take an active role in all aspects of caring for surgical infants and children, active surgical participation in the PIPS program, and surgeons who

take an advocacy role for patients. The PIPS program must be inclusive of relevant medical and surgical providers actively participating in children's surgical care. Surgical leaders who promote the program to the community, hospital, and other colleagues also should be easily recognized. Therefore, surgical commitment is a valuable resource that is integral to a successful children's surgical program.

The ACS supports children's surgical center and system development and related public-health policies, including needs assessment, policy development, and quality assurance. Each community should assess its true needs for children's surgical care, emphasizing a system approach. The center classification scheme (Level I, Level II, and Level III) is intended to assist communities in the development of their system for children's surgical care. Centers developed should match the medical and access needs of the pediatric population that is reasonably expected to require and use these surgical services. Every community of providers should ensure that resources are used appropriately to achieve the stated goal of optimal care for every child undergoing a surgical procedure. The goal of every system is to match the needs of patients to the capabilities of the facility. Proper triage is a critical feature of a good system and is necessary to achieve this goal. Transport to appropriate facilities will optimize outcome and utilization of resources. Although payor status is an important feature of the U.S. health care system, medical necessity is paramount. Children's surgical centers at all levels of verification must accept referrals of all medically appropriate patients within their region from centers without the necessary children's surgical capacity, regardless of payor (CD 2-2). To function well, the system requires proper communication systems and clear, well-defined protocols for triage and transport. In addition, well-designed systems facilitate the acquisition of new knowledge through effective clinical research.

Objective, extramural verification of a hospital's resources, commitment, and capability is an important early step in the development of a regional system. Owing to the inherent differences in population density, geography, and health care resources, each regional system will be individualized to achieve optimal patient care.

Regardless of the size of an area, each system should have an identified lead hospital. Ideally, one hospital, typically a Level I center, would be looked upon as the resource leader within

a given region. This hospital would serve as a resource to all other hospitals within the system. Outside major population centers, a Level II center may serve as the lead hospital for extended geographic areas. In some rural areas, where population densities are low and distances great, a Level III center may be the only resource for miles. Ambulatory surgical centers are considered separately but in any system will have clearly identified relationships and demonstrable integration with one or more verified Level I, II, or III children's inpatient facilities.

Description of Children's Surgical Center Levels

Children's surgical centers must be able to provide on their campuses the necessary human and physical resources to properly provide children's surgical care consistent with their level of verification (CD 2-3). The following are medical and surgical specialist requirements; the standards are applicable at all levels of verification: Medical and surgical specialists must be available at bedside 24/7 within 60 minutes of request or identified need (CD 2-4); surgeons and anesthesiologists must

be physically present for procedures for which they are the primary responsible provider (CD 2-5); and all call schedules for providers involved in children's surgical care must be readily available (CD 2-6). The PIPS process must assess compliance with CD 2-4, CD 2-5, and CD 2-6. The PIPS process also must define, in writing, conditions and circumstances requiring the physical presence of a provider (CD 2-7).

Level I

A Level I children's surgical center should be a regional resource center and generally serve large cities and population-dense or large-catchment areas. This institution will usually serve as the lead hospital for the system. In larger population-dense areas, more than one Level I center may be appropriate. This institution is expected to manage large numbers of patients. A Level I children's surgical center must perform surgical procedures for at least 1,000 patients younger than 18 years annually (CD 2-8).

A Level I children's surgical center is expected to provide optimal care to neonates, infants, children, and adolescents regardless of age or medical and surgical comorbidities. The provision of this care requires access to a comprehensive portfolio of medical and surgical subspecialists on the medical staff who are readily available 24/7 to provide bedside care. The scope of service includes care for major congenital anomalies and complex diseases, including ones that are uncommon or require significant multidisciplinary coordination.

In a Level I children's surgical center, two or more pediatric surgeons must be on the medical staff (CD 2-9). These individuals should serve as the primary operating surgeon for children 5 years or younger who are undergoing relevant general and thoracic procedures (as defined by the Pediatric Surgery Board of the American Board of Surgery). A pediatric surgeon's physical presence is required in the operating room (OR) for operative procedures for which he or she is the primary surgeon. A *pediatric surgeon* is defined as an individual certified or eligible for certification in pediatric surgery by the Pediatric Surgery Board of the American Board of Surgery or an equivalent body. A pediatric surgeon must be available and respond to the bedside within 60 minutes 24/7 when required. A relevant published call schedule must be readily available. Local criteria must be established to define conditions requiring the attending surgeon's physical presence, and a PIPS program must verify compliance.

In a Level I children's surgical center, two or more pediatric anesthesiologists must be on the medical staff (CD 2-10). A pediatric anesthesiologist *must* serve as the primary anesthesiologist for all children 2 years or younger (CD 2-11). One pediatric anesthesiologist *should* serve as the primary anesthesiologist for all children 5 years or younger or with an ASA of 3 or higher. A pediatric anesthesiologist's physical presence is required for procedures for which he or she is the primary anesthesiologist. A *pediatric anesthesiologist* is defined as an individual certified or eligible for certification in pediatric anesthesiology by the American Board of Anesthesiology or equivalent body, or who is similarly qualified by demonstrable experience and training by way of the pediatric anesthesia alternative pathway delineated in this document (Appendix 3).

A pediatric anesthesiologist must be available to respond to the bedside and provide service within 60 minutes 24/7 when required. A relevant published call schedule must be readily available. Local criteria must be established to define conditions requiring the attending anesthesiologist's physical presence, and a PIPS program must verify compliance.

In a Level I center, all surgical specialists require institutional credentials for privileges for operative procedures to be performed specifically in children (delineation of privileges) (CD 2-12).

A Level I children's surgical center must maintain appropriate neonatal and pediatric critical care services with demonstrable surgical leadership participating in their operational management (CD 2-13). Individual children's surgeons must participate in the perioperative care of surgical patients specific to their surgical fields, including planning and implementation of major therapeutic decisions (CD 2-14). At a Level I children's surgical center, individual children's surgeons must demonstrate participation in the care of their surgical patients in the setting of protracted physiologic instability or major postoperative complications (CD 2-15). A Level I children's surgical center should participate in the training of surgical residents and/or fellows and must be a leader in surgical education and outreach activities (CD 2-16); it also must conduct surgical research, as detailed in Chapter 9.

A Level I children's surgical center is required to provide resources consistent with Level IV neonatal intensive care unit (NICU) designation (CD 2-17). NICU designations are consistent with those delineated by current American Academy of Pediatrics' recommendations [American Academy of Pediatrics. Levels of neonatal care: Committee on Fetus and Newborn. *Pediatrics*. 2012;130(3):587-597]. Level I children's surgical center designation requires collaborative care and 24/7 neonatologist availability within 60 minutes when a neonatologist is not on site. A *neonatologist* is defined as an individual who is either sub-board eligible or certified by the American Board of Pediatrics in neonatal-perinatal medicine or equivalent. Level IV NICUs must maintain a full complement and range of pediatric medical subspecialists, children's surgical subspecialists (as detailed in Chapter 6), and pediatric anesthesiologists on site (the index institution is the primary site of practice) (CD 2-18). Compliance must be verified in the PIPS process.

A Level I children's surgical center must have a designated pediatric intensive care unit (PICU) (CD 2-19). This unit must be fully dedicated to pediatric patients. A Level I children's surgical center PICU requires pediatric intensivist availability and collaborative care 24/7 and within 60 minutes by individuals certified in critical-care medicine by the American Board of Pediatrics, the American Board of Anesthesiology, or the American Board of Surgery or equivalent organization (CD 2-20). Compliance must be verified in the PIPS process. Nursing, respiratory therapy, pharmacy, and other support staff must have demonstrable relevant pediatric training and expertise (CD 2-21). Appropriate pediatric equipment must be available for the scope of service (CD 2-22).

Two or more pediatric radiologists must be on the medical staff of a Level I children's surgical center (CD 2-23). One pediatric radiologist must be available to provide appropriate service within 60 minutes 24/7. A *pediatric radiologist* is defined as an individual certified by the American Board of Radiology or equivalent body, in addition to being certified or eligible for certification in pediatric radiology by the American Board of Radiology or equivalent body. An individual may qualify as a pediatric radiologist by demonstrating equivalent training and experience as detailed in the pediatric radiology alternative pathway delineated in this document (Appendix 3). Remote electronic-image analysis is a permissible adjunct; however, individuals trained and skilled in hands-on pediatric imaging, such as critical diagnostic or therapeutic fluoroscopy, must be physically available 24/7 within 60 minutes (CD 2-24). Compliance must be verified in the PIPS process. In addition, interventional radiology physicians and support personnel must be available within 60 minutes 24/7 for designation as a Level I children's surgical center (CD 2-25). Compliance must be verified in the PIPS process.

Level I children's surgical centers must have an attending pediatric emergency physician on-site presence 24/7 (CD 2-26). A *pediatric emergency physician* is an individual who is board certified or eligible to be certified either in pediatrics or emergency medicine, and who has completed an Accreditation Council for Graduate Medical Education (ACGME)-approved or equivalent pediatric emergency medicine fellowship training program. An individual may qualify as a pediatric emergency medicine provider by demonstrating equivalent training and experience, as detailed in the pediatric emergency medicine alternative pathway delineated in this document (Appendix 3). In addition, a Level I children's surgical center must have designated pediatric emergency department facilities (CD 2-27). A Level I children's surgical center must have pediatric-appropriate equipment (CD 2-28). A Level I children's surgical center must have nonphysician emergency department personnel with specific and demonstrable pediatric training and experience (CD 2-29).

In addition to the children's specialists delineated above, a Level I children's surgical center must have a comprehensive panel of pediatric medical and surgical specialists promptly and readily available for consultation (Chapter 6, "Other Surgical Specialists" and "Medical Consultants"). These specialists must be on the medical staff and be available within 60 minutes 24/7 to provide care at the bedside. For these specialists (for example, in Level I centers, exclusive of pediatric surgeons, pediatric anesthesiologists, pediatric radiologists, pediatric intensivists, neonatologists, and pediatric emergency medicine physicians), a portion of this 24/7 coverage may be provided by appropriately trained specialists who lack pediatric certification. In this case, the MDCS and institutional surgical and medical subspecialty leaders must prospectively define the scope of practice of these providers (CD 2-30). There must be a written plan and relevant published call schedules for the provision of pediatric subspecialty care outside this limited scope of practice if needed during periods when call coverage is provided by physicians or surgeons without pediatric certification or without specific pediatric credentials (CD 2-31). The MDCS and institutional subspecialty leaders must monitor compliance with this plan (CD 2-32). Here and elsewhere in this document, *pediatric medical and surgical specialists* are defined as individuals who are either eligible for certification by, or are board certified by, the appropriate Board of the American Board of Medical Specialties (ABMS) or equivalent and who have obtained, or are eligible for, the pediatric certificate of added qualification or equivalent when offered, or who have obtained ACGME pediatric postgraduate fellowship training (or equivalent) when a certificate of added qualification is not offered in the discipline; and who are specifically credentialed to provide children's specialty care in the discipline. Relevant children's medical and surgical specialists will be available to support the entire scope of institutional surgical practice in

infants and children (CD 2-33). Where providers with pediatric-specific training and experience are designated as *available*, the requirement is that patient care will be demonstrably provided by these specialized children's medical and surgical providers for children 5 years and younger (CD 2-34).

A pediatric rapid response and/or resuscitation team is required for Level I verification (CD 2-35). There must be the 24/7 physical presence of a pediatric physician or surgeon who has current pediatric advanced life support (PALS) certification (CD 2-36). The NICU should have a neonatal rapid response and/or resuscitation team with the 24/7 presence of a pediatric provider who has current Neonatal Resuscitation Program (NRP) certification.

Level I centers are required to participate in a data-collection program that yields peer-performance assessments against which an individual program may be externally measured (see Chapter 7). The program should include the ability to assess clinical outcomes at an individual provider level, as well as for the population served.

It is appropriate to include ambulatory sites of care in a Level I institutional application. To be verified, an ambulatory center must be demonstrably integrated with the larger system, and the on-site ambulatory surgery care team must possess pediatric-specific training and experience consistent with the requirements delineated for Level I center verification. Level I centers must have written transfer agreements for specific services not locally available (CD 2-37).

Level II

A Level II children's surgical center provides comprehensive surgical care in two distinct environments that are recognized in the verification program sponsored by the ACS. The first environment is a population-dense area where a Level II children's surgical center may complement the clinical activity and level of resources of a Level I institution to serve the needs of a broad regional population. In this scenario, the Level I and Level II children's surgical centers should work together to optimize resources expended to care for all children with surgical needs in their area. This model implies a cooperative environment between institutions that allows patients to flow between hospitals depending on available resources and clinical expertise.

The second Level II environment occurs in less population dense areas. The Level II hospital serves as the lead children's facility for a geographic area when a Level I institution is not geographically close. This model may be best for many rural areas. This lead hospital should have an outreach program that incorporates smaller institutions in the same service area.

The scope of service for Level II children's surgical centers potentially includes definitive care for neonates, infants, children, and adolescents; it may be limited to neonates or other specific populations (women's and children's centers, military hospitals, or others). Generally, the surgical care will include children with low-risk or moderate comorbidities (ASA 1-3), although it may include infrequent emergency procedures in higher-risk patients and patients who cannot be transported safely. Typically, the procedures involve a single specialty treating common anomalies and diseases that are typically treated by most children's surgical specialists in that discipline and do not require significant multispecialty coordination.

A Level II children's surgical center must have one or more pediatric surgeons available on a consultant basis to provide bedside care within 60 minutes of such a request 24/7 and to provide relevant care for children 5 years or younger, as for a Level I center (CD 2-38). An appropriate published call schedule must be readily available. Written local criteria must be established to define conditions requiring the attending surgeon's physical presence, and a PIPS program must monitor compliance.

A Level II children's surgical center must have one or more pediatric anesthesiologists on the medical staff (CD 2-39) and must be available within 60 minutes 24/7. This individual *must* serve as the primary pediatric anesthesiologist for all children 2 years or younger, and the individual *should* serve as the primary anesthesiologist for all children 5 years or younger or with an ASA of 3 or higher, as for Level I centers (CD 2-40). A relevant published call schedule must be readily available. Written local criteria must be established to define conditions requiring the attending anesthesiologist's physical presence, and a PIPS program must verify compliance.

A Level II children's surgical center must maintain appropriate neonatal and pediatric critical care services with demonstrable surgical leadership participating in their operational management, as for a Level I center (CD 2-13). Individual children's surgeons must participate collaboratively in the perioperative care of surgical patients specific to their surgical fields in the intensive-care units (ICUs), including planning and implementation of major therapeutic decisions, as for a Level I center (CD 2-14). At a Level II children's surgical center, individual children's surgeons must demonstrate participation in the care of their surgical intensive care unit patients in the setting of protracted physiologic instability or major postoperative complications, as for a Level I center (CD 2-15).

A Level II children's surgical center must have a Level III or higher NICU as delineated in current American Academy of Pediatrics' recommendations [American Academy of Pediatrics. Levels of neonatal care: Committee on Fetus and Newborn. *Pediatrics*. 2012;130(3):587-597] (CD 2-41). Level II surgical centers must provide prompt and readily available access to a full range of pediatric medical subspecialists (see Chapter 6, "Other Surgical Specialists") and neonatologists, pediatric surgeons, pediatric anesthesiologists, and pediatric ophthalmologists (CD 2-42). (This requirement may be fulfilled by on-site specialists or by individuals at a closely related institution by a prearranged consultative agreement.) Level II centers that limit the scope of practice to neonatal patients are not required to have ICU services beyond those of the Level III NICU. A Level II children's surgical center must have PICU services to correspond with the scope of services offered (CD 2-43). For example, pediatric infrastructure and pediatric providers would be in place in a Level II center to provide mechanical ventilation to a toddler or a child following a surgical procedure, if necessary. A Level II children's surgical center with a PICU must have pediatric critical care physicians, respiratory therapists, nurses, and others with demonstrable pediatric training and experience, as well as appropriate pediatric equipment available 24/7 (CD 2-44).

A Level II children's surgical center is required to have one or more pediatric radiologists on staff (CD 2-45). Appropriate pediatric coverage must be available within 60 minutes 24/7. In a Level II center, coverage for this immediate-availability requirement may be provided by a combination of pediatric radiologists supplemented by radiologists with pediatric expertise. A *radiologist with pediatric expertise* is defined as a radiologist with certification by the American Board of Radiology or equivalent, demonstrable pediatric experience to support the scope of actual practice, and 10 or more pediatric Category 1 CME credit hours annually. Here and throughout this document, annual CME requirements may be averaged over a 3-year period. Local policy will define in writing credentials, scope of practice, and need for physical presence for the pediatric radiologist, and these aspects must be monitored by PIPS (CD 2-46).

A Level II children's surgical center must have 24/7 emergency department and emergency medicine capability to care for children with surgical needs within the scope of practice (CD 2-47). This emergency medicine coverage may be provided by pediatric emergency medicine physicians (as defined previously) or by emergency medicine physicians with pediatric expertise.

An *emergency medicine physician with pediatric expertise* is defined as an individual certified by the American Board of Emergency Medicine, the American Board of Pediatrics, or equivalent and who has demonstrable pediatric experience and training to support the actual scope of emergency medicine practice, as well as 10 hours annually of pediatric Category 1 CME. A Level II children's surgical center must have children-specific emergency department resources in place to support the level of verification, including facilities, equipment, and nonphysician personnel (CD 2-48). Level II centers that limit the scope of surgical practice to neonatal patients are not required to meet these emergency department requirements.

A Level II children's surgical center must have pediatric medical and children's surgical specialists within the scope of services offered available for consultation within 60 minutes 24/7 (CD 2-49). Level II centers may not have the local resources to provide all these specialists but must have all the children's surgical specialists to match the scope of services offered (CD 2-50). For Level II centers, a portion of the 24/7 physician coverage requirement may be provided by appropriately trained specialists who lack pediatric certification. In this case, the MDCS and relevant surgical and medical leaders must prospectively define the scope of practice of these providers as for Level I centers (CD 2-30). There must be a written plan and relevant published call schedules for the provision of pediatric subspecialty care outside this limited scope of practice if needed during periods when call coverage is provided by physicians or surgeons without pediatric certification or without specific pediatric credentials, as for Level I centers (CD 2-31). The MDCS and institutional subspecialty leaders must monitor compliance with this plan, as for Level I centers (CD 2-32). Where providers with pediatric-specific training and experience are designated as *available*, the requirement is that the care of patients will be demonstrably provided by these children's specialists, as for Level I centers (CD 2-34). Children's surgeons at a Level II center must participate in the care of surgical patients specific to their surgical fields, as in Level I centers (CD 2-51), including planning and implementation of major therapeutic decisions, demonstrable participation in care in the setting of protracted physiologic instability or major postoperative complications, and involvement in the critical care of all infants and children receiving perioperative care. This requirement must be monitored by PIPS.

A Level II children's surgical center must have a pediatric rapid response and/or resuscitation team with experience and training to support the scope of service in place 24/7 to respond to any site in the facility (CD 2-52). Doing so requires the 24/7 physical presence of a pediatric provider to include current PALS certification in the leadership role (CD 2-53). The NICU should have a neonatal rapid response and/or resuscitation team with the 24/7 presence of a pediatric provider who has current NRP certification.

Level II centers are required to participate in a data-collection program that yields peer-performance assessments against which an individual program may be externally measured (see Chapter 7).

It is appropriate to include ambulatory sites of care in a Level II institutional application. To be verified, an ambulatory center must be a component of a demonstrably integrated children's health care delivery system, and the on-site ambulatory surgical care team must possess pediatric-specific training and experience consistent with the requirements delineated for Level II center verification.

A Level II center must have written transfer agreements with a Level I center for patients whose medical needs exceed local resources (CD 2-54).

Performing procedures outside the scope of practice delineated for a Level II center should be uncommon.

Table 1: Requirements for Level I and Level II Children’s Surgical Centers

Requirement	Children’s Level I	Children’s Level II	Children’s Level II (neonatal scope of service only)
Freestanding children’s hospital or comprehensive pediatric care unit within general hospital organization	E	E	-
Children’s surgical service	E	E	E
Pediatric surgeons	E	E	E
Pediatric anesthesiologists	E	E	E
Pediatric emergency medicine physicians	E	D	-
Pediatric radiologists	E	E	E
Other surgical specialists	E	E	E (pediatric ophthalmology)
Pediatric rapid response team	E	E	E
Surgery-specific children’s continuing medical education for children’s surgery medical director and liaisons	E	E	E
Neonatal intensive care unit	Level IV	Level III or greater	Level III or greater
Neonatologists	E	E	E
Pediatric emergency department	E	E	-
Pediatric intensive care unit	E	D	-
Pediatric critical care medicine physicians	E	E	-
Pediatric acute care unit	E	E	-
Pediatric resuscitation equipment in all appropriate patient-care areas	E	E	E
Children’s surgical program manager or coordinator	E	E	E
Surgical data collection	E	E	E
Child-life and family-support programs	E	E	E
Pediatric social work/child protective services	E	E	E/D
Community outreach programs	E	E	-
Children’s education programs	E	E	-
Surgical research	E	D	D
Minimum number of annual surgical procedures for children younger than 18 years	1,000	-	-
Children’s surgical performance improvement and patient safety program	E	E	E

Abbreviations: D, desired; E, essential.

Level III

For many areas, a Level III children’s surgical center will be an important part of the health care system. A Level III center will potentially provide definitive care for well children older than 6 months. Generally, they will be children without comorbidities (ASA 1-2) and without the need for multidisciplinary care, and the procedures will generally be common, low-risk procedures typically performed by a single specialty. A Level III center will have transfer agreements with a Level I or Level II center for patients whose needs exceed its resources.

A Level III children’s surgical center must have general surgeons and anesthesiologists with pediatric expertise on staff and continuously available within 60 minutes 24/7 (CD 2-55). A *general surgeon with pediatric expertise* is defined as a surgeon either eligible for certification or certified by the American Board of Surgery or an equivalent in general surgery. All surgeons who care for children will demonstrate ongoing clinical engagement and expertise in children’s surgery, as evidenced by the performance of 25 or more procedures annually in patients younger than 18 years, as well as completion of 10 or more pediatric Category 1 CME credit hours annually (CD 2-56). An *anesthesiologist with pediatric expertise* is defined as an anesthesiologist either eligible to certify or with a current certificate from the American Board of Anesthesiology or equivalent. He or she will demonstrate continuous experience with children younger than 24 months, defined as 25 patients per anesthesiologist per year. In addition, this individual will demonstrate ongoing pediatric clinical engagement with patients younger than 18 years and will complete 10 or more pediatric Category 1 CME credit hours annually (CD 2-57). Here and throughout this document, the annual CME requirement may be averaged over 3 years. Within a Level III children’s surgical center, children’s surgeons and anesthesiologists with pediatric expertise are required to participate in children’s surgery performance review activities (CD 2-58). Through the PIPS program and hospital policy, the MDCS in a Level III center must have responsibility for performance review and authority for evaluation of each surgeon’s ability to participate in children’s surgical cases based on an annual review (CD 2-59).

A Level III children’s surgical center must have a pediatric rapid response and/or resuscitation team with experience and training to support the scope of service in place 24/7 to respond to any site in the facility. Thus, the 24/7 physical presence of a pediatric provider with current PALS certification in the leadership role is required (CD 2-60). Level III children’s surgical centers are required to have emergency medicine coverage by physicians with pediatric-specific experience and training in a facility with pediatric expertise and equipment to match the scope of service (CD 2-61).

At Level III centers, a radiologist with pediatric expertise must be available to provide care at the bedside within 60 minutes 24/7 (CD 2-62). This individual is defined as a radiologist with certification by the American Board of Radiology or equivalent, demonstrable ongoing pediatric experience to support the scope of actual practice, and 10 or more pediatric Category 1 CME credit hours annually (CD 2-63). The PIPS process will monitor the services provided by these individuals.

Level III centers may treat patients who ultimately need to be transferred to a higher level of care. Written transfer guidelines approved by the MDCS that define appropriate patients for transfer and retention are required at a Level III center (CD 2-64), and these guidelines must be monitored by the PIPS program.

Indications for Transfer of Infants and Children with Surgical Needs to Level I or Level II Centers

<60 weeks postmenstrual age

Patient younger than 6 months

High level of acuity, need for ICU

As it is for Level I and Level II centers, it is appropriate to include ambulatory sites of care in a Level III institutional application. To be verified, an ambulatory center must be demonstrably integrated with the larger system, and the on-site ambulatory surgery care team must possess pediatric-specific training and experience consistent with the requirements delineated for Level III center verification.

Outreach activities to the local community and education programs for nurses, physicians, and allied health care workers involved with children are also functions of a Level III children’s surgical center and should be demonstrable.

Performing procedures outside the defined scope of practice in Level III centers should be uncommon.

Table 2: Summary of Children’s Surgical Center Standards with Expected Scope of Practice

Characteristic	Level I	Level II	Level III
Age of patient	Any	Any	>6 months
ASA	1-5	1-3*	1-2*
Multidisciplinary management of comorbidities	Multiple medical and surgical specialties; pediatric anesthesiology	Typically, single surgical specialties; neonatology; pediatric anesthesiology	None
Operations†	Procedures for major congenital anomalies and complex diseases, including those that are uncommon or require significant multidisciplinary coordination	Procedures for common anomalies and diseases that are typically treated by most children’s surgical specialists and that do not require significant multispecialty coordination	Common, low-risk procedures typically performed by a single specialty
Ambulatory‡	ASA 1-3 Full-term and preterm infants may be cared for as ambulatory patients based on written guidelines established by the pediatric anesthesiologist in charge of perioperative care; institutional guidelines generally require full-term infants <4 weeks or preterm infants <50 weeks’ PMA weeks to be monitored for ≥12 hours postoperatively	ASA 1-3 Full-term and preterm infants may be cared for as ambulatory patients based on written guidelines established by the pediatric anesthesiologist in charge of perioperative care; institutional guidelines generally require full-term infants <4 weeks or preterm infants <50 weeks’ PMA to be monitored for ≥12 hours postoperatively	Otherwise healthy (ASA 1-2) Age >6 months

Abbreviations: ASA, American Society of Anesthesiologists perioperative risk score; PMA, postmenstrual age.

*Emergent procedures in some patients of ASA >3 may be appropriate in neonatal patients, such as those with necrotizing enterocolitis. Infants and children who have emergent or life-threatening surgical needs and cannot be reasonably delayed for transport should receive initial stabilization and necessary care at the site of presentation.

†Types of anomalies and diseases that should have pediatric subspecialty care are further delineated in American Academy of Pediatrics. Levels of neonatal care: Committee on Fetus and Newborns. *Pediatrics*. 2012; 130(3):579-587. Depending on patient age, comorbidities, and need for a multidisciplinary surgical approach, these operations may be appropriate for either Level I or Level II centers.

‡Ambulatory sites of care may be included in these recommended levels of institutional designation when the on-site provider team possesses the same pediatric training and experience as the parent institution. The site of care may be physically attached to, or integrated into, the hospital or may be a component of a demonstrably integrated children’s health care delivery system that provides these defined resources.

The ability to stabilize and transfer critically ill children must be demonstrated at all levels of verification (CD 2-65). This requirement includes critically ill children and neonates whose care may be initiated at an internal site, such as a radiology suite or the emergency department distinct from definitive care, or at another institution for which a formal transfer agreement is in place. All interhospital transfers to a higher level of care should be reviewed. Receiving hospitals should have a mechanism to review transfers and provide feedback to referring hospitals.

Congenital heart centers are not specifically verified or designated in this program, although it is relevant to note that resource standards for this process have been developed by the American Academy of Pediatrics [Bricker JT, Fraser CD, Fyfe DA, et al. AAP Section on Cardiology and Cardiac Surgery: Guidelines for pediatric cardiovascular centers. *Pediatrics*. 2002;109(3):544-549].

Ambulatory Surgical Centers

The American College of Surgeons does recognize the important role of ambulatory surgical centers in the contemporary care of infants and children. An ambulatory surgical center must be demonstrably integrated with a Level I, II, or III children's surgical center to be verified within this program (CD 2-66). Ambulatory surgical centers must meet the resource standards for children delineated, and the on-site ambulatory care team must possess pediatric training and experience consistent with the level of verification (CD 2-67).

The safety of performing outpatient surgical procedures in children is substantially dependent on the provision of a safe anesthetic but is enhanced by having appropriate high-quality surgical equipment with OR personnel experienced in its use. The major postoperative risk is apnea. Risk factors for postoperative apnea are prematurity, history of apnea, and anemia. In general, the risk of postoperative apnea is highest among infants born at younger gestational and postconceptual ages. The most relevant data are found in the analysis of Cote et al of 255 preterm infants undergoing inguinal herniorrhaphy under general anesthesia [Cote CJ, Zaslavsky A, Downes JJ, et al. Postoperative apnea in former preterm infants after inguinal herniorrhaphy. *Anesthesiology*. 1995;82(4):809-821]. In the nonanemic child with a gestational age of 32 weeks and a postmenstrual age of 56 weeks, the probability of apnea was less than 1 percent. With a gestational age of 35 weeks, a postmenstrual age of 54 weeks was the threshold for apnea to be less than 1 percent.

It is widely accepted that one can safely administer anesthesia on an ambulatory basis for preterm infants with a postmenstrual age of more than 50 weeks and who are without other risk factors (www.asahq.org). Ambulatory

surgery in infants born before 37 weeks' gestation may be safely performed after 50 weeks' postmenstrual age as long as there is no anemia, prior apnea, or coexisting disease. Institutional guidelines generally require full-term infants younger than 4 weeks or preterm infants less than 50 postmenstrual weeks to be monitored for at least 12 hours postoperatively.

Optimally, ambulatory children's surgery should be performed in facilities with specific children's resources and policies, as described below. To be a verified Level I, II, or III center, these standards must be met.

A pediatric anesthesiologist, pediatric surgeon, or other specialty-trained children's surgeon must serve as medical director for the children's ambulatory surgical program (CD 2-68).

A pediatric anesthesiologist (Level I or Level II) or an anesthesiologist with pediatric expertise (Level III) must administer, or directly oversee the administration of, a general anesthetic and/or sedation to all patients 2 years or younger who are undergoing a surgical procedure (CD 2-69).

The preoperative preparation and postoperative recovery of children must occur in an area appropriate for pediatric patients (CD 2-70).

The special needs for a child's social and emotional comfort must be considered in the construction and protocols of a pediatric ambulatory surgical center (CD 2-71).

Anesthesia and other equipment, including resuscitation devices and appropriate pharmacologic supplies and drug doses for all sizes of children, must be readily available in all pediatric ambulatory ORs and recovery areas (CD 2-72).

One or more persons currently certified in PALS must be present and available to the pediatric patient who is sedated, anesthetized, recovering from anesthesia, or receiving perioperative opioids (CD 2-73):

- Healthy full-term infants older than 4 weeks and younger than 6 months should be monitored at least 2 to 4 hours after surgery and should be scheduled for surgery early in the day. Prolonged postoperative monitoring should be provided for infants younger than 3 months who receive perioperative opioids.
- Full-term infants younger than 4 weeks and preterm infants younger than 50 weeks' postmenstrual age are not appropriate candidates for surgery on an ambulatory outpatient basis.

Formal transfer agreements and/or a written policy or guidelines must be in place to allow planned processes and prompt transfer to an appropriate Level I, II, or III inpatient children's facility for pediatric ambulatory surgery patients when medically necessary, and these guidelines must be monitored by the PIPS process (CD 2-74).

Notes

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AMERICAN COLLEGE OF SURGEONS

Chapter 3

Triage and Transfer for Seriously Ill Infants and Children



CHAPTER 3

The children's surgical system is driven by the goal of getting a child with surgical needs to the right place at the right time. Imprecision results in overtriage and undertriage. In general, priority is given to reduction of undertriage, because undertriage may result in preventable mortality or morbidity for a seriously ill child. Although overtriage has minimal or no adverse consequences for the patient, it can result in excessive costs and burden for higher-level centers in the routine care of patients, as well as increased travel burden for families. The medical community should be more concerned about undertriage and the medical consequences that result from inadequate use of a system. The system's performance improvement program should evaluate triage (referral) and transfer criteria to provide the best-quality care to patients.

Interhospital Transfer

The development of agreements for transfer of seriously ill patients between institutions is an essential part of a system. These agreements should be made well in advance of the need to implement them and should define which patients should be transferred and the process for doing so. Once the need for transfer or referral is recognized, the process should not be delayed for laboratory or diagnostic procedures that have no impact on resuscitation, immediate needs, or the transfer process. Minimizing the time to appropriate definitive care can have a positive influence on outcome. Regional systems facilitate transfer and referral processes and improve the efficiency of patient movement through the system by designing and implementing plans that deal with transfer and referral issues before the acute patient need.

Written agreements between hospitals help ensure the consistent, timely, proper, and efficient movement of seriously ill children between institutions; allow for review of the structure of transfer and referral processes with the goal of performance improvement; and result in mutual educational benefit for both originating and recipient institutions. An example is provided in Appendix 1. The value of these agreements is that they design a process before it is necessary that allows patients to receive the specialty care needed. This process avoids delays that prolong the time to definitive care. The transferring and receiving hospitals benefit by having predetermined the needs and expectations of both institutions and by having resolved problematic areas before the actual transfer process. The best plans are carefully considered, mutually approved, written, and frequently reviewed and include a mechanism for feedback and performance improvement.

Once the decision for referral or transfer has been made, it is the responsibility of the referring physician to initiate resuscitation and any needed stabilization measures within the capabilities of the local hospital. The referring physician should select a mode of transport according to the patient's needs so that the level of care is appropriate during transport. Effective communication between the referring center and receiving center is essential (CD 3-1). Specifically, the accepting physician should review the current physiologic status of the patient and discuss the initial management and the optimal timing of transfer.

There are identifiable needs and combinations of needs that result in high mortality, even when patients are managed in Level I centers. Patients with these critical needs should be considered for early transfer. Physicians in community hospitals should develop specific guidelines for the identification of patients who would benefit from early transfer based on available local resources. Written agreements for transfer of patients between hospitals have their greatest utility in establishing a system in which patients can be moved expeditiously to an institution that has been identified by prior agreement to be capable and willing to provide needed children's specialty surgical services.

The decision to transfer a patient to a children's specialty care facility in an acute situation must be based solely on the clinical needs of the patients and not on the administrative or financial requirements of the patient's specific provider network (such as a health maintenance organization or preferred provider organization) or the patient's ability to pay.

Subsequent decisions regarding transfer to a facility within a managed care network should be made only after stabilization of the patient's medical/surgical condition.

Obligations of the referring physician and facility include the following:

- Identifying an appropriate children's facility with available space and qualified surgical personnel that has agreed to accept the patient before beginning the transfer.
- Not transferring patients with physiologic instability, except for medical necessity and only after providing medical treatment within the facility's capacity that minimizes the risks to the patient's health.
- Providing appropriate transportation in a vehicle augmented with infant- and child-specific life-support equipment and staff to meet the anticipated contingencies that may arise during transportation.
- Sending all records, test results, radiologic studies, and other relevant reports or data with the patient to the recipient facility unless a delay would increase the risks of transfer, and in that case sending the information as soon as possible.
- Issuing a physician transfer summary and consent for transfer to accompany the patient.

Receiving hospitals also have obligations. Hospitals that have specialized children's care capabilities or facilities are obligated to accept the appropriate transfer of patients requiring such services if they have the capacity to treat them.

Another important aspect of interhospital transfer is an effective PIPS program that includes evaluating transport activities. These activities can be accomplished in a number of ways, depending on the transport service. Regardless of how the process is accomplished, the receiving hospital should have input and feedback with the personnel responsible for the transport process to ensure that problems occurring during, and associated with, transport are addressed in a timely manner. The input, feedback, and communication also should allow recognition of transportation efforts that are consistent with optimal care.

Guidelines for Transferring Patients

1. Transferring physician responsibilities.

- a. Identify patients needing transfer.
- b. Initiate the transfer process by direct contact with the receiving surgeon.
- c. Initiate appropriate resuscitation and stabilization measures within the capabilities of the facility.
- d. Determine the appropriate mode of transportation in consultation with the receiving surgeon.
- e. Transfer all records, test results, and radiologic evaluations to the receiving facility.

2. Receiving physician responsibilities.

- a. Ensure that resources are available at the receiving facility.
- b. Provide consultation regarding the specifics of the transfer, additional evaluation, or resuscitation before transport.
- c. Once transfer of the patient is established, clarify medical control.

Identify a PIPS process for transportation, allowing feedback from the receiving surgeon to the transport team directly or at least to the medical director for the transport team.

3. Management during transport.

- a. Children-specific personnel and equipment should be available during transport to meet anticipated contingencies.
- b. Sufficient supplies, such as intravenous fluids, blood, and medications appropriate for age and size of the patient, should accompany the patient during transport.
- c. Vital signs should be monitored frequently.
- d. Vital functions should be supported.
- e. Records should be kept during transport.
- f. Communication should be maintained with online medical direction during transport.

4. System responsibilities.

- a. Ensure prompt transport once a transfer decision is made.
- b. Interhospital transfers, as well as overtriage and undertriage, must be reviewed by the children's surgical center for PIPS (CD 3-2).
- c. Ensure transportation commensurate with the patient's need.

5. Information to accompany patient.

- a. Appropriate family members and available patient demographic information should accompany the seriously ill child.
- b. Information about the nature of the medical problem and prehospital care constitute important facts that can influence subsequent treatment.

- c. A summary of evaluation and care provided at the transferring facility should include the results of laboratory tests and radiologic evaluations, the needs identified, the patient's response to treatment, and a chronologic record of the patient's vital signs.
- d. Additional information that is helpful includes the medical history, current medications, medications and immunizations administered, and allergies.
- e. The name, address, and telephone number of the referring physician are important.
- f. The name of the surgeon who accepted the patient at the receiving hospital also should be indicated.

Transport Teams

A Level I children's surgical center is required to have a designated transport team for neonatal and pediatric patients (CD 3-3). The complement of personnel, mode of transport, and medical control policies will vary by location, but performance must be monitored by PIPS (CD 3-4). Written policies must address personnel, mode of transport, and medical control, at a minimum. Quality-improvement efforts require data documenting timeliness and appropriateness of response, as well as missed transports. A mechanism for feedback to referring institutions must be in place (CD 3-5). Level II and Level III centers must have a relationship with and deploy pediatric-specific transport teams when transferring appropriate infants and children to or from their centers (CD 3-6).

AMERICAN COLLEGE OF SURGEONS

Chapter 4

Hospital Organization and the Children's Surgical Program



CHAPTER 4

A decision by a hospital to become a children’s surgical center requires the commitment of both the institutional governing body (CD 4-1) and the medical staff (CD 4-2). The commitment and collaboration of these two bodies are necessary to facilitate the allocation of resources and the development of programs designed to improve the care of children with surgical needs. Elements of the children’s surgical program include the following: (1) hospital organization; (2) medical staff support; (3) delivery of surgical care; (4) the medical director of children’s surgery (MDCS); (5) the medical director of children’s anesthesiology (MDCA); (6) the children’s surgery program manager (CSPM); (7) data collection; and (8) the children’s surgery PIPS program.

Hospital Organization

The administrative structure must support the children’s surgical program. Formal written commitment by the hospital’s governing body and the medical staff is necessary (Table 1). This support must be reaffirmed continually (every 3 years) and must be current at the time of verification (CD 4-1 and CD 4-2). Administrative support of the surgical program helps provide adequate resources for the optimal care of children with surgical needs. The responsible administrator works closely with the medical director to establish and maintain the components of the children’s surgery program. The participation of an administrator helps ensure that the written commitment to the surgical program is implemented to provide optimal multidisciplinary surgical care.

The administrative structure of the hospital should demonstrate institutional support and commitment and must include, at a minimum, an administrator, MDCS, MDCA, and CSPM (CD 4-3). Sufficient authority for the surgical program to achieve all programmatic goals should be reflected in the organizational structure. Administrative support includes human resources, educational activities, and community outreach activities to enable community cooperation and a systematic approach to the care of children with surgical needs. Adequate funding of the children’s surgical program is the direct responsibility of the institution.

Table 1: Sample Commitment and Support Statements

Hospital Commitment
Resolved, that the XYZ Hospital Board of Directors (or other administrative governing authority) approves the establishment of a Level ____ children’s surgical center (or “applies for verification or reverification of a Level ____ children’s surgical center”). The Board commits to maintain the high standards needed to provide optimal care of children with surgical needs.
Medical Staff Support
Resolved, that the Medical Staff or Executive Committee of XYZ Hospital (or other governing body of the medical staff) supports the establishment of a Level ____ children’s surgical center (or “supports verification or reverification of a Level ____ center”). This statement acknowledges the commitment to provide appropriate specialty care as required to support optimal care of children with surgical needs.

Medical Staff Support

The medical staff commitment ensures that the members of the medical staff support the children's surgical program in their professional activities. This support includes a current written commitment acknowledging the medical staff's willingness to provide appropriate specialty care to support the optimal care of children with surgical needs (see Table 1). This support must be reaffirmed continually (every 3 years) and must be current at the time of verification (CD 4-2).

The Children's Surgical Program

The children's surgical program involves multiple disciplines that transcend traditional departmental hierarchies. Because optimal care extends from diagnosis of a surgical need through the acute-care setting to discharge and outpatient convalescence, the program should have appropriate specialty representation from all phases of care. Representatives of all disciplines provide the appropriate skills, as team members must work in concert to implement treatment based on a prioritized plan of care. To ensure optimal and timely care, a multidisciplinary program must continuously evaluate its processes and outcomes.

The Medical Director of Children's Surgery (MDCS)

The MDCS is the surgeon who leads the multidisciplinary activities of the children's surgical program. This individual may have a title such as *surgeon-in-chief*. The following are requirements for this program. For Level I and Level II centers, the director must be a surgeon with current board certification (or equivalent) with special interest and qualifications in children's surgical care (CD 4-4) and be demonstrably active in clinical surgery (CD 4-5). The MDCS must have 16 hours annually or 48 hours in 3 years of documented and verifiable external children's surgery-related Category 1 CME (CD 4-6). Membership and active participation in appropriate regional or national children's organizations are essential for the MDCS in Level I and Level II centers (CD 4-7) and are desirable in Level III facilities.

The MDCS's responsibilities extend far beyond executing the technical skills of surgical procedures. The MDCS should have the authority to manage the surgical program. The MDCS participates in the credentialing of surgeons with children's privileges, works in cooperation with the nursing administration to support the nursing needs of children with surgical problems, develops treatment protocols along with the surgical teams, and coordinates the performance improvement and peer review process. The MDCS must have the authority to correct deficiencies in surgical care (CD 4-8). This authority includes serving as chair or designating the chair of the PIPS peer review committee and the surgical services operations committee (OR committee) (see Chapter 8).

The Medical Director of Children's Anesthesiology (MDCA)

The MDCA is the anesthesiologist who leads the multidisciplinary activities of the children's program. This individual may have a title such as *anesthesiologist-in-chief*. The following are requirements for this program. For Level I and Level II centers, the director must be a pediatric anesthesiologist with current board certification (or equivalent) (CD 4-9). The MDCA must be demonstrably active in the delivery of clinical anesthesiology services to infants and children (CD 4-10). The MDCA must have 16 hours annually or 48 hours in 3 years of documented and verifiable external children's surgery-related Category 1 CME (CD 4-11). Membership and active participation in appropriate regional or national children's organizations are essential for the MDCA in Level I and Level II centers (CD 4-12) and are desirable in Level III facilities.

The MDCA's responsibilities extend far beyond executing the technical skills of anesthesia delivery. The MDCA should have the authority to manage the pediatric anesthesia program. The MDCA participates in the credentialing of anesthesiologists with children's privileges, works in cooperation with the MDCS and nursing administration to support the nursing needs of children with surgical problems, develops treatment protocols along with the surgical teams, and helps coordinate the performance improvement and peer review process. The MDCA must have the authority to correct deficiencies in anesthesia care (CD 4-13).

The Surgical Service

A children's surgical service represents a structure to provide care for children with surgical needs. The service includes the personnel and other resources necessary to ensure the appropriate and efficient provision of surgical care. The precise character and composition of a service will vary based on specific needs of the medical facility, available personnel, and other resources. In a Level I or Level II children's surgical center, infants and children with primary surgical problems must be admitted to, or evaluated by, an identifiable surgical

service staffed by credentialed children's surgical providers (CD 4-14). Sufficient infrastructure and support to ensure adequate provision of care must be provided for this service (CD 4-15). The infrastructure and support may require additional qualified physicians, residents, nurse practitioners, physician assistants, or other allied health professionals. The number and type of individuals required for a surgery service should be determined by the volume of patients requiring care and the complexity of their conditions.

Operational Process Improvement

There must be a process to address children's surgical program operational issues (CD 4-16). Typically, this function is accomplished by a multidisciplinary committee that examines related hospital operations and includes representatives from all phases of care provided to surgical patients. This committee is often the OR committee or other surgery department committee, but it may take other forms. Besides physicians, this committee may include nurses, technicians, administrators, and other relevant personnel. In Level I and Level II centers, the OR or other surgical department committee must be dedicated to the children's surgical services; in Level III and ambulatory

centers, this role may be integrated into existing institution-wide processes, but there must be separate discussion or subcommittee activity documented that adequately addresses children's issues (CD 4-17). This committee should meet at least quarterly but may need to meet more often, as necessary, to review operational performance issues. Documentation (minutes) must reflect the review of operational issues and, when appropriate, the analysis and proposed corrective actions (CD 4-18). This process must identify problems and must demonstrate problem resolution (loop closure) (see Chapter 8).

The Children's Surgical Program Manager (CSPM)

The CSPM is fundamental to the development, implementation, and evaluation of the children's surgical program. In addition to administrative ability, the CSPM must show evidence of educational preparation and relevant clinical experience in the care of patients with surgical needs (CD 4-19). The CSPM works in close collaboration with the MDCS and complements the director's efforts. A constructive, mutually supportive relationship among these key leaders is important to the success of the program.

The CSPM, usually a full-time registered nurse, is responsible for the organization of services and systems necessary for a multidisciplinary approach to providing care to children with surgical needs. The CSPM must play an active role in the administration and review of children's surgical care from admission through discharge (CD 4-20). The CSPM, in particular, assumes day-to-day responsibility for process and performance improvement activities as they relate to nursing

and ancillary personnel and assists the MDCS in carrying out the same functions for the physicians. Accountability for all activities of the surgical program resides with the medical director. The role of the CSPM in the educational, clinical, research, administrative, and outreach activities of the surgical program is determined by the needs of the MDCS and the institution. (Various responsibilities of CSPMs are detailed in Table 2.)

The administrative and budgetary support needed for the CSPM depends on the size of the program. Relevant data collection and analysis is required and must be appropriately staffed. A comparable level of administrative assistant and clinical nursing personnel helps fulfill needs for outreach, concurrent case review, and discharge planning. The data-collection personnel, administrative assistant, and surgical nurse clinician(s) should be supervised by the CSPM.

Table 2: The Children's Surgery Program Manager

Qualifications of the Children's Surgery Program Manager (CSPM)	
The CSPM, usually a registered nurse, must show evidence of educational preparation, with a minimum of 16 hours of pediatric continuing education per year (or 48 hours over the 3-year period prior to application) and clinical experience in the care of children undergoing surgery. A written job description should define sufficient authority to do the job and clearly outline the responsibilities of the individual. Qualifications and activities should include the following.	
Clinical activities	Coordinate management across the continuum of children's surgical care, which includes planning and implementation of clinical protocols and practice-management guidelines, monitoring care of inpatient patients, and serving as a resource for clinical practice.
Education responsibilities	Provide intrafacility and regional professional staff development, participate in case review, implement practice guidelines, and direct community-education programs.
Performance improvement	Monitor clinical processes and outcomes and system issues related to the quality of care provided; develop quality filters, audits, and case reviews; identify trends and sentinel events; and help outline remedial actions while maintaining confidentiality.
Administration	Manage, as appropriate, the operational, personnel, and financial aspects of the children's surgical program. Serve as a liaison to administration, and represent the children's surgical program on various hospital and community committees to enhance and foster optimal care management.
Supervision of data collection	Supervise collection, coding, and developing processes for validation and analysis of data. Design and oversee the data collection to facilitate performance improvement activities, trend reports, and research while protecting confidentiality.
Consulting and liaison	Stabilize the complex network of many disciplines that work in concert to provide high-quality children's surgical care. Serve as an internal resource for staff in all departments, and act as an extended liaison for other system entities.
Research	Be involved in research projects, analysis, and distribution of findings. Facilitate protocol design for accurate data collection, feedback, and analysis, and understand the requirements of research oversight.
Community and national engagement in children's surgical care systems	Participate in the development of children's surgical care systems at the community, state, provincial, or national levels.

The Surgery Data Collection Personnel

The individuals responsible for surgery data collection are important members of the team. These individuals may come from a background such as nursing, medical records, computer science, or medical informatics. Ideally, the individual should work directly with the surgical team and report to the CSPM. This children's surgery data collection leader must have sufficient skills and experience to satisfy the job requirements (see Chapter 7). He or she also should complete at least

4 hours of registry-specific continuing education per year. Technical support, locally and from relevant national vendors or agencies, should be available to assist with these training requirements.

It is important to acknowledge that high-quality data begin with high-quality data entry, and it is the children's surgery data collection leader who is responsible for performing this task.

AMERICAN COLLEGE OF SURGEONS

Chapter 5

Clinical Functions: Surgeons



CHAPTER 5

Surgeons caring for children must meet certain requirements, as described herein. These requirements may be considered to be in four categories: board certification or equivalent, clinical involvement, education, and regional or national commitment. The MDSCS must have the responsibility and authority to ensure compliance with these requirements.

Board Certification

Basic to qualification for any surgeon is board certification by the American Board of Surgery, another relevant board of the ABMS, or an equivalent organization such as the Bureau of Osteopathic Specialists and Board of Certification or the Royal College of Physicians and Surgeons of Canada. Board certification is essential for surgeons who take call and provide care in Level I, II, and III and ambulatory children's surgical centers. It is acknowledged that many boards require a practice period and that completion of certification may take 3 to 7 years after completing a residency approved by the ACGME, the American Board of Osteopathic Specialties, or an equivalent entity. A surgeon is specifically permitted to meet these program requirements during this period of eligibility for

certification if credentialed by the applicant organization. If a physician has not been certified within 7 years after successful completion of an ACGME or Canadian residency, the physician usually is not eligible for inclusion on the children's surgical team. A physician may be included when given recognition by a major professional organization in his specialty. On a case-by-case basis, alternative training and certification may be judged equivalent by the applicant organization and the American College of Surgeons. Appendix 3 of this document delineates several such circumstances. The credentialing body of the hospital will ensure that qualifications of the practicing providers are current and specific to the care of children (CD 5-1).

Clinical Involvement

In a hospital committed to children's surgical care, surgeons with demonstrable children-specific expertise should be identified. At all levels of verification, qualified children's surgeons must have specific children's delineation of privileges and provide the bedside care for all such children (CD 5-2). Participation in the organization of protocols, teams, call rosters, and rounds is a clear indicator of commitment to excellence in children's surgical care. It is important for children's surgeons to maintain their surgical skills. To maintain operative skills, credentialed surgeons must remain actively involved in clinical surgery (CD 5-3). One of the ways that this skill maintenance is demonstrated is participation in elective surgery and emergency surgery. Periodic recertification is also evidence of such engagement.

In Level I children's surgical centers, the pediatric surgeons and pediatric anesthesiologists on call must be dedicated to the center while on call (CD 5-4). A Level II center is required to have these individuals available on a consultant basis to care for a patient in the relevant institution within 60 minutes of such a request. In Level III centers, these requirements may be met by general surgeons and anesthesiologists with pediatric expertise.

Performance Improvement and Patient Safety (PIPS)

In Level I, II, and III and ambulatory children's surgical centers, there must be a multidisciplinary peer review process with leadership by the MDCS or designee and representatives from anesthesiology and all surgical and medical specialties relevant to the level of verification and scope of service. The purpose is to improve surgical care by reviewing all deaths, select complications, and sentinel events with the objective of identifying issues and developing appropriate responses. This process is detailed in Chapter 8.

Education

It is important that all members of the surgical team be knowledgeable about current practices in children's surgical care. In Level I and Level II centers, external CME is the recommended method of keeping current. The MDCS must accrue an average of 16 hours annually or 48 hours in the 3 years prior to site visit of relevant children's surgical Category 1 external CME. Programs given by visiting professors or invited speakers are considered external education. It is important that other surgeons and anesthesiologists (that is, staff surgeons

and anesthesiologists) who take children's surgical call be knowledgeable and current in the care of children with surgical needs. In all levels of center verification, this requirement must be met by the acquisition of 16 hours of children's surgical CME per year on average, or by demonstrating participation in an internal educational process conducted by the program based on the principles of practice-based learning and the PIPS program. These requirements are detailed in Chapter 10.

Regional or National Commitment

Membership and active participation in regional or national organizations relevant to children's surgery are essential for the MDCS and the MDCA in Level I or Level II centers and are desirable in Level III facilities.

Notes

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AMERICAN COLLEGE OF SURGEONS

Chapter 6

Collaborative Clinical Services and Resources



CHAPTER 6

Anesthesiology

Specialist pediatric anesthesiology services are critical in the management of infants and children with surgical needs and must be promptly available for elective and emergency operations and for managing airway problems. These anesthesiology needs must be fulfilled in Level I and Level II centers by pediatric anesthesiologists (board certified or equivalent, or eligible for examination) and may be fulfilled in Level III centers by anesthesiologists and certified registered nurse anesthetists (CRNAs) with pediatric expertise. Although anesthesia services are often based primarily in the OR, the responsibilities of the anesthesiology team extend beyond the OR. Examples include airway management, assisting with resuscitation, providing preoperative and postoperative cardiorespiratory support, and assisting with pain management.

- A *pediatric anesthesiologist* is defined as an individual certified or eligible for certification in pediatric anesthesia by the American Board of Anesthesiology or equivalent. In addition, an individual who is similarly qualified by demonstrable experience and training may be considered a pediatric anesthesiologist by way of the relevant alternative pathway delineated in Appendix 3. All such individuals must demonstrate adequate ongoing engagement in the practice of pediatric anesthesia in patients younger than 18 years.

- An *anesthesiologist with pediatric expertise* is defined as an anesthesiologist either eligible to certify or with a current certificate from the American Board of Anesthesiology or equivalent. He or she must demonstrate continuous experience with children younger than 24 months, defined as 25 patients per anesthesiologist per year. In addition, this individual will demonstrate ongoing pediatric clinical engagement in patients younger than 18 years, as well as complete 10 or more pediatric Category 1 CME credit hours annually.
- A *CRNA with pediatric expertise* is defined as a credentialed CRNA provider with continuous supervised experience with children younger than 24 months, defined as 25 patients per practitioner per year. In addition, this individual will demonstrate ongoing pediatric clinical engagement with patients younger than 18 years, as well as 10 pediatric Category 1 CME credit hours annually.

Here and elsewhere in this document, the continuing education credit hours may be averaged over 3 years to achieve the annual requirement.

Level I and Level II Centers

The anesthetic care of children with surgical needs in a Level I or Level II center must be organized and overseen by a pediatric anesthesiologist who is highly experienced and devoted to the care of infants and children. A pediatric anesthesiologist medical director for the children's surgical program must be designated for both Level I and Level II centers (CD 6-1).

Pediatric anesthesia services in Level I centers must be immediately available on site 24 hours a day (CD 6-2). This requirement may be fulfilled by on-site anesthesiology residents in their final year of training, pediatric anesthesiology fellows, CRNAs, or board-certified anesthesiologists who are capable of assessing emergency situations in children and of providing any indicated treatment, including airway management and initiation of surgical anesthesia. When anesthesiology chief residents, pediatric fellows, CRNAs, or board-certified anesthesiologists are used to fulfill immediate-availability requirements, the staff pediatric anesthesiologist on call must be advised of clinical activities, be promptly available at all times (be able to respond to the bedside within 60 minutes), and be physically present for all

operations for which he or she is the responsible anesthesiologist. A pediatric anesthesiologist *must* serve as the primary anesthesiologist for all children 2 years or younger (CD 2-11) and *should* serve as the primary anesthesiologist for all children 5 years or younger with an ASA of 3 or higher. The availability of appropriate pediatric anesthesia services and the absence of delays in airway control or operations must be documented by the hospital PIPS process.

In a Level II children's surgical center, a pediatric anesthesiologist must be available 24 hours a day to respond within 60 minutes to the bedside (CD 6-3). A portion of this 24/7 coverage may be provided by appropriately trained specialists who lack pediatric certification; however, a pediatric anesthesiologist *must* serve as the primary anesthesiologist for all children 2 years or younger (CD 2-11) and *should* serve as the primary anesthesiologist for all children 5 years or younger or with an ASA of 3 or higher, as for Level I centers. A Level II children's surgical center must have the on-site presence of a physician or allied health professional with demonstrable pediatric airway management skills 24 hours a day (CD 6-4). The availability of pediatric anesthesia services and the absence of delays in airway control or operations must be documented by the hospital PIPS process.

Level III Centers

At Level III children's surgical centers, anesthesiologists or CRNAs with expertise in pediatrics must be promptly available 24 hours a day to respond to the bedside within 60 minutes (CD 6-5). This expertise is defined above. One of these providers should serve as the medical director of pediatric anesthesiology. For Level III children's surgical centers, anesthesiologists or CRNAs with pediatric expertise must be on the medical staff, and one of them *must* serve as an anesthesia provider for all children 2 years or younger (CD 6-6). One of them *should* serve as an anesthesia provider for all children 5 years or younger or with an ASA of 3 or higher. Physical presence is required for procedures for which he or she is the primary anesthesiologist.

Local criteria must be established to allow the anesthesia provider to take call from outside the hospital but with the clear commitment that this provider will be promptly available and provide airway and operative management for children. Under these circumstances, the presence of a physician or allied health professional demonstrably skilled in emergency airway management for children whose age is within the scope of service must be documented on site 24/7 (CD 6-7). The availability of pediatric anesthesia services and the absence of delays in airway control or operations must be documented by the hospital PIPS process.

In Level I and Level II facilities, at least one pediatric anesthesiologist should put forth a specific effort and commitment for education in pediatric-related anesthesia and lead an effort to educate other anesthesiologists and the entire team.

In Level I, II, and III and ambulatory children's surgical centers, an anesthesiology medical director must be identified and serve as liaison or identify a designee to the children's surgical PIPS program (CD 6-8). In centers of all levels, participation in the PIPS program by this anesthesiology representative is essential. The anesthesiology representative to the program must attend at least 50 percent of the multidisciplinary peer review meetings with documentation by the PIPS program.

Operating Room

Personnel

A dedicated children's OR must be adequately staffed and immediately available 24/7 at any level of children's surgical center (CD 6-9). This standard is ideally met by an in-house team for a Level I facility but can be met by having a complete OR team immediately available by call so that if a patient requires emergency operative care, he or she can receive it in the most expeditious manner. This criterion cannot be met by individuals who have other responsibilities within the institution. Their primary function must be the OR. At all levels of children's surgical center, there must be nursing and other appropriate technical personnel with pediatric expertise immediately available and deployed for all patients 5 years or younger (CD 6-10). At all levels of verification, if the first OR becomes occupied, a mechanism for providing additional appropriate pediatric staff members must be in place to staff a second room (CD 6-11).

In all centers, prompt and appropriate OR response times—both provider and institutional—must be demonstrable for emergencies such as critical airway foreign bodies, malrotation with midgut volvulus, and others of similar life-, limb-, or disability-threatening medical urgency (for example, less than 60 minutes from diagnosis to OR) (CD 6-12).

The availability of children's specialty OR personnel and timeliness of starting operations must be evaluated by the hospital PIPS process for Level I, II, and III centers, and measures must be implemented as required to ensure response times that yield optimal care.

Equipment

Level I, II, and III and ambulatory children's surgical centers must have age- and size-appropriate OR equipment and support for the patient populations they serve (CD 6-13). All centers must have pediatric-specific equipment for the scope of service to include airway management, vascular access, thermal control, surgical instruments, intraoperative imaging capabilities, equipment for endoscopic evaluation (airway and gastrointestinal endoscopy), and minimally invasive surgery. In addition, age-appropriate resuscitation fluids, medications, and pharmacy support must be available to support the operative services provided.

Postanesthesia Care Unit

Postoperative care of infants and children may be provided in a postanesthesia care unit (PACU), depending on the patient's needs. At Level I, II, and III and ambulatory children's centers, a designated PACU or other unit with specific pediatric personnel and functional capacity, including qualified pediatric nurses, must be available 24 hours per day to provide care for the pediatric patient if needed during the recovery phase (CD 6-14). If this availability requirement is met with a team on

call from outside the hospital, absence of delays must be documented by the PIPS program. The PACU or other unit used must have the necessary equipment to monitor and resuscitate pediatric patients within the scope of services offered (CD 6-15).

Similarly, preoperative facilities, personnel, and processes meeting the specific needs of the pediatric population served must be demonstrable at all levels of verification (CD 6-16).

Radiology

Specialized radiology services are critical in the management of infants and children with surgical needs. Qualified pediatric radiologists must be promptly available in person 24/7 for the interpretation of diagnostic-imaging studies or to do therapeutic procedures in Level I centers. Interventional radiology must be immediately available 24/7 in Level I centers. Teleradiology is a permissible adjunct but is not alone sufficient to meet these requirements. Radiologists with pediatric expertise, as defined, may help meet this requirement in Level II and Level III centers.

Diagnostic information from imaging studies must be communicated in a written form and in a timely manner (CD 6-17). Critical information that is deemed to immediately affect patient care must be verbally communicated to the surgical team (CD 6-18). The preliminary report should be permanently recorded. The final diagnostic-imaging report must accurately reflect the chronology and content of communications with the

surgical team, including changes between the preliminary and final interpretation (CD 6-19). Changes in interpretation must be monitored through the PIPS program.

Collaboration between the children's radiology team and the children's surgical program is important. In Level I and Level II facilities, a pediatric radiologist must be appointed as liaison to the surgical program. The pediatric radiology liaison or designee should attend PIPS meetings and should educate and guide the entire surgical team in the appropriate use of radiologic services. In Level I and Level II centers, participation in the PIPS program process by the pediatric radiology liaison is essential (see Chapter 8). At a minimum, a pediatric radiologist must be involved in the development of protocols and analysis of trends that relate to diagnostic imaging (CD 6-20). In Level III centers, radiologists with pediatric expertise should be involved in the PIPS program.

Radiology Support Services

Level I and Level II children's surgical centers must have policies designed to ensure that infants and children who may require resuscitation and monitoring are accompanied by appropriately trained providers and relevant children-specific support equipment during transportation to and from the department and while in the radiology department (CD 6-21).

Conventional radiography and computed tomography with radiation dosing suitable for infants and children within the scope of services must be immediately available (within 60 minutes 24/7) in Level I and Level II centers (CD 6-22). This requirement includes appropriate equipment and pediatric-trained personnel. The requirement can be fulfilled with a combination of technicians, residents, fellows, allied health professionals, and teleradiology. Interventional radiology, magnetic resonance imaging, and ultrasonography must be available within 60 minutes 24/7 at Level I centers (CD 6-23). Pediatric-trained radiology technologists and relevant others may respond from outside the hospital, but appropriate timeliness of arrival must be documented by the PIPS program.

Qualifications for Radiologists

- In Level I, II, and III and ambulatory children's surgical centers, all staff radiologists providing imaging services must have successfully completed a radiology residency program approved by the ACGME and should either have or be eligible for board certification by the American Board of Radiology or have completed equivalent residency training either in a foreign radiology residency or a program approved by the American Board of Osteopathic Specialties (radiology) and have equivalent certification and/or credentials .
- A *pediatric radiologist* is defined as an individual certified by the American Board of Radiology or equivalent body, in addition to being certified or eligible for certification in pediatric radiology by the American Board of Radiology or equivalent body. In addition, an individual who is similarly qualified by demonstrable experience and training may be considered a pediatric radiologist by way of the relevant alternative pathway delineated in Appendix 3.
- A *radiologist with pediatric expertise* is defined as a radiologist with certification by the American Board of Radiology or equivalent, demonstrable pediatric experience to support the scope of actual practice, and 10 or more pediatric Category 1 CME credit hours annually.

- Level I centers are required to have a pediatric radiologist available within 60 minutes 24 hours a day, and PIPS verification of appropriate and timely response is required. Electronic-image analysis is a permissible adjunct; however, individuals trained and skilled in hands-on imaging such as fluoroscopy must be physically available within 60 minutes. In Level II and Level III centers, coverage for this immediate-availability requirement may be provided by a combination of pediatric radiologists and radiologists with pediatric expertise. In addition to 24/7 pediatric radiologist coverage, interventional radiology must be available 24/7 within 60 minutes for verification as a Level I children’s surgical center.

Level II centers may meet the requirements for 60-minute response with radiologists with pediatric expertise, as defined above, supplementing the complement of pediatric radiologists. Clear delineation of scope of practice, including thresholds for the physical presence of pediatric radiologists, must be established by written policy with oversight by the medical director of pediatric radiology through the PIPS process.

Critical Care

It is the expectation in all verified children’s centers that children’s surgeons will be actively engaged in all phases of care for infants and children with surgical problems. This expectation includes collaborative care in the ICU environments.

ICU Organization

In a Level I children’s surgical center and for Level II centers with a scope of service inclusive of PICU needs, an ICU pediatric physician team that demonstrates direct surgeon involvement in the day-to-day management of the patient is essential for the care of surgical infants and children. This team provides continuous in-house coverage by appropriately trained pediatric specialty physicians and advanced-practice providers for all infants and children in an ICU environment. This team can be staffed by pediatric physicians trained in critical care from different specialties. A PICU with pediatric intensivists requires coverage 24/7 with individuals certified in critical-care medicine by the American Board of Pediatrics, the American Board of Anesthesiology, or the American Board of Surgery or equivalent body.

In Level I centers and Level II children’s surgical centers with PICU service, there must be a children’s surgeon who serves within the medical leadership structure of the PICU (who may be designated as the “surgical director”) and is responsible for setting policies and defining administrative needs related to PICU patients with surgical needs (CD 2-13). In Level I and Level II centers, pediatric specialty physician and surgeon coverage of critically ill surgical infants and children must be promptly available 24 hours a day. These physicians must be capable of rapid response to deal with urgent problems as they arise. In Level III centers, a surgeon must remain responsible for the surgical issues for her patients while they are in the ICU. Generally, Level III centers transfer most critically ill patients, but when patients are treated locally, there must be documentation of joint medical decision making and a process in place to ensure prompt availability of ICU physician and surgeon coverage 24 hours a day (CD 6-24).

In a Level I children’s surgical facility, the surgical critical care leader should have obtained critical-care training during residency or fellowship. He or she must have expertise in the perioperative care of infants and children who are surgical patients. This expertise may be demonstrated by having board certification or a certificate of added qualification in surgical critical care from the American Board of Surgery or other ABMS board that offers critical-care certification (pediatrics or anesthesiology). In a Level I children’s surgical center, the critical-care qualifications of the surgical leader require documentation of active participation in ICU administration, specifically as it pertains to children’s surgical care and PIPS activities, as well as direct involvement in the ICU care of surgical infants and children during the preceding 12 months (CD 2-13). In Level I, II, and III centers, surgeons who are credentialed by the hospital to care for infants and children in the ICU must participate in the PIPS process.

Surgeon Responsibility for Infants and Children with Surgical Needs in the ICU Organization

The surgical service that assumes initial responsibility for the care of an infant or child with surgical needs in an ICU should maintain that responsibility and involvement either throughout the acute-care phase of hospitalization or until formal transfer to another service upon adequate resolution of acute surgical issues. For centers of all levels, the children’s surgeon must remain actively involved with the surgical needs of the patient while in the ICU. The surgical service must retain responsibility for the surgical needs of the patient and be involved in the therapeutic decisions in the ICU (CD 2-14). Some of the daily-care requirements can be managed by a dedicated ICU team, but the surgeon must be kept informed of, participate in, and concur with major therapeutic and management decisions of the ICU team. The PIPS program must document that the surgeon’s engagement and responsibility are medically appropriate.

ICU Support Services

Level I and Level II ICU support services are detailed in Chapter 2. It is expected that Level III centers will transfer most children who require ICU care to a Level I or Level II center. If local care is necessary at a Level III children’s surgical center, a qualified nurse with pediatric-specific experience and training must be present 24 hours a day to provide care for infants and children with surgical needs during any ICU phase of care (that is, both NICU and PICU) (CD 6-25).

Neonatal Intensive Care Unit (NICU)

NICU designations in this document are consistent with current American Academy of Pediatrics recommendations [American Academy of Pediatrics. Levels of neonatal care: Committee on Fetus and Newborns. *Pediatrics*. 2012;130(3):579-587]. Facilities, nonphysician personnel, and equipment are detailed. Surgeon engagement with neonates with surgical problems who require the NICU environment must be as delineated above for surgical critical care in a PICU (CD 2-14). Ongoing attending surgeon involvement with neonates with surgical problems in the NICU must be documented in the medical record.

Level IV NICU resources are required for verification as a Level I children’s surgical center. A Level I children’s surgical center requires 24/7 neonatologist coverage and a Level IV NICU. Level IV NICUs must maintain a full range of pediatric medical subspecialists, children’s surgical subspecialists, and pediatric anesthesiologists on site; the index institution is the primary site of practice. Level III or higher NICU resources are required for a Level II children’s surgical center designation. Level III NICUs must provide prompt and readily available access to a full range of pediatric medical subspecialists, pediatric surgeons, pediatric anesthesiologists, and pediatric ophthalmologists; this service can be at the site or at a closely related institution by prearranged consultative agreement.

Inpatient Surgical Services

For all levels of verification, ongoing attending surgeon involvement must be documented in the medical record for all perioperative and other surgical patients regardless of physical location (CD 6-26).

Emergency Services

The ability to rapidly evaluate, respond to, and resuscitate an infant or child is essential when caring for surgical patients of all ages. A Level I, II, or III verification requires that pediatric-specific rapid response and/or resuscitation teams with experience and training to support the scope of service be in place 24/7 to respond to any site within a designated facility. The 24/7 physical presence of a certified pediatric provider with current PALS certification in the leadership role for such a team is required for Level I, II, or III verification.

Level I children's surgical center verification requires on-site pediatric emergency medicine personnel 24/7. In addition to pediatric emergency physician coverage 24/7, children-specific emergency department resources must be present to support the entire scope of emergency care for infants and children, including facilities, equipment, and nonphysician personnel.

Level II and Level III children's surgical centers are required to have emergency medicine coverage by physicians with pediatric-specific experience and training. All levels of children's surgical centers must have emergency department resources in place to support the scope of practice, including facilities, equipment, and nonphysician personnel. Level II centers that limit the scope of practice to neonatal patients are not required to have emergency physicians with pediatric experience or pediatric emergency physicians but must have a demonstrable follow-up plan for discharged patients, including for emergency care (CD 6-27).

Primary-Care Physicians and Pediatricians

The personal physician or pediatrician is important to infants and children of any age. The primary-care physician or pediatrician is helpful in providing information about the patient's history, dealing with long-term problems, and meeting the family's psychosocial health needs. Primary-care physicians and pediatricians are also important to provide continuity of care throughout the patient's home-recovery period and return to health. The immediate presence of the primary-care physician or pediatrician is not a requirement.

When a committed surgeon has assumed responsibility for an infant or child with a surgical problem in a Level I, II, or III children's surgical center, he or she should recognize the primary-care physician or pediatrician as a valuable resource. Depending on the local circumstances, a primary-care physician may serve as a member of the care team or may provide continuity of care and act as a liaison with the family. Children with surgical needs should not be admitted or transferred by the primary-care physician without the knowledge and active involvement of the surgical service.

Other Surgical Specialists

Many surgical subspecialists are needed to properly serve a population of infants and children. Level I facilities must be prepared to manage the most complex patients and must have available a full spectrum of children's surgical specialists, in addition to pediatric surgeons and pediatric anesthesiologists. Children's specialty surgeons in pediatric orthopaedic surgery, pediatric neurosurgery, congenital heart surgery, pediatric plastic surgery, pediatric ophthalmology, pediatric otolaryngology, and pediatric urology are required in Level I children's surgical centers (CD 6-28). Level II centers may not have the local resources to provide all these specialists but must have all of the above children's surgical specialists to match the scope of services offered.

Children's surgical specialists are defined in Chapter 2. For Level I and Level II verification, children's surgical specialists must be on the medical staff and be readily available (within 60 minutes) 24/7 to provide care at the bedside. Where individuals with pediatric-specific training and experience are designated previously as "available," it is required that the care of infants and children 5 years or younger be demonstrably provided by these specialized providers.

Medical Consultants

Contemporary management of many infants and children with surgical needs requires support from pediatric medical specialists as well. In a Level I children's surgical center, pediatric medical specialists on staff must be available from the following disciplines: cardiology, hematology/oncology, infectious disease, gastroenterology, pulmonary medicine, endocrinology, genetics, neurology, and nephrology (CD 6-29). Available is defined as responding to the bedside within 60 minutes 24/7, with care demonstrably provided by the pediatric specialist. In addition, the respective children-specific support teams (for example, children's respiratory therapy, pediatric dialysis team, and pediatric nutrition support team) must be readily available in a Level I center. A multidisciplinary cancer program is highly recommended for a Level I children's surgical center.

In a Level II facility, providers from pediatric medical specialties appropriate for the scope of services offered must be available

on staff. In Level II facilities, pediatric specialty consultants for problems related to pediatric pulmonary medicine, cardiology, gastroenterology, neurology, hematology/oncology, and infectious disease must be available (CD 6-30). As for "available" surgical specialists detailed previously, physicians who provide bedside care for patients 5 years or younger must be children's specialists. A multidisciplinary cancer program is highly recommended for a Level II facility.

Hospitalists have become important members of the acute-care team in many institutions. In Level I, II, and III centers, a general pediatrician or pediatric hospitalist must be readily available (within 60 minutes 24/7) if perioperative acute hospital care beyond the NICU or PICU is within the scope of service (CD 6-31).

The PIPS program will monitor all of the above provisions for both medical and surgical specialists.

Support Services

Specialized support services are required to care optimally for infants and children with surgical needs. In Level I and Level II centers, a respiratory therapist with pediatric-specific experience and training must be available in house 24/7 to care for infants and children within the scope of institutional

service. Acute pediatric dialysis must be available in Level I centers 24/7. If a Level II center does not have pediatric dialysis capability, it must have a transfer agreement in place (CD 6-32). Pediatric nutrition support must be available in Level I and Level II centers (CD 6-33).

Child Life

A child life support program is required at Level I and Level II children's surgical centers (CD 6-34).

Nonaccidental Trauma (NAT) Team

A program or policies to identify nonaccidental trauma (NAT) patients and provide support for patients as well as providers is essential at all levels of verification (CD 6-35). A Level I center must have a NAT team available 24/7 (CD 6-36). Level II centers should have a NAT team available 24/7.

Clinical Laboratory

Pediatric laboratory services to support the scope of service offered must be available 24/7 for standard analyses of blood, urine, and other body fluids (CD 6-37); this requirement includes microsampling when appropriate. Likewise, coagulation studies, blood-gas analysis, and microbiology must be available 24/7. The blood bank must be capable of blood typing and cross-matching and must have an adequate supply of red blood cells, fresh frozen plasma, platelets, cryoprecipitate, and appropriate coagulation factors to meet the needs of infants and children within the scope of services (CD 6-38). Level I centers must have a massive transfusion protocol (CD 6-39).

The department of laboratory services in Level I centers should have a dedicated pediatric component that meets the needs of the patients and their caregivers. The anatomic pathology component should be represented by one or more anatomic pathologists fully committed to children's needs. The best indicator of achieving this goal will be confirmation by the children's surgeons that the patients' needs in this area are being met.

The department of laboratory services (including anatomic pathology) in Level II centers should have a dedicated pediatric component that meets the needs of the patients and their caregivers. The best indicator of achieving this goal will be the confirmation by the children's surgeons that the patients' needs in this area are being met.

Transfer of Patients

The ability to stabilize and transfer critically ill infants and children must be demonstrated at all levels of verification (CD 6-40). This ability must include processes to safely move patients from one location to another, either within or between institutions.

AMERICAN COLLEGE OF SURGEONS

Chapter 7

Data Collection and Reporting



CHAPTER 7

An overarching principle of this Children’s Surgery Verification initiative is to support the program using evidence-based information to the maximum extent possible. Although many core recommendations in this document are evidence based, a large proportion is guided by expert opinion and consensus. Expansion of the existing evidence base is not only necessary for improvement in the program but also critical to the mission of the Children’s Surgery Verification Program. Institutions providing optimal care for children have an obligation to participate in the collection of data locally, to contribute these data to the program for collation and distribution, and to use the data to improve the care of children.

Participation in Data Collection

Every verified children’s surgical center must collect and analyze its surgical outcome data and contribute those data to the national collaborative effort. For centers seeking Level I or Level II verification, this requirement will be fulfilled by participation in the American College of Surgeons National Quality Improvement Program Pediatric (ACS NSQIP Pediatric) (CD 7-1). Children’s surgical centers at all levels (I, II, and III) and ambulatory surgical centers applying for verification must collect and report specific safety events detailed in the accompanying Children’s Surgery Safety Report (Appendix 2) (CD 7-2).

The ACS NSQIP Pediatric and Appendix 2 data should be directly viewed by the MDCS and the CSPM and should be reviewed with the participants of the PIPS peer review committee. Programs must demonstrate that both institution-specific and national aggregate data are reviewed in this manner on a regular basis (CD 7-3) and that these data are used to guide specific quality-improvement initiatives within the institution (CD 7-4). Verified centers will be expected to demonstrate the presence of ongoing quality-improvement

projects that derive directly from the analysis of collected data (CD 7-5). The institutions will also be able to demonstrate that these improvements have been sustained or that there is a plan in place for sustainability.

The relationship with the medical center’s electronic medical record and other data-collection systems continues to evolve. The ACS supports efforts to reduce redundancy in data-collection efforts. However, it is imperative that the data populating the ACS NSQIP Pediatric and Children’s Surgery Safety Report databases be as accurate as possible. Participating institutions must be actively engaged in using the electronic resources within the institution to optimize the accuracy of data and efficiency of collection; institutions must be able to demonstrate engagement in this effort (CD 7-6). The outcome data collected by way of ACS NSQIP Pediatric will be guided by the ACS NSQIP Pediatric sampling algorithm. The data regarding safety events in surgical patients are expected to include all such events at the center. Verified children’s surgical centers will be able to demonstrate the effectiveness of their data-collection process in capturing all relevant events (CD 7-7).

ACS NSQIP Pediatric

The ACS NSQIP Pediatric is the first comprehensive, risk-adjusted, peer-reviewed outcomes program in children's surgery. The program has demonstrated the ability to create valid risk-adjusted models that discriminate performance among participating institutions for all-cause combined morbidity, morbidity in neonatal surgery, specific morbidities (that is, surgical-site infections, pneumonia, and so on), and morbidity in specific specialties (for example, spine surgery and pediatric abdominal surgery). The incidence of mortality in the pediatric surgical population is generally insufficient for this variable to be a discriminating one.

Experience with the adult ACS NSQIP program, which has been in existence for approximately 20 years, has demonstrated that the program is associated with a reduction in surgical morbidity and mortality in certain areas. Benefit was observed in essentially all participating institutions to varying degrees. The ACS NSQIP program provides periodic reports of an institution's adverse-event rates compared with peer institutions, and there are data showing that the baseline incidence of these events has progressively declined after implementation of the program.

The ACS NSQIP Pediatric is an entity that is closely aligned with the Children's Surgery Verification Program. Historically, the program has focused on measuring system-wide events such as infections, renal failure, and pulmonary complications. The ACS NSQIP Pediatric is evolving to examine complications that are more operation and specialty specific and to address resource utilization and patient safety.

The ACS NSQIP Pediatric seeks to provide a sample of surgical practice that allows assessment of key relevant issues in children's surgery at participating institutions and to provide national comparable data to identify opportunities for improvement at the institutional level. The specific data collected by the ACS NSQIP Pediatric are determined by the ACS NSQIP Pediatric Steering Committee, which is composed of leaders in children's surgery and an experienced staff of investigators and statisticians. It is expected that institutions that participate in the ACS NSQIP Pediatric and actively use the information will have created a culture that is in the best interest of all patients undergoing surgery at the institution, not only patients with procedures or diagnoses currently being assessed by the ACS NSQIP Pediatric.

Major Adverse Perioperative Events

An important, but not the sole, focus of the Children's Surgery Verification Program is to ensure that the OR and immediate proximate care is provided in the safest manner possible. Much of this care is provided or strongly influenced by nonsurgeon members of the surgical team. This team includes, but is not limited to, anesthesiologists, CRNAs, nurses, technicians, and OR support staff. It is imperative that every verified children's surgical center accurately track and report all the major adverse events that occur in the center and address them in a systematic manner within a culture of improvement and prevention.

These safety events to be monitored in all surgical patients younger than 18 years are detailed in Appendix 2. Children's surgical centers at all levels of verification will report these data directly to the American College of Surgeons as part of the Children's Surgery Verification Program. All levels of verified children's surgical centers will be expected to develop detection and reporting processes for these events and to articulate this process for the ACS verification team at the time of the site visit. Doing so will allow better understanding of the strengths, limitations, and cost of detection methods so that detection may be improved as the program evolves.

Use of the Data

There are two primary purposes for collecting data, as described previously. The first is for the ACS Children's Surgery Verification Committee to better understand the processes and outcomes of children's surgical care in the United States and to develop benchmarks, standards, and expectations that

will guide the evolution of the Children's Surgery Verification Program. The second is to give the institutions providing the care the information and tools needed to develop and execute meaningful and impactful quality-improvement initiatives that directly improve the quality of care for children at the facility.

Public Health

The Children's Surgery Verification Program and the ACS NSQIP Pediatric are part of a comprehensive data system needed to describe the current status of children's surgery in the United States. These data will provide important information about the safety, quality, cost, and outcomes of the system. The data can be further stratified and analyzed by age, gender, race, ethnicity, and socioeconomic status.

In combination with other public-health data, this information can provide a crucial resource to governments, policymakers, and agencies interested in the health and welfare of children. These data also may be used to inform public officials about major opportunities for improvement in children's surgical care, thus serving as a basis for legislative and regulatory efforts.

Research

Generation of new knowledge is an effective means of advancing the quality of care provided to children. It requires reliable, accurate, and available data. The data collected by participation in this program can be a rich source of information to answer research questions or provide background data for

new studies. All children's surgical centers are encouraged to use their own data and national pooled data for research. Level I centers should demonstrate active research efforts using the data collected, ideally resulting in peer-reviewed publication of findings.

Data Entry and Maintenance

High-quality data begin with high-quality data entry and require ongoing maintenance to ensure that the quality endures. For Level I and Level II centers, the primary individual responsible for data entry and data quality will be the surgical clinical reviewer (SCR) for the institution's ACS NSQIP Pediatric. SCRs undergo a rigorous and closely monitored period of training that is well described elsewhere [Saito JM, Chen LE, Hall BL,

et al. Risk-adjusted hospital outcomes for children's surgery. *Pediatrics*. 2013;132(3):e677-688]. For children's surgical safety reports (Appendix 2), a process must be developed and implemented that ensures that the data-collection staff members are appropriately trained and monitored to ensure high-quality data (CD 7-8). The MDCS and the CSPM will be responsible for ensuring this (CD 7-9).

Confidentiality

Hospitals are responsible for ensuring patient and hospital confidentiality. The passage of the Health Insurance Portability and Accountability Act (HIPAA) by Congress in 1996 brought about major changes in the way internal and external data are handled at health institutions. All children's surgical programs are required by current law to ensure that appropriate measures are in place to meet the confidentiality requirements of the data. All reasonable means should be used to protect

against threats, hazards, and unauthorized uses or disclosures of these data. The responsible parties should ensure that all persons dealing with these data are trained in protecting the confidentiality of patients. Actions to protect confidentiality should be firmly integrated in the administration of the data-collection effort at all levels so that identifying information is available only to people who have a need to know.

Data Collection Mechanisms and Staffing

In the planning stages of a data-collection effort, it is useful to consider the mechanisms for data collection and entry from medical records and the hospital information system. Data downloading from hospital information systems is expanding. The use of portable computers and handheld devices for data extraction and data entry is popular. It allows SCRs and data collectors to work concurrently from the medical record and interviews. Alternatively, a paper data form may be designed to record patient information for subsequent batch data entry. The least desirable method is postdischarge data extraction from the medical record.

Once collected, these data are downloaded to the central registry. Provisions should be made to ensure timely and complete availability of prehospital care reports, operative notes, medical examiner reports, and other documents that may not always be present in the active medical record.

The amount of time and effort that will be necessary to maintain the data-collection process should not be underestimated. A designated and well-trained SCR is critical to the success of the NSQIP data collection. The ACS NSQIP Pediatric has a track record of effective training and support of SCRs, and further information is available from this program. At Level III centers and children's ambulatory surgical centers, appropriate data-collection staffing must be demonstrated (CD 7-10). This staffing need increases if additional data elements are collected. Hospitals must also take into account the additional tasks, above the abstraction and entry of patient data, that are assigned to the data-collecting staff. Processes such as generating reports, analyzing data, assisting with research, and meeting various submission requirements will decrease the time dedicated to the meticulous collection of patient data. Electronic downloads into the system also create additional tasks, as does ongoing data validation prior to data acceptance. Additional staff will be required to perform these tasks to ensure the integrity and quality of registry data that are used for prevention, quality improvement, and other essential aspects of the children's surgical program.

Notes

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AMERICAN COLLEGE OF SURGEONS

Chapter 8

Performance Improvement and Patient Safety (PIPS)



CHAPTER 8

This chapter describes the concepts of monitoring, evaluating, and improving the performance of a children's surgical program. Although there is no single consensus prescription for PIPS, the ACS Children's Surgery Verification Program requires a structured effort that is integrated into the hospital's quality-improvement and safety programs with the board of trustees' quality committee (or equivalent) and that demonstrates a continuous process for improving care for children with surgical needs at all levels of verification (CD 8-1).

Current health care imperatives emphasize the value proposition: demonstrably high-quality care delivered in a cost-effective manner. This goal may be difficult to translate to the care of some infants and children, but an evidence-based rather than an empiric approach presents more meaningful criteria against which care can be measured. A standardized approach to recurring problems minimizes unnecessary variation, allows better outcome assessment, and makes changes in care easier to implement and more uniform. Coordination of the PIPS program with the children's surgical program into a hospital-wide effort offers a reduction in labor while producing more impact on quality.

Patient safety is a core focus of the PIPS process and underscores an important program goal. Safety in medical practice once was considered a given, but it is now recognized as an issue that clearly requires monitoring and focused attention to achieve. The patient safety process directs its efforts at the environment in which care is given, and the

performance improvement process is directed at the care itself. The boundary between the PIPS processes is indistinct, and overlap is common. A combined PIPS program is necessary to ensure optimal outcomes.

The PIPS methods, which involve guideline development, process assessment, process correction, and monitoring for improvement, may seem unnecessary to surgeons who are highly motivated and work hard at providing good patient care. However, health care experts believe that individual physicians simply trying harder will not result in better quality and safer patient care. Contemporary care processes are complex and require an entire multidisciplinary team, so responsibility for a patient's safety and optimal outcome should be shared by all individuals involved. In centers with residency programs, residents should be exposed to the PIPS process. This exposure is valuable training and may be used to demonstrate compliance with ACGME core competency requirements (Table 1).

Table 1: ACGME Core Competencies and Related Areas within a Children’s Surgical Program

ACGME Competency	Examples of Related Program Areas
Patient care	Patient-centered emphasis on all aspects of a children’s surgical program <hr/> Ease of patient access to children’s surgical care
Medical knowledge	Board certification requirements of physician care providers <hr/> Mandatory children’s surgery-related continuing education requirements for the team <hr/> ACS center verification process <hr/> Children’s surgical research <hr/> Local, regional, and national educational conferences
Professionalism	Commitment by the surgeons to accountability for dutiful action on behalf of patients in the framework of a public contract for care
System-based practice	Design of the health care system as a coordinated system of care from diagnosis to operation through patient recovery <hr/> Development, use, and periodic reevaluation of standardized care processes <hr/> Use of electronic medical record and physician order entry systems when available <hr/>
Practice-based learning and improvement	Development, use, and assessment of evidence-based practice guidelines <hr/> Data-collection/outcomes assessment <hr/> Emphasis placed on performance improvement and patient safety processes <hr/> Children’s surgical center committee activities
Interpersonal and communication skills	Multidisciplinary team approach to care (rounds, conferences) <hr/> Communication training related to patients, families, and other professional staff <hr/> Conflict-resolution training

Abbreviations: ACGME, Accreditation Council for Graduate Medical Education; ACS, American College of Surgeons.

Operational Concepts

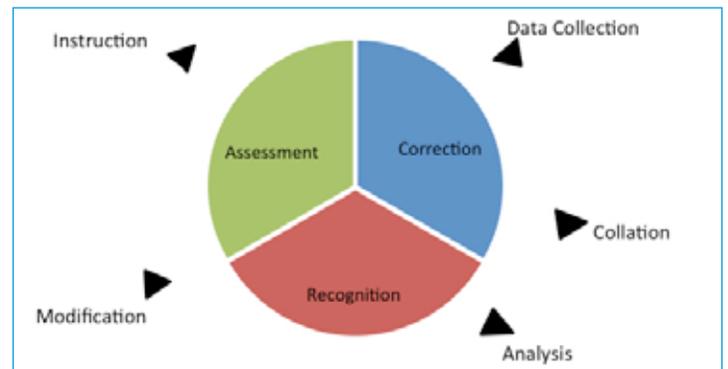
Children’s surgical care should be effective, safe, and cost-effective. All hospitals and providers in the United States are expected to measure, evaluate, and improve their performance. Quality assurance began with retrospective chart reviews by nonphysicians looking for documentation of predetermined criteria thought to reflect acceptable quality of physician performance. Quality assurance evolved through concepts known as *total quality management* and *continuous quality improvement* to what is known today as *performance improvement*. Performance improvement emphasizes a continuous, multidisciplinary effort to measure, evaluate, and improve the processes of care and the related outcomes. A major objective of PIPS is to reduce inappropriate variation in care and to improve patient safety. All ACS-verified children’s surgical centers (Levels I, II, and III and children’s ambulatory surgical centers) must demonstrate a clearly defined PIPS program for their populations that should be coordinated within an institution-wide program.

The traditional use of empiric “audit filters” or “indicators” to measure the effectiveness of the process of care has had limited value, because many of these resource-intensive tools do not correlate with outcome. However, some filters, such as those readily available in registries or hospital-wide PIPS programs (for example, unplanned readmissions), are reasonable for trending, especially when comparative risk-adjusted benchmarking data are available. The development of expectations from evidence-based guidelines, pathways, and protocols presents an alternative for measuring the process, expected outcomes, and consistency of care. This model also allows for assessment of the cost-effectiveness of care.

Modern PIPS work in surgical care is a continuous cycle of monitoring, assessment, and management (Figure 1). Performance improvement must be supported by a reliable

method of data collection that consistently obtains valid and objective information necessary to identify opportunities for improvement (see Chapter 7). At a minimum, the program must be able to demonstrate that the data collection relevant to the children’s surgical program supports the performance improvement process. The process of analysis must include multidisciplinary review at regular intervals. The results of analysis must define and document corrective strategies. The effect of this change then is evaluated as the cycle repeats itself. A patient safety program evaluates the overall care process to determine whether it minimized the risk of harm related to the care process itself. Various agencies concerned with patient safety have proposed specific program initiatives to improve safety of care that is often complex and delivered by multiple providers.

Figure 1: The Continuous Process of Performance Improvement



An effective PIPS program is characterized by several elements: (1) authority and accountability for the program; (2) a well-defined organizational structure; (3) appropriate, objectively defined standards to determine quality of care; and (4) explicit definition of outcomes derived from relevant standards.

Program Configuration

Administrative Accountability

Because it crosses many traditional specialty lines, the surgical program must be empowered to address issues that involve multiple disciplines. The program, including PIPS, should be approved by the hospital governing body as part of its commitment to optimal care of children with surgical needs. This commitment must include adequate administrative support and defined lines of authority that ensure comprehensive evaluation of all aspects of surgical care for infants and children beginning at transport from referring hospitals through discharge (CD 8-2). The children's surgical program must have a medical director with the authority and administrative support to lead the program. A CSPM is a critical component of a surgical program. Although the physician director remains responsible for the overall function of the program, the surgical program manager usually is responsible for logistics, coordination of daily data processing, analysis oversight, and monitoring of the effectiveness of interaction of all involved services, including case management and resource utilization.

Surgery Privilege Assessment

The medical director of the children's surgical program will work with the existing credentialing body to review the qualifications for the children's surgical service members and will have sufficient authority to recommend changes based on performance review. This review may include evaluation of the practitioners' continuing education, resource utilization, complications, mortality rates, and participation in evidence-based guidelines, pathways, and protocols. The granting of privileges and credentialing are departmental and medical staff functions.

Categories of Performance: General Principles

The meaning of outcome measurement varies depending on the perspective from which it is viewed. The patient and family anticipate a complete and rapid recovery; the administrator and payor focus on the cost of care; and the surgeon emphasizes the quality of care, most often based on morbidity and mortality. Regardless of individual perspective, most practitioners would agree with a goal of improving the value of surgical care. The spectrum of performance evaluation can extend from institution-wide assessment to measures of individual practitioner performance. Determinants of patient outcomes include modifiable variation in care, as well as factors not so readily managed (for example, patient comorbidities and systems performance). Another useful method of viewing performance is through the "value equation" concept:

Value = (Quality of Process + Quality of Outcome)/Cost

Value can be increased by improving the quality of process or outcome or by decreasing cost. However, a modest increase in cost that significantly improves quality also can add value. This perspective can help prioritize performance improvement initiatives. It is clear that high-quality care in the United States can be delivered at lower cost.

Examples of Process Measures

The following categories of process variables require defined criteria (expectations), which can be determined from consensus, institutional guidelines, or, ideally, nationally derived, evidence-based guidelines. Some of these variables require peer review for determination. It is practical to monitor several, rather than all, of the following examples of process measures:

- Compliance with guidelines, protocols, and pathways
- Appropriateness of prehospital and emergency department triage/referral
- Delay in assessment, diagnosis, technique, or treatment
- Error in judgment, communication, or treatment
- Appropriateness of documentation
- Timeliness and availability of imaging reports
- Timely participation of subspecialists
- Availability of the OR
- Professional behavior
- Availability of family services
- Consistency of outpatient follow-up

Care processes should be evaluated to determine if they are adequate to achieve the desired outcome. Ineffective processes should be identified, revised, and reevaluated to determine if the revisions are effective.

Examples of Outcome Measures

Clinical outcomes, as well as outcomes that reflect the patient and/or family perspective, are fundamental to a children's surgical program. These examples may reflect quality of patient care:

- Mortality
- Morbidity (complications)
- Length of stay—ICU and total
- Patient safety initiatives
- Cost
- Quality of life
- Functional outcomes
- Patient satisfaction

Performance Review and Educational Programs

The goals of multidisciplinary review are as follows: (1) review the performance of the surgical program; (2) review the safety of the program; (3) provide focused education; and (4) provide peer review. These activities can be accomplished in a variety of formats, depending on the volume of patients. Patient care may be evaluated initially by individual specialties within their usual departmental morbidity and mortality or PIPS review structures; however, identified problem trends must undergo multidisciplinary peer review by a dedicated children's surgical peer review committee in Level I and Level II centers (CD 8-3). This function may be integrated into existing institution-wide processes for Level III and ambulatory centers. The center must be able to demonstrate that specific patient population processes or systems issues can be identified for separate review regardless of the institutional PIPS processes (CD 8-4). This identification usually is done through a registry or similar data collection and monitoring process. Risk-adjusted outcomes assessment using ACS NSQIP Pediatric data is required for Level I and Level II children's surgical center verification (see Chapter 7).

Performance Improvement and Patient Safety Committee

In Level I and Level II centers, a dedicated multidisciplinary children’s PIPS committee must be chaired or co-chaired by the MDCS or designee (CD 8-5). Participation must include representatives from pediatric anesthesiology, radiology, and other children’s surgical specialties and medical procedural specialties, as well as hospital administration, nursing, neonatology, critical-care medicine, and emergency medicine, if within the scope of service (CD 8-6). The committee will improve surgical care by reviewing all deaths occurring in surgical patients, selected complications, and sentinel events with the objectives of identifying issues and developing appropriate responses (CD 8-7).

The MDCS must ensure the dissemination and documentation of information derived from this PIPS process to participants in the children’s surgical care program and to the hospital leadership (CD 8-8). Center staff should be familiar with state laws governing peer review. Most peer review activities are protected from discovery. Minutes from peer review activities should be written carefully but document a candid discussion. It shall be a confidential quality-improvement activity that is protected by all pertinent state and federal statutes (CD 8-9).

Dissemination of information typically is achieved by attendance at peer review meetings and by letter or minutes. Members or designees must attend at least 50 percent of the PIPS meetings (CD 8-10). The frequency of meetings is to be determined by the MDCS based on the needs of the PIPS program; the meetings must be frequent enough to ensure timely review of children’s surgical care, but they must be at least quarterly (CD 8-11).

All deaths of infants and children occurring within 30 days of an operative procedure must be systematically reviewed and categorized through a peer review process as unanticipated mortality with opportunity for improvement, mortality without opportunity for improvement, or anticipated mortality with opportunity for improvement (CD 8-12). Likewise, these deaths will be characterized as patient related, system related, or provider related.

Corrective Action

Monitoring and evaluation may determine that performance meets or exceeds expectations. It may be useful to monitor trends continuously or periodically. When a consistent problem or inappropriate variation is identified, corrective actions must be taken and documented (CD 8-13). Examples of corrective actions include the following:

- Guideline, protocol, or pathway development and revision
- Targeted education (for example, rounds, conferences, and journal clubs)
- Enhanced resources, facilities, or communication
- Process improvement/team implementation
- Counseling
- Peer review presentations
- Change in provider privileges or credentials
- External review

Closing the Loop (Results)

Performance improvement entails demonstrating that a corrective action has the desired effect as determined by continuous evaluation. As the definition of *quality* is neither exact nor constant, improvement cannot always be demonstrated with compelling data; however, the systematic use of a defined PIPS process can do so. Although some process loops may never be completely closed, all children's surgical centers (Levels I, II, and III and ambulatory) should demonstrate the continuous pursuit of PIPS.

Summary of the Performance Improvement and Patient Safety Program

A children's surgery PIPS program is an essential component of a high-quality clinical surgical program. The unique elements of the perioperative care of children with surgical diseases require a focused quality and safety construct that supplements existing hospital quality-improvement activities. The PIPS program for a Level I or Level II center must be a specific children's surgical program (CD 8-3); Level III and ambulatory centers may use processes integrated with institution-wide efforts to achieve these stated objectives.

The programs for Level I, II, and III and ambulatory centers must include the following elements:

- The program shall be a confidential quality-improvement activity that is protected by all pertinent state and federal statutes.
- The program must be integrated with all appropriate hospital quality-improvement and safety programs and with the board of trustees' quality committee or equivalent (CD 8-1).
- The committee may be a dedicated subcommittee of the hospital's existing PIPS program but must be focused on improving children's surgical care within the institution.
- The committee must be chaired or co-chaired by the MDCS or her designee (CD 8-5).
- The committee must include representatives of all surgical disciplines that provide care to children in the participating center, as well as pediatric anesthesiology and radiology. When within the scope of hospital surgical services, neonatology, pediatric intensive care, procedural medical specialties, and emergency medicine representatives must also participate. The committee must also include appropriate members of hospital administration—at a minimum, representatives from nursing and the administrative leadership team (CD 8-6).
- The committee must meet frequently enough to ensure timely review of children's surgical care, but at least quarterly (CD 8-11).
- Members or designees must attend at least 50 percent of the PIPS meetings (CD 8-10).
- The committee must review criteria for the participation of providers in each specialty, including individual providers' credentials that document their validity as pediatric specialists in their respective disciplines.
- The committee must establish criteria for conditions that require the physical presence of specific specialty providers.
- The committee must review performance relative to criteria for conditions that require the physical presence of specific specialty providers.
- The committee must review all deaths occurring in surgical patients, a significant cohort of surgical complications, and any serious safety events related to children's surgical care (CD 8-7).
- The committee should review the program's quality performance metrics compared with national benchmarks and develop plans to address any significant outlying metrics.
- The committee must review transfers out and to a higher level of care for appropriateness, timeliness, and outcome (CD 8-14). Level III programs should review all transfers to a higher level of care. Appropriate feedback (loop closure) should be provided where there are opportunities for education and/or improvement following transfers of care.
- The committee must evaluate and monitor the availability of children's specialty OR personnel and the timeliness of starting operations and measures implemented as required to ensure response times that yield optimal care (CD 8-15).
- The committee will disseminate PIPS reviews to all pertinent participants in the children's surgical care program and to the hospital leadership (CD 8-8).

AMERICAN COLLEGE OF SURGEONS

Chapter 9

Research and Scholarship Requirements



CHAPTER 9

Research and scholarly work are some of the activities that distinguish a Level I children's surgical center from other centers. Research, the process to advance knowledge, is essential to optimize the care of patients. The unique combination of a large volume of complex and/or severely ill infants and children; a core of experienced specialty pediatricians and pediatric surgeons, pediatric anesthesiologists, and other children's specialty surgeons; and an academic infrastructure enable Level I children's surgical centers to be effective and productive in research and scholarly activity. The research portfolio of a Level I children's surgical center seeking American College of Surgeons' verification should be balanced to reflect the diverse aspects of children's surgical care. Mechanistic questions regarding pathophysiology and clinical care are answered using rigorous scientific methods, whereas evidence-based clinical investigations use large relational databases and other tools to evaluate standard operating procedures and patient outcomes, including cost-effectiveness. Either basic or clinical investigative approaches meet the requirements delineated herein. This chapter outlines the fundamental components of a successful research program in a Level I children's surgical center. It also may serve as a template for research endeavors in other centers and for what is desirable for Level II centers.

The concept of scholarship entails the following elements:

- Discovery
- Leadership in major children's surgery-related organizations
- Extramural funding
- Dissemination of information
- Application of clinical knowledge
- Participation in clinical discussions and conferences
- Support of trainee participation in scholarly activities
- Mentorship of junior faculty, residents, and fellows

There are two alternatives to fulfilling the research and scholarship criteria for Level I verification:

1. A Level I children's surgical center, at minimum, must have 20 peer-reviewed articles published in journals in PubMed in the most recent 3-year period (CD 9-1). These publications must result from work related to the surgical services of the applicant center (CD 9-2). Of the 20 publications, at least one must be authored or co-authored by members of the general pediatric surgery team (CD 9-3). Related articles authored by members of other disciplines or work done in collaboration with the surgical services and/or with other centers and participation in multicenter investigations may be included in the remainder of the publications.

OR

2. A Level I program must meet requirements A here and B below:

- A. (CD 9-4) The center must have 10 peer-reviewed articles in journals included in PubMed in the most recent 3-year period. These publications must result from work related to the center. Of the 10 articles, at least one must be authored or co-authored by members of a children's specialty surgical service. Related articles authored by members of other disciplines or work done in collaboration with surgical services and/or with other centers and participation in multicenter investigations may be included in the remainder,

AND

- B. (CD 9-5) Of the seven following related scholarly activities, four must be demonstrated:
 1. Leadership or active participation in major organizations relevant to children's surgical care. Evidence includes membership on committees of any of the regional and national organizations or demonstrable similar work.
 2. Peer-reviewed funding for related research. There should be demonstrated evidence of funding of the center from a recognized government or extramural private agency or organization.

3. Evidence of dissemination of knowledge to include review articles, book chapters, technical documents, Web-based publications, editorial comments, training manuals, or related course material or other educational materials that contribute to the practice of children's surgery.
4. Display of scholarly application of knowledge as evidenced by case reports or reports of clinical series in journals included in PubMed.
5. Participation as a visiting professor or invited lecturer at relevant national, regional, or local conferences.
6. Support of resident participation in institution-focused scholarly activity, including laboratory experiences, clinical trials, or resident paper competitions at the state, regional, or national level.
7. Mentorship of residents and fellows, as evidenced by the development of a children's surgical fellowship program or successful matriculation of graduating residents into such fellowship programs.

Research Infrastructure

There has been renewed emphasis on translational research in recent years. Discoveries in basic science require the engagement of enlightened clinicians to make them applicable at the bedside, and queries at the bench are not relevant to patients until pursued from a clinical perspective. Capitalizing on the unique coexistence of expert children's surgeons and committed basic and social scientists benefits a structured research program. It is likely that most Level I centers will be housed in academic medical centers.

Perhaps the most important resource is a core of children's surgeons with interests and dedicated training in research methodology. Specifically, the Level I center MDCS should have a record of established basic science or clinical research

productivity with regular participation in academic forums. A children's surgeon who remains clinically active in patient care should direct formal, regularly scheduled research meetings with documentation of the ongoing activities. Basic or social scientists should participate in the regularly scheduled research meetings, but the majority of the attendees should be surgeons and surgical residents or research fellows. Finally, the administration of the Level I children's surgical center must demonstrate support for the research program, such as by providing basic laboratory space, research equipment, advanced information systems, biostatistics support, salary support for basic and social scientists, research support personnel, or seed grants for less experienced faculty (CD 9–6).

Research Activity

Every children's surgical center should continually evaluate its own outcomes and compare them with regional and national benchmarks. Trend analyses of morbidity and mortality and assessment of pertinent selected events to monitor the quality of care often raise important research questions. In addition to morbidity and mortality, outcome assessment should include age-appropriate functional outcome and quality-of-life measures.

Nurse coordinators and registrars are an integral part of the research team to ensure the collection of complete and accurate data and regularly provide clinical outcomes reports. Clinical research nurses and clinical specialists also make a valuable contribution to the research program by coordinating patient selection, adherence to protocols, timely specimen acquisition, and ongoing surveillance of patient outcomes. All of these personnel should be involved in the research effort; they should participate in the presentation and publication of reports and in major meetings, as well as in the peer-reviewed literature.

The more sophisticated the performance improvement process, the more likely it will generate appropriate research questions. The distinguishing quality of a Level 1 children's surgical center is the development of timely research questions well beyond established national standards. Because of the fortuitous combination of expert children's surgeons and patients with complex illness in a scholarly environment, Level I centers are ideal settings to generate novel study hypotheses that explore clinical dilemmas from a unique perspective. Furthermore, Level I centers are positioned to engage the collaboration of qualified basic and social scientists to design studies to address these complex issues.

Residents and fellows in surgical training are another key component of research activity in a Level I children's surgical center. Involving these individuals in research projects, presentations at major meetings, and publications is an important element in the mentorship function of centers and a valuable part of surgical education that fosters the development of the next generation of children's surgeons. The Level I children's surgical center should demonstrate resident participation and authorship in related publications.

Research Productivity

Level I children's surgical centers have a responsibility to disseminate their research findings in a timely and effective manner. The best measure of research productivity is peer-reviewed publication. In addition, currently the most effective means to convey novel and provocative research findings is by presentation at meetings of national and regional academic societies. Level I centers should be presenting their research results at these venues annually. The MDCS and other children's surgeons in each discipline should be presenting their research work regularly as well. The MDCS and surgeons

participating in patient care at a Level I center should be actively engaged in research and should co-author peer-reviewed articles. Furthermore, because Level I children's surgical centers provide comprehensive care for severely ill infants and children with multidisciplinary needs, other key team members also are expected to be academically productive. Each of these groups should present peer-reviewed articles and presentations at their respective national academic society meetings.

Research Funding

The administration of a Level I children's surgical center should contribute substantively to the research program, but extramural funding may be necessary to conduct and sustain meaningful research. Level I centers should be competitive for extramural research funds.

Research Role Models

The leadership in surgery should continue to demonstrate, by personal example, that quality research is an integral and gratifying part of the discipline. Implicitly, the medical director of surgery of a Level I children's center ideally should have an established record of research productivity and continue to be an active participant in and spokesperson for children's surgical research at the national level. For example, Level I centers should participate in large collaborative research programs sponsored by the National Institutes of Health, the Department of Health and Human Services, the American College of Surgeons, or other professional societies. Research is important to advance the field of children's surgical care and train the future generation of children's surgeons. The Level I center serves as the role model within the community. Research is an opportunity and an obligation.

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Chapter 10

Outreach and Education



CHAPTER 10

Children’s surgical centers are important community and regional resources. In addition to the patient-care services they provide, these centers are sources of information, expertise, and public leadership. Programs to strengthen and foster community engagement are an integral part of children’s surgical center services designed to help improve outcomes through the public and professional dissemination of information and by facilitating access to clinical and educational resources. The components of an outreach program may include public awareness and education or professional education through course offerings, lectures, conferences, visitation programs, websites, newsletters, and other means. The scope of educational and outreach programs will depend on many factors in a given region, including population size, type and level of the center, and regional needs and resources. All verified children’s surgical centers, however, must engage in public and professional education (CD 10-1). Level I and Level II centers also must provide some means to facilitate referral and access to children’s surgical center resources (for example, patient access to the center and pediatric and neonatal transport teams) (CD 10-2).

Professional Education and Training

Principles of children’s surgical care are introduced in medical school, nursing school, prehospital provider programs, and other allied health training programs. Graduate medical education in the form of relevant residency and fellowship training programs is highly desirable within a children’s health care system. The ACS recognizes that residency programs provide service to surgical centers, but the educational experience should be the prime focus. The residency training programs should emphasize direct supervision and teaching of residents by dedicated attending surgeons who have demonstrated interest and expertise in children’s surgery. Centers that support residency training programs and fellowships in children’s surgery should have a clear written curriculum for the development of trainee expertise and appropriate trainee supervision within the program. In addition, residents should be given an introduction to the surgical services and meet the ACGME educational requirements for their respective programs. A Level I children’s surgical center should have a continuous rotation in surgery for senior residents that is part of an ACGME-accredited program in at least one of the following disciplines: general surgery, orthopaedic surgery, urology, neurosurgery, or otolaryngology. In teaching facilities, the relevant requirements of the ACGME and appropriate residency review committees also must be met.

CME programs are important to maintain and enhance the knowledge and skills needed to care for children with surgical needs. Cooperative arrangements with other institutions may enhance available educational programs. Postgraduate education courses for nurses are available. Some nurse practitioners may choose to specialize in pediatric care. Nurses and other allied health professionals who are involved in the children’s surgical program should have their educational needs identified and served. In Level I, II, and III and ambulatory centers, the hospital must provide a mechanism to offer relevant children’s surgical education to nurses and other allied health professionals who are part of the children’s surgical team (CD 10-3).

Multidisciplinary education should be ongoing in all children’s surgical centers. Performance improvement programs should be an important part of educational activities. Intramural educational programs are an efficient means of providing information to the surgical team. Children’s surgical centers should expend financial resources to facilitate intramural and extramural educational programs.

It is important that all members of the children’s surgical team be knowledgeable about current practices in children’s surgical care. External CME is the recommended method

of keeping current. The MDCS, the liaison representatives from each of the surgical subspecialties performing children's surgery, and the liaison or medical director of pediatric anesthesiology, emergency medicine, and radiology must accrue an average of 16 hours annually or 48 hours in 3 years of related external Category 1 CME (CD 10-4). Programs given by visiting professors and invited external speakers, as well as teaching done by children's surgeons elsewhere, are considered external CME.

All members of children's surgical specialties who take call also must be knowledgeable and current in the care of children with surgical needs (CD 10-5). This requirement may be met by documenting the acquisition of 16 hours of relevant CME per year on average, as above; by demonstrating participation in an internal educational process conducted by the children's surgical program and the specialty liaison based on the principles of practice-based learning and the PIPS program; or by meeting the requirements for maintenance of certification of the respective specialty board.

Medical specialists and other providers involved in children's surgical care are encouraged to participate in related CME activities on a regular basis.

Outreach: Engaging the Center in Regional Care and Education

Outreach is the act of providing children's surgical center expertise, information, and leadership to institutions, agencies, and individuals within a region for the purpose of improving the care of infants and children with surgical needs. A good outreach program allows the verified center to serve as a regional resource for the benefit of patients and providers. The goals of an outreach program are as follows:

- To improve regional outcomes for children's surgery by the dissemination of knowledge and expertise regarding the care of infants and children
- To participate with regional agencies, organizations, and providers in improving the care within the geographic region
- To facilitate access to center resources (such as educational programs, performance improvement, consultation, and referral)
- To support educational programs of regional facilities and health care personnel

Regional hospitals, including pediatric and nonpediatric center facilities, should have access to consultation by staff members from larger children's centers for a variety of purposes: (1) to improve and facilitate care on a case-by-case basis, including referrals, transfers, and follow-up care, as appropriate; (2) to enhance institutional performance improvement activities, including protocol development; and (3) to facilitate the adaptation of children's surgical center programs, including PIPS and prevention, to other institutions. It falls to the regional referral center (typically Level I and Level II centers) to facilitate this access.

Children's surgical centers also should promote the quality and continuity of care in cases of referral or transfers out by good communication with referring and receiving providers and the establishment of guidelines applicable to referrals and repatriation transfers.

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Chapter 11

ACS Children's Surgery Verification Program



CHAPTER 11

The American College of Surgeons has a long history of activities directed toward the improvement of surgical care. The new ACS Children’s Surgery Verification Program defines the resources believed necessary to achieve optimal patient outcomes for children’s surgical care at verified centers. The verification program is administered by the American College of Surgeons and the ACS Children’s Surgery Verification Committee. This document, *Optimal Resources for Children’s Surgical Care*, is to be used as a guide for the development and verification of centers throughout the United States and Canada. It is the basis upon which centers will be reviewed by ACS-approved site surveyors. The ACS does not designate centers; rather, it verifies the presence of the resources detailed in *Optimal Resources for Children’s Surgical Care*.

The ACS Children’s Surgery Verification Program is designed to assist institutions in the evaluation and improvement of children’s surgical care and to provide objective, external review of institutional capability and performance. These functions are accomplished by an on-site review of the hospital by a peer review team composed of individuals experienced in the field of children’s surgical and anesthetic care. The team assesses commitment, readiness, resources, policies, patient care, performance improvement, and other relevant features of the program as outlined in *Optimal Resources for Children’s Surgical Care*.

Center verification is the process by which the ACS confirms that a hospital is performing as a children’s surgical center and meets the criteria delineated in *Optimal Resources for Children’s Surgical Care*. A verification review process results in a report outlining the findings and, if successful, a certificate of verification. This certificate is valid for 3 years, after which a reverification site visit may be requested.

If, during a verification review, a hospital is found to have criterion deficiencies, it must demonstrate that they have been corrected before a certificate is issued. If the deficiencies are

significant, at the discretion of the ACS Children’s Surgery Verification Committee, an on-site focused review may be necessary, in which a team returns to the facility. Generally, one member of the original team will be involved in this review process. The focused review will be accomplished no less than 6 months and not more than 1 year from the time of the notification of the results of the initial review.

When the correction of deficiencies can be demonstrated by submitting data to the ACS Children’s Surgery Verification Committee, the focused review can be completed without an on-site review. The information submitted must be signed by the MDCS and the hospital’s chief executive officer. If the deficiencies are remedied and their correction can be demonstrated in writing, a certificate will be issued.

If a hospital has previously been verified and criterion deficiencies are identified at the time of a reverification visit, the verification status may be extended for up to 6 months. During this time, the hospital must document the correction of all identified deficiencies. If all deficiencies are not corrected, further extensions will not be considered.

Multidisciplinary Review

The on-site review team will consist of various children’s surgeons, anesthesiologists, and nurses. The exact composition of the team will be developed and may change throughout program growth. The ACS will assist in coordinating the site-visit dates and process.

The Verification Process

Following the receipt of a request (an application for a site visit) and the completion of the prereview questionnaire (PRQ), a review team is selected. A mutually acceptable date for the review will be established. Surgeon reviewers are selected from specialty-qualified children's surgeons. The hospital is required to provide the medical records needed at the time of the visit. A description of the medical records needed to conduct a site visit will be provided to allow the hospital 2 to 3 weeks or more to identify the charts and obtain or access the records.

Consistency of the review process is facilitated by the following:

1. A PRQ allows site visitors to have a better understanding of the existing care capabilities and the performance of the center and medical staff before beginning the review. This questionnaire may be completed online by the hospital.
2. Guidelines for site visitors (a document describing the guidelines for a review) are provided to all site visitors. This document is designed to ensure that reviews are conducted consistently. It defines the process of the review and elements of appropriate conduct by a reviewer.
3. An organized agenda is prepared for the review so that all reviews are performed in an efficient manner.
4. Every site-visit team is led by an experienced reviewer selected by the ACS.
5. The report is written in a standardized format.
6. A final review of all reports is done by the ACS Children's Surgery Verification Committee, and the final decision regarding verification is made by this committee.

Prereview Meetings

A prereview meeting facilitates an efficient on-site review process. The review team will meet with the MDCS, the CSPM, and a hospital administrator selected by the applicant organization. Other individuals who are needed to clarify the PRQ and describe existing center activities may be invited. The meeting is intended to include discussion of the overall children's surgical program, clarification of the PRQ, specific concerns, unique features of the institution, regional context, and clarification of the review process.

On-Site Review

The on-site review will require approximately 6 to 8 hours. All children's surgical care areas of the hospital may be visited. Emphasis is placed on evaluating medical records of selected surgical infants and children and correlating patient care with the performance improvement program. The visit concludes with an exit interview to discuss the reviewers' findings and conclusions.

The reviewers will prepare a report that reflects the statements made at the exit interview. This report is forwarded to the ACS Children's Surgery Verification Committee, which will review the report and determine the presence or absence of deficiencies and whether the hospital can be verified. The ACS Children's Surgery Verification Committee has the authority to issue final approval. This process ensures accurate interpretation of the findings, well-documented conclusions, and consistency and professionalism in the final report. This final process may modify the conclusions of the individual site reviewers' report to ensure consistent interpretation of the resources documented. Confidentiality of the entire review process assures an institution that the program is designed to be a constructive process in which a hospital can place its trust. If verified, a hospital will be included on an ACS list of currently verified children's surgical centers, which will be available publicly.

Appeal Process

If the applicant organization or hospital does not agree with the review process, the reviewers' findings, or the final report, it may appeal in writing to the ACS Children's Surgery Verification Committee. The committee may require additional documentation, a new review team may be sent for another review, or the issue may be referred to the ACS.

Verification Quality-Assurance Process

In keeping with the concept of self-evaluation for the purpose of improvement, the ACS Children's Surgery Verification Program will institute a process to ensure that the needs of applicant hospitals/organizations are being met in a satisfactory manner. At the time the final report is sent, an extensive questionnaire will be sent to the MDCS and CSPM. This survey will cover the entire process, from the PRQ to the quality of the final report. Comments will be solicited about the conduct of the reviewers, and an assessment of the total program will be obtained. The ACS Children's Surgery Verification Program leadership and the chair of the ACS Children's Surgery Verification Committee, as well as other selected members of the committee, will carefully review these comments.

Changes will be made in certain areas identified, and if appropriate, reviewers will be counseled. For similar reviews in other programs, the biggest concern occurs when the institution is told one thing at the exit interview and additional deficiencies appear in the final report. A concerted effort will be made at the time of the review to inform the organization or hospital that the ACS Children's Surgery Verification Committee makes the final decision.

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Application Forms



Application Forms and Site-Visit Information

Requests for verification information should be addressed to the following:

American College of Surgeons
Children's Surgical Verification Program
633 N. St. Clair St.
Chicago, IL 60611-3211
312-202-5456

All program forms and online application are available on the American College of Surgeons' website at www.facs.org/quality-programs/childrens-surgery-verification.

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Appendix



APPENDIX 1

Disclaimer: State and local laws may apply to patient transfers, and this Sample Agreement has not been reviewed for compliance with state and local laws.

SAMPLE PATIENT TRANSFER AGREEMENT

THIS AGREEMENT is made effective as of _____ by and between _____ (Children's Hospital), a not-for-profit corporation, and _____ ("Hospital"), a corporation.

WHEREAS, Hospital operates a tertiary-level acute care pediatric hospital to provide access to patient care for the residents of its primary service area and to provide tertiary-level services on a regional and national basis to individuals requiring specialized pediatric care; and

WHEREAS, Hospital operates a general acute care hospital to provide access to patient care for the residents of its primary service area; and

WHEREAS, Hospital (the "Institutions") has determined that it would be in the best interest of patient care and it would promote the optimum use of facilities, including addressing surge capacity, to enter into a transfer agreement for transfer of patients between the respective Institutions;

NOW, THEREFORE, in consideration of the mutual covenants and agreements contained in this Agreement, and for other valuable consideration, the receipt and sufficiency of which is acknowledged, and Hospital agree as follows:

- 1. Term.** This Agreement shall commence on the date written above and shall continue for a period of one year. Thereafter it shall be renewed automatically for successive periods of one year unless terminated earlier as provided in this Agreement.
- 2. Purpose of Agreement.** Each Institution agrees to transfer to the other Institution and to receive from the other Institution patients in need of the care which may not be available in the other Institution and provided by their respective Institutions for the purpose of providing continuity of patient care and treatment appropriate to the needs of each patient.
- 3. Patient Transfer.** This Agreement shall apply to transfers between hospital location and referring Hospital. The need for transfer of a patient from one Institution to another shall be determined by the patient's attending physician, who will contact the receiving hospital regarding the need for transfer. The receiving Institution shall confirm its acceptance of the patient after confirming the following: a) the receiving Institution has appropriate space, equipment, and personnel to provide safe patient care; and b) the Institution has agreed to accept transfer of the patient and to provide appropriate medical treatment. Requests for transfer shall be made only after the patient has been evaluated and the referring Institution has stabilized the patient within the limits of the referring Institution's capabilities and in compliance with the Emergency Medical Treatment and Active Labor Act ("EMTALA") and/or state laws. The receiving Institution agrees to admit the patient as promptly as possible. However, the receiving Institution is not obligated to accept a patient if the receiving Institution determines, in its sole discretion, that it does not then have the capacity to treat the patient, that the care required can be provided at the referring Institution (unless transfer is required by a third-party payor or EMTALA applies and the receiving Institution has specialized capabilities or facilities), or that the transfer request is based solely on the patient's lack of financial resources. The receiving Institution may deny requests for nonemergent transfers to a specific hospital program if the patient does not meet the specific admission criteria of the program to which transfer is proposed.

4. **Medical Staff Membership.** Once the receiving Institution has accepted the transfer, if the attending physician responsible for determining the medical need for transfer is not a member of the receiving Institution's medical staff with admitting privileges, that physician shall arrange for transfer of responsibility for the care of the patient to a member of the receiving Institution's medical staff for the period of hospitalization, or the nonmember physician must apply for and obtain appropriate clinical privileges to admit and attend the patient during hospitalization.
5. **Provision of Information to Each Institution.** The Institutions agree to provide to each other information about the type of resources offered at their respective facilities and the types of patients and health conditions that each Institution will accept and/or transfer. Each Institution shall provide the other Institution with the names or classifications of persons authorized to initiate, confirm, and accept the transfer of patients on behalf of their respective Institution and shall update such information at least annually.
6. **Patient Record and Personal Effects.** Each Institution agrees to provide the following information to accompany the patient from one Institution to the other. The information shall include the following, when available:
 - a. Patient's name; address; patient identification number; age; and the name, address and telephone number of at least one of the following (in the order of priority): the patient's legal guardian or other person authorized to make medical decisions for the patient;
 - b. Pertinent administrative and social information;
 - c. Patient's third-party billing data, if any, including information regarding whether the patient participates in a managed care plan and any prior authorizations for treatment, provided, with respect to emergency transfers, that this information can be obtained without delaying evaluation and treatment;
 - d. All medical records (or copies of such records) related to the patient's condition that are available at the time of transfer, including available history, records relating to the patient's emergency medical condition, observation of signs or symptoms, preliminary diagnosis, results of diagnostic studies or telephone reports of the studies, treatment provided, and results of any tests;
 - e. Written informed consent to transfer signed by the patient or the patient's legally authorized representative or written certification by a physician that the medical benefits reasonably expected from the provision of appropriate treatment at the receiving Institution outweigh the increased risks to the patient (or unborn child) from being transferred;
 - f. Name, address, and phone number of physician referring patient;
 - g. Name of the physician in the receiving Institution to whom the patient is to be transferred, if different from the referring physician;
 - h. Name of the physician at the receiving Institution who has been contacted about the patient; and
 - i. Name of any on-call physician at the referring Institution who has refused or failed to appear within a reasonable time to provide necessary stabilizing treatment.

Each Institution agrees to supplement the above information as necessary for the maintenance of the patient during transport and treatment upon arrival at the receiving Institution and to send other pertinent records not readily available at the time of transfer to the receiving Institution as soon as practicable after transfer. Each Institution shall provide the other with a receipt for any original medical records received from the other and the patient's valuables and personal effects exchanged between the parties as a result of a transfer.

7. **Transfer Consent.** The referring Institution shall have the responsibility for obtaining the patient's or guardian's written informed consent to the transfer or that of the patient's authorized representative prior to the transfer. If such consent is not possible, the Institution shall obtain certification of the need for the transfer from the attending physician or other qualified medical personnel in accord with the requirements of the EMTALA and state law. When the patient has an emergency medical condition that has not been stabilized within the meaning of the EMTALA and state law, the referring Institution shall comply with the requirements of the EMTALA and state law in securing the patient's consent to transfer or certification of the need for transfer by a physician or other qualified medical personnel in compliance with the EMTALA and state law requirements.

8. **Return of Patient.** In the event the transfer is only temporary and for a specific procedure or service with the intent that the patient is to be returned to the referring Institution, the referring Institution agrees to accept the patient for continued care upon completion of the procedure or service that necessitated the transfer, provided the patient is stabilized within the meaning of the EMTALA and any applicable state laws.
9. **Payment for Services.** The patient is primarily responsible for payment for care received from each Institution. Except as otherwise agreed to in writing between transferring hospital and receiving hospital, each Institution shall be responsible for collecting its own payment for services rendered to the patient by it from the patient, insurer, or Medicare/Medicaid programs, as appropriate. No clause of this Agreement shall be construed to authorize either party to look to the other to pay for services rendered as a result of a transfer pursuant to this Agreement, except to the extent that such liability for a particular transfer is set forth in a written agreement signed by both parties or is negotiated between the parties, or where such liability would exist separate and apart from this Agreement.
10. **Transfer Arrangements.** Transfer arrangements will be made by mutual consent of the referring and receiving physicians. It shall be the responsibility of the receiving physician to arrange the admission of the patient to the receiving Institution. The referring physician, in collaboration with the receiving physician (pursuant to ss 146.50, 2006 Interfacility Transport Guidelines, U.S. Department of Health and Human Services, EMTALA, and applicable state law), shall determine the mode of transport and team configuration based on patient needs and the scope of practice of the transporting team.

Requests for children's Transport Team and Medical Control support and patient transfer can be generated by telephone to:

11. **Transportation of Patient.** Unless contrary arrangements have been mutually agreed upon in advance, the referring Institution shall have responsibility for arranging and paying for transportation of the patient to the other Institution, including selection of the appropriate mode of transportation and providing appropriate health care practitioner(s) to accompany the patient. The referring Institution retains the right to seek payment from the patient or other third-party payor for the cost of transfer. Subject to Section 13 below, the receiving Institution's responsibility for patient care shall begin when the patient is physically delivered into the hands of a health care professional authorized by the receiving Institution to accept transfers under this Agreement.
12. **Responsibility for Care or Treatment of Patients Transported by Transport Team.** The Transport Team provides care based on patient-specific orders submitted by online Medical Control. The team assumes primary-care responsibilities in collaboration with the referring Institution for transferring patients while the patient is within the referring Institution and after formal patient handoff has been completed. The referring physician and patient-care team should remain available to the Transport Team for mutual support as patient acuity dictates and to provide further information.
13. **Responsibility for Care or Treatment.** The receiving Institution shall not be responsible for any care or treatment provided by the referring Institution. The referring Institution is responsible for any care or treatment given any transferred patient or any untoward event concerning such patient unless and until the referring Institution fulfills its responsibility for all of the following: a) notifying the receiving Institution promptly and providing all information appropriate under the circumstances whenever it wants to transfer a patient to the receiving Institution; b) obtaining any necessary medical authorization by a physician or other qualified medical person and any necessary consent by or on behalf of the patient for the transfer; c) documenting the medical justification for the transfer in the patient's medical records; d) making all transportation arrangements required to accomplish the transfer; and e) delivering the patient to the receiving Institution or the receiving Institution's Transport Department, with his or her billing information (if, in the case of an emergency transfer, the referring Institution is able to obtain the same without causing delay in providing appropriate treatment and screening to patient), valuables, and medical records and other information sufficient to allow knowledgeable treatment of the patient at the receiving Institution.

To the extent possible, stabilization and treatment will be initiated prior to transfer to ensure that the transfer will not, within reasonable medical probability, result in harm or jeopardize survival of the patient or transporting team.

14. **Advertising and Public Relations.** Neither Institution shall use the name of the other Institution in any promotional or advertising material unless review and approval of the intended advertisement is first obtained from the party whose name is to be used. Both Institutions shall deal with each other publicly and privately in an atmosphere of mutual respect and support.
15. **Medicare/Medicaid Certification.** Each Institution shall remain Medicare/Medicaid certified, shall accept and treat Medicare/Medicaid patients, and shall remain eligible for payment from the Medicare/Medicaid programs.

16. **Applicable Standards.** Each Institution shall ensure that all duties performed and all services provided pursuant to this Agreement are in compliance with applicable standards, rulings, and regulations of The Joint Commission, the U.S. Department of Health and Human Resources, the state department of health services, and/or any other government agency, corporate entity, or individual exercising authority with respect to the Institution. Nothing in this Agreement shall be interpreted to require the Institutions to violate the EMTALA or any other applicable state or local laws.
17. **Compliance with COBRA.** Each Institution acknowledges that it is aware of and agrees to comply with the requirements of the Consolidated Omnibus Budget Reconciliation Act of 1985, as amended, as it relates to patient transfers.
18. **Confidentiality.** Each party agrees to maintain the confidentiality of patient information disclosed for the purposes of providing necessary medical care and not to disclose any such information except where permitted by law. Both parties acknowledge that in receiving or otherwise dealing with any records or information relating to patients receiving treatment for alcohol or other drug abuse, both Institutions are fully bound by the provisions of the federal regulations governing confidentiality of alcohol and drug abuse patient records (42 C.F.R. Part 2, as amended from time to time).
19. **Independent Contractor Status.** Both Institutions are independent contractors. Neither Institution is authorized or permitted to act as an agency or employee of the other. Nothing in this Agreement is intended nor shall be construed to create an employer/employee partnership or joint venture relationship or to allow either party to exercise control or direction over the manner or method by which either party provides services to patients, provided that such services are performed in accordance with all applicable medical standards and the terms and conditions of this Agreement.
20. **Liability.** Each Institution shall be responsible for its own acts and omissions and agrees to indemnify and hold the other Institution harmless from any actual or threatened harm caused by or arising out of any claimed improper, negligent, or wrongful act or omission of the indemnifying Institution, its trustees, officers, agents, and employees. The term "harm" as set forth in the preceding sentence includes any and all of the following: claims, suits, or legal proceedings; damages or injuries; interest; costs, expenses or fees, including costs associated with investigating and defending claims, suits, or legal proceedings and including reasonable attorneys' fees attributable to such investigation or defense or attributable to enforcing the provisions of this Agreement; loss of profits; and all other loss or liability of whatever kind or nature.
21. **Insurance.** Each Institution shall secure and maintain, or cause to be secured and maintained during the term of this Agreement, comprehensive general and professional liability insurance and property damage insurance providing adequate limits of liability for its respective operations. Each party shall cause its insurance carrier to file a certificate of continuous coverage with the other party, and each party shall immediately notify the other of any notice received from its insurance carrier of intent to modify or cancel such insurance coverage.
22. **Termination.**
 - a. Voluntary Termination. This Agreement may be terminated by either party for any reason, by giving at least thirty (30) days' written notice of its intention to withdraw from this Agreement, and by ensuring the continuity of care to patients who already are involved in the transfer process.
 - b. Involuntary Termination. This Agreement shall be terminated immediately upon the occurrence of any of the following:
 1. Either Institution is destroyed to such an extent that the patient care provided by such Institution cannot be carried out adequately;
 2. Either Institution loses, has suspended, or has revoked its operating license or approval, its Joint Commission accreditation, or its Medicare/Medicaid certification;
 3. Either Institution no longer is able to provide the services for which this Agreement was sought; or
 4. Either Institution is in default under any of the terms of this Agreement.
23. **Nonwaiver.** No waiver of any term or condition of this Agreement by either party shall be deemed a continuing or further waiver of the same term or condition or a waiver of any other term or condition of this Agreement.
24. **Governing Law.** This Agreement is made and entered into in the State of _____ and shall be governed and construed in accordance with the laws of _____.
25. **Assignment.** This Agreement shall not be assigned in whole or in part by either party without the express written consent of the other party.

- 26. **Severability.** If any provision of this Agreement shall be held or declared to be invalid, illegal, or unenforceable under any applicable law, such provision shall be deemed deleted from this Agreement and shall be replaced by a valid and enforceable provision that so far as possible achieves the same objectives as the severed provision was intended to achieve, and the remaining provisions of this Agreement shall continue in full force and effect.
- 27. **Amendment.** This Agreement may be amended at any time by a written agreement signed by the parties, which amendment shall be attached to and become a part of this Agreement.
- 28. **Notices.** All notices regarding the transfer or care of patients shall be made via telephone to the parties designated in this Agreement, as amended from time to time. Any other notice required or allowed to be given under this Agreement shall be deemed to have been given upon facsimile transmission with confirmation of receipt, upon personal delivery, or upon deposit in the U.S. mail, registered or certified, with return receipt requested and addressed as follows, unless and until either of the parties notifies the other in accordance with this section of a change of address:

- 29. **Entire Agreement.** This Agreement constitutes the entire agreement between the parties and contains all of the agreements between them with respect to the subject matter hereof and supersedes any and all other agreements, either oral or in writing, between the parties with respect to the subject matter of this Agreement.
- 30. **Binding Agreement.** This Agreement shall be binding upon the successors or assigns of the parties.
- 31. **Confidentiality of Information.** Neither party shall disclose information relating to the operations of the other persons other than to authorized agents or employees of the other, state licensing boards, The Joint Commission, or third-party reimbursement agencies and professional organizations, without the prior written consent of the other party.
- 32. **Headings.** The headings to the various sections of this Agreement have been inserted for convenience only and shall not modify, define, limit, or expand express provisions of this Agreement.
- 33. IN WITNESS WHEREOF, _____ and _____ have executed this Agreement effective the day and year first above written.

APPENDIX 2

These perioperative events *should* be captured and reviewed in the PIPS process for all patients younger than 18 years. Those events so designated *must* be captured with review documented and improvement demonstrable when appropriate.

Children's Surgery Safety Report

Intraoperative events or those occurring within 48 hours of operation:

Event	Should	Must
Airway		
Inadvertent extubation		X
Unanticipated reintubation		X
Respiratory		
Definite aspiration		X
Cardiovascular		
Severe anaphylaxis with hives, wheezing, or hemodynamic effects		X
Cardiac arrest (chest compressions or defibrillation)		X
Malignant hyperthermia: definite, suspected, or use of dantrolene		X
Hemorrhage (≥ 25 mL/kg)	X	
Institution of massive transfusion protocol		X
Unanticipated need for hemodynamic (vasopressor) support	X	
Unanticipated need for ECMO		X
Vascular access complication with vascular injury or pneumothorax	X	
Neurologic		
Stroke or coma		X
Unanticipated seizure	X	
Regional		
Epidural hematoma	X	
Major systemic local anesthetic toxicity	X	
Peripheral neurologic deficit following regional anesthesia: residual sensory, motor, or autonomic block		X
Unanticipated high spinal with bradycardia, respiratory insufficiency, or intubation		X
Infection following epidural or spinal anesthesia: abscess, meningitis, or sepsis	X	
Infection following peripheral nerve block	X	
Postdural headache	X	

Intraoperative or perioperative events occurring as delineated:

Event	Should	Must
Death within 30 days		X
Dental trauma: unanticipated loss of permanent tooth (teeth)	X	
Intraoperative awareness: explicit awareness during anesthesia		X
Medication error: wrong medication or dosing within 48 hours	X	
Operation on incorrect patient		X
Operation on incorrect side		X
Operation: wrong operation performed		X
Surgical fires and/or patient burns		X
Transfusion reaction within 48 hours		X
Unanticipated ICU admission within 48 hours	X	
Unanticipated return to OR within 30 days	X	
Unanticipated inpatient admission within 30 days	X	
Unanticipated transfer to another institution for higher level of patient care within 30 days	X	
Visual loss: permanent impairment or total loss of sight		X
Pressure ulcers related to events in the OR within 30 days	X	
VTE within 30 days		X

Abbreviations: ECMO, extracorporeal membrane oxygenation; ICU, intensive-care unit; OR, operating room; PIPS, performance improvement and patient safety; VTE, venous thromboembolic event.

APPENDIX 3

Criteria for Qualification by Way of Alternative Pathway as Pediatric Anesthesiologist, Pediatric Emergency Medicine Provider, or Pediatric Radiologist

Pediatric Anesthesiology	Pediatric Emergency Medicine	Pediatric Radiology
<p>Numbers 1 through 4 and number 6 must be submitted to the ACS Children’s Surgery Verification Committee office at least 1 month in advance of the on-site visit.</p>	<p>Numbers 1 through 4 and number 6 must be submitted to the ACS Children’s Surgery Verification Committee office at least 1 month in advance of the on-site visit.</p>	<p>Numbers 1 through 4 and number 6 must be submitted to the ACS Children’s Surgery Verification Committee office at least 1 month in advance of the on-site visit.</p>
<p>1. Evidence that the anesthesiologist successfully completed a residency training program in anesthesiology with the time period consistent with the years of training in the United States. This completion must be certified by a letter from the program director that details the pediatric component of the individual’s training.</p>	<p>1. Evidence that the emergency medicine provider successfully completed a residency training program in emergency medicine with the time period consistent with the years of training in the United States. This completion must be certified by a letter from the program director that details the pediatric component of the individual’s training.</p>	<p>1. Evidence that the radiologist successfully completed a residency training program in radiology with the time period consistent with the years of training in the United States. This completion must be certified by a letter from the program director that details the pediatric component of the individual’s training.</p>
<p>2. Documentation of current status as a provider or instructor in the pediatric advanced life support (PALS) program.</p>	<p>2. Documentation of current status as a provider or instructor in the pediatric advanced life support (PALS) program.</p>	<p>2. Documentation of current status as a provider or instructor in the pediatric advanced life support (PALS) program.</p>
<p>3. A list of the 48 hours of children’s anesthesia-related continuing medical education during the past 3 years.</p>	<p>3. A list of the 48 hours of children’s emergency medicine-related continuing medical education during the past 3 years.</p>	<p>3. A list of the 48 hours of children’s radiology-related continuing medical education during the past 3 years.</p>
<p>4. Documentation of membership or attendance at local, regional, or national anesthesia meetings with a children’s component during the past 3 years.</p>	<p>4. Documentation of membership or attendance at local, regional, or national emergency medicine meetings with a children’s component during the past 3 years.</p>	<p>4. Documentation of membership or attendance at local, regional, or national radiology meetings with a children’s component during the past 3 years.</p>
<p>5. The physician’s clinical practice must have been devoted primarily to pediatric anesthesiology for the last 2 years, or at least 30 percent of the clinical practice averaged over the last 5 years must have been devoted to pediatric anesthesiology. The physician’s practice must include neonates and children 2 years or younger and procedures considered high risk. A list of patients younger than 2 years and their procedures treated during the reporting year must be provided.</p>	<p>5. The physician’s clinical practice must have been devoted primarily to pediatric emergency medicine for the last 2 years, or at least 30 percent of the clinical practice averaged over the last 5 years must have been devoted to pediatric emergency medicine. The physician’s practice must include neonates and children 5 years or younger. A list of patients 5 years or younger and their diagnosis treated during the reporting year must be provided.</p>	<p>5. The physician’s clinical practice must have been devoted primarily to pediatric radiology for the last 2 years, or at least 30 percent of the clinical practice averaged over the last 5 years must have been devoted to pediatric radiology. The physician’s practice must include neonates and children 5 years or younger. A list of patients 5 years or younger and their diagnosis treated during the reporting year must be provided. In addition, a list of all patients with intussusception and malrotation treated during the reporting year must be provided.</p>

6. A license to practice medicine and documentation of full and unrestricted anesthesia privileges to care for children younger than 2 years by the hospital's credentialing committee.	6. A license to practice medicine and documentation of full and unrestricted emergency medicine privileges to care for children younger than 5 years by the hospital's credentialing committee.	6. A license to practice medicine and documentation of full and unrestricted radiology privileges to care for children younger than 5 years by the hospital's credentialing committee.
An on-site review will be needed for number 7.	An on-site review will be needed for number 7.	An on-site review will be needed for number 7.
7. The volume and quality of pediatric anesthesia care that is provided by the non-board-certified anesthesiologist must be determined to be adequate during the site review process. The anesthesiologist's care will be evaluated by an on-site reviewer, with oversight by other anesthesiologists who are members of the Children's Surgery Verification Committee and the Verification Committee as a whole. Documentation of internal review by PIPS or other processes will be the basis for this review and must be available for on-site review.	7. The volume and quality of pediatric emergency medicine care that is provided by the non-board-certified emergency medicine provider must be determined to be adequate during the site review process. The emergency medicine provider's care will be evaluated by an on-site reviewer, with oversight by the Children's Surgery Verification Committee. Documentation of internal review by PIPS or other processes will be the basis for this review and must be available for on-site review.	7. The volume and quality of pediatric radiology care that is provided by the non-board-certified radiologist must be determined to be adequate during the site review process. The radiologist's care will be evaluated by an on-site reviewer, with oversight by the Children's Surgery Verification Committee. Documentation of internal review by PIPS or other processes will be the basis for this review and must be available for on-site review.
All seven criteria must be fulfilled as determined by the Children's Surgery Verification Committee for an anesthesiologist to be approved by the alternate pathway.	All seven criteria must be fulfilled as determined by the Children's Surgery Verification Committee for an emergency medicine provider to be approved by the alternate pathway.	All seven criteria must be fulfilled as determined by the Children's Surgery Verification Committee for a radiologist to be approved by the alternate pathway.
A current CV must also be submitted to the Children's Surgery Verification Committee for review at the time of application.	A current CV must also be submitted to the Children's Surgery Verification Committee for review at the time of application.	A current CV must also be submitted to the Children's Surgery Verification Committee for review at the time of application.

Abbreviations: CV, curriculum vitae; PIPS, performance improvement and patient safety.
The alternative-pathway criteria will be applicable to new and previously approved providers.

APPENDIX 4

The American College of Surgeons (ACS) Children's Surgery Verification Committee has reviewed and prepared these optimal resource standards.

The Children's Surgery Verification Committee is derived from the ad hoc Task Force for Children's Surgical Care, which met on four occasions:

April 30–May 1, 2012

Fizan Abdullah, MD, PhD, FACS, Baltimore, MD
Marjorie Arca, MD, FACS, Milwaukee, WI
Douglas Barnhart, MD, MSPH, FACS, Salt Lake City, UT
Stuart Berger, MD, Milwaukee, WI
Mary Brandt, MD, FACS, Houston, TX
Laura Cassidy, PhD, Milwaukee, WI
Clinton Cavett II, MD, FACS, Indianapolis, IN
Li Ern Chen, MD, FACS, Dallas, TX
Jacquelyn Evans, MD, Philadelphia, PA
Keith Georgeson, MD, FACS, Spokane, WA
Adam Goldin, MD, FACS, Seattle, WA
David B. Hoyt, MD, FACS, Chicago, IL
Bruce Kaufman, MD, FACS, Milwaukee, WI
Jacqueline Kueser, Kansas City, KS
Lynn Martin, MD, Seattle, WA
R. Lawrence Moss, MD, FACS, Columbus, OH
Keith Oldham, MD, FACS, Milwaukee, WI
Shawn Rangel, MD, FACS, Boston, MA
Thomas Ricketts, PhD, Chapel Hill, NC
Marshall Schwartz, MD, FACS, Philadelphia, PA
Thomas Tracy, MD, FACS, Providence, RI
Mark Wietecha, Washington, DC

May 30–31 2013

Rick Abbott, MD, Bronx, NY
Fizan Abdullah, MD, PhD, FACS, Baltimore, MD
Marjorie Arca, MD, FACS, Milwaukee, WI
Douglas Barnhart, MD, MSPH, FACS Salt Lake City, UT
Stuart Berger, MD, Milwaukee, WI
Mary Brandt, MD, FACS, Houston, TX
Laura Cassidy, PhD, Milwaukee, WI
Clinton Cavett II, MD, FACS, Indianapolis, IN
Li Ern Chen, MD, FACS, Dallas, TX
Craig Derkay, MD, FACS, Norfolk, VA
Jay Deshpande, MD, Little Rock, AK
Jacquelyn Evans, MD, Philadelphia, PA
Mary Fallat, MD, FACS, Louisville, KY
Keith Georgeson, MD, FACS, Spokane, WA,
Constance Houck, MD, Boston, MA
Adam Goldin, MD, FACS, Seattle, WA
David B. Hoyt, MD, FACS, Chicago, IL

Bruce Kaufman, MD, FACS, Milwaukee, WI
Michael Klein, MD, FACS Detroit, MI
Thomas Krummel, MD, FACS, Palo Alto, CA
Jacqueline Kueser, Kansas City, KS
Lynn Martin, MD, Seattle, WA
R. Lawrence Moss, MD, FACS, Columbus, OH
Keith Oldham, MD, FACS, Milwaukee, WI
Shawn Rangel, MD, FACS, Boston, MA
Robert Sawin, MD, FACS, Seattle, WA
Mark Wietecha, Washington, DC

May 21–22, 2014

Rick Abbott, MD, Bronx, NY
Fizan Abdullah, MD, PhD, FACS, Baltimore, MD
Marjorie Arca, MD, FACS, Milwaukee, WI
Douglas Barnhart, MD, MSPH, FACS, Salt Lake City, UT
Stuart Berger, MD, Milwaukee, WI
Mary Brandt, MD, FACS, Houston, TX
Clinton Cavett II, MD, FACS, Indianapolis, IN
Li Ern Chen, MD, FACS, Dallas, TX,
Jim Couto, MA, Elk Grove Village, IL
Craig Derkay, MD, FACS, Norfolk, VA
Jay Deshpande, MD, Little Rock, AK
Jacquelyn Evans, MD, Philadelphia, PA
Mary Fallat, MD, FACS, Louisville, KY
Randall Flick, MD, MPH, Rochester, MN
Henri Ford, MD, FACS, Los Angeles, CA
Keith Georgeson, MD, FACS, Spokane, WA
Adam Goldin, MD, FACS, Seattle, WA
BJ Hancock, MD, FACS, Winnipeg, MB, Canada
Constance Houck, MD, Boston, MA
David B. Hoyt, MD, FACS, Chicago, IL
Tyler G. Hughes, MD, FACS, McPherson, KS
Bruce Kaufman, MD, FACS, Milwaukee, WI
Michael Klein, MD, FACS, Detroit, MI
Clifford Ko, MD, FACS, Chicago, IL
Amy Knight, CHA, Washington, DC
Thomas Krummel, MD, FACS, Palo Alto, CA
Lynn Martin, MD, Seattle, WA
R. Lawrence Moss, MD, FACS, Columbus, OH
Keith Oldham, MD, FACS, Milwaukee, WI
James Perrin, MD, FAAP, Boston, MA

David Plager, MD, Indianapolis, IN
Shawn Rangel, MD, FACS, Boston, MA
Karen Richards, Chicago, IL
Thomas Ricketts, PhD, Chapel Hill, NC
Ramesh Sachdeva, MD, FACS, FAAP, Chicago, IL
Robert Sawin, MD, FACS, Seattle, WA
Marshall Schwartz, MD, FACS, Philadelphia, PA
Mark Wietecha, Washington, DC

October 5, 2015

Lisa Allen, MD, Toronto, Ontario, CA
Rick Abbott, MD, Bronx, NY
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Douglas Barnhart, MD, MSPH, FACS, Salt Lake City, UT
Stuart Berger, MD, Sacramento, CA
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Jay Deshpande, MD, Little Rock, AK
Jacquelyn Evans, MD, Philadelphia, PA
Mary Fallat, MD, FACS, Louisville, KY
Randall Flick, MD, MPH, Rochester, MN
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Keith Georgeson, MD, FACS, Spokane, WA
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Kenneth Guidera, MD, Tampa, FL
BJ Hancock, MD, FACS, Winnipeg, MB, Canada
Ronald Hirschl, MD, FACS, Ann Arbor, MI
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Tyler G. Hughes, MD, FACS, McPherson, KS
Bruce Kaufman, MD, FACS, Milwaukee, WI
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David Mooney, MD, FACS, Boston, MA
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Keith Oldham, MD, FACS, Milwaukee, WI
David Plager, MD, Indianapolis, IN
Shawn Rangel, MD, FACS, Boston, MA
Thomas Ricketts, PhD, Chapel Hill, NC
Robert Sawin, MD, FACS, Seattle, WA
Marshall Schwartz, MD, FACS, Philadelphia, PA
Thomas Tracy, MD, FACS, Providence RI
David Tuggle, MD, FACS, Austin, TX
Kasper Wang, MD, FACS, Los Angeles, CA
Mark Wietecha, Washington, DC

Notes

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Children's Surgery Verification™

QUALITY IMPROVEMENT
PROGRAM



AMERICAN COLLEGE OF SURGEONS

*Inspiring Quality:
Highest Standards, Better Outcomes*

100+years